JOHN DEERE

2021 TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURE

SUMMARY

A team of climate and operations experts at John Deere reviewed and prioritized a universe of 50 potential climate-related risks and opportunities involving John Deere's business. These included physical and transition risks and opportunities involving Deere's operations, supply chain and customers. Six risks and two opportunities were identified to be further assessed through scenario analysis.

Each of the eight risks and opportunities were researched against two potential climate scenarios. The Deere team reviewed the research and rated the impact and likelihood of each risk and opportunity under a "high emissions" scenario (RCP 8.5) and a "low emissions" scenario (RCP 2.6) leveraging Deere's enterprise risk management criteria for these ratings.

KEY TAKEAWAYS

1. Under the low emissions scenario (RCP 2.6), **new disruptive business models and technologies** was the risk with the highest likelihood and impact to Deere's business.

2. Under the high emissions scenario (RCP 8.5), **acute weather events reducing crop yield for farmers** risk emerged as the highest likelihood and impact to Deere's business.

3. While the demand for existing fuel-efficient products was rated the most likely opportunity for Deere, the opportunity to provide **new products and services** to meet farmer demand for carbon sequestration and sustainable farming emerged as the most impactful.

This report outlines our Governance, Strategy, Risk Management and Metrics & Targets related to climate change. For further details related to the projects and initiatives we are working on to mitigate risks and optimize opportunities, please see pages 32-35 of the John Deere 2021 Sustainability Report.

GOVERNANCE

a) Describe the board's oversight of climate-related risks and opportunities.

The Deere & Company Board of Directors has oversight of sustainability and is responsible for aligning our strategic priorities as well as ensuring Environmental, Social, and Governance (ESG) principles are integrated throughout the enterprise. The Corporate Governance Committee reviews ESG topics on a quarterly basis. Through regular engagement, the committee guides and directs our strategic ESG planning, ESG goal setting, and the scope of our sustainability reporting.

The Compensation Committee is responsible for ensuring that compensation is aligned with the strategic priorities, performance and opportunities of the company. Throughout 2021, the committee was involved in understanding our progress toward setting the Leap Ambitions and understanding the priorities that will move our business forward over the next decade.

In addition, the full Board of Directors has oversight of the risks and opportunities associated with climate change. Updates are provided in alignment with our Enterprise Risk Management process.

b) Describe management's role in assessing and managing climate-related risks and opportunities.

CEO Staff

John Deere's CEO Staff provides direction for and ultimately owns the execution of our sustainability initiatives. Oversight and ownership at this level ensures that our sustainability initiatives are aligned with and a core component of our overall business strategy. CEO Staff receives updates from the sustainability teams throughout the year. During 2021, these updates encompassed the following topics: Scope 3 greenhouse gas emissions quantification and Science Based Targets initiative-based goals; goal-setting priorities; performance on 2022 targets and metrics; status updates on projects and initiatives enabling our ESG priorities; sustainability reporting trends and multiyear roadmap; and stakeholder feedback.

Sustainability Leadership Team

The Sustainability Leadership Team is comprised of a group of leaders from our Environmental, Health & Safety, Production Systems, Technology, and Finance organizations. This team engages closely with the teams working on setting strategic ESG priorities, driving toward delivery of our sustainability goals, and determining the roadmap for effective reporting. The group also works to engage with other leaders across the company to ensure alignment of our strategic ESG priorities with our business objectives, technology roadmap, and financial performance.

Goal Champions

Each of our sustainability-related Leap Ambitions has a Goal Champion. Each Goal Champion has ownership of the delivery of that goal and is responsible for aligning priorities and resources throughout the organization, reviewing progress and challenges, and driving execution of initiatives to meet the goals.

Climate Team

During 2021, we organized a new Climate Team within the organization (replacing the previous Climate Change and Carbon Risk Team), which is comprised of a cross-functional team of individuals whose roles are responsible for action related to the various risks and opportunities that we have identified for our business related to climate change. This team monitors developments, quantifies risk and opportunities, develops action plans, and engages throughout the organization to ensure alignment and assess performance toward our goals and targets. Members of this team engaged in a variety of projects this year, including quantifying our Scope 3 GHG emissions, setting Science Based Targets, executing a Carbon Market Pilot program with customers, and external engagement on policy and industry trends.

STRATEGY

a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.

b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.

TRANSITION RISKS

Transition to lower emissions technology

Risk type: Technology

Description: Demand for electric farm equipment and alternative farming models (e.g., indoor farming, equipment as a service) is expected to rise, more so in a low emissions climate scenario (RCP 2.6) than a high emissions scenario (RCP 8.5), as farmers look for ways to increase efficiency and yields and reduce costs and emissions in their operations. While electrification in large equipment is currently only in test phases or niche markets, John Deere's competitors are investing in these technologies to enter this market and claim market share. Additionally, using hydrogen as a fuel source has some advantages to Deere customers (e.g., significant improvement on charge time) and the indoor farming model could become increasingly attractive as water scarcity and urbanization increases. If John Deere fails to properly invest in new technologies to meet customer demands, we will be at risk of losing potential revenue sources in the future. This analysis considered a long-term view of four years or greater, in alignment with John Deere's strategic planning.

Impact
Time horizon: Long-term
Likelihood: More likely than not
Magnitude of impact: Medium
Primary potential financial impact: Decreased revenues due to reduced demand for traditional products and services

Carbon Pricing Mechanism on Deere & Company

Risk type: Policy and Legal

Description: John Deere's operating costs could be impacted if regulators enact a carbon pricing mechanism (e.g., carbon tax, emissions trading scheme). Under a high emissions scenario (RCP 8.5), we assume little to no increase in carbon pricing over time and thus no financial impact to Deere's operations. Under a low emissions scenario (RCP 2.6), we assume a carbon price of approximately $100/mt by 2050 which will result in significantly higher operating costs for Deere in the future. This analysis considered a long-term view of four years or greater, in alignment with John Deere's strategic planning.

Impact
Time horizon: Long-term
Likelihood: Likely
Magnitude of impact: Medium-low
Primary potential financial impact: Increased indirect (operating) costs

STRATEGY

a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.

b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.

Carbon Pricing Mechanism on Production Inputs

Risk type: Policy and Legal

Description: Many of John Deere's production inputs are carbon intensive and highly susceptible to increased costs from physical impacts of climate change and regulatory action. Physical risks to energy infrastructure intensify under a high emissions scenario (RCP 8.5), which could result in an estimated 8-12 percent increase in energy costs by 2050. Additionally, a carbon tax would significantly raise the cost of steel and aluminium production especially under a low emissions, high regulatory action scenario (RCP 2.6). This analysis considered a long-term view of four years or greater, in alignment with John Deere's strategic planning.

Impact
Time horizon: Long-term
Likelihood: More likely than not
Magnitude of impact: Medium-low
Primary potential financial impact: Increased indirect (operating) costs

Carbon Pricing Mechanism on Customers

Risk type: Policy and Legal

Description: Under a low emissions, high regulation scenario (RCP 2.6), changes in climate policy, including carbon taxation, have the potential to increase input costs for farmers resulting in decreased or shifting demand for John Deere products. For example, a carbon tax on fuels could drive farmers away from gas and diesel John Deere products towards equipment that uses lower-carbon fuels or electric equipment from competitors. Additionally, as global demand for fuels overall may decrease under this low emissions scenario, demand for bio-based fuels produced from crops has the potential to decrease also, resulting in negative financial impacts for row crop farmers and potentially decreased revenue for John Deere. However, depending on how global policies develop and the agricultural industry adapts, we think the evolution of bio and renewable fuels is one of the greatest potential opportunities for our business. This opportunity is discussed further below in this section under *"Development and/or expansion of goods and services – alternative fuels."*

In a high emissions scenario (RCP 8.5), we would not expect to see a major impact on fuel or biofuel demand. We would expect to see an increase in pests and weeds resulting in the increased need for pesticides and fertilizer use. We would expect this to increase costs for farmers which could negatively impact demand for John Deere products. However, this could also drive increased demand specifically for John Deere's precision technology solutions that enable customers to maintain or enhance outcomes while using less inputs. This analysis considered a long-term view of four years or greater, in alignment with John Deere's strategic planning.

Impact
Time horizon: Long-term
Likelihood: More likely than not
Magnitude of impact: Medium
Primary potential financial impact: Decreased revenues due to reduced demand for products and services

STRATEGY

a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.

b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.

PHYSICAL RISKS

Increased severity and frequency of extreme weather events such as heat waves and storms

Risk type: Acute

Description: The IPCC assessment reports find extreme weather conditions will worsen as a result of climate change. Under a high emissions scenario (RCP 8.5), we assume a nine times increase in frequency of heatwaves, 30 percent increase in severity of heavy rain storms, and a 35 percent increase globally in high fire danger. Under a low emissions scenario (RCP 2.6), extreme weather is still expected to increase though not to the extent of the high emissions scenario. As a result, farmers may see reduced crop yields over time due to extreme weather events. Crop insurance can mitigate the direct financial impact of lost yields to farmers, but insurance premiums could rise and reduce profit margins for farmers. These potential changes in revenue and profit margins could result in decreased cash on hand for John Deere products. This analysis considered a long-term view of four years or greater, in alignment with John Deere's strategic planning.

Impact
Time horizon: Long-term
Likelihood: Likely
Magnitude of impact: Medium
Primary potential financial impact: Decreased revenues due to reduced farmer spending

Changes in precipitation patterns and extreme variability in weather patterns

Risk type: Chronic – Physical

Description: IOP Science estimates that drought conditions will be eight times as prevalent in the high emissions scenario (RCP 8.5) compared to today, and two times as prevalent under the low emissions scenario (RCP 2.6). Drought conditions are expected to increase demand for irrigation by 15-25 percent under the high emissions scenario, with a slight increase in demand under the low emissions scenario. Limited irrigation adaptation could lead to constrained water resources and most John Deere markets would likely see increased irrigation costs, which has the potential to significantly increase costs to farmers growing crops in areas under significant drought. Under the high emissions scenario, areas under water stress may see a decrease in crop production causing John Deere sales to decrease in these markets. This analysis considered a long-term view of four years or greater, in alignment with John Deere's strategic planning.

Impact
Time horizon: Long-term
Likelihood: More likely than not
Magnitude of impact: Medium-low
Primary potential financial impact: Decreased revenues due to reduced demand for products and services

STRATEGY

a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.

b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.

OPPORTUNITIES

Development and/or expansion of goods and services – agricultural practices

Opportunity type: Products and Services

Description: As farmers look for ways to reduce emissions, especially under a low emissions scenario (RCP 2.5), John Deere has the opportunity to help farmers meet their emission reduction and sustainability goals through new equipment and services. John Deere products could support regenerative agriculture practices such as cover cropping, hasten outdated equipment through performance upgrades or retirement, and supply soil carbon measurement products (similar to nitrogen sensing product lines). In particular we expect the value of the John Deere Tech Stack and Operations Center platform to increase as the agricultural community looks to validate carbon sequestration and optimize inputs such as water, fertilizer and pesticides. John Deere Financial also has the opportunity to ease farmers' transition costs via unique financing options. This opportunity relies heavily on the low emissions scenario as the high emissions scenario (RCP 8.5) is not likely to yield the same demand for sustainable farming products and services. This analysis considered a long-term view of four years or greater, in alignment with John Deere's strategic planning.

Impact
Time horizon: Long-term
Likelihood: More likely than not
Magnitude of impact: Medium-low
Primary potential financial impact: Increased revenues through access to new and emerging markets

Development and/or expansion of goods and services – alternative fuels

Opportunity type: Products and Services

Description: The sustainable fuel market is poised for significant growth, with an estimated 8.3 percent CAGR from 2021 to 2030. Under a low emissions scenario (RCP 2.6) where alternative fuels are recognized and potentially incentivized as a critical component of the transition away from high-carbon fuels, we would expect to see demand for equipment and education around a variety of bio and renewable fuels to be higher than under a high emissions scenario (RCP 8.5). This would provide John Deere the opportunity to supply equipment that utilizes low-carbon fuels, new equipment that enables our customers to produce crops for bio and renewable fuel production, and the opportunity for John Deere Financial to partner with farmers to transition towards these new fuels. However, depending on how global policies develop and the agricultural industry adapts, we think the evolution of bio and renewable fuels is also a potential risk for our business. This risk is discussed further above in this section under *"Carbon Pricing Mechanism on Customers."* This analysis considered a long-term view of four years or greater, in alignment with John Deere's strategic planning.

Impact
Time horizon: Long-term
Likelihood: More likely than not
Magnitude of impact: Medium-low
Primary potential financial impact: Increased revenues through access to new and emerging markets

STRATEGY

c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

SCENARIO ANALYSIS

John Deere chose the RCP 8.5 scenario as the "high emissions" scenario to evaluate impact and likelihood of physical risks of climate change. Deere chose this scenario as it has been cited by Woodwell Climate Research Center that current emissions are tracking most closely to this scenario. 2050 was selected as a time horizon, as many global net zero targets and world governments align with 2050.

John Deere chose the RCP 2.6 scenario as the "low emissions" scenario to evaluate impact and likelihood of transition risks of climate change. Deere chose this scenario as it represents the "bookend" scenario to RCP 8.5. Including RCP 2.6 in the scenario analysis will allow Deere to understand the broad spectrum of potential climate-related risks and opportunities. 2050 was selected as a time horizon, as many global net-zero targets and world governments align with 2050.

During the second workshop, the working group evaluated each risk and opportunity for impact to John Deere's business and the likelihood that the risk or opportunity will occur. The top risks and opportunities, and the associated drivers, were then assessed under two climate scenarios ("low emissions" and "high emissions") using ERM criteria.

Our assessment of risks and opportunities under the two scenarios was qualitative and quantitative. The scenario analysis considered all areas of the organization. We considered risks to Deere's business and primary customers (farmers). Physical risks, such as rising mean temperature and increased frequency and severity of acute weather events, were found to have significant potential impact to farmers, especially under the RCP 8.5 scenario. Transition risks, such as cost of new business models as farmers seek more sustainable farming practices, were found to have significant potential impact to Deere, especially under the RCP 2.6 scenario.

The scenario analysis results will be used to further enhance existing risk management practices and establish risk responses and procedures for climate-related risks and opportunities that are not currently managed. The results have been discussed with the Deere management team to identify opportunities for further integration into Deere's annual risk management procedures.

For example, during the scenario analysis, a top risk identified under the RCP 8.5 scenario in terms of highest impact and likelihood to John Deere was the physical risk to farmers of increased drought creating pressure on water resources. Under this scenario, drought conditions are modelled to be eight times as prevalent compared to today globally, though there is variation in drought exposure regionally. This could lead to a 15-25 percent increase in demand for irrigation in almost all John Deere markets. This quantitative assessment was then used to develop a qualitative analysis on the impact to Deere. We determined that while limited water availability could increase costs to farmers, thus trimming profits and reducing farmers ability to purchase Deere products, it could also create an increased demand in alternative farming methods such as precision agriculture.

Similarly, during the scenario analysis, the top risk identified under the RCP 2.6 scenario in terms of highest impact and likelihood to John Deere. was the cost of new disruptive business models and technology related to moving to a low-carbon economy. We assessed the costs of several types of transformative low-carbon business models for farming, including electrification of equipment, indoor farming, equipment as a service, and miniaturization/autonomous equipment. Under RCP 2.6, we determined that electrification would see the most significant and rapid growth, with estimates of up to 18 percent compound annual growth rate (CAGR). Should John Deere fail to adapt to the changing demand in farming equipment from farmers, we have the potential to lose revenue and market share opportunities.

RISK MANAGEMENT

a) Describe the organization's processes for identifying and assessing climate-related risks.

b) Describe the organization's processes for managing climate-related risks.

c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.

Since 2009, the company has had a Climate Team (prior to 2021 the company had a Climate Change and Carbon Risks Team). The current team is composed of global representatives from Environmental, Agronomy, Public Affairs, Legal, Strategic Marketing, Energy, and Sustainability. Climate change risks and opportunities are reported to this team at the production system, division and company levels via quarterly meetings. This team monitors changes in climate science, technical issues such as land-based offset protocol developments, macro and sector level economics related to forestry and agricultural modelling, carbon and fuel prices, representative customer trade associations' positions, climate regulation and legislation globally, and other carbon marketplace news. The team discusses if the company or any division or facility should be doing anything differently and may include discussion of asset processes, company processes, or customer processes.

The Climate Team utilizes a variety of tools to identify and assess climate-related risks. In 2021, this team, working with others in the organization, assessed climate-related risks and opportunities to our business in alignment with the Task Force on Climate-related Financial Disclosures (TCFD). This assessment utilized the methodologies outlined by TCFD as well as our global risk management process described above. This process involved conducting two TCFD workshops with representatives across Deere's organization to determine a) which climate-related risks and opportunities are most impactful to our business and b) the impact and likelihood ratings of those top risks and opportunities under two climate scenarios (RCP 2.6 and RCP 8.5).

METRICS AND TARGETS

a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.

c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

In February 2022, John Deere launched a new suite of Leap Ambitions, which include climate goals focused on Scopes 1, 2 and 3 greenhouse gas emissions. We have committed to achieving a 50 percent absolute reduction of operational CO_2e emissions (Scope 1 & 2) and 30 percent absolute reduction of upstream and downstream CO_2e emissions (Scope 3 Categories 1 and 11). Deere has committed to setting these goals with the Science Based Targets initiative.

At the same time, Deere is committed to delivering on its existing suite of 2022 Sustainability Goals, including a goal to reduce greenhouse gas emissions by 15 percent (as compared to 2017 as the baseline) through 50 percent renewable electricity supply and excellence in energy efficiency. We are on track to meet this goal.

b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.

Fiscal Year 2021 GHG Emissions	**Metric Tons CO_2e**
Scope 1	403,300
Scope 2	407,700
Scope 3	112,453,000
Category 1	7,336,000
Category 11	105,117,000