

# Assessing climate-related risks in the global meat industry

March 2020

## FAIRR has developed the first-ever tool to help investors assess financial implications of climate-related risks on the global meat sector.

The Collier FAIRR Climate Risk Tool has been developed by the FAIRR Initiative, which was established by the Jeremy Collier Foundation. FAIRR has worked with climate modelling experts to create a tool that helps investors understand how climate-related physical and transition risks and opportunities will impact investments in primary producers of animal proteins in a 2°C scenario.

The tool is based on scenario analysis, as recommended by the Task Force on Climate Related Financial Disclosures (TCFD), to explore how climate change may over time impact companies in the sector under a given set of assumptions and constraints.

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“Climate change is real and so are its financial impacts. The cost of powering poultry sheds, of sourcing feed for livestock and veterinary care will all rise as global temperatures do. This ground-breaking financial model has done the maths. Investors can see the inescapable truth for the meat sector is that it must adapt to climate change or face ruin in the years ahead. Conversely, there is also an appetising prospect of enormous upside if the world's meat companies shift their protein mix to align with a climate-friendly path.”

### Jeremy Collier

Founder of FAIRR and  
Chief Investment Officer  
at Collier Capital



## The tool is designed as a first step to enhance forward-looking analysis on the meat sector.

It aims to give an indication of the trend in a company's financial performance and does not proclaim to predict accurate and precise performance forecasts since forward-looking scenarios are inherently highly uncertain.

Scenario analysis is, by definition, not a sensitivity analysis or a forecast. It is based on a consistent cluster of assumptions that describe a certain world (in this case, a global temperature increase by 2°C compared to pre-industrial levels). As such, the assumptions made are not attached to any likelihood or probability and are based on a high level of uncertainty.

This analysis should be considered as a conceptual tool to inform discussions and engagement with protein-producing companies about their strategic positioning and adaptation to the consequences of climate change.

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“ Scenarios are not intended to represent a full description of the future, but rather to highlight central elements of a possible future and to draw attention to the key factors that will drive future developments. It is important to remember that scenarios are hypothetical constructs; they are not forecasts or predictions, nor are they sensitivity analyses.

*A key feature of scenarios is that they should challenge conventional wisdom about the future. In a world of uncertainty, scenarios are intended to explore alternatives that may significantly alter the basis for “business-as-usual” assumptions.*

### **Task Force on Climate-related Financial Disclosures (TCFD)**

Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities

# Objective:

## To understand the financial implications of a 2°C increase in average global temperatures on the meat sector.

The tool identifies seven key risks that will impact the profitability of the meat sector in IPCC scenarios that limit warming to 2°C. The basis for this scenario analysis is data from the IPCC Reports, combining scientific research on emissions pathways that would lead – with a likelihood of 66% - to a global warming potential of 2°C.

It is accompanied by an [interactive online tool](#), available exclusively to FAIRR's investor members, where users can input their own data. The results of the tool showcase company-level impacts on profitability rather than sector-level impacts.

The contents of the model and online tool have been created and tested with the greatest possible care. However, FAIRR does not guarantee the accuracy, completeness and timeliness of the content provided. FAIRR is not liable for lost profits, missed savings, damages from third party claims and other direct damages. The pure use of this tool does not constitute a contractual relationship between the user and FAIRR. The model and report do not constitute the provision of advice on legal, economic, investment or other professional issues and services.

## About this tool

This tool uses established climate scenario sources to define a likely 2°C transition pathway:

- Capros et al 2012, Trieu et al 2013, IEA 2016A, IEA 2016B
- The IEA Stated Policies Scenario
- IPCC climate change and land use reporting

The tool is applicable to primary producers classified within Global Industry Classification Standard (GICS) as Packaged Foods & Meats and produce beef, poultry and/or pork. It is not currently applicable to primary producers of dairy and aquaculture. It focuses on geographies with the large meat producers: Brazil, Canada, UK and the US.

# Acknowledgements

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Christina Downend, Climate Change Manager, **Tesco**

Laurence Webb, Responsible Sourcing Manager, **Tesco**

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5. Actions for investors and companies

1.

# Key findings and recommendations

# Key findings: Disruption at the sector and company level



SECTOR IMPACTS	COMPANY VARIATION	TIMING OF RE-PRICING	REGIONAL VARIATION	UNLISTED IMPACTS
<p>As a particularly carbon exposed sector, the protein industry is a top candidate for <b>substantial devaluation</b>.</p> <p>Sector performance, and payoff to the most adaptable companies, depends largely on the <b>scale of carbon policy</b> and <b>shifts in consumer preferences away from conventional proteins</b>.</p>	<p>There are <b>big differences in the market position and likely performance</b> of listed protein sector companies.</p>	<p><b>A large market repricing is likely to occur sometime near 2025</b>, when climate policy is assumed to start affecting cash flows of companies.<sup>1</sup></p> <p><b>Increased volatility is also likely</b> with an event-driven price adjustment.</p>	<p>Increasing wealth and meat demand in <b>developing countries</b> is offset somewhat by the prevalence of unsustainable business activities, particularly regarding <b>deforestation and water consumption</b>.</p>	<p><b>Many alternative meat companies are not yet listed or are currently only venture-scale.</b> Passive investors are, therefore, unlikely to be as exposed to the upside as the downside of re-pricing.</p>

1. The Inevitable Policy Response – UNPRI, Vivid Economics and Energy Transition Advisors

# Limitations & areas for further research

**There are several additional risks not reflected in the analysis that investors need to consider:**

- **Acute physical risks**, such as infrastructure and livestock losses from floods or droughts, are not explicitly modelled or priced.
- A variety of **difficult-to-quantify indirect risks** are not modelled, including reputational and litigation risks.
- Assets at **risk of stranding** in a low carbon transition, such as slaughterhouse assets in areas of prevalent tropical deforestation, are not completely accounted for in the model.
- Possible **market contagion** and high-volatility – as previously experienced in other re-pricing events – is not modeled
- This analysis is currently based on beef, poultry and pork production and focuses on key meat-producing regions (North America, Latin America, Europe). This means that modelling does not completely account for firms that are **privately held or other regions**, which will have slightly different risk exposure.
- Moreover, several key uncertainties affect the robustness of the results including uncertainties around **data, climate change models** and **policy pathways**. These could be improved by higher policy clarity from governments and improved data disclosure from companies (such as green revenues, carbon footprints and supply chains).



# Investors should use results to understand where their portfolio is heading under a disruptive two-degree transition

The analysis highlights the importance **of a forward-looking climate risk assessment** in the protein industry. The results are designed to help inform **investor and company implementation of the TCFD recommendations** on a forward-looking risk assessment and climate scenario analysis, alongside Paris-aligned scenarios.

## EXTERNAL ACTIONS

Asset owners should engage with asset managers and service providers to understand how they are factoring climate risk in the agricultural sector

All investors can use results to engage with exposed companies, including policy response, alternative meat technologies, climate-resilient supply chains, and animal and geography exposure

Continue to advocate and engage for earlier and more ambitious climate action to minimise the disruption from a disorderly transition and increasingly severe physical risks in the meat sector

## INTERNAL ACTIONS

Asset owners can use the 2°C scenario as one potential pathway and define risk mitigation strategies and timing of transition for exposed protein equities

Asset owners may want to review equity asset allocation strategies and the proportion of passive and active mandates

Active investors can consider climate as a factor potentially creating alpha from a progressive protein portfolio

Investors can use benchmarks, such as the Coller FAIRR Index, to identify leaders and laggards in climate management and alternative meat investment

2.

# Industry Risks

# Financial markets are underprepared for climate-related risks

Physical and transition risks are not priced into today's markets. Yet these risks are becoming severe, with increasingly forceful policy responses likely over the next decade.

**The animal protein industry  
is particularly exposed.**

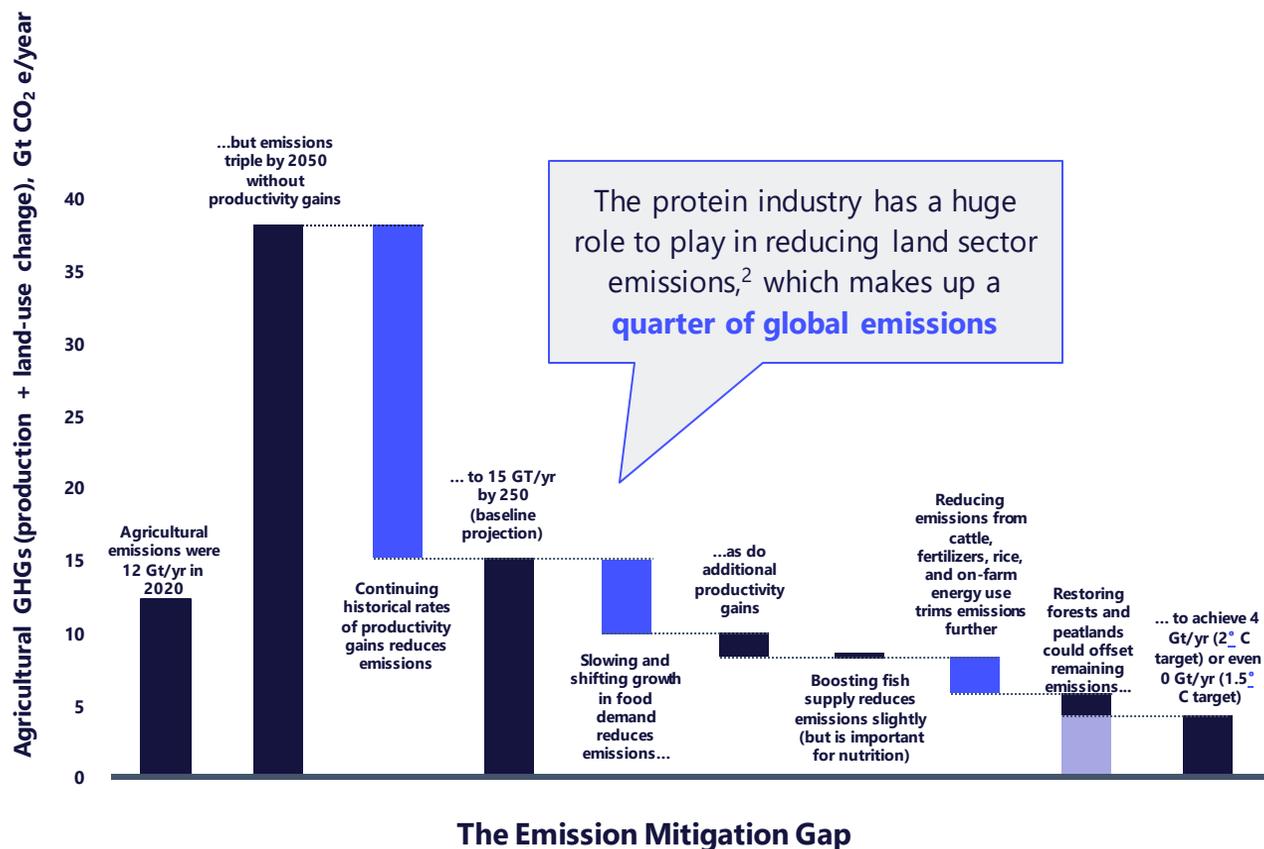


**Investors failing to account for these risks  
will misallocate capital and investment by  
overpaying for assets expected to underperform  
financially.**

# Livestock has a key role to play in curbing global emissions

## IPCC Special report on 1.5 degrees<sup>1</sup>

- Human activity so far has caused ~1°C of warming
- The emissions budget for 1.5°C will be exceeded **before 2030** even if all current Paris Agreement commitments are met
- The risks in a 2°C world are much higher than 1.5°C – risk increase is severe and non-linear
- Physical risks, such as extreme weather events and temperature increases are already affecting agricultural productivity
- These risks will gradually but continuously worsen



The protein industry has a huge role to play in reducing land sector emissions,<sup>2</sup> which makes up a **quarter of global emissions**

This model uses IPCC scenarios that limit warming to 2°C in 2050. However, some of the impacts described by these scenarios may play out sooner than 2050.

# Climate-related risks can be divided into different types

		TRANSITION RISK <sup>1</sup>				PHYSICAL RISK <sup>1</sup>	
		MARKET	REGULATION, POLICY, LEGAL	CONSUMER RESPONSE	TECHNOLOGY	CHRONIC	ACUTE
INDIRECT	DIRECT	Input cost increases	Carbon pricing and operational regulations	Shifting diets and consumer preferences	Investments required to enhance productivity and yield	Declining water supply Higher livestock mortality and lower growth rates due to temperature increase <sup>2</sup>	Losses due to hurricanes or flooding
	INDIRECT	Downstream buyers imposing sustainability requirements on suppliers, limiting market access	Litigation Increased enforcement of land zoning	Reputational risk and supply chain transparency initiatives	Competition with alternative meats	Increased feed costs, as well as lower availability and quality due to changing temperature and precipitation patterns	Input supplier shortages resulting from extreme weather Spread of pests and diseases

**'Transition':** Risks related to the transition to a lower-carbon economy

**'Physical':** Risks related to the physical impacts of climate change

**'Direct':** Risks to companies that affect their operations

**'Indirect':** Risks that act on a company's environment, affecting business operations through other actors, often in the supply chain

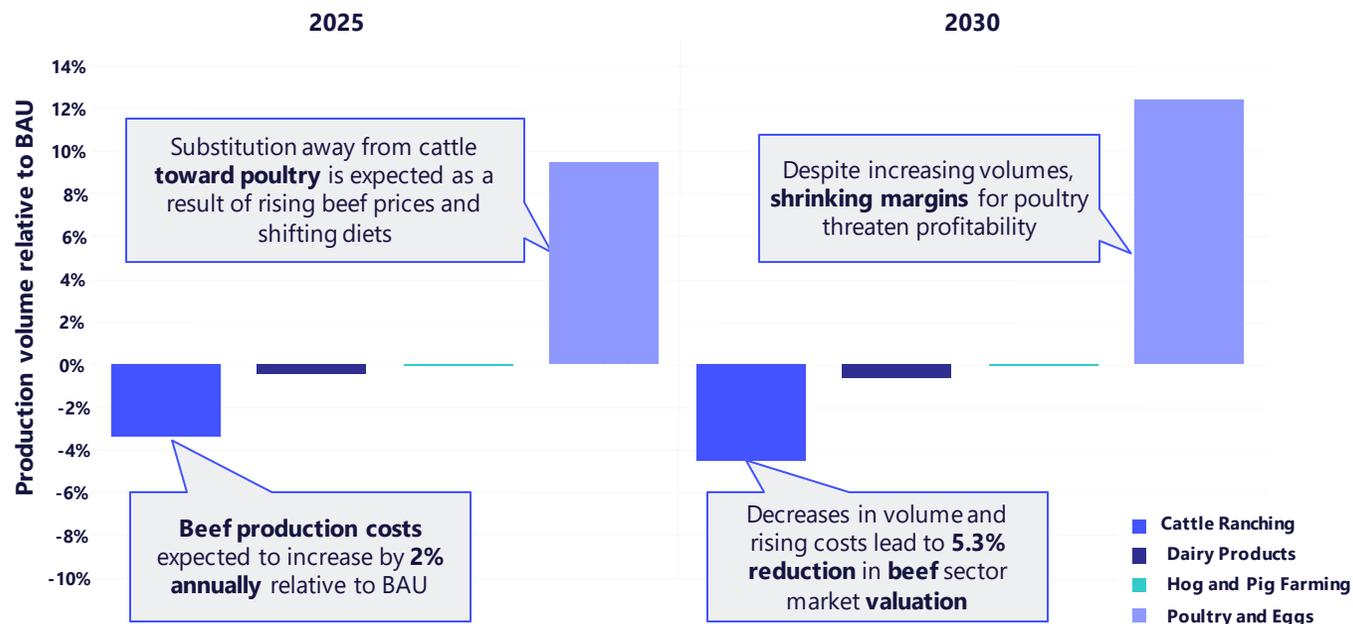
Note: Sample list of risks (not exhaustive)

- Adapted from TCFD Recommendations, p.10-11: <https://www.fsb-tcf.org/wp-content/uploads/2017/06/FINAL-2017-TCFD-Report-11052018.pdf>
- IPCC Special Report on Climate Change and Land, Chapter 3: Impacts of 1.5C of Global Warming on Natural and Human Systems, p.237: [https://www.ipcc.ch/site/assets/uploads/sites/4/2019/12/02\\_Summary-for-Policymakers\\_SPM.pdf](https://www.ipcc.ch/site/assets/uploads/sites/4/2019/12/02_Summary-for-Policymakers_SPM.pdf)

# Direct risks alone suggest substantial risk to protein sectors

## Direct risks

- Expected advances in international carbon pricing and markets
- Paris Nationally Determined Contributions
- Deforestation and biodiversity no-net-loss commitments (REDD+/GCF)
- Buyer and seller country controls
- Energy efficiency requirements
- Expanding voluntary offset markets
- Substantial investment in yield enhancing technologies
- Changing consumer preferences



Even before accounting for indirect risks, recent modelling work suggests that the beef sector is particularly exposed to risk implying it is currently overvalued by 5.3%.

# Case study: Carbon tax on meat is no longer hypothetical

## New Zealand Zero Carbon Bill<sup>1</sup> ...



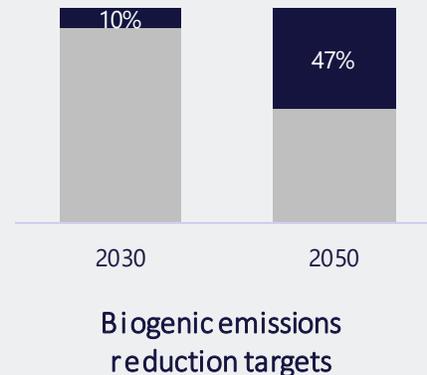
### Climate Change Response (Zero Carbon) Amendment Act 2019

Public Act 2019 No 61  
Date of assent 13 November 2019  
Commencement see section 2

Bill introduced to deliver commitment to making country carbon net-zero by 2050

## ... which has different regulations for methane emissions

Aims to cut **10%** of biological methane by 2030 and up to **47%** by 2050



## Livestock emissions



Farm-level levy or rebate scheme

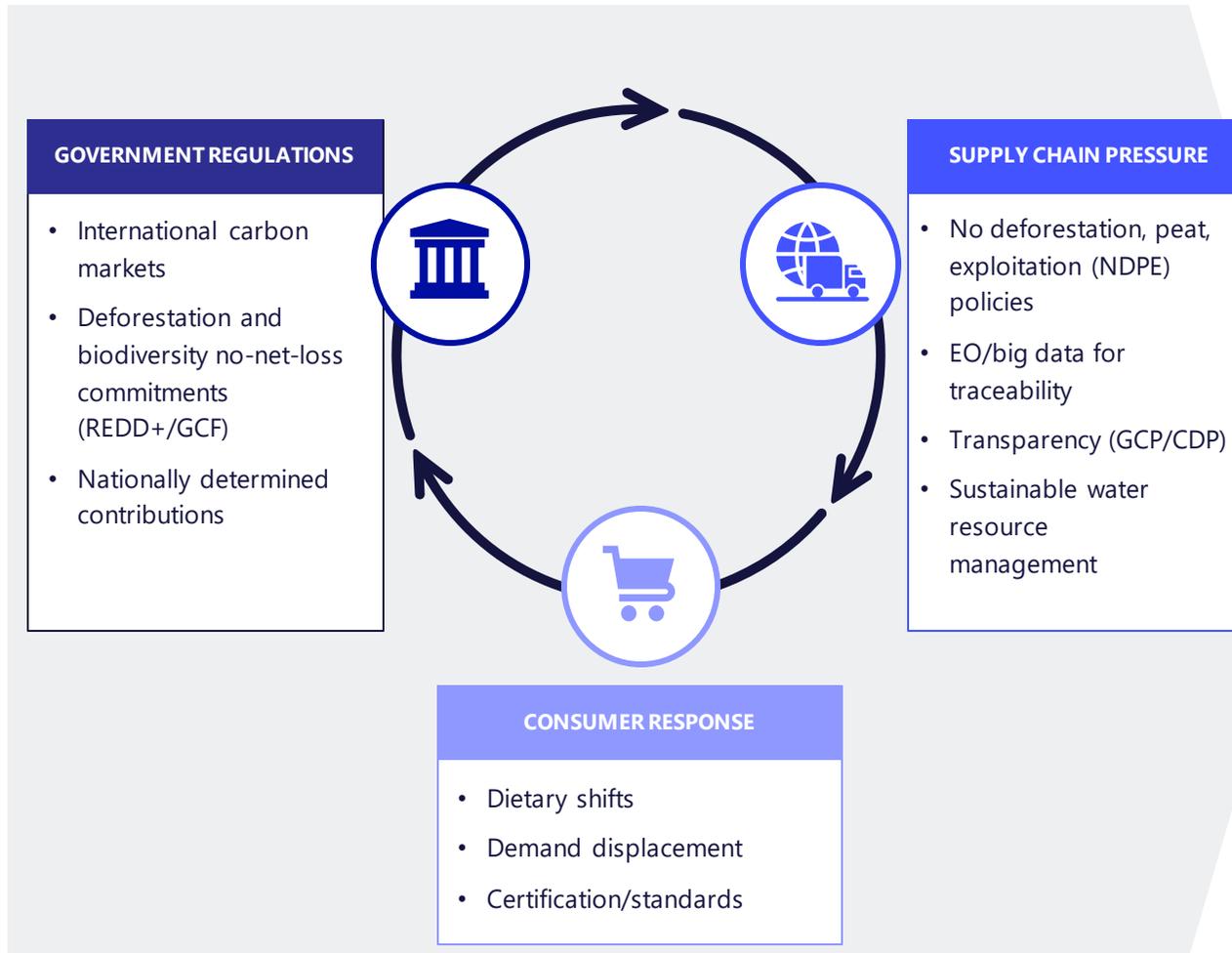
## Emissions from fertilizers



Producer/importer level levy

Government to conduct review of livestock sector's progress in 2022 – if no progress made, sector emissions will be subject to NZ ETS scheme

# A variety of indirect risks due to climate change also threaten protein market valuation



## Indirect business risks largely act through supply chains

- Many risks stem from **unsustainable land use** in supply chains



Historic **loss of forest land**, driven largely by agricultural commodity demand, will necessitate new policies



Businesses will have to deal with increasing competition for **scarce water** and more frequent extreme events

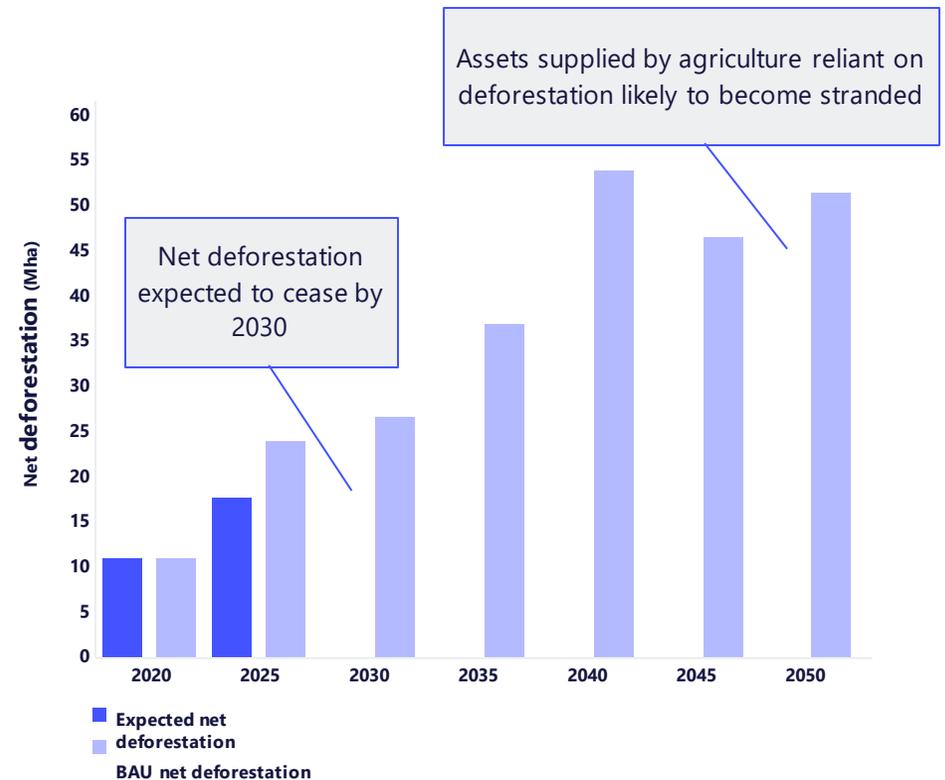
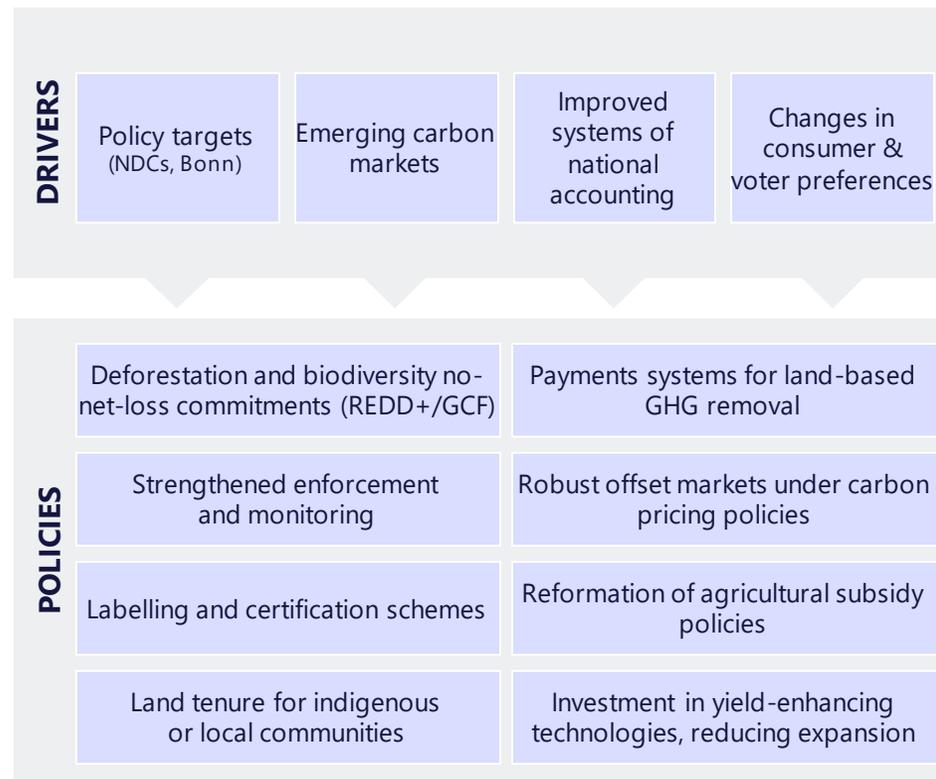
- Increased **financial instability of suppliers** will increase volatility and emphasize the importance of climate-sensitive forward business planning
- **Technological advancements** in alternative proteins will increasingly threaten conventional meat supply chains

# Forest loss and associated activity is expected to all but cease by 2030, threatening current practices in tropical soy and beef

Agriculture accounted for **51% of global deforestation**,<sup>1</sup> with the dominant contributors being **beef** cattle and **soy** for animal feed.

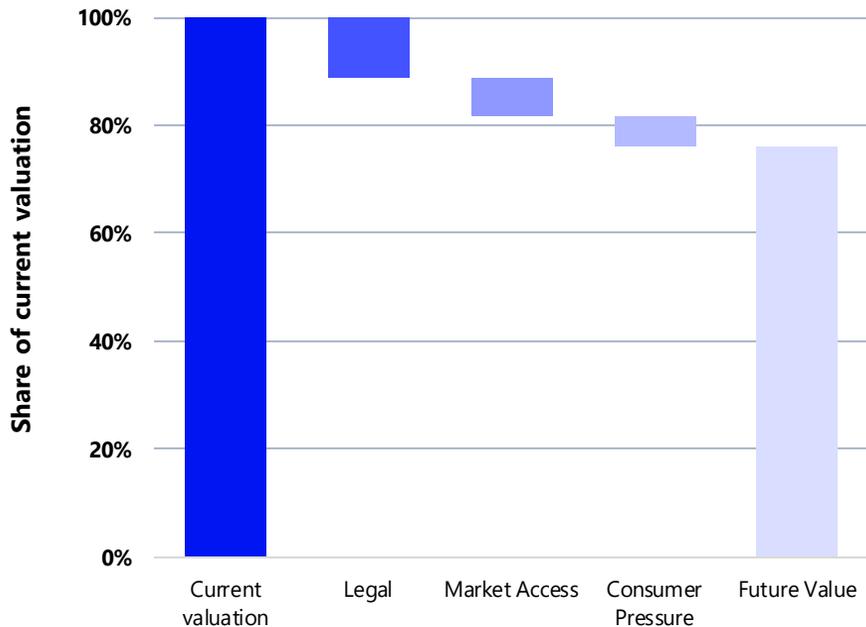
If tropical forest loss were a country, it would emit nearly as much CO<sub>2</sub>e annually as the entire US, the world's second largest emitter.<sup>2</sup>

A strong **policy response** in this sector is expected to drive rapid shifts in current agricultural practices, requiring changes in business models and supply chains.



# Case study: Supply chain risks already being realized in Brazilian beef

Estimated valuation impacts on Brazilian beef supply chains



## Legal

New frameworks make downstream firms liable for illegality in their supply chains. 75 companies have signed contracts (TACs) that make unsustainable sourcing a legal liability.



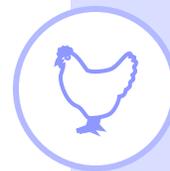
## Market

Deforestation risk in supply chains can cause disruption in business operations and strand assets. A 2019 investigation resulted in heavy fines for ranchers operating in embargoed areas.



## Reputation

Consumer awareness and demand for transparency is growing. Widespread fires in the Amazon linked to cattle-driven deforestation are driving international calls for traceability.



Poultry supply chains are also exposed to deforestation to a lesser extent through **soybean (animal feed)**

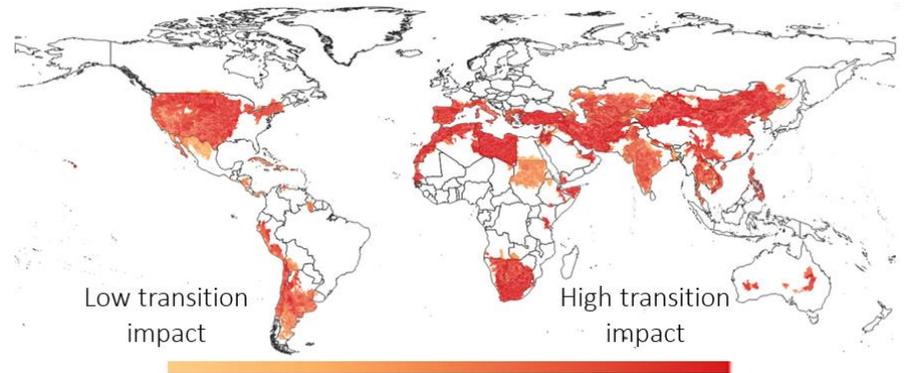
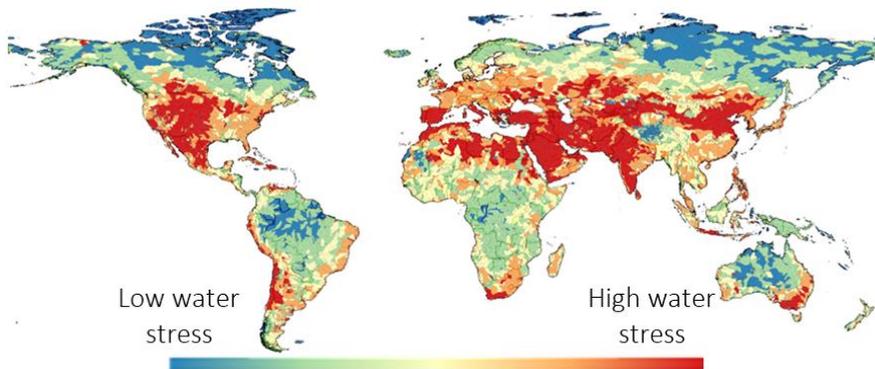
# Increasing water stress comes with tail risks for the private sector that require forward planning and ongoing management

## Physical climate risks

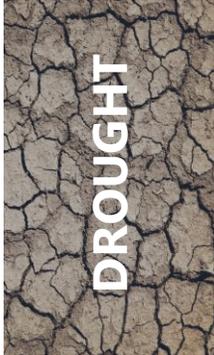
## Low carbon transition policies

Increased frequency of flood and droughts increase the likelihood and scale of catastrophic events that can cause a variety of business disruptions

Policies that promote afforestation and bioenergy production can exacerbate water stress further by increasing competition for resources.



## Case study: Water risks already being realized in U.S. livestock sector

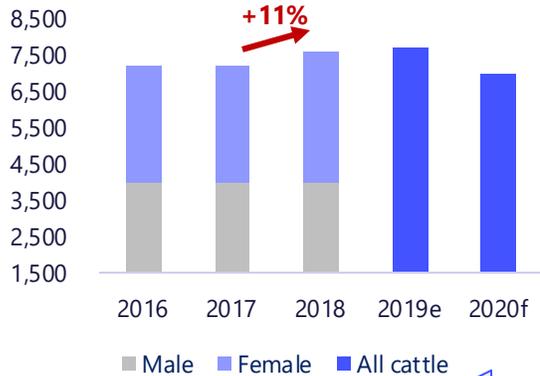
CAUSE	IMPACT	SHORT TERM	LONG TERM	EXAMPLES
 <p><b>DROUGHT</b></p>	<p>Reductions in rangeland quality</p> <p>Reductions in herd health and loss of productivity</p>	<ul style="list-style-type: none"> <li>• Reduced productivity</li> <li>• Increased vulnerability to wildfire</li> <li>• Reduced milk production and reproduction capacity</li> <li>• Increased susceptibility to ticks and worms</li> </ul>	<ul style="list-style-type: none"> <li>• Soil erosion, regrowth of nutrient-poor grasses</li> <li>• Higher livestock mortality</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Tyson cited</u> an \$89 million increase in feed costs due to drought in 2018</li> <li>• Nearly 38% of Texas, which accounts for 15% US beef, is <u>currently under drought</u>, causing shortages of grass, hay and water</li> <li>• Drought-fuelled wildfires <u>killed thousands of cattle</u> in Texas, Kansas and Oklahoma in 2017</li> </ul>
 <p><b>FLOODS</b></p>	<p>Decreased feed and hay availability</p>	<ul style="list-style-type: none"> <li>• Increased cost of production</li> <li>• Overgrazing</li> </ul>	<ul style="list-style-type: none"> <li>• Imported feed</li> <li>• Lower quality hay</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Cal-Maine feed costs</u> expected to increase in 2020 due to historic rainfall and flooding</li> <li>• 2019 floods in <u>Nebraska</u> cost cattle industry \$400 million</li> </ul>

Companies will require an increasingly resilient supply chain & agile operations management to hedge against water & other acute physical risks

# Case study: Extreme weather already impacting AUS livestock sector

**Continuing drought forced increased female slaughter rates, reducing cattle inventories to their lowest levels in >20 years**

Female cattle slaughter increased 11% from 2017-2018



Higher female slaughter rates reduce forecast beef production rates in 2020

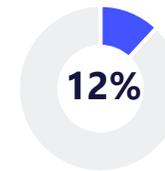
**Queensland floods killed an estimated 500,000 head of cattle<sup>2</sup>**



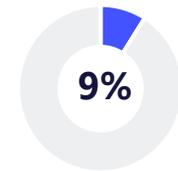
**Australian Agricultural Company**, the country's largest cattle and beef producer, suffered losses of up to **43,000 heads** of cattle

Losses equivalent to **US\$30 million<sup>3</sup>**

**Bushfires killed over 100,000 sheep and cattle<sup>4</sup>**



NATIONAL SHEEP FLOCK



NATIONAL CATTLE HERD

*“My fear — and it is also that of the National Farmers Federation's estimates as well — is that in excess of 100,000 head of livestock will be deceased as a result of the fire events that we've seen to date*

**Bridget McKenzie,**  
Federal Agricultural Minister

# Opportunities for landowners combined with increasing financial instability underscores the importance of forward operations planning

## Low carbon transition policies will support the development of nascent bioenergy and nature-based solutions that increase outside options for land owners.

These will be increasingly taken up as the costs for conventional operations increase. The US farm sector is now at its highest risk of insolvency since 2003.

Financial instability and improving outside options for suppliers will increase input prices and supply volatility in the meat sector.



Most protein companies rely on input suppliers and don't own agricultural land themselves. Farm sector financial instability is increasing.



The nature-based solutions market is expected to total \$2.8 trillion through 2050 globally as carbon markets strengthen.



Bioenergy crops are expected to supply nearly 65 exajoules of energy annually by 2050, 4.5 times today's supply.

# Innovation in food technology increases substitution risk

## Disruption in dairy sector foreshadowing disruption to meat sector

**NOV 2019**



“Dean Foods’ business has struggled as more **consumers turn to non-dairy** milk or buy private label products. Consumption of milk has fallen **26 percent** in the last two decades (USDA data)<sup>1</sup>

**JAN 2020**



As **consumers** increasingly turn **to milk alternatives** and thousands of dairy farms are collapsing, milk now falls **into the same** **category** as **plant-based** products, putting thousands of jobs at risk and threatening their brands.<sup>2</sup>

### 3 types of disruptive technologies<sup>3</sup>

#### Plant-based proteins

Products that **replicate** animal proteins in **texture, flavour and aroma** through use of **plant sources** that can mimic the structure of animal proteins on a molecular level (e.g. mung bean, lupin, algae, mycoprotein) and/or through novel processing methods (e.g. extrusion).

Example



#### Fermentation technology

Specific **animal proteins** such as caseins found in milk and ovalbumin in egg can be **produced without the animal through a fermentation** or brewing process where yeast organisms or another host are programmed to produce the proteins.

Example



#### Cell culture technology

The **growing** of **meat cells** in a **nutrient-rich culture** medium to create whole pieces of meat instead of harvesting meat from animals. The process involves many of the same tissue engineering techniques that were developed for regenerative medicine.

Example



## Risks are additive, suggesting a coming transition in the protein sector

**Direct, indirect, physical and transition risks** are combining to dramatically change both absolute and relative costs across the sector. Emissions and land intensive conventional protein sources, including **beef and dairy**, are starting to shift toward **poultry, fish and alternative meats**. As climate policy and changing preferences accelerate in the coming decade, so too will **financial losses for firms that fail to adapt**.

Investors can **act now** to improve capital allocation for future return:

1

Risks are heterogeneous within sector and geography. Identify companies positioned to lead in sector shift.

2

Work with investees to ensure they are adaptable and prepared for market changes.

3

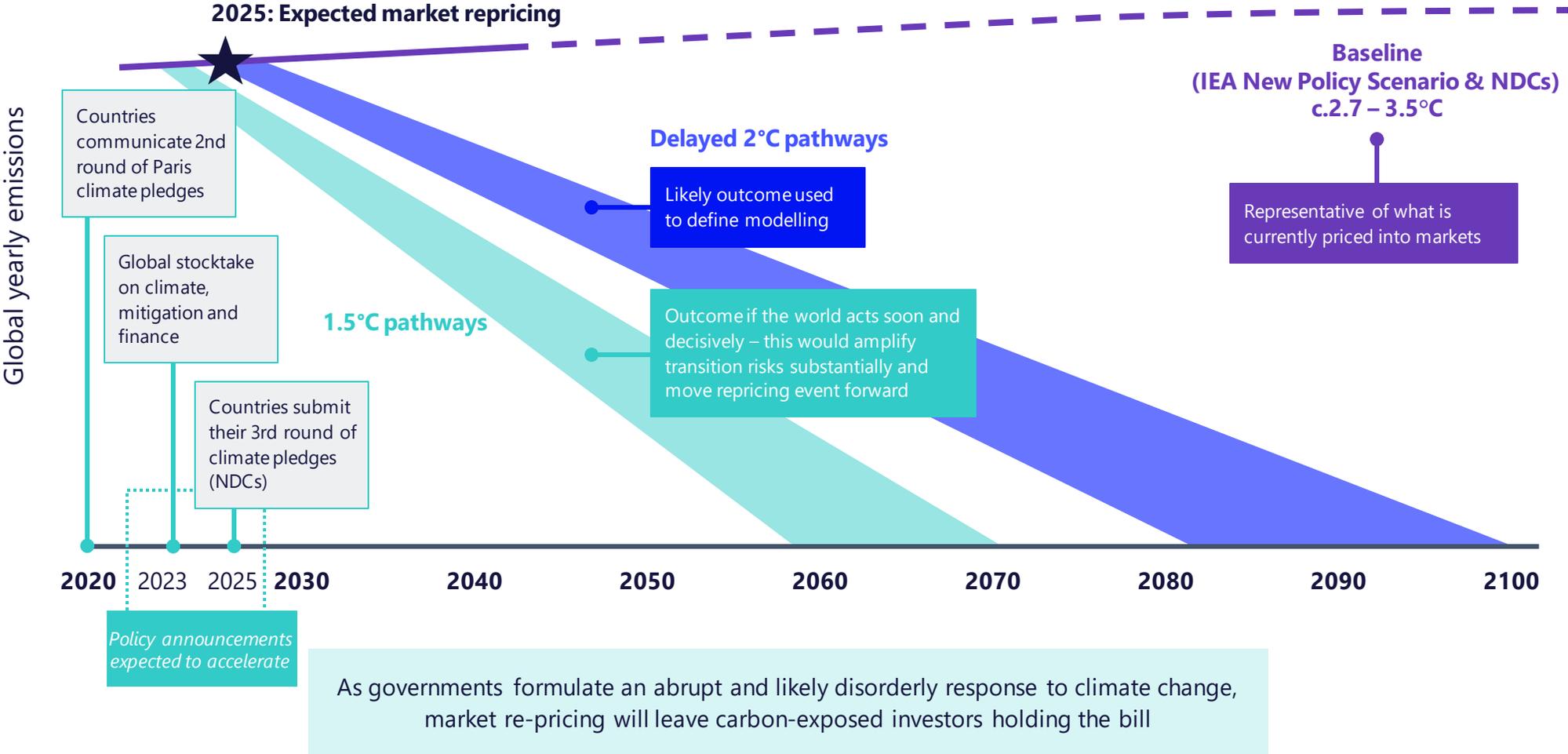
Gain exposure to high-growth markets through alternative companies or investment vehicles.

The next section explores tools designed to help investors prepare.

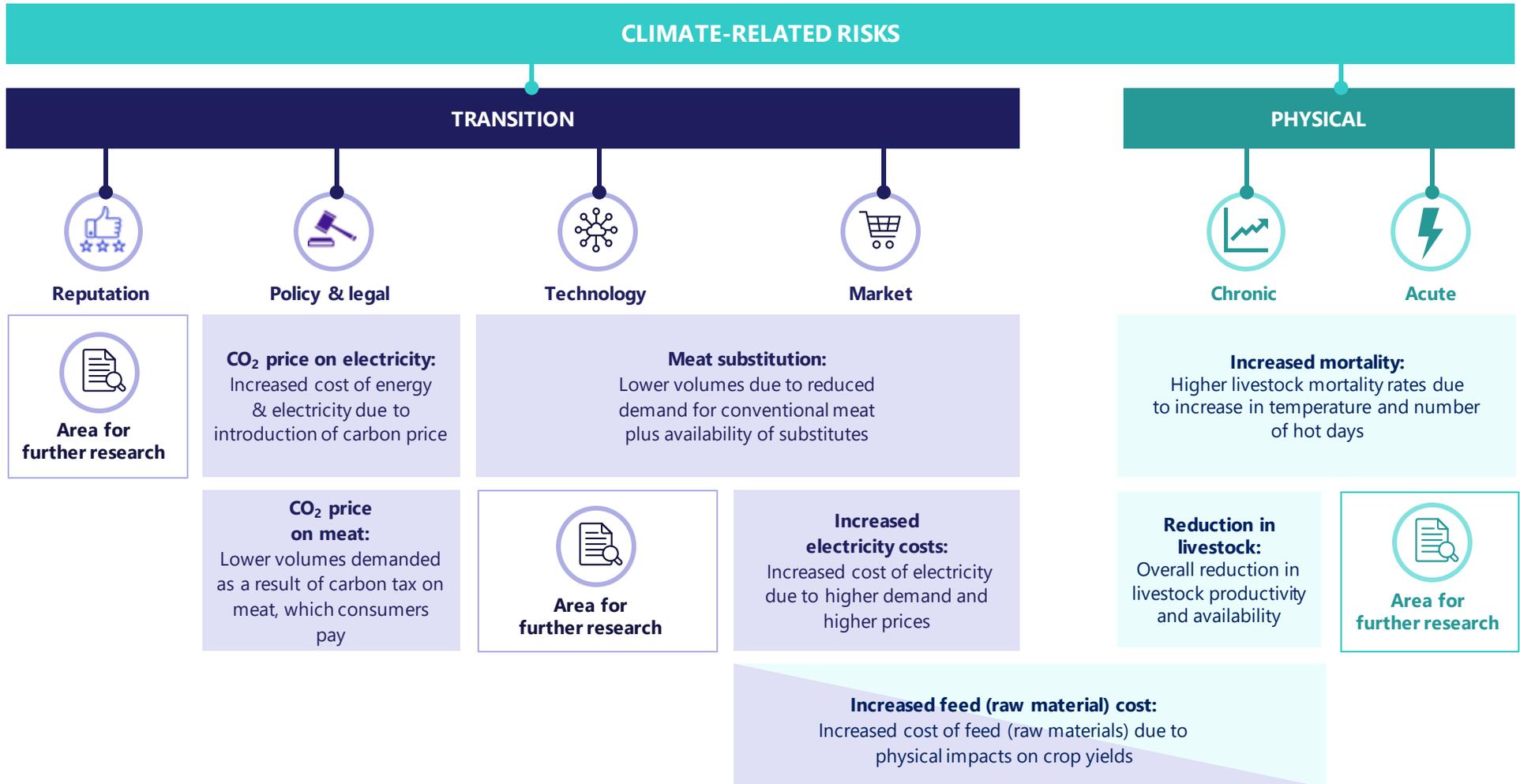
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# Tool & assumptions

# Market re-pricing increases climate change urgency for investors



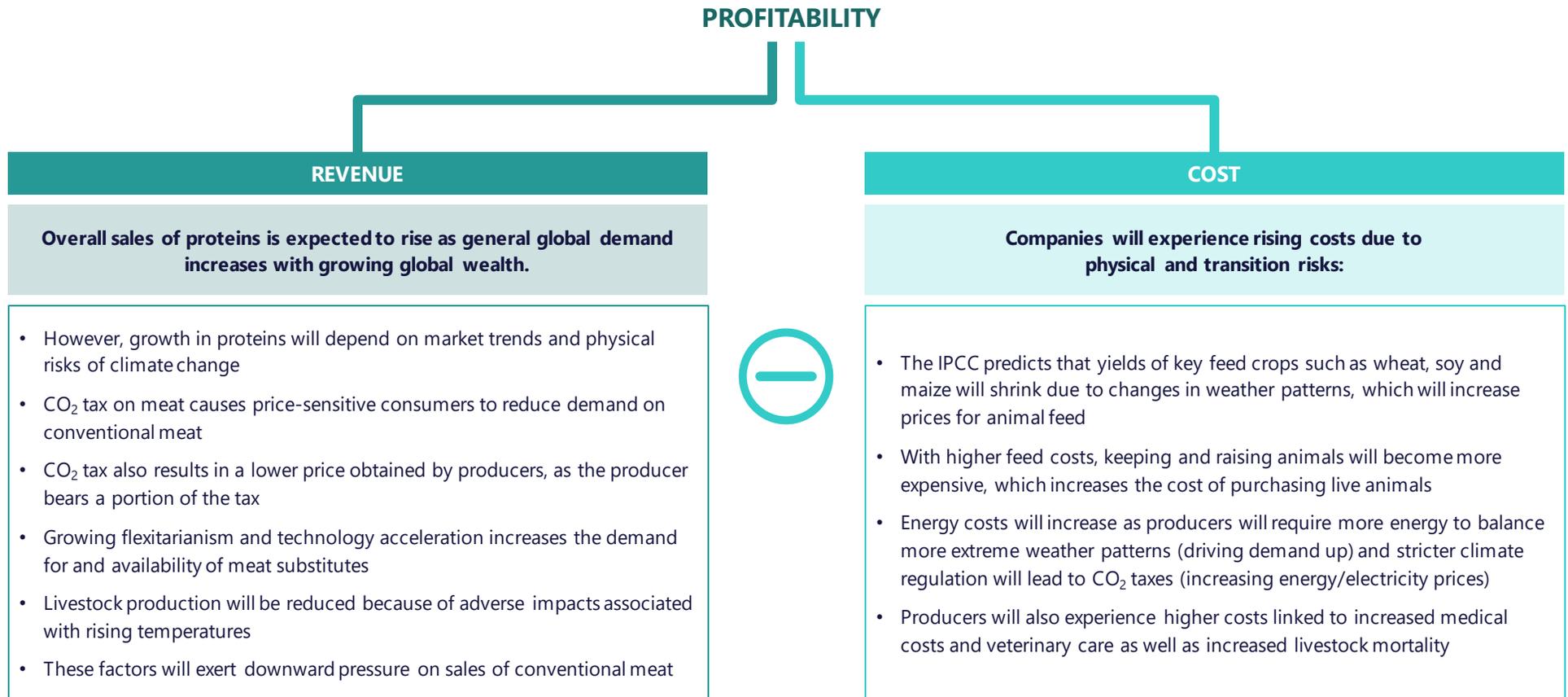
# The Coller FAIRR Climate Risk Tool identifies seven direct/first-level effects impacting profitability of meat sector



**Notes:**

- Some risks are physical risks at **other parts of the supply chain** but manifest themselves as **transition risks** for meat producers.
- First-level effects **directly impact** animal farming and/or processing.
- Second-level effects would be a **consequence of a consequence** (more than two loops). In other words, second level effects are indirect effects.

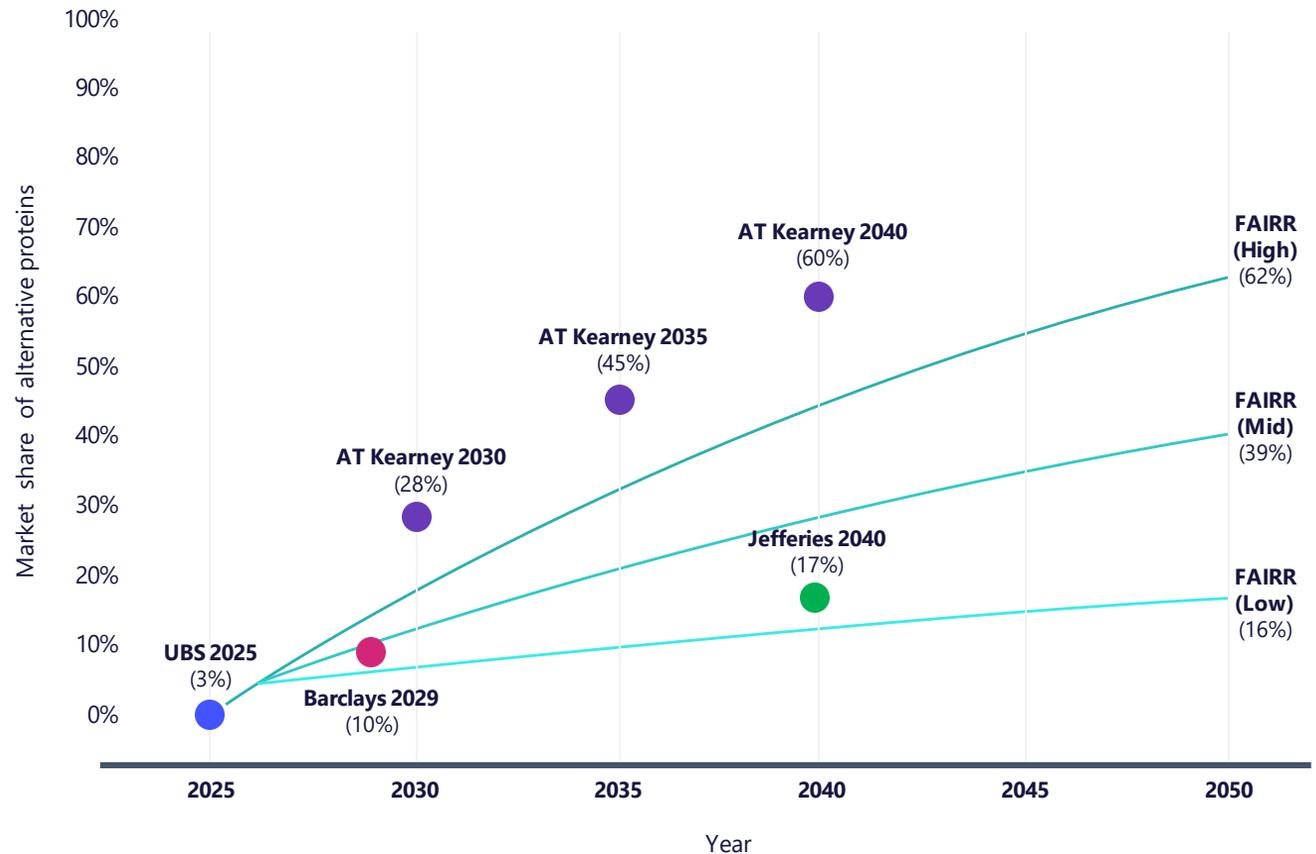
# Tool thesis: Profitability of meat companies will be impacted by protein substitution, demand constraints and rising costs linked to climate change



This model is intended to be a conceptual tool to help investors engage investee companies

# Alternative protein market development is a key determinant of appropriate adaptive responses

- Projections of alternative meat futures vary dramatically across sources, depending on shifts in consumer preferences and how quickly alternative protein **technology can develop** and **production capacity can scale**
- Substitution is first expected in lower grade processed products, such as hamburgers, but lab-scale bioreactor technology already exists for higher quality cuts
- A **FAIRR High substitution** pathway is informed by AT Kearney<sup>1</sup> estimates of protein market development and IPCC<sup>2</sup> estimates of declines in livestock
- A **FAIRR Low substitution** pathway is informed by Barclays<sup>3</sup>, Jefferies<sup>4</sup> estimates, and analogous trends in electric vehicle adoption<sup>5</sup>



1. AT Kearney (2019): How will cultured meat & meat alternatives disrupt the agricultural and food industry: <http://bit.ly/ATKearneyalternativemeat>
2. IPCC (2019) Global warming of 1.5C, p.237: <https://www.ipcc.ch/sr15/download/#full>
3. Barclays (2019) I can't believe it's not meat: <http://bit.ly/barclaysalternativemeat>
4. Jefferies (2019) The great protein shake-up: <http://bit.ly/jefferiesalternativemeat>
5. IEA (2017) Energy Technology Perspectives 2018, OECD/IEA, Paris

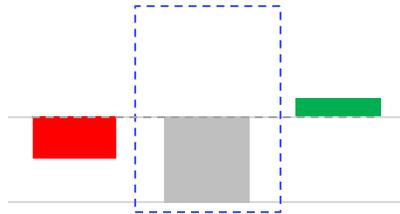
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# Results

# The tool projects outcomes for three pathways that a company can take in 2050 with a 2°C increase in average global temperatures

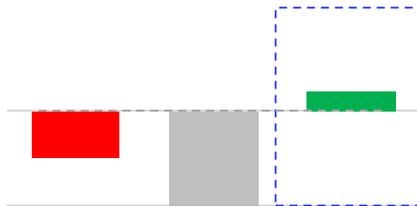
The tool calculates the impact on **company profitability** across three different pathways. The result measures the **difference** in profitability for a company between the baseline (market pathway) and the progressive and regressive pathways.

**Baseline**  
(market pathway)



The company invests in minimal climate mitigation efforts and makes limited shifts in protein mix.

**Climate progressive pathway**



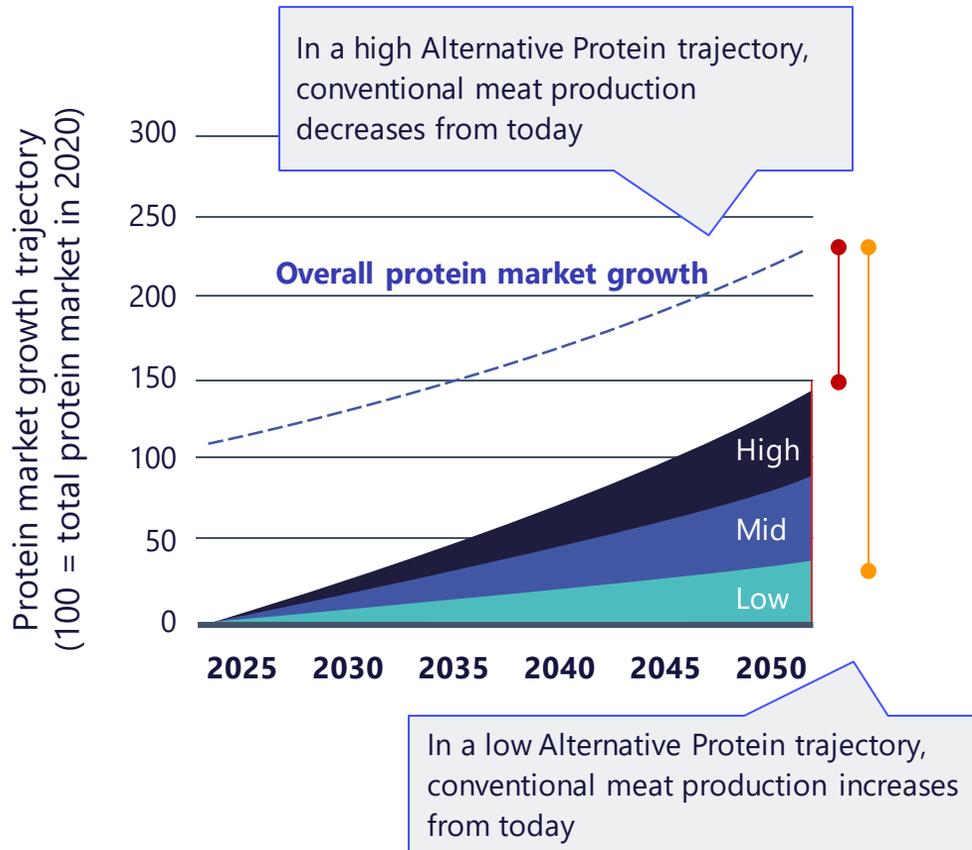
The company invests in higher-impact climate mitigation efforts and strategically shifts its protein mix compared to the baseline.

**Climate regressive pathway**



The company does not invest in climate mitigation efforts and sticks to its 2020 protein mix.

# Returns generated by adaptive capacity depend on pace of change

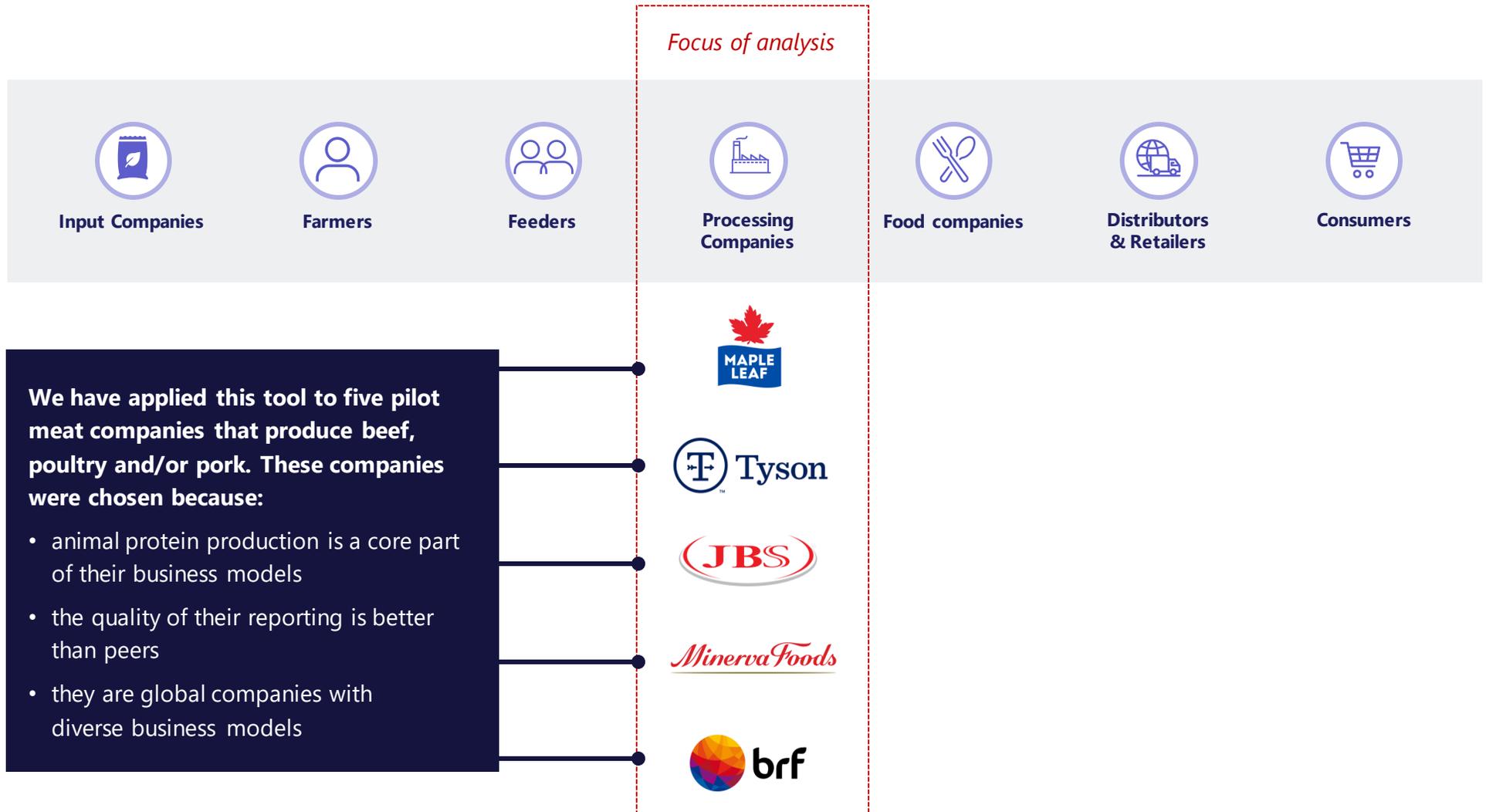


●—● Conventional meat in high AP trajectory

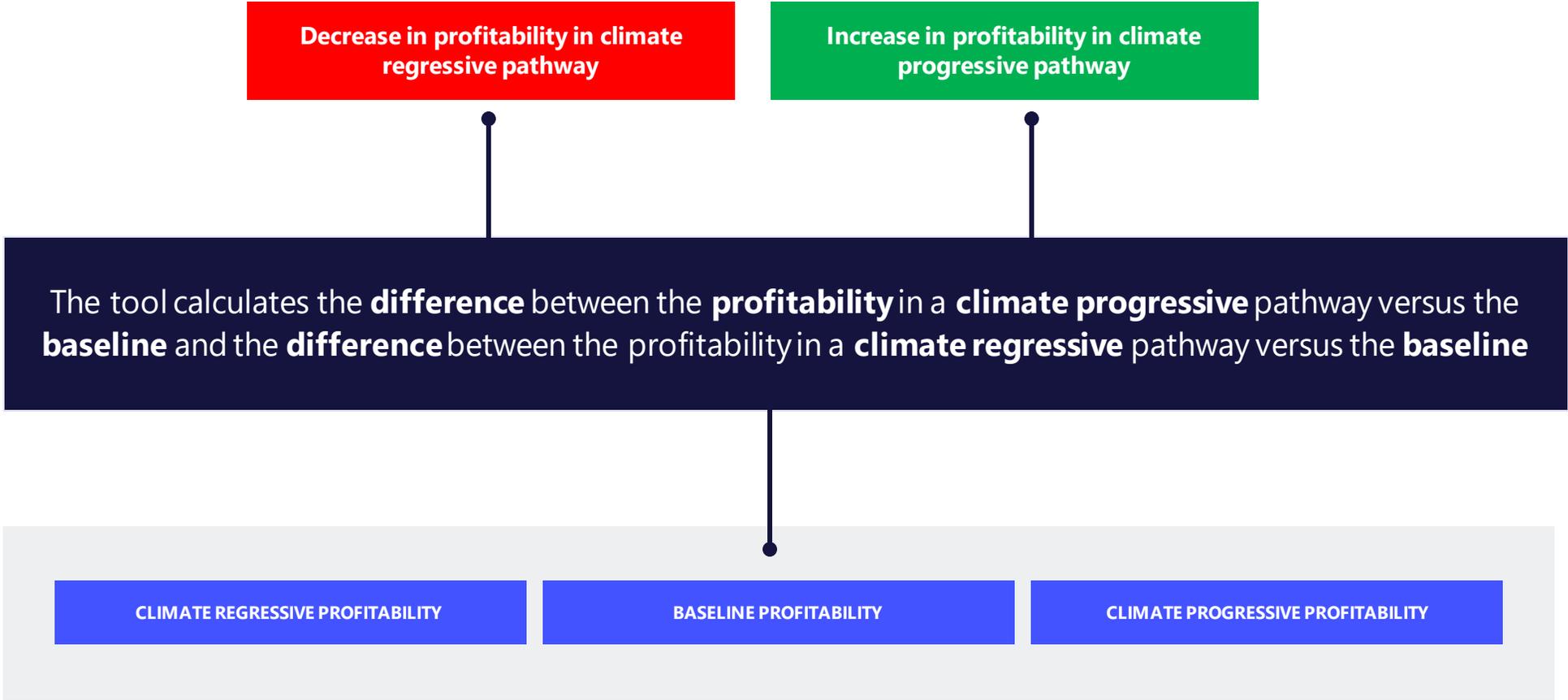
●—● Conventional meat in low AP trajectory

- Future company performance will be increasingly determined by their carbon exposure
- Companies that actively seek to decarbonize (change mix of proteins and grow alternative protein business) outperform the market
- The degree to which these companies outperform the market depends on market and policy trajectories
- Performance is sensitive to **alternative protein market and carbon pricing policy** trajectories
- Companies with more adaptive capacity are rewarded more when markets move faster in that direction
- Similarly companies less able to adapt (overreliance on carbon-intensive proteins) stand to lose more when markets move quickly

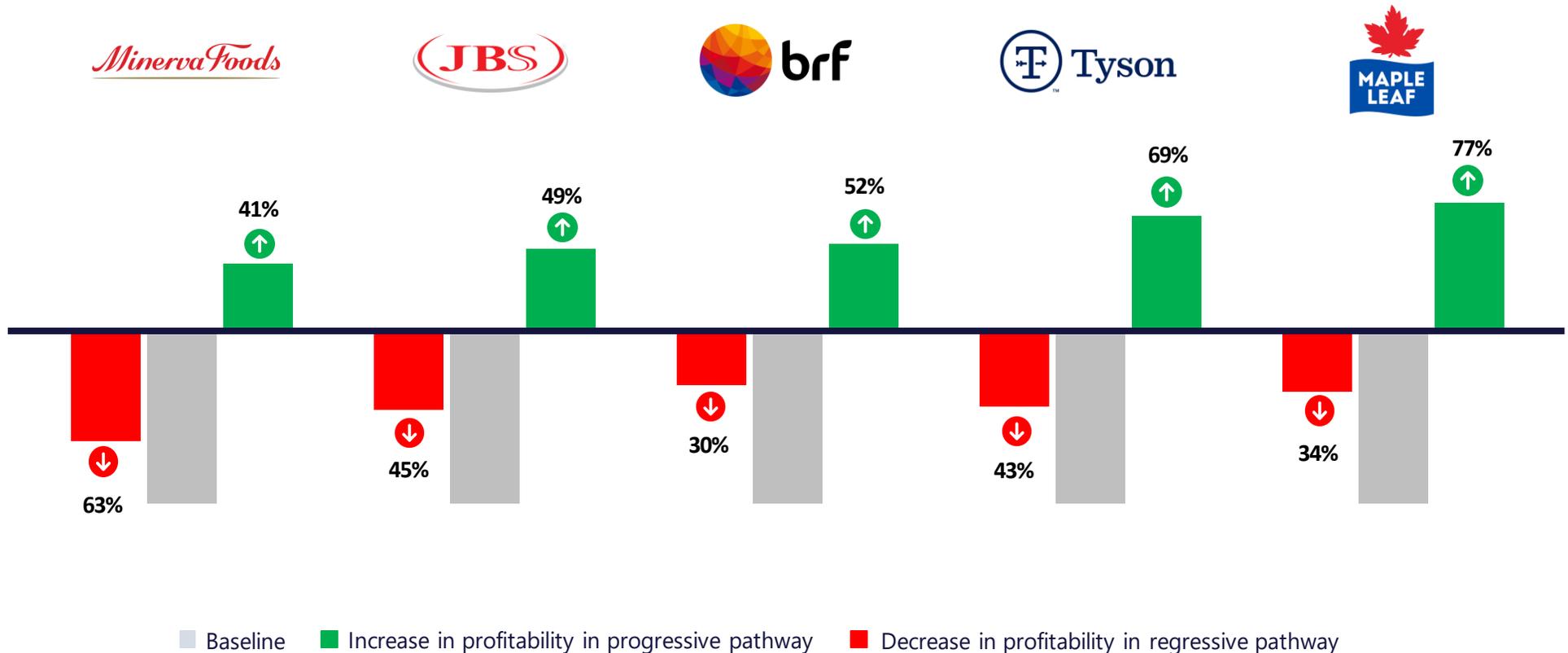
# The tool focuses on the processing step in the protein value chain



# Key outputs of the tool



# Companies with high EBITDA margin, diverse protein mix & exposure to alternatives have higher increase in profitability



# Company deep dive: how to interpret model results



- Maple Leaf’s relatively high EBITDA margin enables it to better absorb any increase in production costs linked to climate risk.
- Maple Leaf’s exposure to alternative protein, currently representing 4% of sales, benefits from the growth in this market and avoids the negative impacts of climate change on its animal protein business.
- Maple Leaf’s animal protein portfolio is hit by an anticipated carbon tax, lowering baseline profitability. Its focus on poultry leaves the company exposed to increased energy costs (including a potential carbon tax on electricity). With feed and veterinary care representing a higher share of the costs in pig and poultry farming than beef, Maple Leaf is vulnerable to increased costs in both its operations. As Maple Leaf has no beef exposure, it avoids the effect of increasing cattle mortality due to heat stress.
- In the progressive pathway, Maple Leaf’s lack of exposure to beef allows it maximum opportunity to offset the effects of climate change on its meat operations, generating upside.

- Minerva’s relatively low EBITDA margin reduces its capacity to absorb any increase in production costs linked to climate risk.
- Minerva does not currently have alternative protein exposure, nor is it planning to enter this space. The company is unable to offset the negative impacts of climate change from its animal protein business.
- Minerva’s animal protein portfolio is hit by an anticipated carbon tax, lowering baseline profitability. The company’s full exposure to beef incurs the effect of increasing cattle mortality due to heat stress. Costs in relation to energy, feed and veterinary care will remain relatively stable in beef production and therefore, Minerva is less exposed.
- In the progressive pathway, Minerva might shift its protein portfolio away from beef. Without this being done with scale, however, its ability to offset the effects of climate change and its associated risks is low and upside is, therefore, limited.

■ Baseline    
 ■ Increase in profitability in progressive pathway    
 ■ Decrease in profitability in regressive pathway



# Maple Leaf Foods: Likely to take the climate progressive pathway

## CURRENT CLIMATE ACTION



- Has set a **science-based target** to reduce emissions, aligned with a **well-below 2°C** trajectory
- Target includes a commitment to **reduce Scope 3** emissions by 30% per tonne of product by 2030<sup>1</sup>
- Plans to conduct climate-related **scenario analysis** in 2020<sup>2</sup>
- Carbon & energy management and alternative protein strategy are identified as **highly material** in sustainability materiality matrix<sup>3</sup>
- **Decreasing absolute emissions**, though GHG inventory is incomplete (excludes Scope 3)<sup>4</sup>

## ADVANTAGES



- Relatively high EBITDA margin vs. peers
- No beef exposure, which reduces exposure to potential tax on carbon-intensive proteins
- Several established alternative protein brands, primarily using pea proteins<sup>5</sup>
- Expanding production capacity in alternative proteins
- Only meat producer to disclose sales from plant proteins, reporting 4.3% of total sales from its plant protein segment in Q3 2019<sup>6</sup>

## DISADVANTAGES



- Small player (revenue and EBITDA vs. peers)
- Moderate exposure to poultry, which exposes it to higher costs from electricity demand and potential carbon price on electricity

## COMMENTARY



- Best positioned to capitalise on market developments in alternative protein due to higher margins and current exposure to alternatives (relative to peers)
- Set an SBT and has plans to conduct scenario analysis, but increasing absolute emissions indicate moderate climate action currently
- Location of carbon management & alternative protein strategy in materiality matrix indicates that low-carbon transition is a priority

1. Science-Based Targets Initiative (SBTi) Companies taking action: <https://sciencebasedtargets.org/companies-taking-action/>

2. CDP response 2019, C3.1d

3. Maple Leaf Foods 2018 Sustainability report, p.7: <https://www.mapleleaffoods.com/wp-content/uploads/2019/08/Maple-Leaf-Foods-2018-Sustainability-Report.pdf>

4. Based on CDP responses in 2018 and 2019; Scope 3 emissions in the upstream purchased goods & services category. This analysis excludes all other Scope 3 categories, such as business travel, which are not a material proportion of meat company emissions.

5. Peas have a much smaller water and carbon footprint compared to animal protein sources.

6. Maple Leaf Foods Interim Report 2019: <https://www.mapleleaffoods.com/wp-content/uploads/2019/10/Maple-Leaf-Foods-Q3-2019-Interim-Report-to-Shareholders.pdf>

# Tyson Foods: Likely to take a climate progressive pathway

## CURRENT CLIMATE ACTION

- Has set a **science-based target** to reduce emissions, aligned with a **2°C trajectory**<sup>1</sup>
- Target includes a commitment to **reduce Scope 3** emissions by 30% per tonne of product by 2030<sup>1,2</sup>
- Has **conducted scenario analysis** against a 2°C scenario,<sup>3</sup> though discussion appears to be **limited to past actions** rather than future resilience of business model
- **Unclear how material climate action** is to company: relatively low materiality according to sustainability matrix<sup>4</sup>
- Pilot project to improve environmental practices on **2 million acres** of row crop **corn** (feed material)<sup>3</sup>
- **Decreasing absolute emissions**, though GHG inventory is incomplete (excludes Scope 3)<sup>5</sup>

## ADVANTAGES

- One of the largest players in terms of revenue, EBITDA and margins
- Ramping up alternatives business, with investments in cultured meat and own plant-based product line<sup>6</sup>
- Dedicated executive-level position responsible for alternative protein business<sup>7</sup>
- Diverse animal protein portfolio (beef, poultry and pork)

## DISADVANTAGES

- High exposure to beef and moderate exposure to poultry, which exposes it to costs linked to potential carbon tax and higher electricity demand

## COMMENTARY

- Strong starting point in alternative proteins and strong financials improve ability to capitalise on growth in alternative proteins market
- Set an SBT and disclosed some type of scenario analysis, though unclear how these results inform future business plans
- Diverse animal protein portfolio lends potential for agile business model/supply chains
- Feed sourcing pilot indicates strong engagement with major source of GHG emissions for meat sector (feed production)

1. Science-Based Targets Initiative (SBTi) Companies taking action: <https://sciencebasedtargets.org/companies-taking-action/>

2. The target only covers 80% of the Scope 3 inventory

3. CDP response 2019, C3.1d

4. Tyson webpage – Sustainability, materiality reporting: <https://www.tysonustainability.com/approach/materiality-reporting>

5. Based on CDP responses in 2018 and 2019; Scope 3 emissions in the upstream purchased goods & services category. This analysis excludes all other Scope 3 categories, such as business travel, which are not a material proportion of meat company emissions.

6. Tyson Raised & Rooted webpage: <https://www.raisedandrooted.com/>

7. Tyson Foods webpage – Leadership: <https://www.tysonfoods.com/who-we-are/our-people/leadership/justin-whitmore>



# BRF: Likely to take a climate regressive pathway

## CURRENT CLIMATE ACTION



- Has **not yet set** a science-based emissions reduction target nor an ordinary **emissions target**<sup>1</sup>
- **Does not** plan to use **scenario analysis** in the next 2 years<sup>2</sup>
- Identifies 'environment' as a material theme, but **does not** specifically **identify climate change** and/or carbon emissions<sup>3</sup>
- Scope 1 and 2 absolute emissions **increased** from 2017 to 2018, and GHG inventory is incomplete (excludes Scope 3)<sup>4</sup>

## ADVANTAGES



- No beef exposure, which reduces exposure to potential tax on carbon-intensive proteins
- Potential future exposure to alternatives, as company plans to launch plant-based product line<sup>5</sup>
- Nearly half of sales derived in emerging markets (Middle East, Asia) where highest protein growth is projected<sup>6</sup>

## DISADVANTAGES



- Small player (revenue and EBITDA relative to other showcase companies)
- Small margins (relative to peers)
- Very high exposure to poultry which exposes it to higher costs from electricity demand and potential carbon price on electricity

## COMMENTARY



- Moderate financial performance and high exposure to poultry constrain ability to absorb higher costs of production and grow alternatives business
- Lack of strong climate action currently e.g., lags peers on setting an emissions target

1. CDP response 2019, C4.1

2. CDP response 2019, C3.1a

3. BRF 2018 Annual Report, p.40: <https://www.brf-global.com/wp-content/uploads/2019/06/BRF-Annual-Report-2018.pdf>

4. Based on CDP responses in 2018 and 2019; Scope 3 emissions in the upstream purchased goods & services category. This analysis excludes all other Scope 3 categories (not material proportion of meat company emissions).

5. Reuters (2019): <https://uk.reuters.com/article/us-brazil-food/meat-loving-brazil-joins-the-search-for-plant-based-alternatives-idUKKCN1TK2XG>

6. BRF 2018 Annual Report, p.13: <https://www.brf-global.com/wp-content/uploads/2019/06/BRF-Annual-Report-2018.pdf>



# JBS: Likely to take a market pathway

## CURRENT CLIMATE ACTION



- Has **not yet set** a science-based emissions reduction target, though some subsidiaries have set targets focused on **energy & gas consumption**<sup>1</sup>
- Europe-based **subsidiary** (Moy Park) **plans to set** a science-based target in the next 2 years<sup>2</sup>
- States that it **plans** to conduct **scenario analysis**, but timeline is unclear as it is linked to completion of Brazilian NDC is complete<sup>3</sup> (in 2025 and 2030)<sup>4</sup>
- Climate change is in the Top 5 sustainability priorities<sup>5</sup>
- Scope 1 and 2 absolute emissions **increased** from 2017 to 2018, though GHG inventory is incomplete (excludes Scope 3)<sup>6</sup>

## ADVANTAGES



- One of the largest protein producers globally
- Limited current exposure to alternatives, though plans to introduce plant-based protein line in April 2020<sup>7</sup>
- Diverse animal protein portfolio (beef, poultry, pork)

## DISADVANTAGES



- Moderate margins
- High exposure to beef
- Moderate exposure to poultry
- Remains highly exposed to deforestation risks in the Amazon through indirect beef supply chain

## COMMENTARY



- Moderate margins constrain ability to absorb higher costs of production
- Deforestation risk in supply chain presents regulatory/policy/legal risk
- Diverse animal protein portfolio lends potential for agile business model/supply chains
- However, given moderate climate action currently, adapting business model would require significant shift in strategic focus

# Minerva Foods: Likely to take a climate regressive pathway

## CURRENT CLIMATE ACTION

- Has **not yet set** a science-based emissions reduction target, though it has a target on **energy consumption**<sup>1</sup>
- Has **not disclosed** whether it plans to conduct **scenario analysis**
- Has not identified climate change as a material issue, though climate-related issues such as **water scarcity** and **energy consumption** are identified as **material**<sup>2</sup>
- Company is just beginning to disclose GHG inventories: Scope 1 and 2 emissions were disclosed in 2018 but not in previous years, so we are **unable to analyse emissions performance**<sup>1</sup>

## ADVANTAGES

- Plans to expand into emerging markets (entered into joint venture to explore commercial opportunities in China)<sup>3</sup>

## DISADVANTAGES

- Small margins and EBITDA
- Pure beef player, which increases exposure to potential tax on carbon-intensive proteins
- No exposure to alternative proteins
- Remains highly exposed to deforestation risks in the Amazon through indirect supply chain

## COMMENTARY

- Poor margins constrain ability to absorb higher costs of production and/or regulatory action
- Lack of product diversity (100% exposure to beef) and lack of exposure to alternatives limit ability to adapt business model
- Lack of strong climate action currently indicates that shifting business model would require radical change

5.

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# Actions for investors & companies

# Investors should use results to understand where their portfolio is heading under a disruptive two-degree transition

The analysis highlights the importance **of forward-looking climate risk assessment** in the protein industry. The results are designed to help inform **investor and company implementation of the TCFD recommendations** on forward-looking risk assessment and climate scenario analysis alongside Paris-aligned scenarios.

## EXTERNAL ACTIONS

Asset owners should engage with asset managers and service providers to understand how they are factoring climate risk in the agricultural sector

All investors can use results to engage with exposed companies, including policy response, alternative meat technologies, climate-resilient supply chains, and animal and geography exposure

Continue to advocate and engage for earlier and more ambitious climate action to minimize the disruption from a disorderly transition and increasingly severe physical risks in the meat sector

## INTERNAL ACTIONS

Asset owners can use the 2°C scenario as one potential pathway and define risk mitigation strategies and timing of transition for exposed protein equities

Asset owners may want to review equity asset allocation strategies and the proportion of passive and active mandates

Active investors can consider climate as a factor potentially creating alpha from a progressive protein portfolio

Investors can use benchmarks, such as the Coller FAIRR Index, to identify leaders and laggards in climate management and alternative meat investment

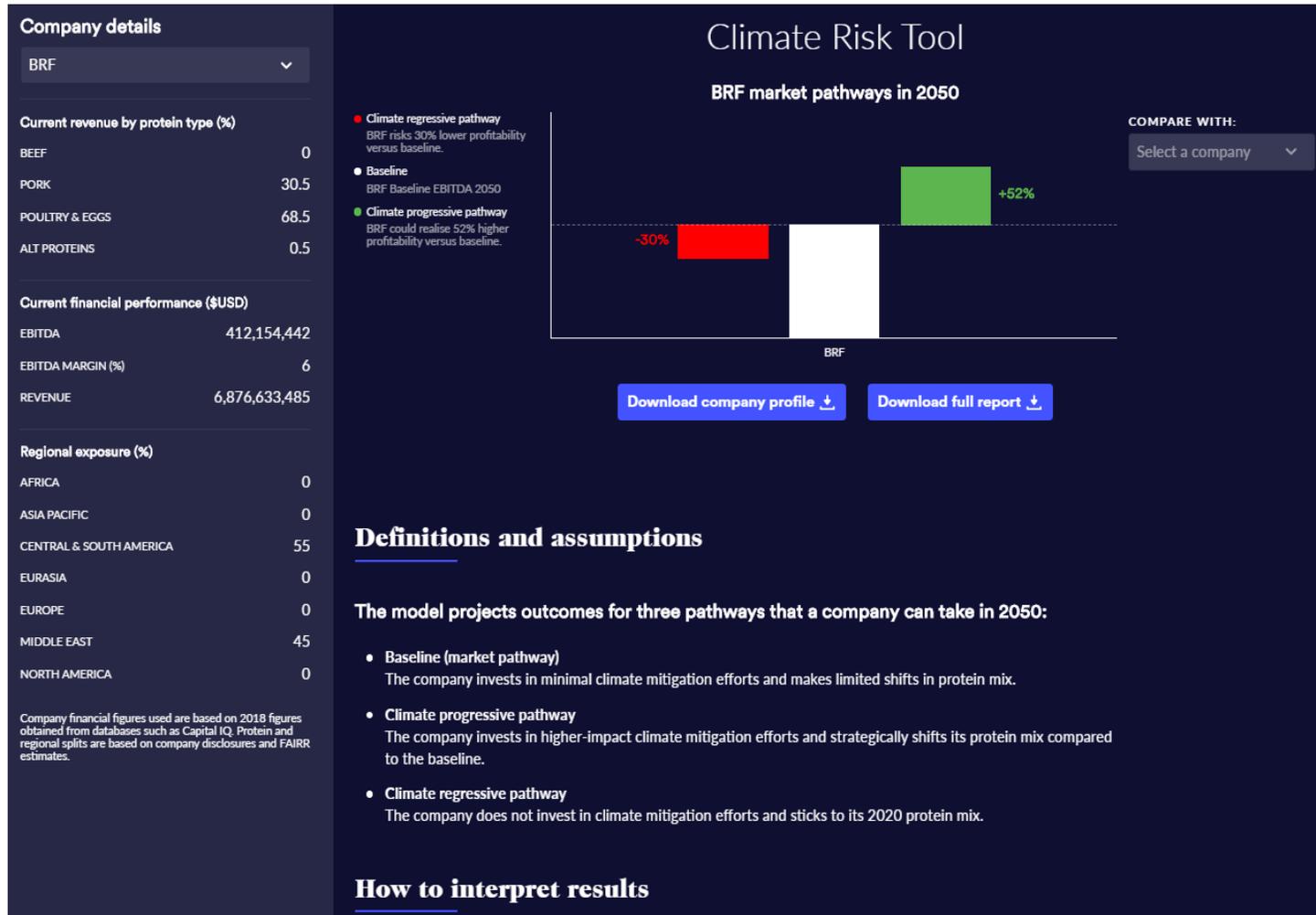
## Investor resource: Engagement questions for companies

1. Would you consider making any changes to your protein portfolio to increase the climate resilience of your business model?
2. Are you considering any measures to increase the flexibility of feed mix and pasture management?
3. Are you considering expanding your business in certain geographical areas /markets? If yes, where?
4. What is your strategy on alternative proteins in your portfolio? Do you have any plans on extending this product type?
5. For beef companies: Are you considering any measures to reduce heat stress in beef production and processing?
6. For poultry companies: How is your company factoring the impact of projected increases in electricity and energy demand and prices associated with rising temperatures?
7. Have you had any discussions on how rising temperatures will impact mortality rates and vet costs?
8. Are you planning to set a science-based target to reduce emissions, aligned with a well-below 2°C trajectory? How will this target impact different protein sources? How will it incorporate emissions associated with feed production?
9. How are you factoring in the projected impact of extreme weather events (e.g., droughts, flooding) on the availability and price volatility of feed ingredients?
10. Has your company modelled the impact of potential carbon taxes on electricity and/or carbon intensive animal proteins?

# Online tool for investors

<https://www.fairr.org/research/climate-risk/>

# All users can see the results for the five pilot companies



# Users can compare the results between two sets of companies

### Company details

BRF

**Current revenue by protein type (%)**

BEEF	0
PORK	30.5
POULTRY & EGGS	68.5
ALT PROTEINS	0.5

**Current financial performance (\$USD)**

EBITDA	412,154,442
EBITDA MARGIN (%)	6
REVENUE	6,876,633,485

**Regional exposure (%)**

AFRICA	0
ASIA PACIFIC	0
CENTRAL & SOUTH AMERICA	55
EURASIA	0
EUROPE	0
MIDDLE EAST	45
NORTH AMERICA	0

Company financial figures used are based on 2018 figures obtained from databases such as Capital IQ. Protein and regional splits are based on company disclosures and FAIRR estimates.

## Climate Risk Tool

### BRF vs JBS market pathways in 2050

- **Climate regressive pathway**  
BRF risks 30% lower profitability versus baseline.
- **Baseline**  
BRF Baseline EBITDA 2050
- **Climate progressive pathway**  
BRF could realize 52% higher profitability versus baseline.

COMPARE WITH:

JBS

[Download company profile ↓](#)
[Download full report ↓](#)

## Definitions and assumptions

The model projects outcomes for three pathways that a company can take in 2050:

- **Baseline (market pathway)**  
The company invests in minimal climate mitigation efforts and makes limited shifts in protein mix.
- **Climate progressive pathway**  
The company invests in higher-impact climate mitigation efforts and strategically shifts its protein mix compared to the baseline.
- **Climate regressive pathway**  
The company does not invest in climate mitigation efforts and sticks to its 2020 protein mix.

## How to interpret results

# FAIRR members can also input their own data into the model

### Company details

Input company information ▼

Enter company name

**Current revenue by protein type (%)**

BEEF	0
PORK	0
POULTRY & EGGS	0
ALT PROTEINS	0

**Current financial performance (\$USD)**

EBITDA	0
EBITDA MARGIN (%)	0
REVENUE	0

**Regional exposure (%)**

AFRICA	0
ASIA PACIFIC	0
CENTRAL & SOUTH AMERICA	0
EURASIA	0
EUROPE	0
MIDDLE EAST	0
NORTH AMERICA	0

Submit

## Climate Risk Tool

- **Climate regressive pathway**  
risks lower profitability versus baseline.
- **Baseline**  
Baseline EBITDA 2050
- **Climate progressive pathway**  
could realise higher profitability versus baseline.

**market pathways in 2050**

COMPARE WITH:

Select a company ▼

Download company profile ↓

Download full report ↓

*Coming soon: Detailed analysis of this company*

### Definitions and assumptions

**The model projects outcomes for three pathways that a company can take in 2050:**

- **Baseline (market pathway)**  
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The company does not invest in climate mitigation efforts and sticks to its 2020 protein mix.

### How to interpret results



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