

# TCFD reporting for the agriculture and pulp & paper sectors

Carbon Trust and EthnoExpert

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01/03/2021

# Welcome and opening remarks



Anton Zhigalov, Head of Sustainability – *Opening remarks*

# Introduction and speakers



Tom Cumberlege, Associate Director – *Speaker and panel*

Alice Ainsworth, Senior Analyst – *Speaker and panel*

Gregorio Giorgi, Senior Associate – *Moderator*



Maxim Titov, Director – *Speaker and panel*



Evgenia Moskalyuk, Chief Ecologist – *Speaker and panel*

# Agenda

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- 1. Introduction to TCFD and context**
- 2. Climate change risks and opportunities in the agriculture and pulp & paper sectors**
- 3. TCFD practical how-tos**
- 4. Case study from Arkhangelsk Pulp & Paper Mill**
- 5. Panel discussion and Q&A**

*‘Increasing transparency makes markets  
more efficient and economies more stable and resilient’*

Michael R. Bloomberg

To be part of the  
solution and not the  
problem...

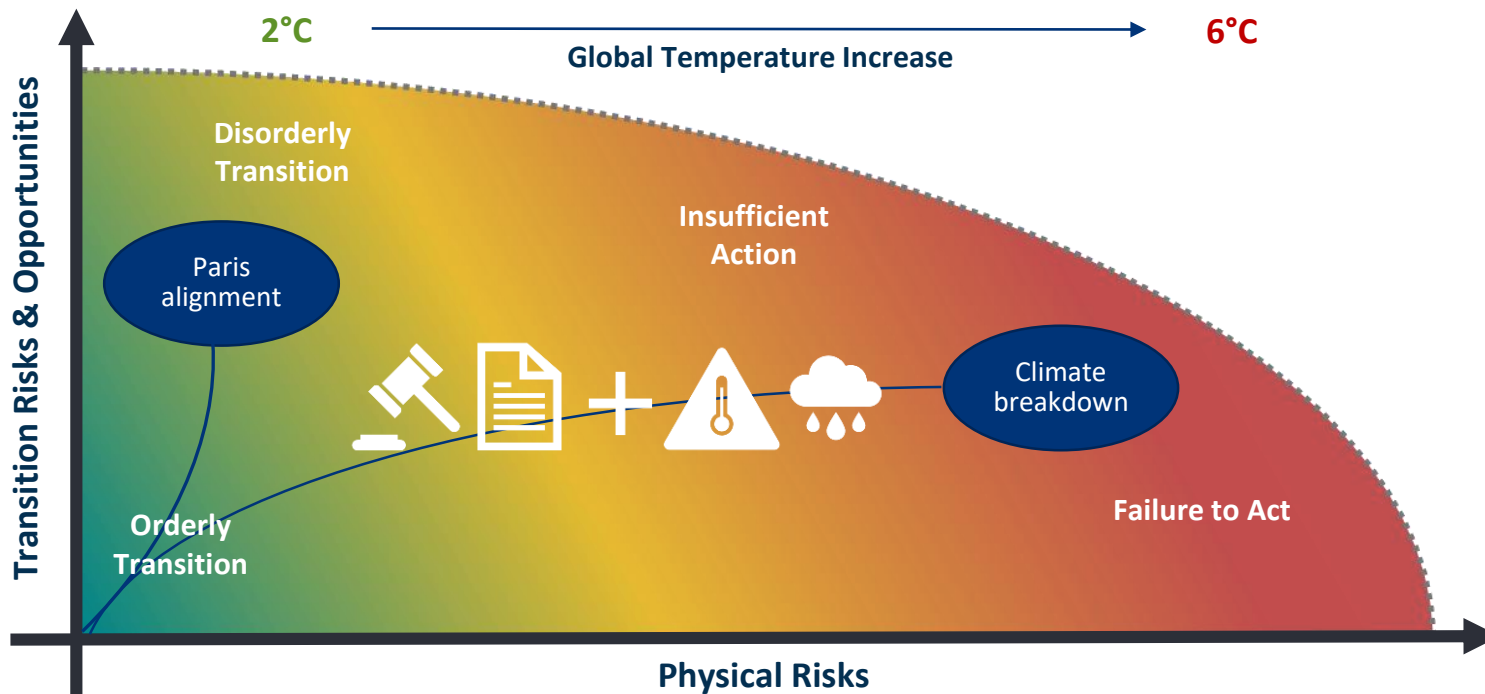
...you need to be able  
to convincingly  
answer the question:

‘How will climate-related impacts affect your current and future potential for growth?’



# How will climate change affect your business?

*TCFD encourages organisations to explore the likelihood and magnitude of financial impacts from potential climate-related risks & opportunities now and in the future*



# How will climate change affect your business?

*TCFD is a disclosure framework of 11 questions across 4 categories*



## Governance

- a) **Board oversight** of climate-related risks and opportunities
- b) **Management role** in risk assessment and management

## Strategy

- a) **Risks and opportunities** identified
- b) **Impact** on business, strategy, and planning
- c) **Resilience of strategy** to different scenarios

## Risk Management

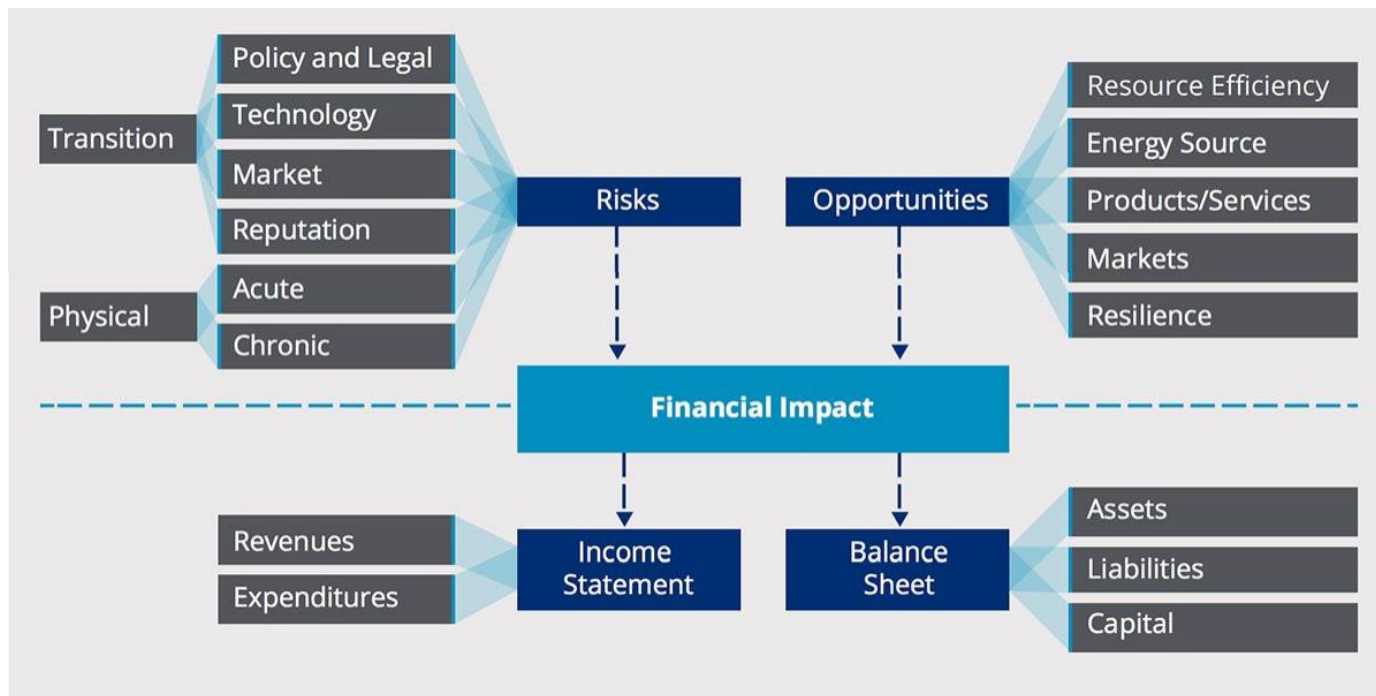
- a) Process for **identifying and assessing** climate-related risks
- b) Process for **managing** climate-related risks
- c) **Integration** with overall risk management

## Metrics and Targets

- a) **Metrics** for climate-related risk assessment
- b) **Scope 1, 2, and (if needed) 3** emissions and related risks
- c) **Targets** for risks and opportunities and related performance

# Types of climate-related risks and opportunities

*TCFD identifies 11 categories of risks and opportunities*

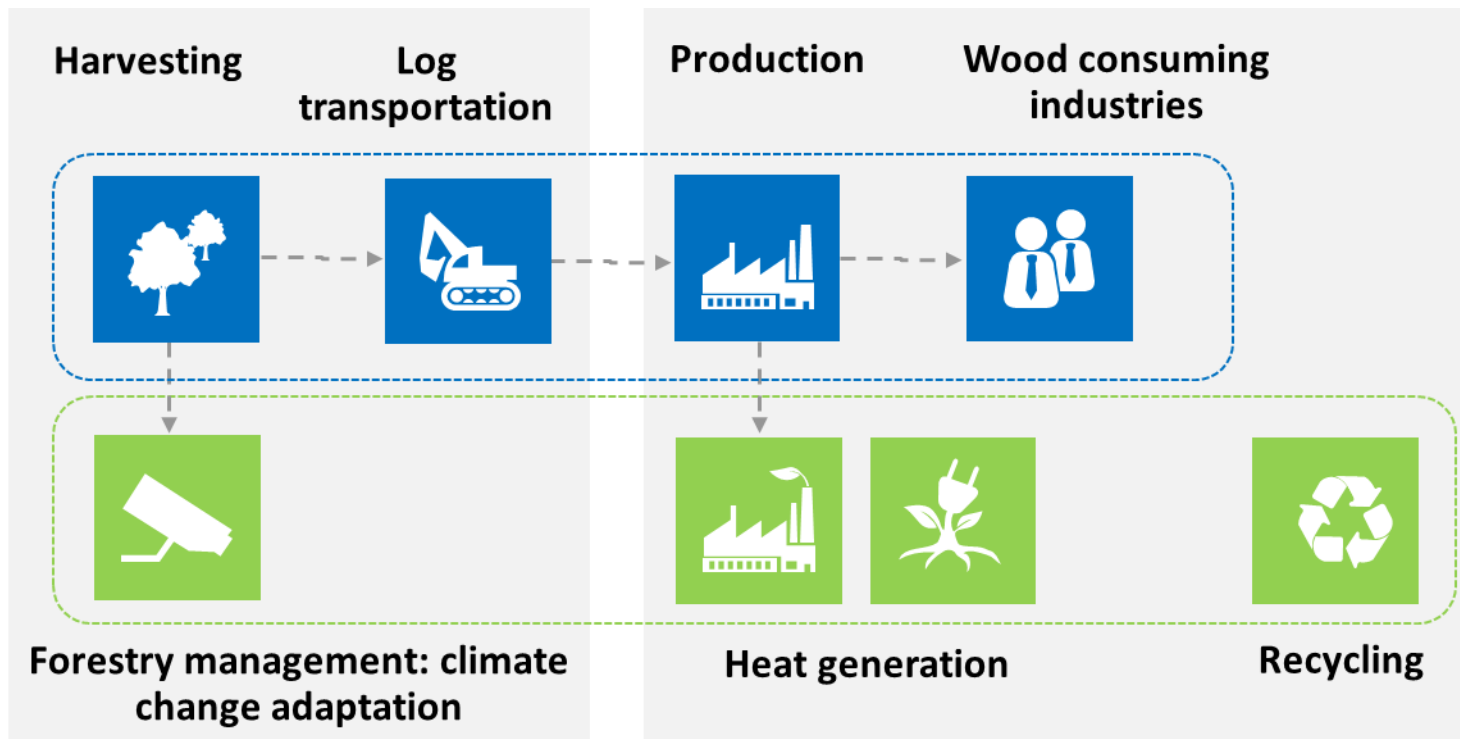


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## An evolving value chain – pulp and paper



## An evolving value chain - Agriculture

| Inputs >                           | Production >                             | Procurement and storage > | Processing >                 | Retail                            |
|------------------------------------|------------------------------------------|---------------------------|------------------------------|-----------------------------------|
| Seeds, fertilisers, farm equipment | Farmers, cooperatives, private companies | Warehouses, cold stores   | Grading, sorting and packing | Food markets, retail shops, malls |
| Physical risks<br>Policy & Legal   | Physical risks<br>Policy & Legal         | Market risks              | Market risks                 | Market risks<br>Reputation        |

# Transition risks for the Agriculture and Pulp & Paper sectors

| Agriculture | <b>Policy and Legal:</b> <ul style="list-style-type: none"> <li>Carbon price increase up to 110-120 USD per ton CO<sub>2</sub>e</li> <li>Tightening of existing regulation within the EU-ETS system (reduction in number of carbon allowances, increase in cost of CO<sub>2</sub>)</li> </ul> | <b>Market:</b> <ul style="list-style-type: none"> <li>Increased energy prices due to regulatory restrictions / increased costs relevant to energy suppliers</li> <li>Risks related to customers solvency due to increased and unexpected climate-related costs</li> </ul> | <b>Reputation:</b> <ul style="list-style-type: none"> <li>Negative perceptions about palm oil used to substitute dairy in products (Russia)</li> <li>Negative image of palm oil and its links to deforestation can affect market (International)</li> </ul> |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pulp&Paper  | <ul style="list-style-type: none"> <li>Carbon pricing or taxation effects on price of transportation of goods</li> <li>Tightening of EU-ETS regulation (reduction of allowances)</li> <li>Tightening of the forestry regulation</li> </ul>                                                    | <ul style="list-style-type: none"> <li>Upstream: energy price volatility due to carbon tax or other policy measures in the energy sector</li> <li>Reduced demand for P&amp;P products due to circular economy developments</li> </ul>                                     | <ul style="list-style-type: none"> <li>Negative perception of pulp and paper products by customers and investors</li> <li>Negative public perception of forestry operations in regions subject to hydric stress</li> </ul>                                  |

# Physical risks for the Agriculture and Pulp & Paper sectors

## Agriculture

### Chronic:

- Disruption of temperature-sensitive production processes due to rising average temperatures
- Disruption in supply of imported raw materials (coffee, cocoa, sugar),
- Disruption in supply of locally produced raw materials (cereals, etc) due to rising average temperatures, increased occurrence of droughts, etc
- Water scarcity
- Reduced agricultural yields due to increased temperatures

### Acute:

- Changes in precipitation patterns
- Natural disasters related to climate change, industrial accidents at production facilities
- Increased severity and frequency of extreme weather events such as cyclones and floods - reduction in demand for products due to extreme weather events
- Extreme weather events leading to disruption of upstream supply chain in chemical production

## Pulp&Paper

- Disruption of logging and transportation operations during winter due to milder temperatures
- Long-term changes in tree species composition
- Warming-enabled spread of pests and diseases

- Loss of assets due to forest fires
- Electricity supply and prices volatility in case of hydric stress in hydropower plants
- Drought events impact water availability causing disruptions to production.
- Destruction of site assets due to flooding

# Opportunities for the Agriculture and Pulp & Paper sectors

## Agriculture

### Markets:

- Development and/or expansion of low-carbon products and services (melamine, carbamide, etc) alongside with emissions reduction
- Access to new markets with customers whose activity is related to climate adaptation/mitigation
- Increasing demand for low-carbon products and services, including vegetable substitutes for meat
- Development of new cultures and agrochemical solutions (fertilizers, crop protection chemicals) adapted to changing climate conditions (droughts, floods, soil salinization)
- New areas suitable for agricultural production

### Resilience:

- Developing competences in climate-related risks and opportunities management
- Drip irrigation technology

## Pulp&Paper

### Products/Services:

- Implementation of “Cascading use of wood” approach prioritizing long-life, high-added-value products (furniture, etc) over disposable ones
- Providing customers with detailed carbon footprints of products on request
- Increased demand for timber as an alternative building material to more carbon intensive sources such as steel

- Transition to integrated forest management to increase carbon sequestration in soils and timber
- Mitigating climate-related risks by geographic diversification of supply chain and assets
- Benefiting from higher growth rates in certain areas due to increased temperatures and CO2 concentration

## Polling

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- *What do you consider as the main risks for the agriculture sector in Russia?*
- *What do you consider as the main opportunities for the agriculture sector in Russia?*
- *What do you consider as the main risks for the pulp and paper sector in Russia?*
- *What do you consider as the main opportunities for the pulp and paper sector in Russia?*

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# The process for TCFD implementation

*Disclosing aligned to TCFD is an iterative process with three fundamental steps.*

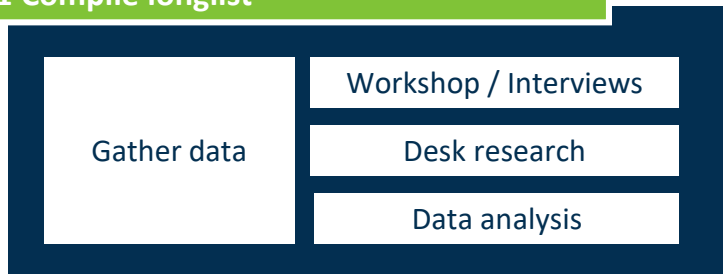


# 1. Identification and categorisation

*Identify and categorise relevant risks and opportunities*



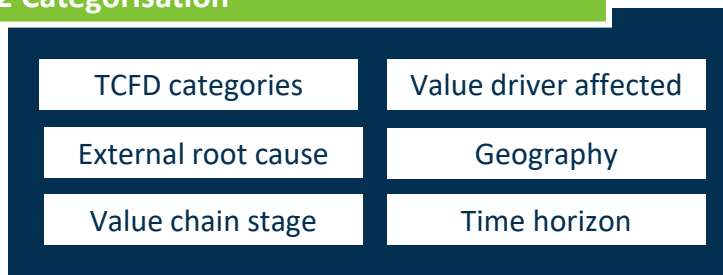
## 1.1 Compile longlist



### Aim:

- Identify risks and opportunities based on the organisation's specific characteristics and value creation model, as well as the industry context in which it operates
- Identify both internal and external drivers of risks

## 1.2 Categorisation



### Aim:

- Group risks and opportunities by pre-defined categories to start identifying trends and hotspots

# 1. Identification and categorisation

*Identify and categorise relevant risks and opportunities*



| Risk or opportunity                           | TCFD category           | External root cause                          | Value chain stage | Value driver affected | Geography                | Time horizon |
|-----------------------------------------------|-------------------------|----------------------------------------------|-------------------|-----------------------|--------------------------|--------------|
| Carbon pricing                                | Policy & legal risk     | EU Carbon Border Adjustment                  | Sales             | Revenue               | Europe                   | Short        |
| Reduce wheat yields                           | Physical risk (chronic) | Increase in average temperature              | Harvest           | Revenue               | Russia                   | Long         |
| Increased demand for low-carbon choices       | Markets opportunity     | Increased demand for meat/dairy free produce | Sales             | Revenue               | Europe and North America | Medium       |
| Investor demand for environmental disclosures | Reputational Risk       | Changing investor expectations               | Admin / overheads | Cost                  | Europe                   | Medium       |

*Illustrative purposes only*

## 2. Prioritisation

*Assign quantitative metrics and score against set criteria*



### 2.1 Assign parameters and metrics

|                                          |              |
|------------------------------------------|--------------|
| Scenario data<br>for external factors    | 3°C scenario |
|                                          | 2°C scenario |
| Company information for<br>value drivers | Public       |
|                                          | Internal     |

#### Aim:

- Assign a parameter to the risks and source relevant scenario data
- Assign financial metrics to the risks based on the elements of the business model that may be affected

### 2.2 Score risks against detailed criteria

|                      |                      |
|----------------------|----------------------|
| Confidence level     | Scenario sensitivity |
| Probability          | Time horizon         |
| Financial indicators | Reputation or other  |

#### Aim:

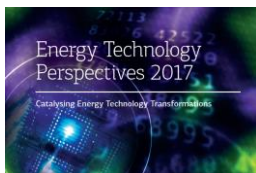
- Translate evidence base into comparable outputs
- Score risks and opportunities following a systematic, data-driven and coherent approach based on set criteria

# Focus area – scenario analysis

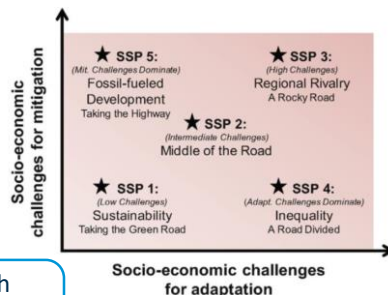
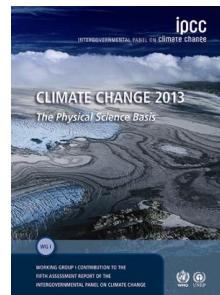
*Different types of scenarios exist, each providing appropriate underlying data for relevant risks and opportunities. These are examples of data sources*

## Transition scenarios

### Sector-specific models

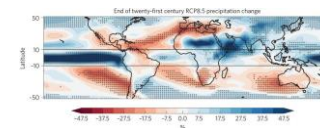
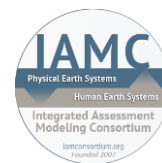


### Integrated Assessment Models (IAMs)



## Physical scenarios

### Climate models



Data on energy consumption by industry and source can show energy projections across sectors

Data on the agricultural indicators such as GHG emissions in agriculture and crop production (tonnes/ha)

Data on water availability in nearby basins can show availability of water for agriculture and pulp and paper processes

## Focus area – financial quantification

*The financial impact is spread across different business areas, depending on the risks and opportunities considered. TCFD recommends considering four financial categories*

|                                        | Revenues                                                                                                                                                                                  | Expenditures                                                                                                                                                                                                                    | Assets and liabilities                                                                                                                                                                                                                | Capital and financing                                                                                                                                                                                                 |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value driver exposed to climate change | <ul style="list-style-type: none"> <li>▪ Demand</li> <li>▪ Product mix and production capacity</li> <li>▪ Market positioning and competition</li> <li>▪ Operational continuity</li> </ul> | <ul style="list-style-type: none"> <li>▪ Production costs</li> <li>▪ Energy and other operating costs</li> <li>▪ Fines and regulatory compliance</li> <li>▪ R&amp;D</li> <li>▪ Resilience to supply chain disruption</li> </ul> | <ul style="list-style-type: none"> <li>▪ Fixed asset values and re-pricing</li> <li>▪ Asset valuation and lifetimes</li> <li>▪ R&amp;D and innovation costs</li> <li>▪ CAPEX requirements</li> <li>▪ Return on investments</li> </ul> | <ul style="list-style-type: none"> <li>▪ Access to finance</li> <li>▪ Trustworthiness and creditability</li> <li>▪ Relations with workforce, investors and other stakeholders</li> <li>▪ Legal environment</li> </ul> |
| Example financial metrics              | <ul style="list-style-type: none"> <li>▪ Revenue</li> <li>▪ EBITDA</li> </ul>                                                                                                             | <ul style="list-style-type: none"> <li>▪ COGS</li> <li>▪ Fixed costs</li> <li>▪ Operating and other margins</li> </ul>                                                                                                          | <ul style="list-style-type: none"> <li>▪ Inventory loss</li> <li>▪ RoE and RoI</li> </ul>                                                                                                                                             | <ul style="list-style-type: none"> <li>▪ Cost of capital</li> <li>▪ Interest rates</li> <li>▪ Long term debt</li> <li>▪ Minority interest and retained equity</li> </ul>                                              |

## 2. Example prioritisation analysis

Each risk and opportunity is scored on the 6 criteria, using scenario analysis

Identify

Prioritise

Quantify

| Risk or opportunity                                | Parameter                                                                                                                                                      | Confidence                                               | Scenario sensitivity                                 | Probability                            | Time horizon            | Financial impact                                        |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------|----------------------------------------|-------------------------|---------------------------------------------------------|
| Carbon pricing                                     | EU ETS price (\$/tCO <sub>2</sub> )                                                                                                                            | 5                                                        | 5                                                    | 5                                      | 3                       | \$5-10m                                                 |
|                                                    | <u>IEA, European Commission</u><br>Baseline: IEA Stated Policies, EU Impact Assessment<br>Transition: IEA Sustainable Development, EU Impact assessment (2020) | High, trusted source and relevant parameter              | High, >50% parameter divergence across scenarios     | High, >50% rate of change of parameter | Short term, <5 years    | (Price of EU ETS * Scope 1 emissions) – free allowances |
| Reduced crop yields                                | Average temperature change in Russia(DegC)                                                                                                                     | 5                                                        | 5                                                    | 5                                      | 1                       | \$50-100m                                               |
|                                                    | KNMI climate explorer<br>Baseline: RCP 4.5<br>Transition: RCP 2.6                                                                                              | High, trusted source and relevant parameter              | High, >50% parameter divergence across scenarios     | High, >50% rate of change of parameter | Long term, 5-20 years   | Revenue from wheat sales                                |
| Increased customer preference for low carbon diets | Agricultural production from livestock (OECD)                                                                                                                  | 3                                                        | 3                                                    | 1                                      | 2                       | \$1-2m                                                  |
|                                                    | SSP database<br>Baseline: SSP2-45 R5.2 OECD<br>Transition: SSP1-26 R5.2 OECD                                                                                   | Medium, trusted source and relatively relevant parameter | Medium, 25-50% parameter divergence across scenarios | Low, <25% rate of change of parameter  | Medium term, 5-20 years | Revenue from non-meat products                          |
| Investor demand for environmental disclosures      | None / qualitative assessment                                                                                                                                  | 1                                                        | 3                                                    | 5                                      | 2                       | Low                                                     |
|                                                    | No parameter available                                                                                                                                         | Low, only qualitative assessment possible                | Medium, qualitative assessment                       | High, qualitative assessment           | Medium term, 5-20 years | Qualitative assessment                                  |

## 2. Example prioritisation analysis

Each risk and opportunity is scored on the 6 criteria, using scenario analysis

Identify

Prioritise

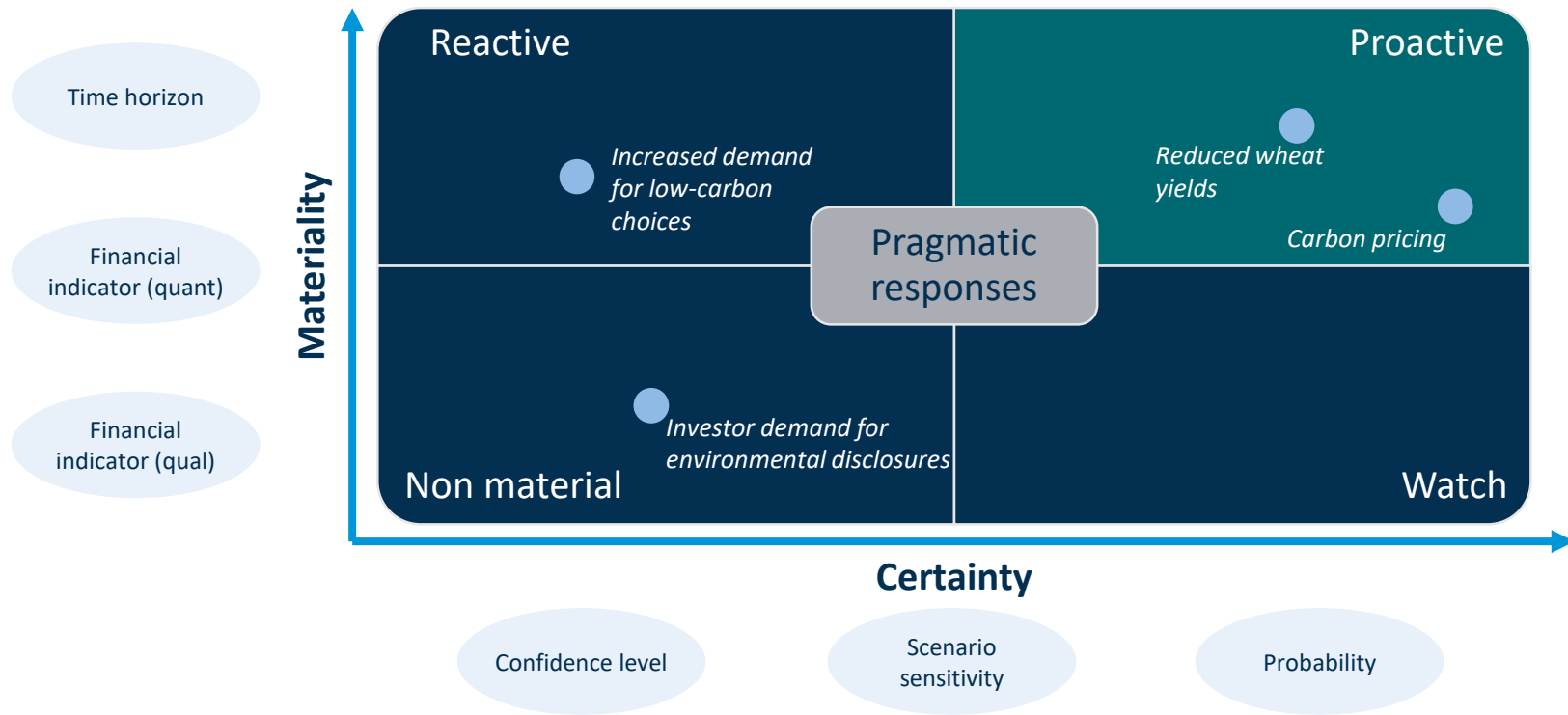
Quantify

| Risk or opportunity                                | Parameter                                                                                                                                                                                             | Confidence                                                           | Scenario sensitivity                                             | Probability                                           | Time horizon                            | Financial impact                                                          |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------|
| Carbon pricing                                     | EU ETS price (\$/tCO <sub>2</sub> )<br><i>IEA, European Commission</i><br>Baseline: IEA Stated Policies, EU Impact Assessment<br>Transition: IEA Sustainable Development, EU Impact assessment (2020) | 5<br><i>High, trusted source and relevant parameter</i>              | 5<br><i>High, &gt;50% parameter divergence across scenarios</i>  | 5<br><i>High, &gt;50% rate of change of parameter</i> | 3<br><i>Short term, &lt;5 years</i>     | \$5-10m<br><i>(Price of EU ETS * Scope 1 emissions) – free allowances</i> |
| Higher temperatures reduce crop yields             | Average temperature change in Russia(DegC)<br><i>KNMI climate explorer</i><br>Baseline: RCP 4.5<br>Transition: RCP 2.6                                                                                | 5<br><i>High, trusted source and relevant parameter</i>              | 5<br><i>High, &gt;50% parameter divergence across scenarios</i>  | 5<br><i>High, &gt;50% rate of change of parameter</i> | 1<br><i>Long term, 5-20 years</i>       | \$50-100m<br><i>Revenue from wheat sales</i>                              |
| Increased customer preference for low carbon diets | Agricultural production from livestock (OECD)<br><i>SSP database</i><br>Baseline: SSP2-45 R5.2 OECD<br>Transition: SSP1-26 R5.2 OECD                                                                  | 3<br><i>Medium, trusted source and relatively relevant parameter</i> | 3<br><i>Medium, 25-50% parameter divergence across scenarios</i> | 1<br><i>Low, &lt;25% rate of change of parameter</i>  | 2<br><i>Medium term, 5-20 years</i>     | \$1-2m<br><i>Revenue from non-meat products</i>                           |
| Investor demand for environmental disclosures      | None / qualitative assessment<br><br><i>No parameter available</i>                                                                                                                                    | 1<br><br><i>Low, only qualitative assessment possible</i>            | 3<br><br><i>Medium, qualitative assessment</i>                   | 5<br><br><i>High, qualitative assessment</i>          | 2<br><br><i>Medium term, 5-20 years</i> | Low<br><br><i>Qualitative assessment</i>                                  |

Illustrative purposes only

## 2. Example prioritisation decision

The six criteria are grouped into “certainty” and “materiality”, and risks/opportunities in the “proactive” quadrant are prioritised



### 3. Quantification

*Determine the value-at-stake (VaS)*



#### 3.1 Determine VaS for risks

|              |                 |
|--------------|-----------------|
| BAU          | Cumulative loss |
| 3°C scenario |                 |
| 2°C scenario |                 |

#### 3.2 Determine VaS for opportunities

|              |                          |
|--------------|--------------------------|
| BAU          | Potential value creation |
| 3°C scenario |                          |
| 2°C scenario |                          |

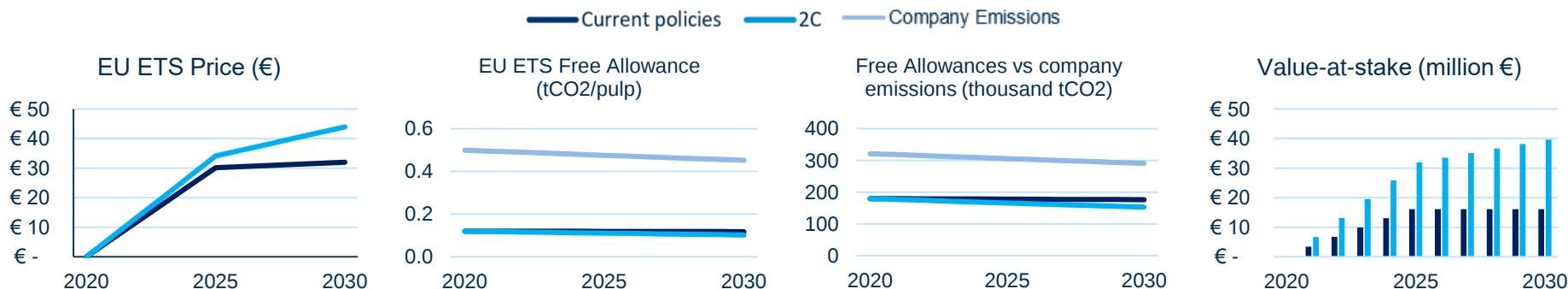
**Aim:**

- Quantify long-term financial impact of prioritised risks and opportunities
- Determine the cumulative loss (for risk) or potential value creation (for opportunities) between the “Business-as-Usual” baseline and two pathways developed aligned to climate scenarios

# Focus area – financial quantification

*Example approach to modelling financial impacts under different climate scenarios*

## Assessed risk: Introduction of carbon border adjustment in Europe affects costs



### Projected EU ETS price

1. Extract EU ETS projections from climate scenario databases

Source: [IEA, European Commission](#)

- Baseline: IEA Stated Policies, EU Impact Assessment (2020)
- Transition: IEA Sustainable Development, EU Impact assessment (2020)

### Projected carbon intensity

2. Develop calculation for carbon intensity of sector:

**Benchmark carbon intensity**  
\* *innovation uptake*

Source: [European commission](#)

- Baseline/Transition: EU ETS, Allocation to Industrial Installations

### Difference between emissions within the EU ETS cap and actual company emissions

3. Calculate difference in impact on costs payable between BAU scenario (no border adjustment) and the two climate scenarios

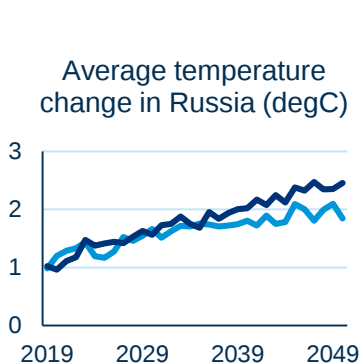
### Value-at-stake

3. Calculate difference in impact on costs payable between BAU scenario (no border adjustment) and the two climate scenarios

# Focus area – financial quantification

*Example approach to modelling financial impacts under different climate scenarios*

## Assessed risk: Reduced wheat yield due to increased average temperature

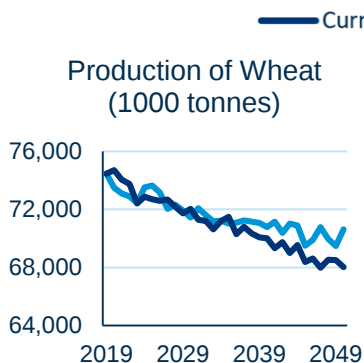


### Projected temperature

1. Extract Russian average temperature projections

Source: [KNMI database](#)

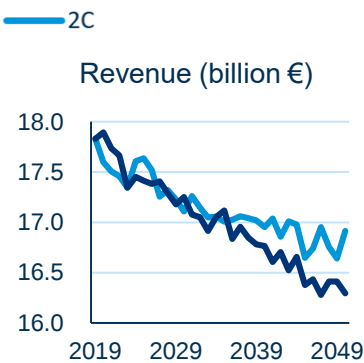
- Baseline: RCP4.5
- Transition: RCP2.6



### Resulting impact on parameter

2. Understand implication to wheat yields:
  - 1 degree temperature increase expected to reduce wheat yield by 6%

Source: Carbon Trust internal modelling based on Zhao et al., 2017



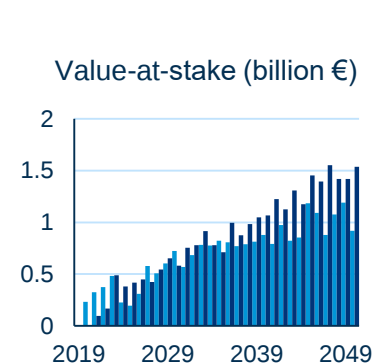
### Resulting impact on value driver

3. Develop calculation for foregone revenue due to reduced wheat yield:
 

***price/t \* tonnes produced***

Source:

- Price of wheat (company sales data, assumed €239.5/t)



### Value-at-stake

4. Calculate difference in impact on revenue between BAU scenario (no temperature increase) and the two climate scenarios

## Polling

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- *What part of a TCFD disclosure project do you think is the easiest?*
- *What part of a TCFD disclosure project do you think is the most difficult?*
- *What team(s) within your organisation is responsible for TCFD?*
- *Have you already disclosed aligned to TCFD?*
- *If YES, is there an area you plan to expand on in your next iteration of TCFD disclosure?*
- *If NO, what do you see as the main barriers for starting a TCFD project?*
- *If NO, when do you think TCFD will be important for your business?*

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## Upcoming webinars

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| When                        | Webinar title                                                 | In collaboration with                                                               |
|-----------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 10 <sup>th</sup> March 2021 | TCFD reporting for the <b>ferrous metals</b> sector in Russia |  |
| 17 <sup>th</sup> March 2021 | TCFD reporting for the <b>banking sector</b> in Russia        |  |

## Polling

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- *Did you find the content of the webinar useful?*
- *Have you received new information during this webinar?*
- *What was your reason for attending the event?*
- *What additional resources would be necessary or useful for you to start systematically assessing your climate related risks and opportunities?*

## Panel discussion and Q&A



Tom Cumberlege, Associate Director – *Speaker and panel*

Alice Ainsworth, Senior Analyst – *Speaker and panel*

Gregorio Giorgi, Senior Associate – *Moderator*



Maxim Titov, Director – *Speaker and panel*



Evgenia Moskalyuk, Chief Ecologist – *Speaker and panel*



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