



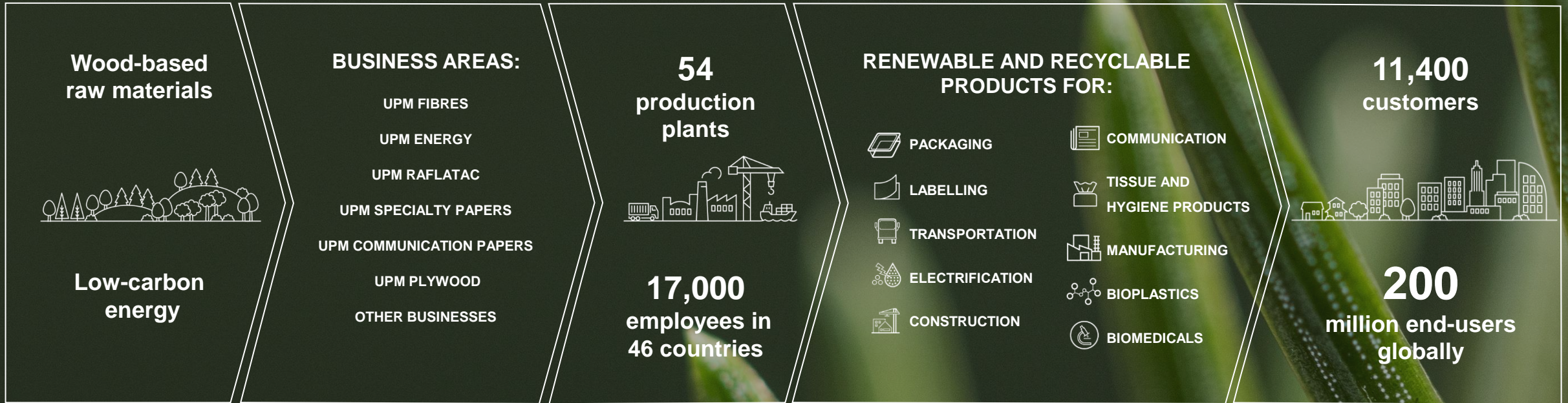
# Climate scenarios and their effect on UPM

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# This is UPM



# It's a material world

## WHAT WE OFFER



A sustainable and healthy lifestyle – Meeting daily consumer needs



Innovation for a better future – Replacing fossil fuels and materials



Building better – Low-carbon construction



Driving the transition – low-emission energy

# Sustainable choices



## HOW WE MAKE A POSITIVE IMPACT



Enabling sustainable  
Consumer choices



Mitigating  
climate change



Improving  
biodiversity



Advancing a circular  
bioeconomy

# Climate change: one of the biggest challenges of our time

Mitigating climate crisis requires decisive actions:

- Reducing emissions
- Finding alternatives for fossil-based materials
- Serving the needs of a growing population with circular economy and renewable materials

In addition to mitigation, we also need to adapt to climate change by forest management

# Our climate commitment



- **WE ACT THROUGH FORESTS**
- We are committed to climate-positive forestry and enhancing biodiversity.



**WE ACT THROUGH EFFICIENCY AND EMISSIONS**  
Our target is to reduce our CO<sub>2</sub> emissions by 65%.



**WE ACT THROUGH PRODUCTS**  
We innovate novel products, and our aim is to scientifically verify the climate impacts of all our products.

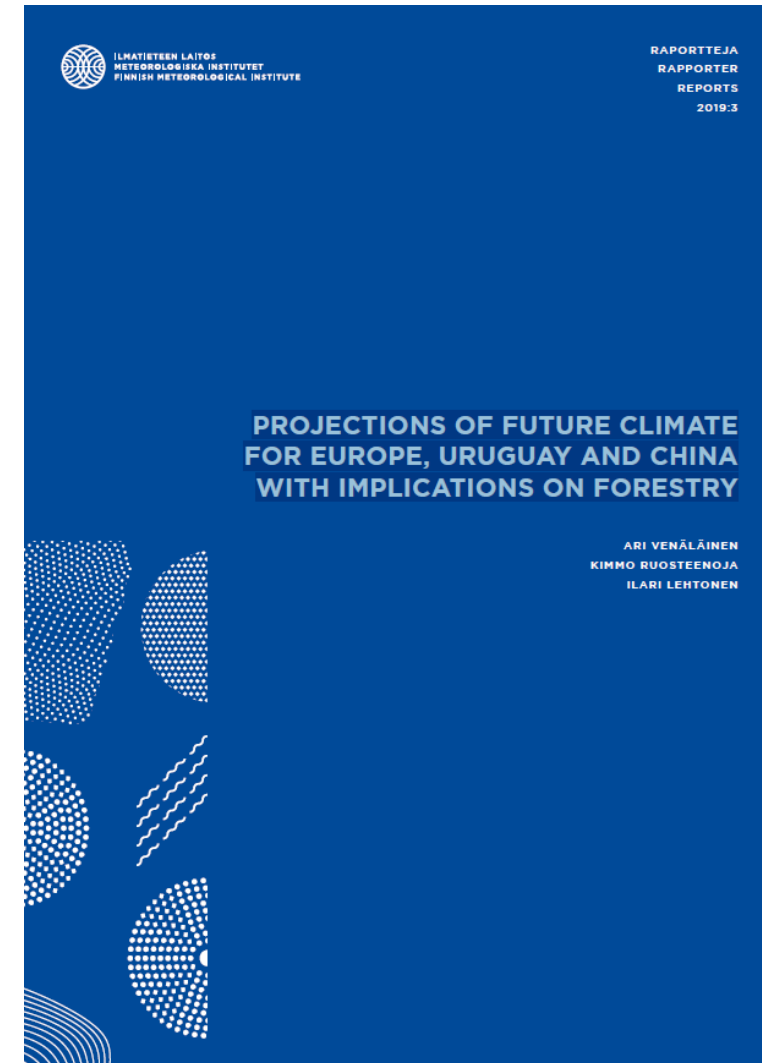


**BUSINESS AMBITION FOR 1.5°C**   **OUR ONLY FUTURE**

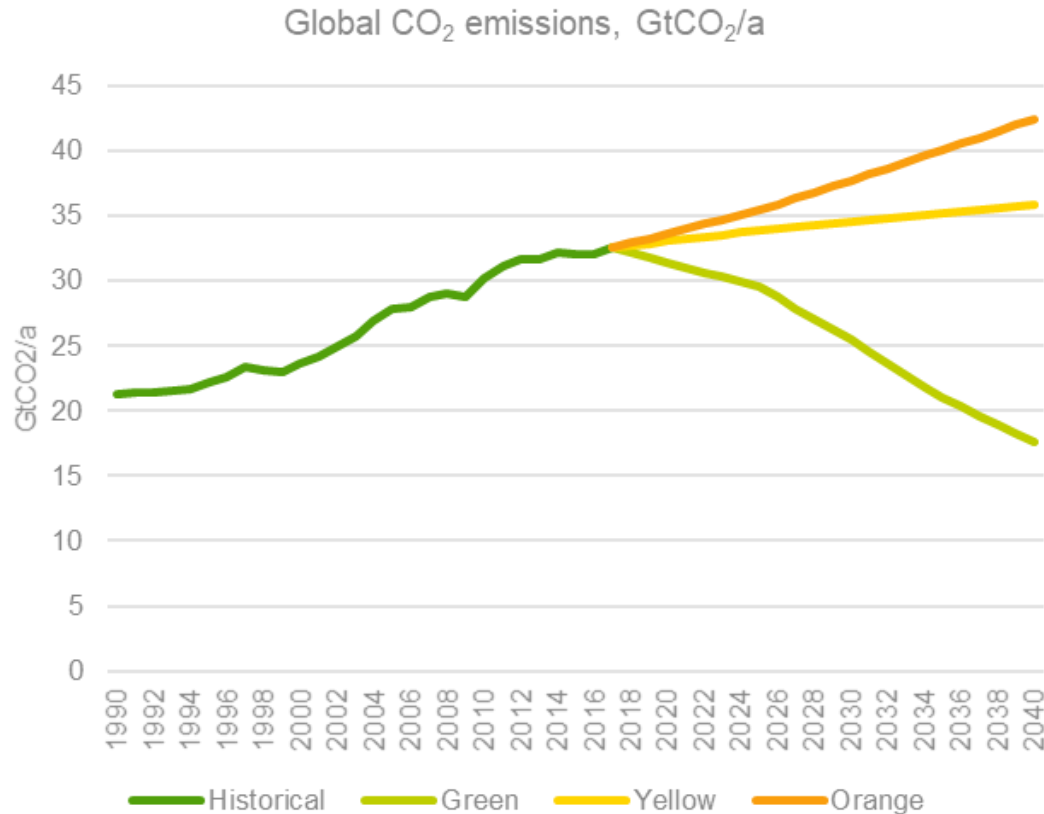
**THE Paris...  
CLIMATE 10 years  
PLEDGE Early**

# What risk climate change pose to UPM business?

- Joint project with Finnish Meteorological institute
- Focus on four areas: Finland, Southern Germany, Uruguay, Eastern China
- Focus on forests
- Projection calculated mainly to period 2040-2069
- Target was to get science based, consistent and forward looking information on climate change on UPM business and its raw material - wood



# Global CO<sub>2</sub> emission trajectories in UPM scenarios



**Orange - Increasing emissions, high warming**  
 Weak commitment to climate change mitigation. Globally, CO<sub>2</sub> emissions increase, resulting in over 4 degrees warming.

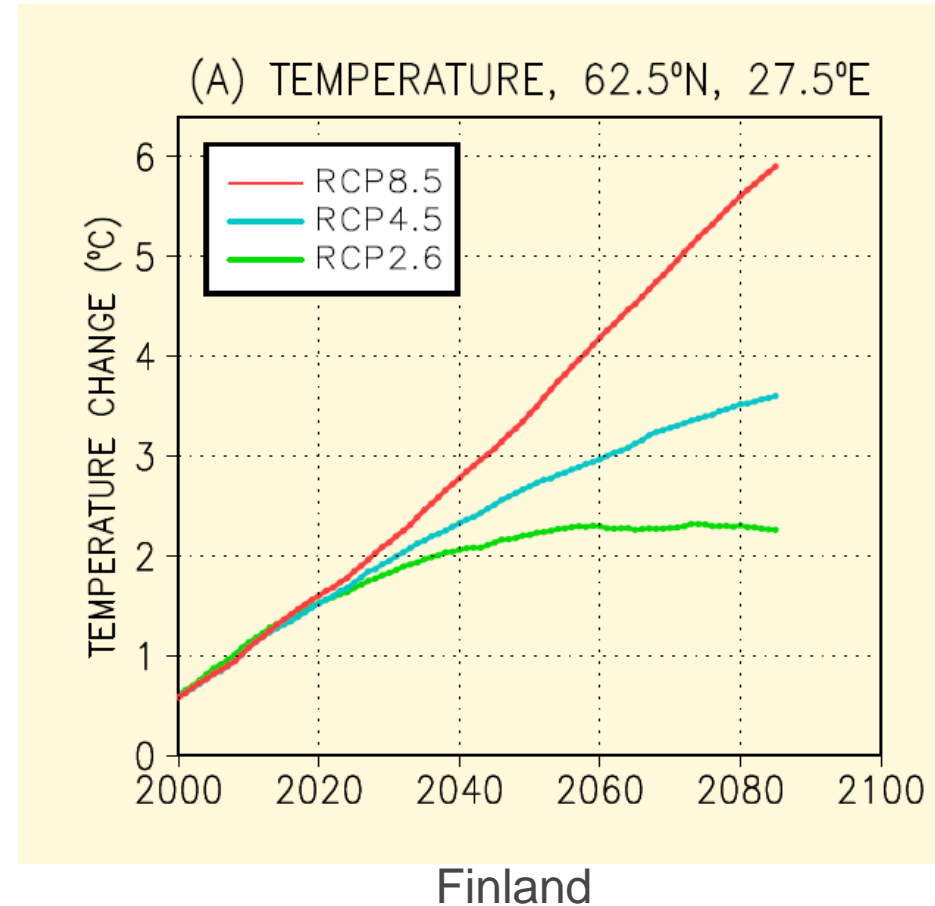
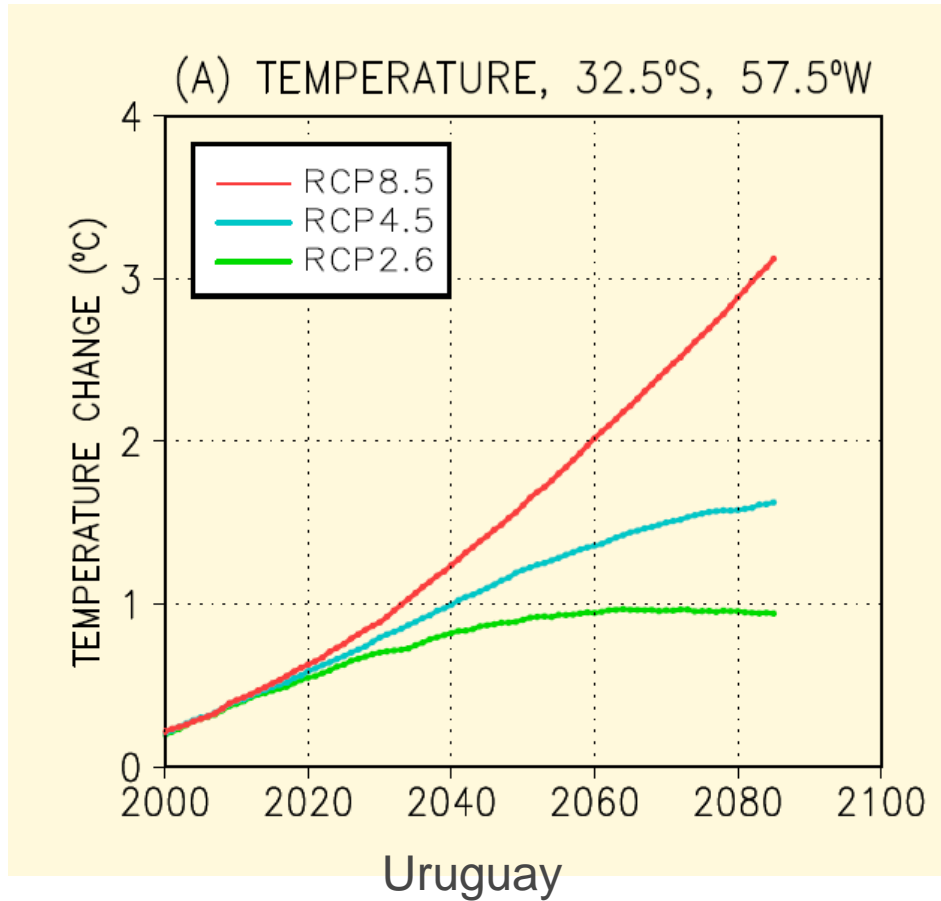
**Yellow - Current commitment level, moderate warming**  
 In aggregate, countries keep their current commitment level in climate change mitigation. Total CO<sub>2</sub> emissions increase, but at a low pace. Resulting global warming is almost 3 degrees.

**Green - Low carbon transition, low warming**  
 Strong global response and rapid low-carbon transition. Change is driven by both regulation and customer demand. Global emissions peak in 2020 and then enter a steep and sustained decline. Resulting global warming stays below 2 degrees.

- RCP 2.6 = Global temperature rise less than 2 °C
- RCP 4.5 = Global temperature rise between 2-3 °C
- RCP 8.5 = Global temperature rise 5 °C



# Effects of climate change are not similar in Finland and Uruguay



# How does our future look like?



Photo: A.J.Punkka



Photo: K.Kotro

# Risk of (large) forest fires will increase



Sweden, 3.8. 2014



Canada, 9.5. 2016



Kalifornia, 9.9. 2017



Portugal, 16.10. 2016

# Wind damage in Poland, August 2017



# Soil bearing capacity. Reduced soil frost period will hamper forest harvesting and can increase forest damages

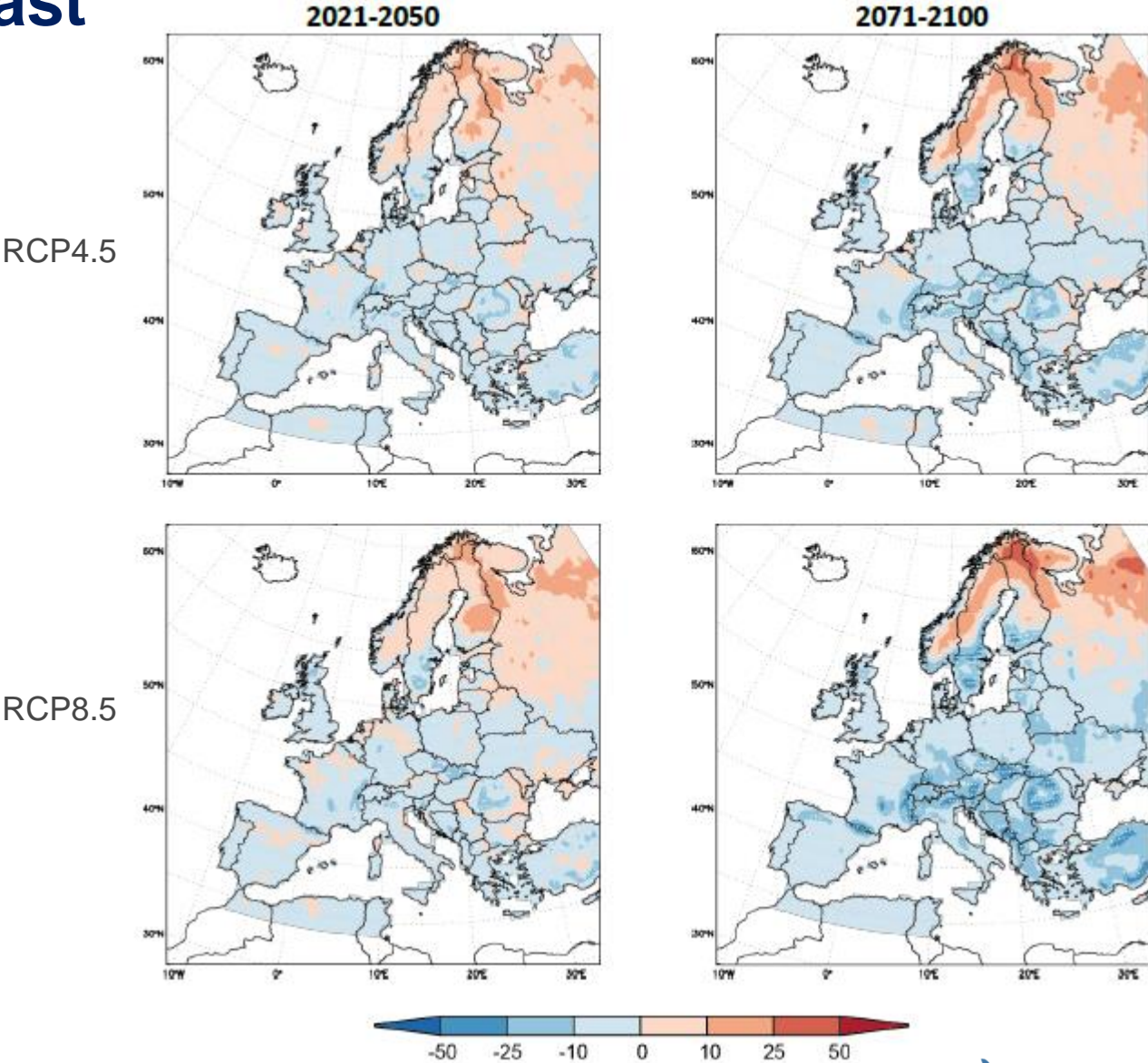


# Snow damages. Projected to increase north-east



Picture: Elenia

The change in probability (%) of > 20 kg/m<sup>2</sup> snow load



# Biotic damages. Warmer climate increases risk of insect pests

Bark beetle



Kuva: D.I.Gavryushin



Tähtikudospistiäinen

Kuva: Antti Pouttu



Arge bullata

Kuva: Heikki Niorteva



Anoplophora glabripennis



Kuva: Ruokavirasto

UGA1460069



Black-arched moth



Kuva: Kimmo Silvenen

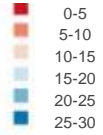
Kimmo's Lep Site

Number of years during 30 year period when temperature sinks below -27°C

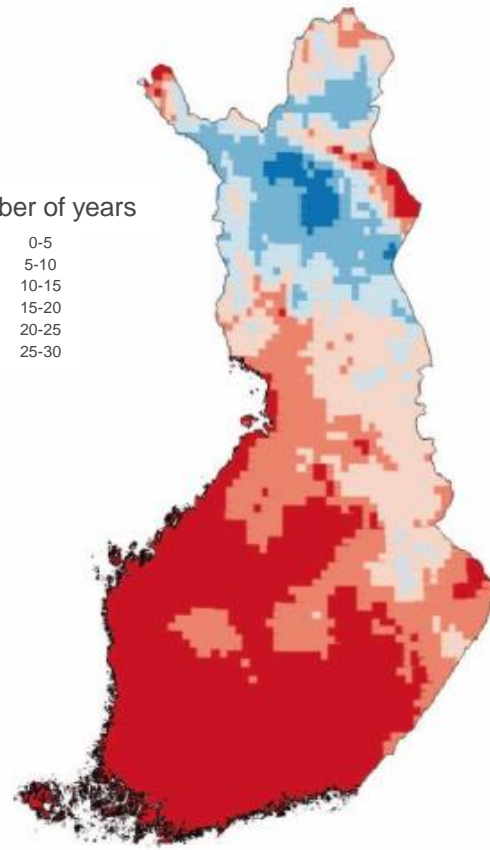
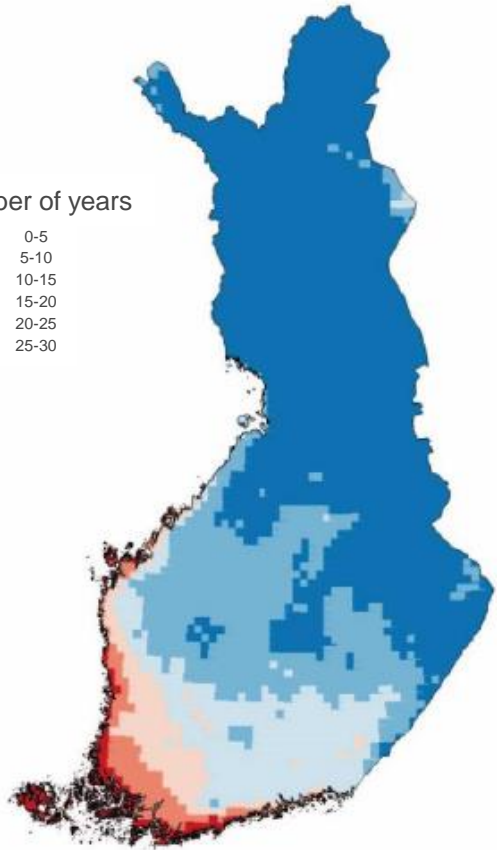
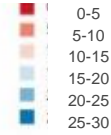
1980-2009

2040-2069

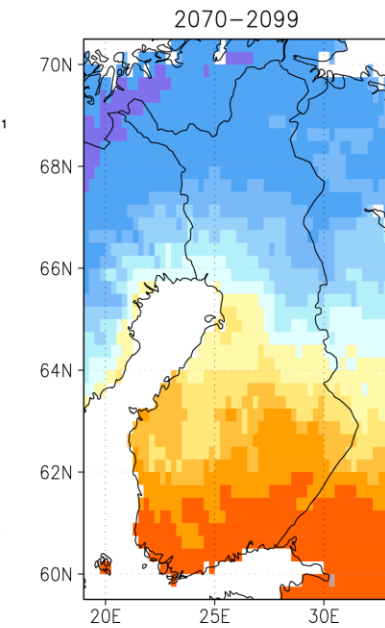
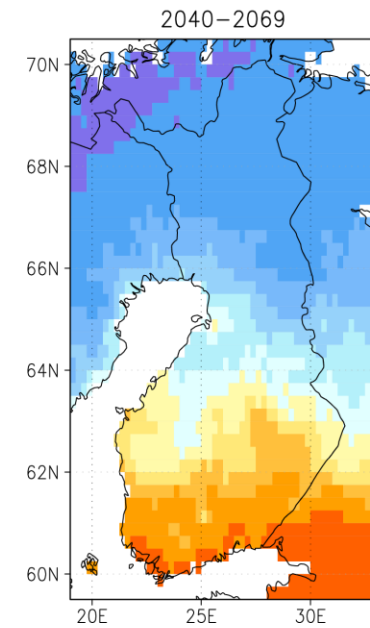
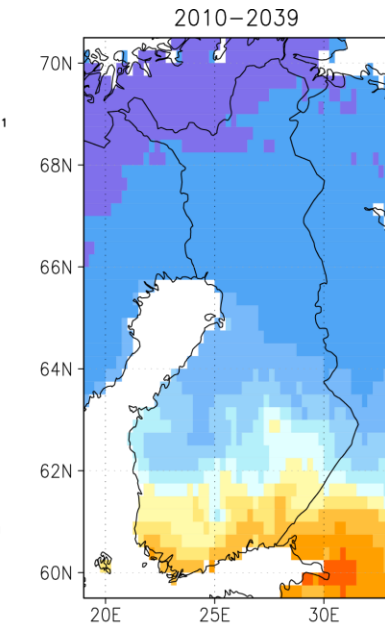
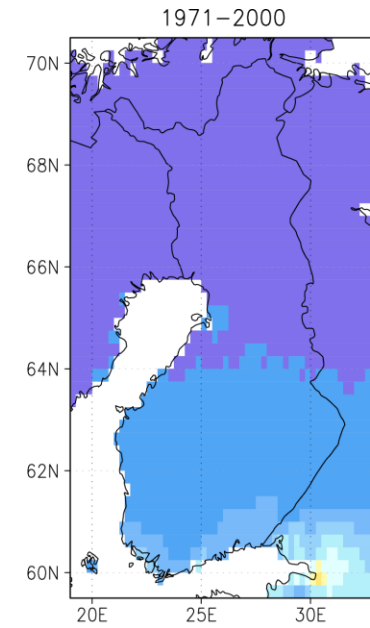
Number of years



Number of years



RCP4.5





# Climate change will significantly impact our business environment – direction of the change is uncertain

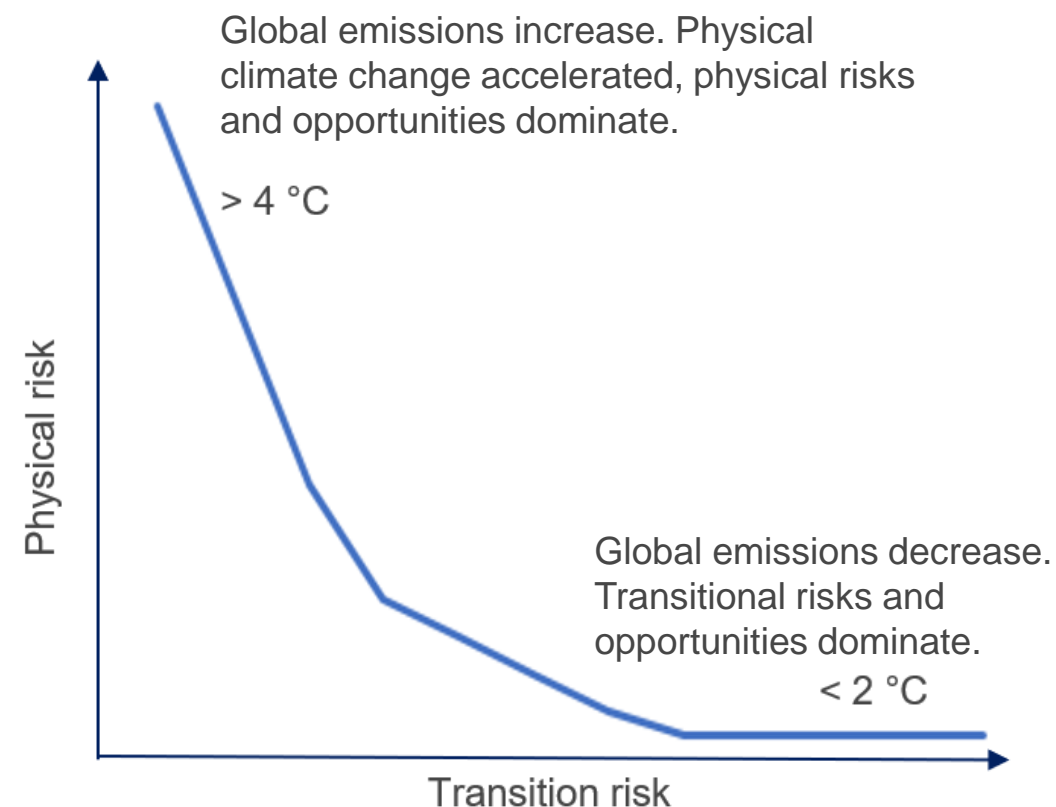


## Physical risks and opportunities

- Chronic changes like increasing temperature, increased or decreased precipitation and sea level rise as well as more frequent and severe extreme weather events
- Physical risks dominate if emissions are higher (and corresponding transitional risks are lower)

## Transitional risks and opportunities

- Move towards low-carbon economy will bring changes in climate and energy policies, shift to low-carbon technologies, and changes in up- and downstream markets
- Transitional risks dominate if emissions are lower (and corresponding physical risks are lower)



## Conclusions

- Climate change increases forest growth in the beginning at high latitudes
- Later, and at especially at lower latitudes forests will suffer due to the change
  - physical risks
    - More frequent and severe events
    - Risks of forest damages will increase, e.g., forest fires, drought, biotic damages
- UPM is well positioned due to renewable forest biomass and many of our products replace fossil-based materials on transitional risks
- Human induced tree cover loss (deforestation) continues in many locations of the world , e.g. in Brazil, Indonesia, Africa. Simultaneously forest cover is increasing e.g. in Europe and in China

We act through FORESTS

# Sustainably managed forests grow more, while taking care of biodiversity and carbon sinks



We plant over **100** trees per minute.

Annual growth in Finland from

**50** million to **108**  
million m<sup>3</sup> since 1960's

From

**0** to **1,000,000**  
ha in 30 years in Uruguay

2030  
TARGETS



# Committed to mitigate climate change

We have linked the pricing mechanism of a syndicated revolving credit facility (RCF) and executive remuneration to both biodiversity and climate targets.



UPM **BIOFORE**  
**BEYOND** FOSSILS

