DATA AHEAD ANALYTICS

ClimateLaunchpad

eit Climate-KIC

National Winner of Climate Launchpad 2019

**Climate Risks:
Machine intelligence to enable forward-looking risk management**

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From science to resilience – AMLD 2020, Lausanne

Making companies resilient: measuring sustainability risks

Which cost can I expect resulting from CO_2 prices in the legislations I am operating?

How resilient are global supply chains against natural disasters and how high are expected losses?

How resilient are local productions and logistics against increasingly extreme weather situations?

Which technologies and markets in my portfolio are at risk and where are major opportunities?

How high is the financial risk on my building portfolio and what is an optimal mitigation pathway?

How can I answer questions from investors about my climate risk management and mitigation strategy?
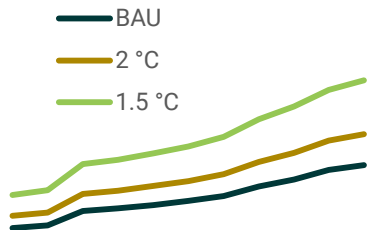
The TCFD financial climate impact framework

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Transition Risks
- Policy and Legal
- Technology
- Market
- Reputation

Physical Risks
- Acute
- Chronic

Opportunities
- Resource Efficiency
- Energy Source
- Products/Service
- Markets
- Resilience

Risks

Opportunities

Strategic Planning
Risk Management

Financial Impact

Revenues

Expenditures

Income
Statement

Cash Flow
Statement

Balance
Sheet

Assets & Liabilities

Capital & Financing

https://www.fsb-tcfd.org/

Supply chain risks in a changing global environment

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Suppliers

Business interruption
Regulatory
Reputation
Litigation
Market

OEM

Risks not controllable
by OEM

Risks partly controllable
by OEM

CO_2 Risk Site A (M€ cost)

— BAU
— 2 °C
— 1.5 °C

Scenarios include changes in climate, political response

Micro-economic effect of scenarios?
How do companies react on technology and market shifts?
Which companies are early adopters, which are laggards?

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Company data is modeled in our enterprise knowledge graph

Legend:
- Process impact graph
- Legal impact graph
- Supply chain impact graph

Reduce CO2 by X until Y

Paris Agreement

Country

City

Tier 2

Tier 1

OEM

Production division

Office division

Other group site

Process impact?

Extreme weather impact?

Talent impact?

Climate data / climate model

T(t)

prec(t)

wind(t)

Geolocation

lon

lat

alt

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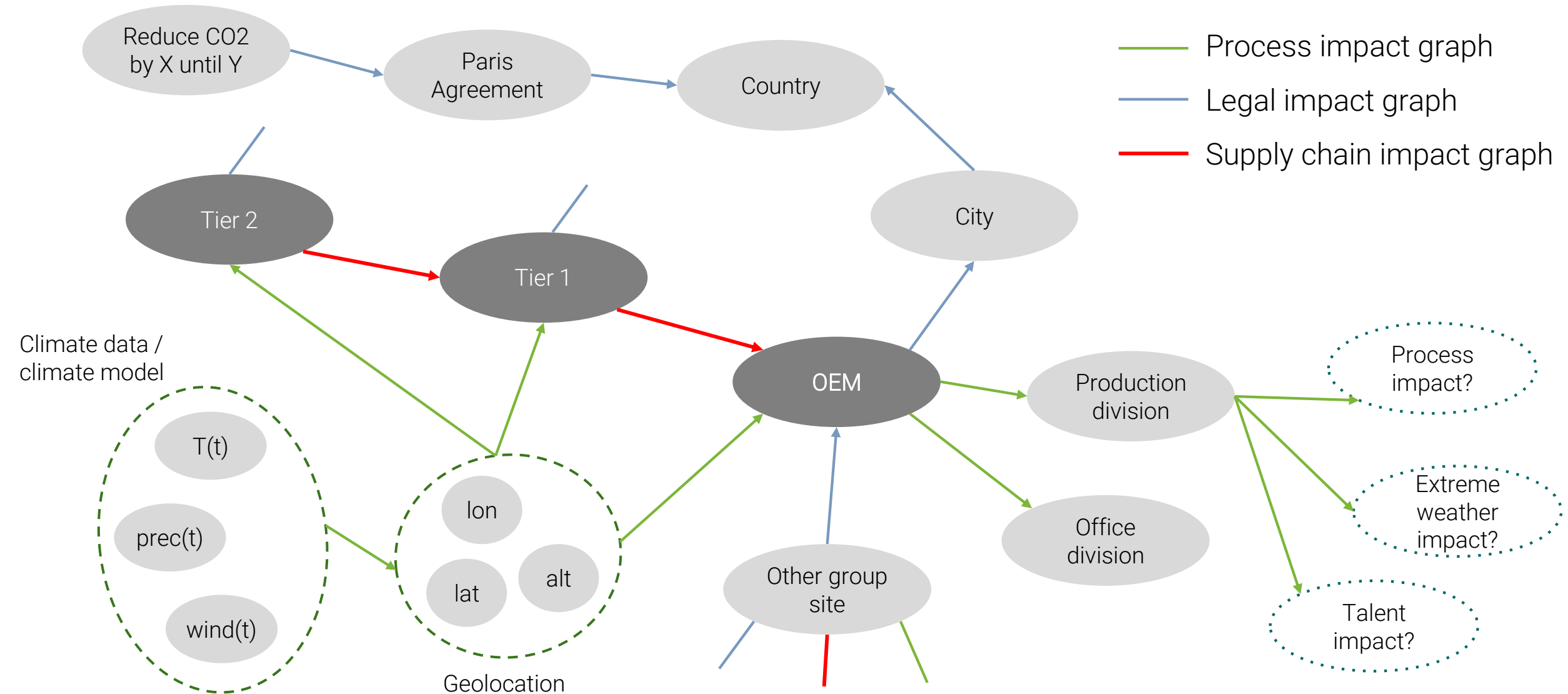
Modeling the impact of carbon pricing in the supply chain...

... with caveats:
- Aggregating all policy impacts into a single, national carbon price figure
- Assuming costs can be fully forwarded through supply chain

Carbon price is represented as probability distribution per country, per year

CN

p(cost | year, CN)

CH

p(cost | year, US)

US

p(cost | year, RO)

p(cost | year, RO | CN)

RO
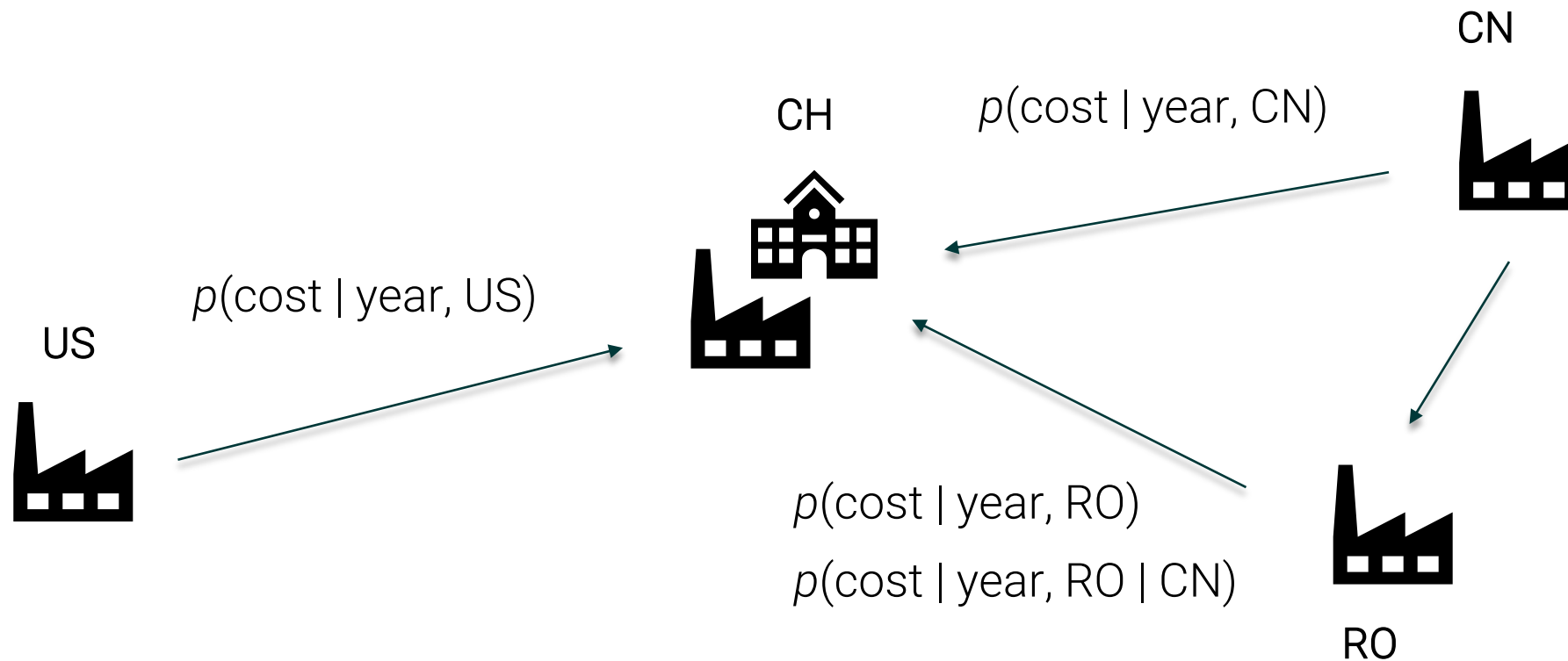
Though it's a bit more complicated in real live…

p(cost | year, location, business, policies, processes, management, history…)

p(cost | year, location, business, policies, processes, management, history…) =

p(year)

- p(location)

- p(business)

Known or set

- p(policies | location, year)

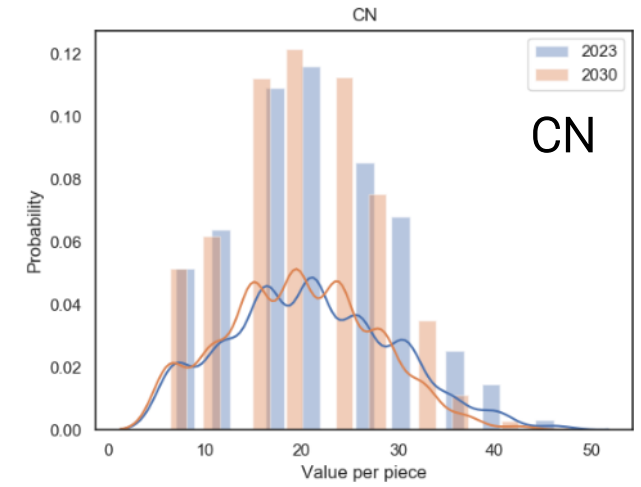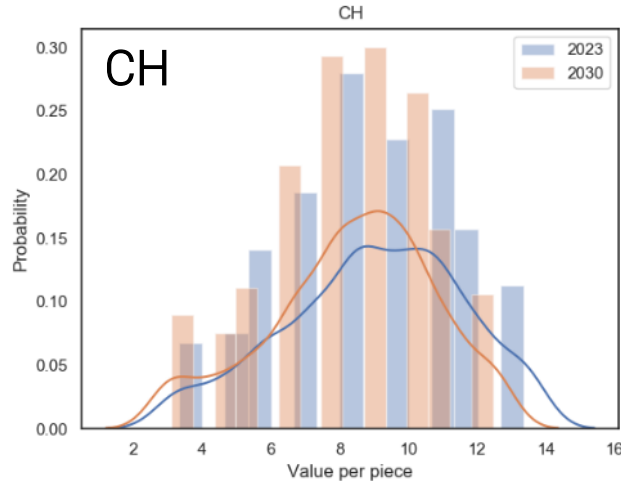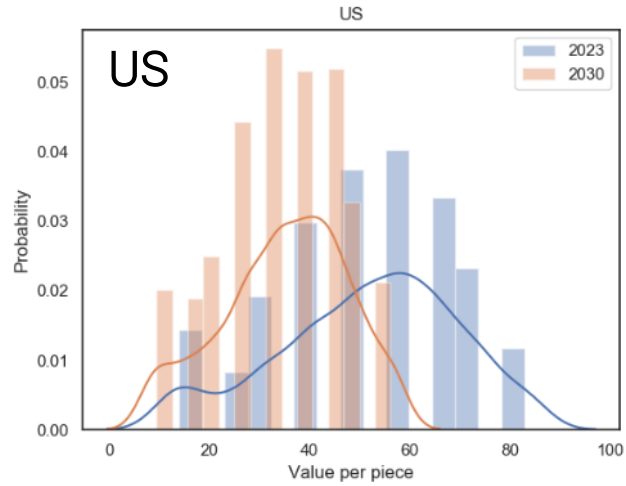- p(processes | business)

- p(management | history)

- p(history)
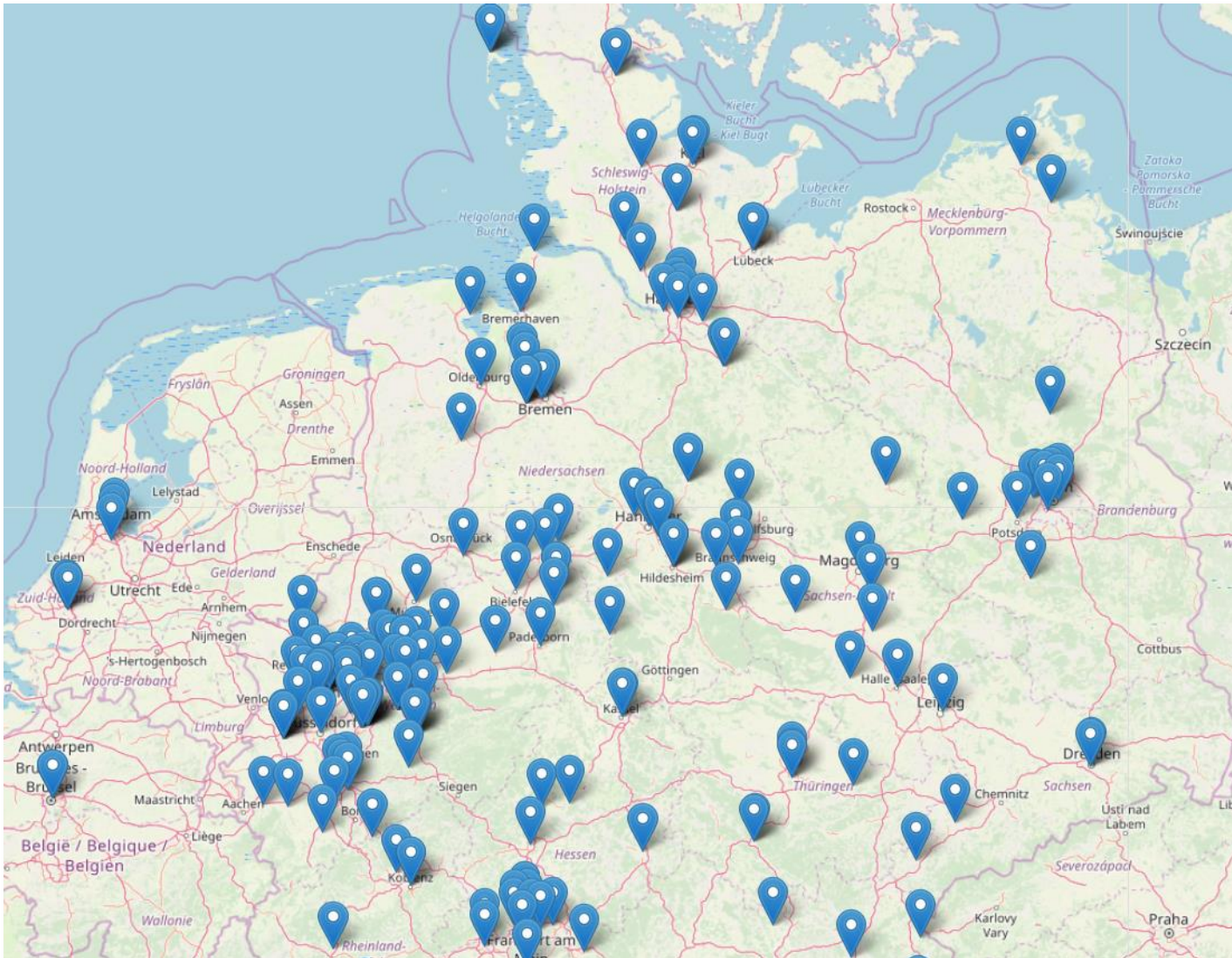
- p(…)

Estimate distributions

Probability distributions of the Sustainable Development scenario
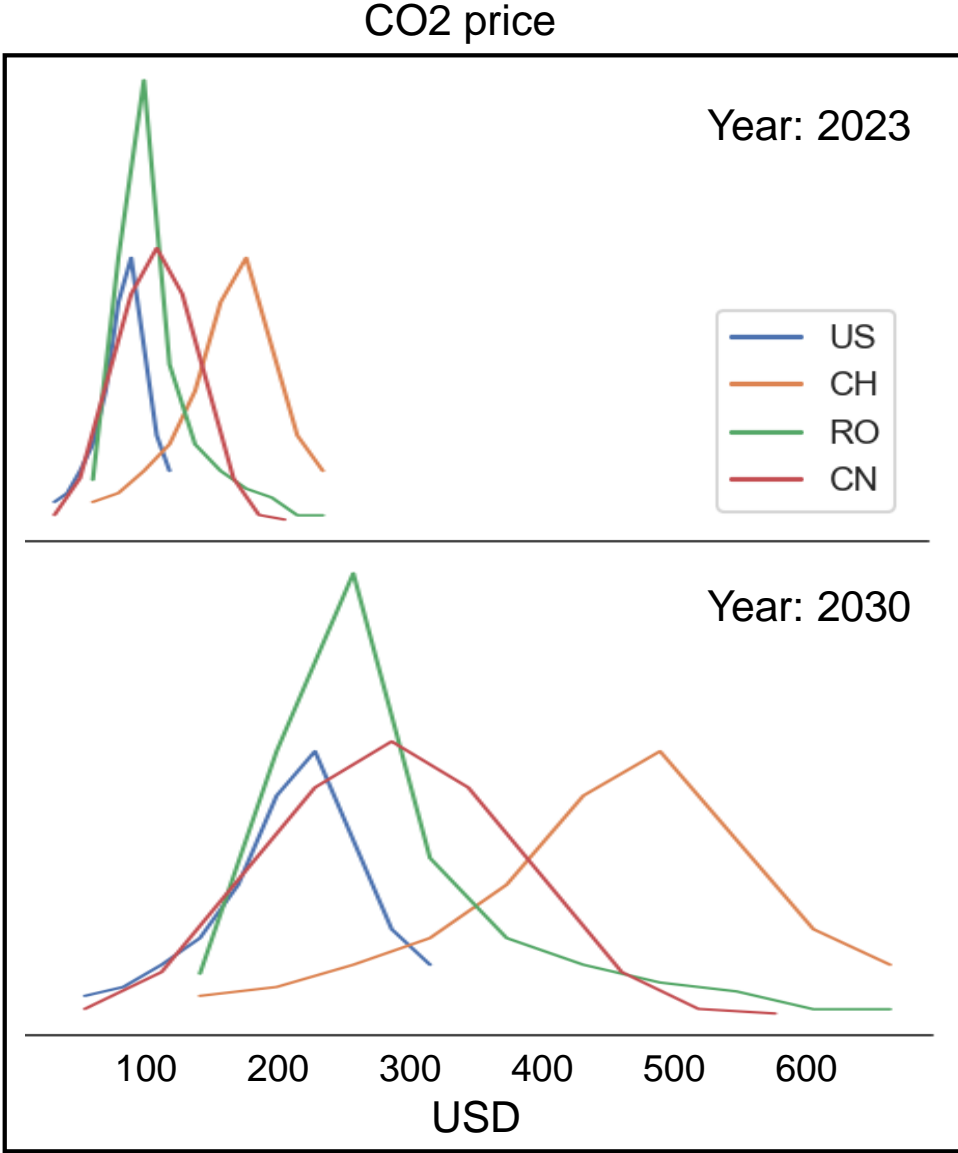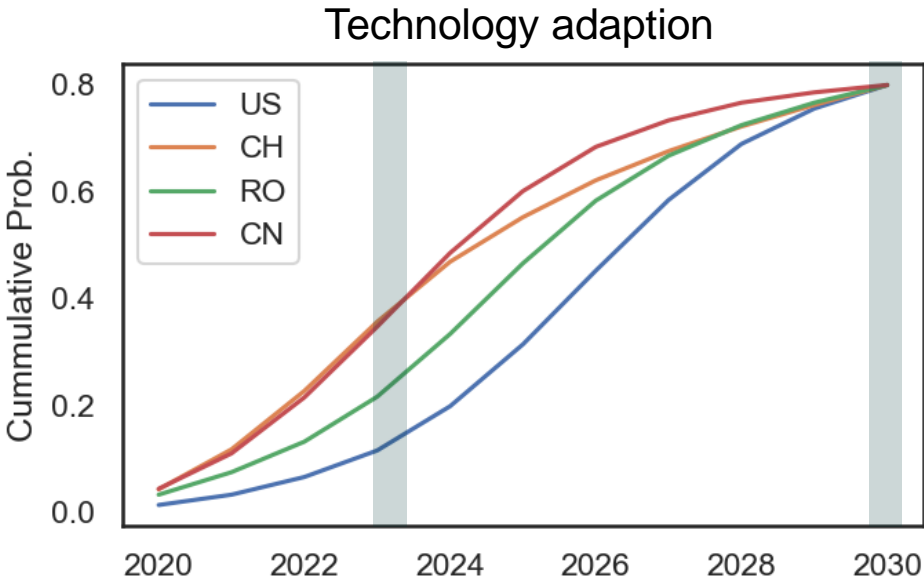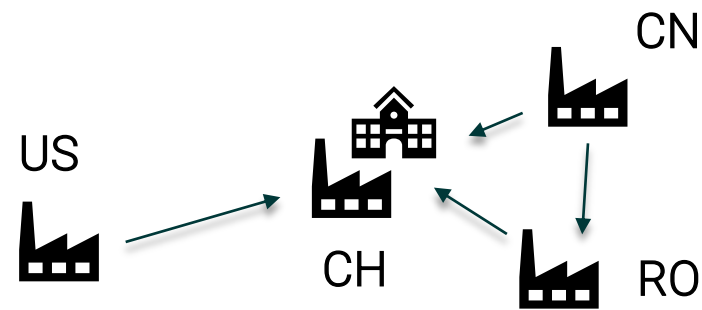
# Result: tech adaption keeps cost under control
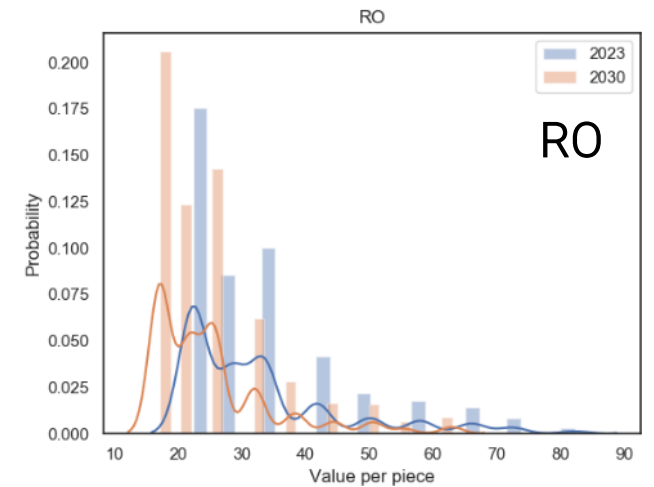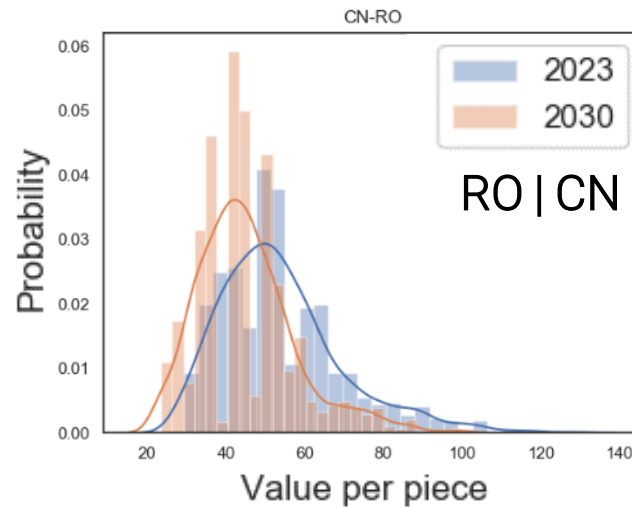
Real estate portfolio analysis

- **Power CO2 cost**
  Cost of electricity-based emissions using probabilistic power supply and demand model

- **Heating OPEX cost**
  Fuel cost scenarios

- **Heating CO2 cost**
  Heating-based emission cost using CO_2 price scenario and consumption models

- **Sea level rise**
  Annual mitigation cost of buildings

- **Heat wave days**
  Probabilistic heat-wave related cost model derived from climate models

- **Storm damage**
  Probabilistic model for extreme storm events

Limitation:
Enterprise data systems

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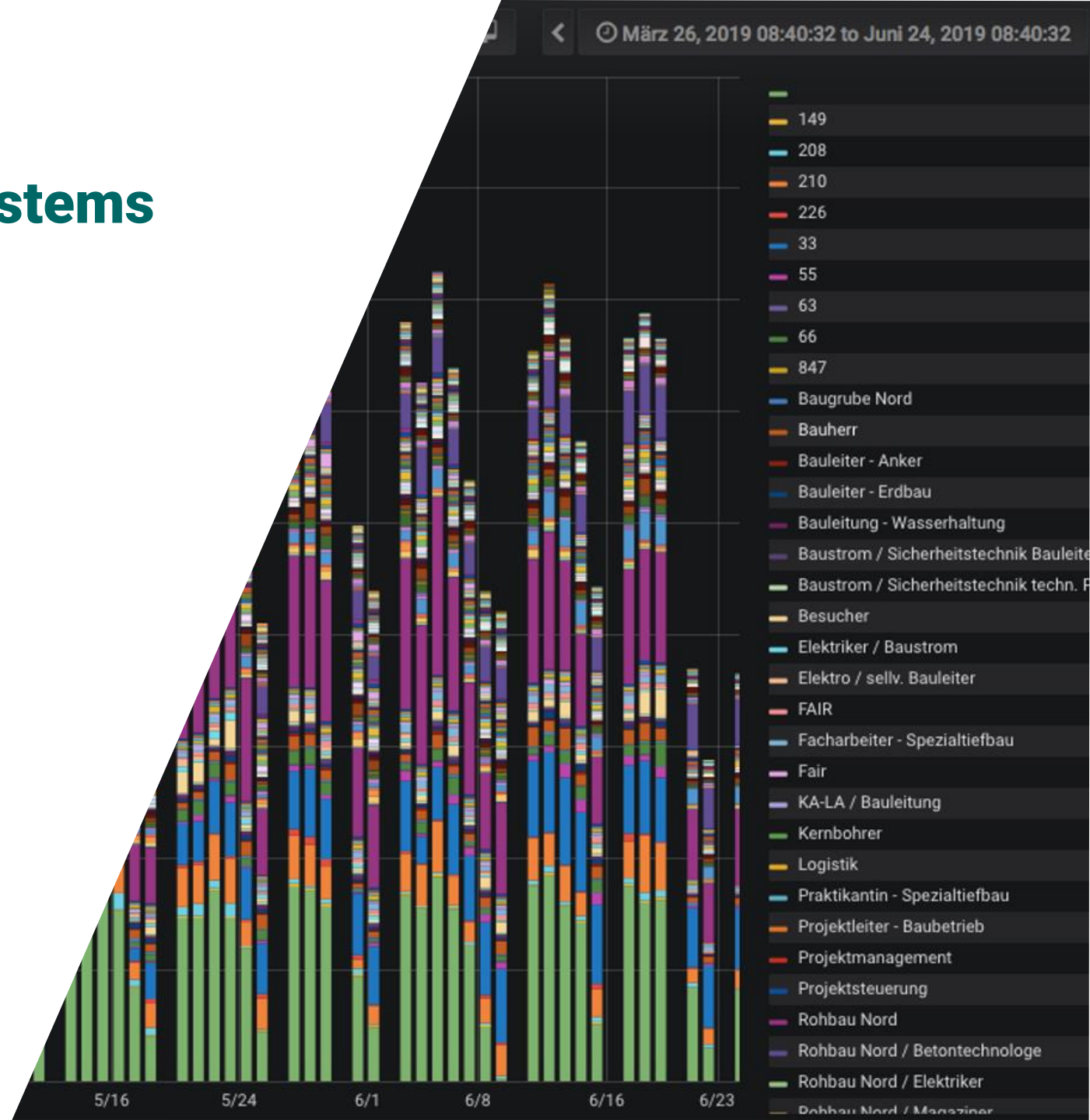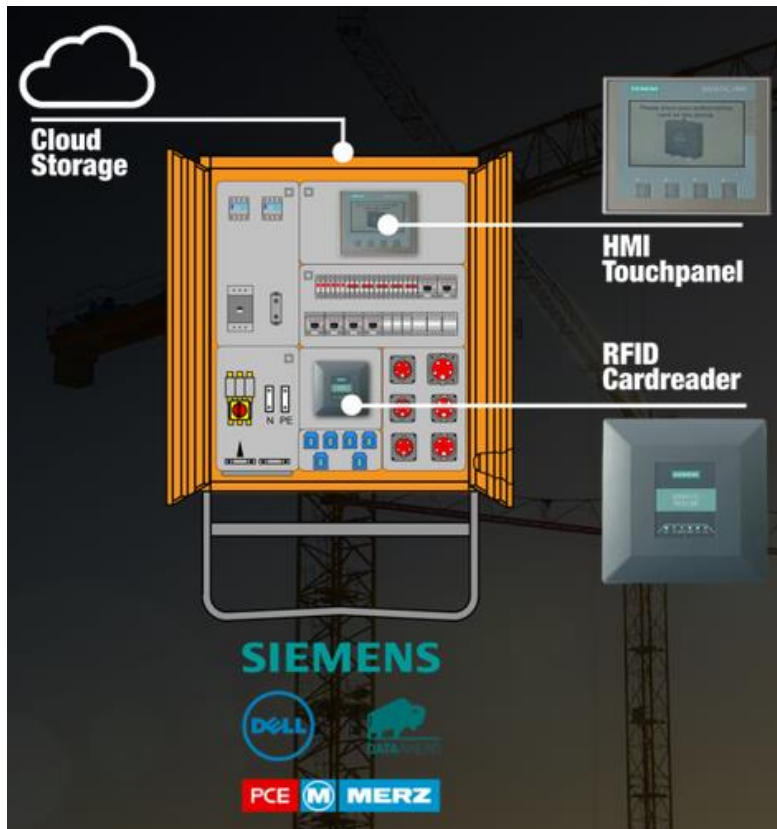
NLP based resilience assessment based on historic data

Historic data with future reach:

- Patent applications

- M&A

- *Media news*

Process:

1. Define use case: "Climate-related company resilience score"

2. Choose tool: "Sentiment scoring tuned to climate resilience"

3. Select data: Any news aggregator of your trust

"Microsoft to double internal CO2 tax as it plots 'tech first' sustainability path"
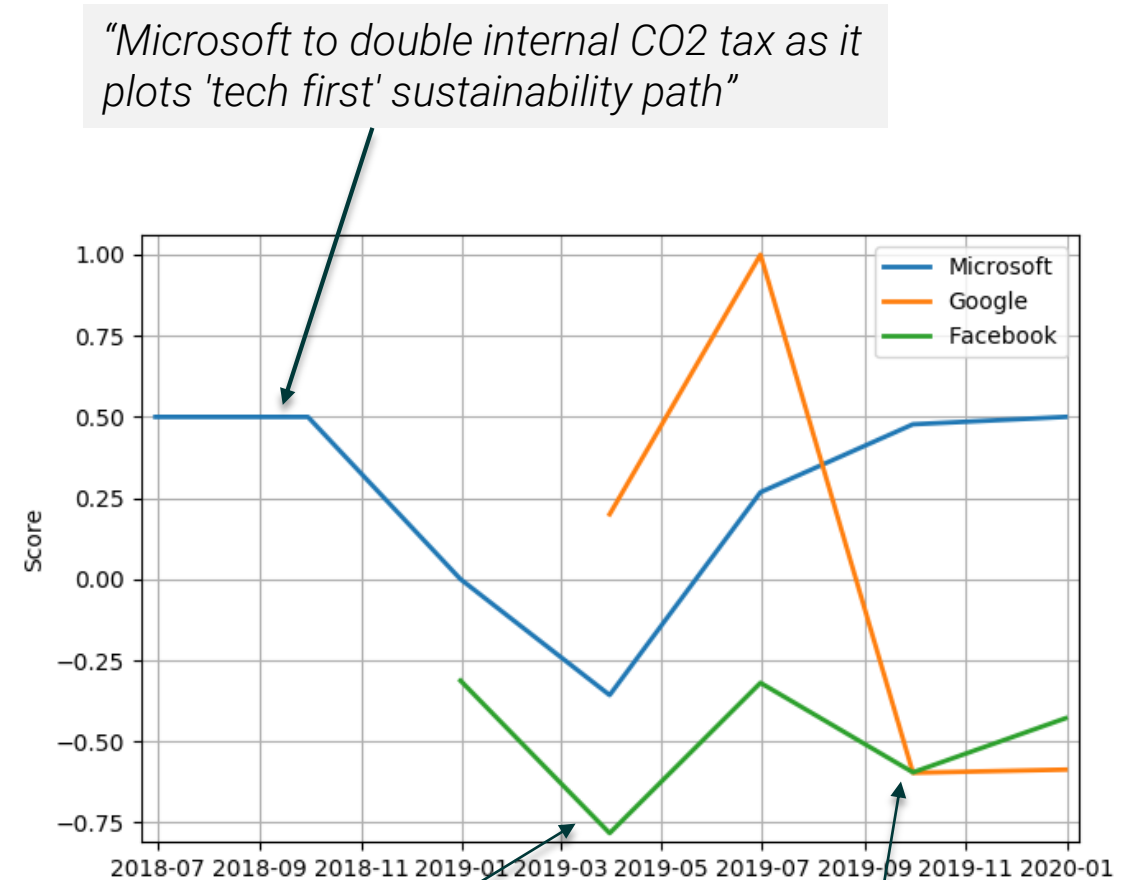
"Google, Facebook and Microsoft were the top sponsors of a conference that featured climate change denial kooks"

"Facebook and Tesla accused of hiding climate change risks"

The essence: Points-of-truth data beat aggregations and estimations

Use machine learning for improving what you know and inferring signal from complexity

- Data augmentation (e.g., matrix factorization)

- Scenario analysis (e.g., probabilistic graphs)

Thank you for your interest!

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