ESG data for Sustainable Finance and Green Banking

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ESG Concept

Sustainable finance paradigm

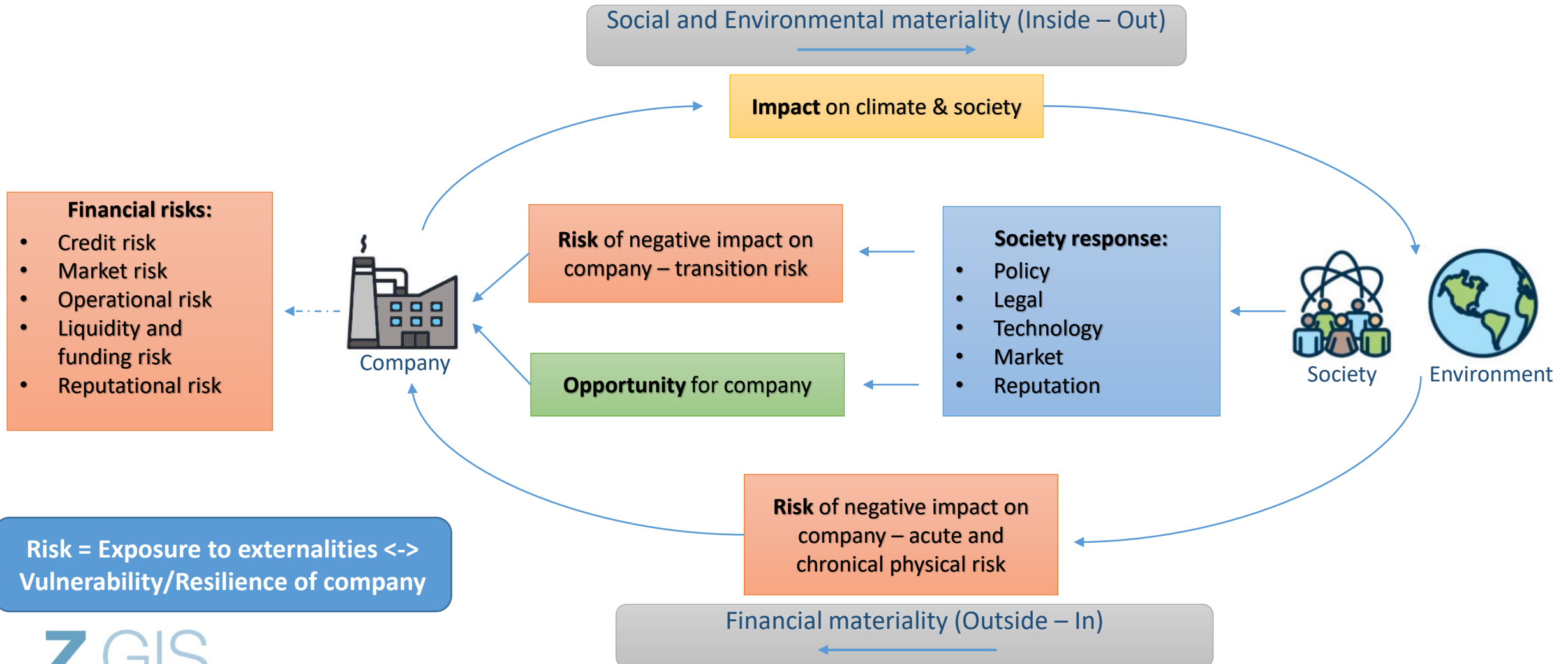**Focus**: Sustainability impact of business activities

Belief: sustainability enhance financial returns through risk reduction and growth opportunities

Goal: to identify sustainability issues impacting the materiality (financial performance)
 -> issues depends on sectors & industries

ENVIRONMENT
- Climate
- Resources
- Biodiversity
- Water
- Energy
- Emission
- ...

SOCIAL
- Working conditions
- CSR
- Human rights
- Health & Safety
- ...

GOVERNANCE
- Risk management
- Compliance
- Business ethics
- Diversity
- ...

ESG Concept – Double Materiality

Social and Environmental materiality (Inside – Out)

Impact on climate & society

Financial risks:
- Credit risk
- Market risk
- Operational risk
- Liquidity and funding risk
- Reputational risk

Company

Risk of negative impact on company – transition risk

Opportunity for company

Society response:
- Policy
- Legal
- Technology
- Market
- Reputation

Society

Environment

Risk of negative impact on company – acute and chronical physical risk

Financial materiality (Outside – In)

Risk = Exposure to externalities <-> Vulnerability/Resilience of company

State of Art: ESG ratings

ESG rating agencies:

- Proprietary ESG framework (cross-industry)
- Data collection:
  - company: disclosure, questionnaires
  - public data sources: reports, articles, statistics
- Tech-based: data scraping & Natural language processing (AI)
- Spatial analysis: models of natural and man-made disasters (partially)
- Diversity of frameworks: scope, measurements (data/methods), weighting

Problem:

- non-standardized & incomplete/inconsistent data
- under-disclosure (ex. nature-related risks)
- bias (ex. greenwashing of self-disclosure)
- heterogenous frameworks
  - low granularity
  - -> no/ little correlation, no comparability
- -> accuracy & objectivity?

State of Art: ESG ratings

Standardization:
- GRI, SASB, TCFD, … -> disclosure & sustainability accounting
- EU Taxonomy / SFDR

Discrepancy: Quality of existing ESG ratings <-> actual need of the industry

Request (for risk management):
- Higher granularity & resolution (space & time)
  - -> asset assessment
- More objectivity -> based on hard facts (quantifiable measures)
- standardization & transparency

-> Higher demand for data and standardization

New approach

Geospatial approach based on a further developed 'spatial finance' concept
- Make use of EO & GIS data potential
- spatial embeddedness of ESG
  - Q: Does a high-water demand has the same risk for a company, if the company is located in an arid or non-arid region?
- -> Focus on E&S (Inside-out & Outside-in)
- -> Integration in a holistic ESG framework (G – entity level; E & S asset level)

Mix of methods required due to diversity of indicators & data sources
- simple to complex spatial & AI methods
- insufficient data (absent or quality) -> equivalent or inferior substitutes/proxies

Extended 'Spatial finance' concept

ESG Framework:
Defines ESG issues specific to business activity/asset

Asset Aggregation

Tier 0 – Country Level

Tier 1 – Portfolio Level

Tier 2 – Company Level

ESG Asset Assessment

Tier 3 – Asset Level

Tier 4 – Sub-Asset Level

Spatial Embeddedness

Levels: Proximity, Network, Administrative Unit

Observational Data (GIS, EO, statistics, …)
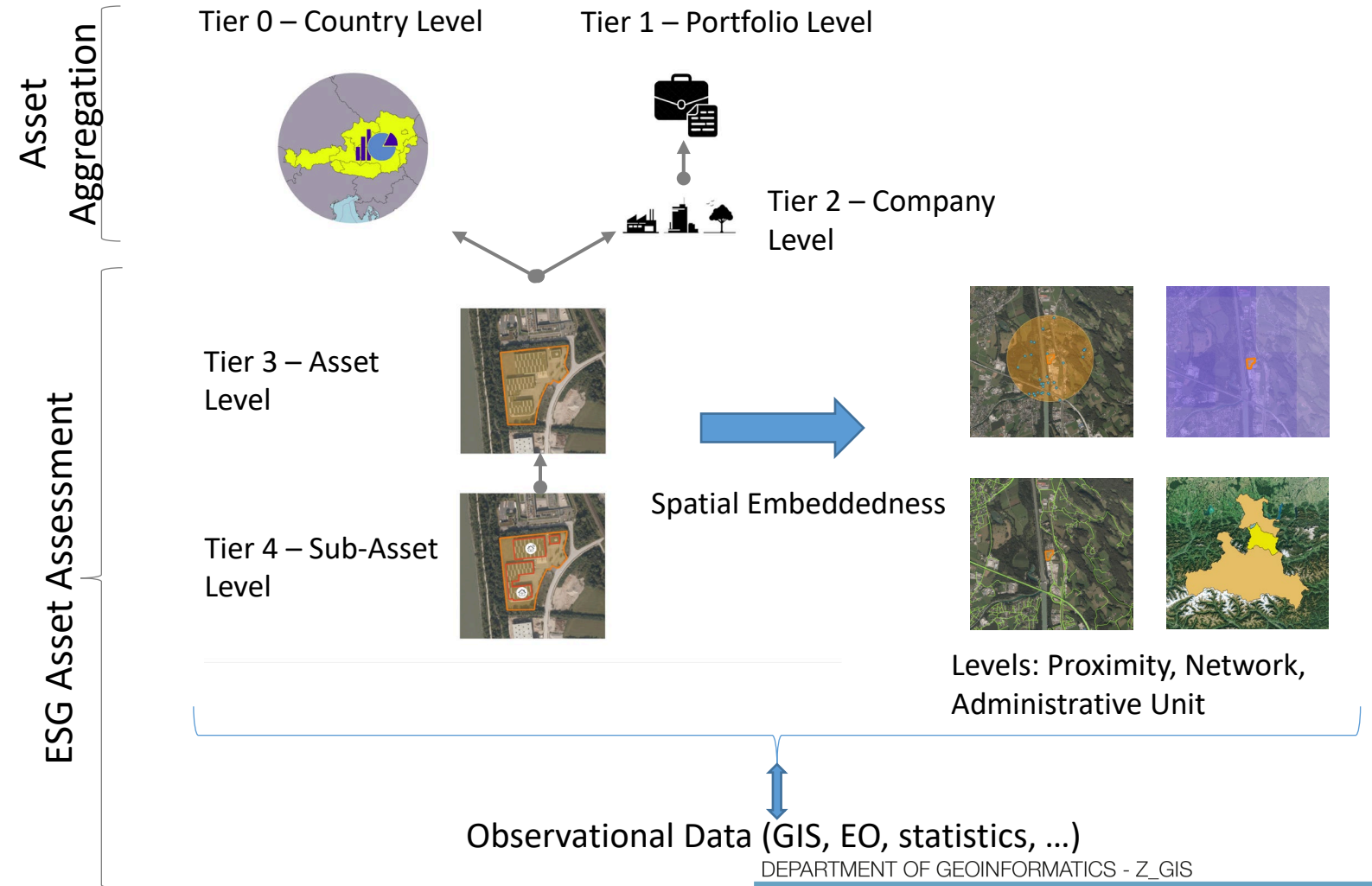
Potential – ESG Indicators (Real Estate)

Cadastral land register

Satellite imagery (high resolution)
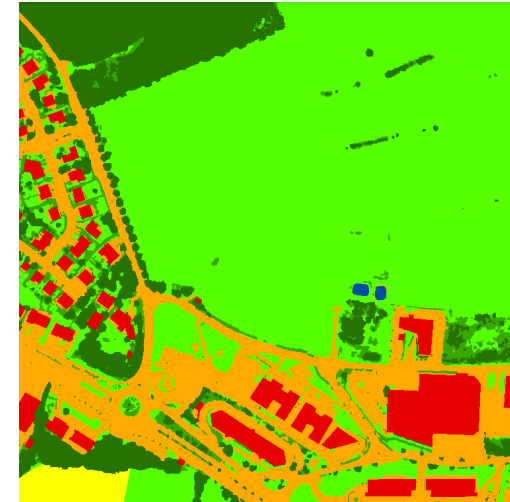
Land use classification

Tier 3: Asset Level -> On site

- Biotope area factor
- Green roof area

- Heat island effect

(Sealing, surface reflectance, ecological features,...)
Combined with spatial embedded data: weather (ex. CAMS), large scale sealing, surface reflectance
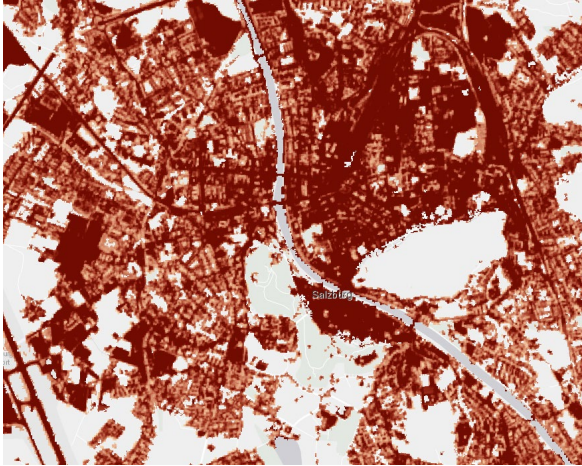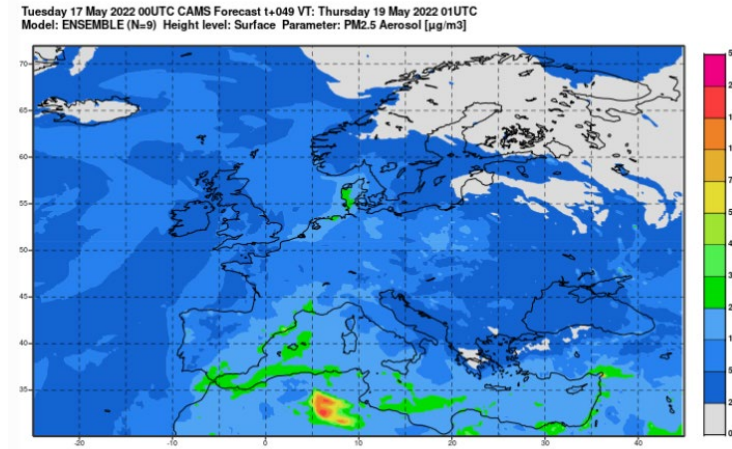
- Surface runoff

(Sealing/Imperviousness, DEM)
Combined with spatial embedded data: Weather data, large scale sealing

Potential – ESG Indicators

Sealing (10x10m resolution)

Pollution (PM2) (low resolution)

Forest (10x10m resolution)

Tier 3: Asset Level -> Spatial Embeddedness

- Pollution
- Ecological recreation areas
- Heat island

- Surface runoff (imperviousness/sealing)

- Sensitive Land Protection

Copernicus Services:
- CLMS (land use, …)
- CCS (water quantity indicators, climate change projection,…)
- CAMS (air quality,…)

Conclusion

Geospatial approach based on 'hardfacts' (quantifiable measures):

- Objective
- Scalable/world wide applicable
- Enables automation
- Spatio-temporal assessment
- High accuracy
- High resolution (asset level)
- High granularity

-> Integration of spatial embeddedness of ESG
-> Harmonization between tech & financial actors/companies
-> Flexibility due to diverse data sources
-> Huge potential for E & S

Integration in holistic ESG framework as Sub-framework
Potential:

- ESG automated metrics & ratings
- Digital solution for disclosure & risk management of companies