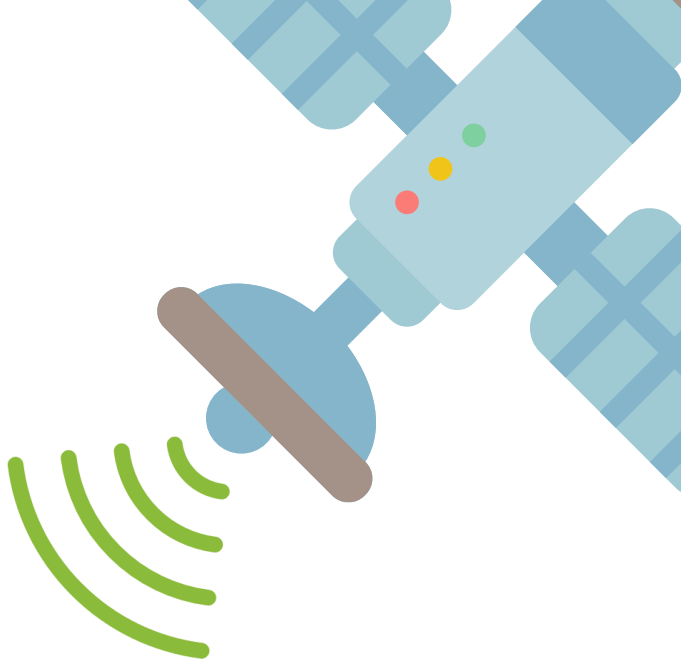
Space for Earth!

Using Earth Observation data to navigate uncertainty.

mews PARTNERS

SPACE TECH EXPO EUROPE

Earth Observation science provides key insights for environmental protection.



INFORM

Explain how and why our Earth's Climate and environment are changing.

ASSIST

Provide improved weather forecasting, air quality warning.

COMPLY

Measure, report, verify the commitment and the legislation.

EVALUTATE

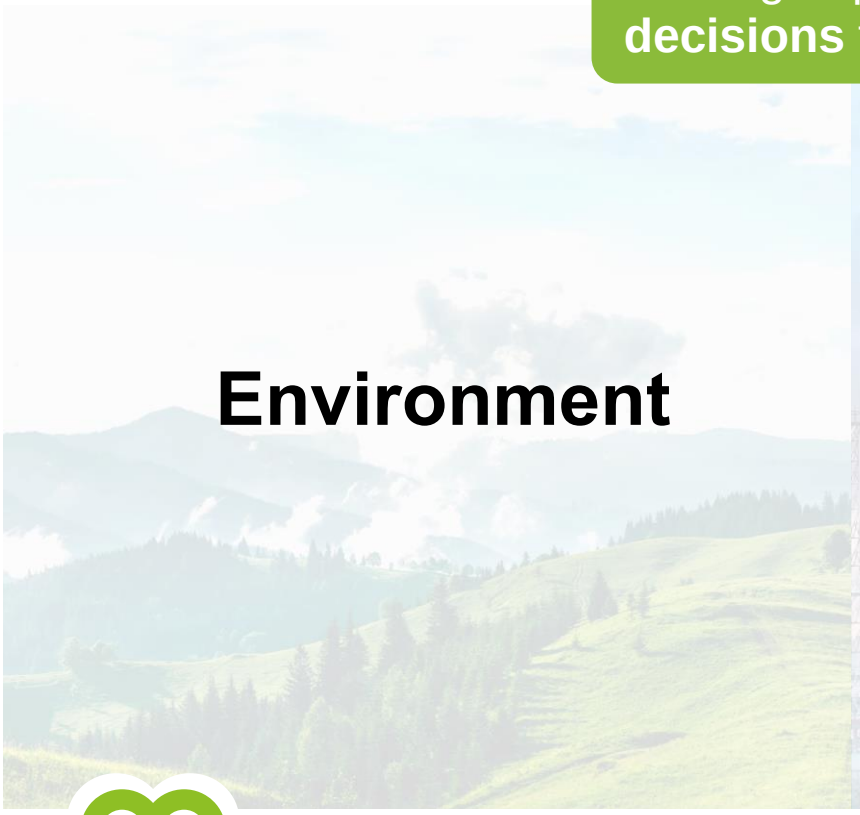
Support assessment of the outcomes of policy decisions.

Earth observation meets society's need for a better understanding and management of environmental issues.

Source : ESA Earth Observation Science Strategy issued Sept 2024

But protecting the environment is an economic and social challenge as well.

Acting to protect the environment means **making strategic decisions** that will have **an impact on multiple dimensions.**



Environment

Economic

Social

Coupling Earth Observation data with models for a complete view on the systemic transition.

Earth Observation data

Sentinel1, Sentinel2, Sentinel6, Sentinel-5P

Landsat, Copernicus Land Service, Copernicus

Atmosphere Monitoring Service

Other types of data

Economic data (Cost of energy)

Technological data (Green technology adoption rates)

Demographic data (Population growth & urbanization, age distribution)

Social data

Cultural & behavioral data (Consumers habits)

Legacy data

ENHANCED VIEW ON SYSTEMIC IMPACTS

Protecting the environment : a complex problem to solve in an uncertain world.

Complex : "*multiple elements or parts are interconnected*"

Many environmental, economic and social parameters must be considered.

Acting on one parameter may have negative or positive impacts on others.

The more parameters to consider, the more interdependency to manage,
the more complex the decision marking is.

Uncertain : "*not known or fixed* "

Unstable political context, geopolitical tensions.

Economy : Financial crisis ; Fluctuating interest rates ; access to resources…

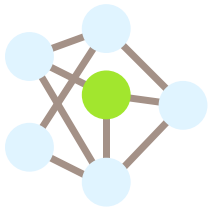
Various timescales of public policies implementation in each country.

How to make the right decisions?

Agent based models, one modelling approach to address issues in a complex, interdependent, multi-actors systems.

AGENT BASED MODELS

Computer simulations used to **study the interactions between agents** in order to **reveal/identify system behaviour**.



AGENT

Agent is an automous and adaptive decision-making entity, interacts with its environment and other agents through behavioral rules to produce emergent system level patterns

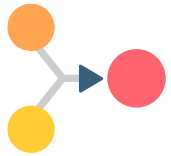
BEHAVIOUR

Behaviour refers to the rules or actions that an agent follows within the model. This behavior is influenced by the agent's characteristics, decision-making processes, and interactions.

ABM are used to model complex multi-player, multi-dimensional systems. Therefore, they are relevant to complex problems linked to environmental issues.

Modeling complexity, beyond uncertainty.

Major risks



Combinations of minor risks

Opportunities for value optimization

BETTER UNDERSTAND

Climate-Related Disasters, Water Scarcity Risks, Biodiversity Loss, Air and Soil Pollution.

SIMULATE

Minor Pollution events cascading to food chain; incremental deforestation leading to loss of carbon sequestration

OPTIMISE

Improve energy efficiency in buildings, maximize renewable energy production , Circular Economy in Waste Management, Reduce carbon emissions in supply chains.

How does it work?

Agent based models applied to the forest system.

Biodiversity

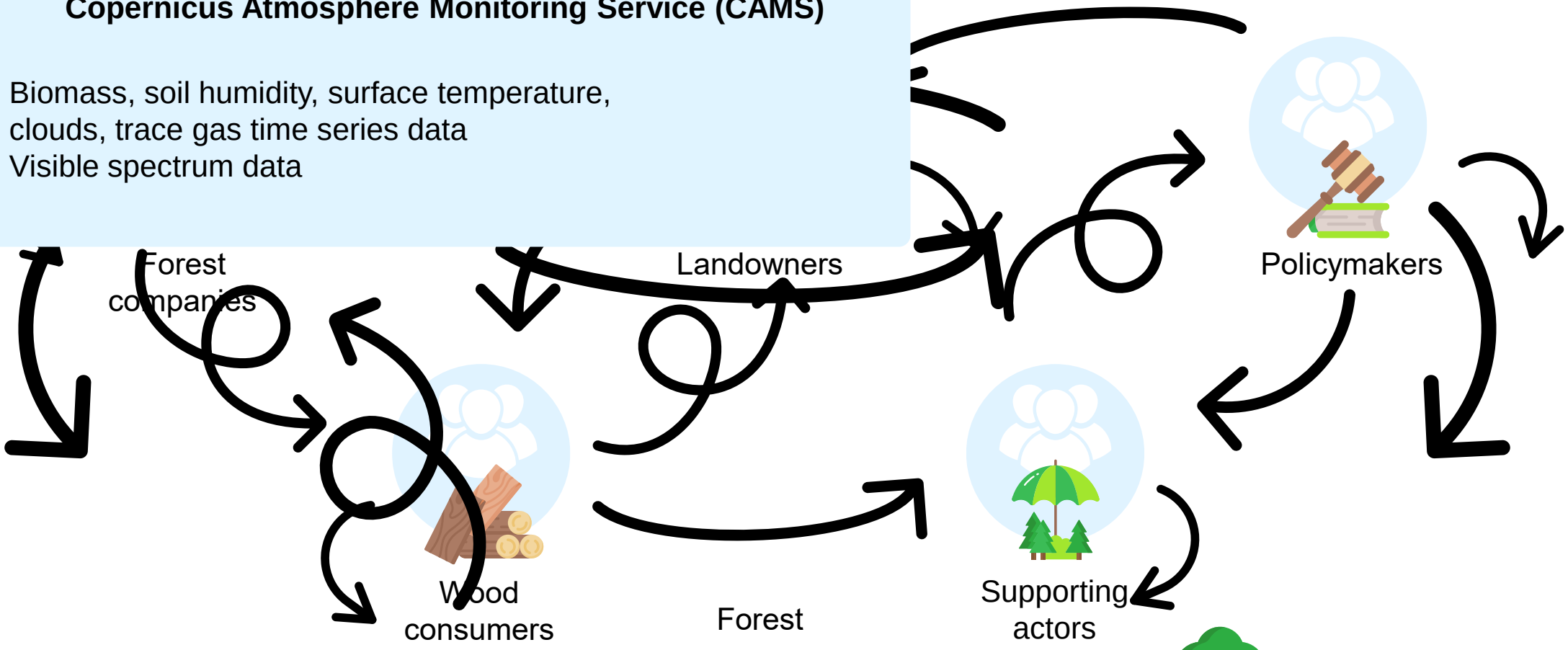
Climate

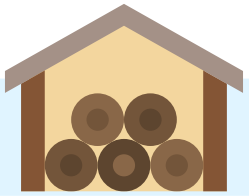
Economy

Deforestation threats

Copernicus Land Monitoring Service (CLMS)
Copernicus Atmosphere Monitoring Service (CAMS)

Biomass, soil humidity, surface temperature,
clouds, trace gas time series data
Visible spectrum data





Forest companies

Define regulation on forest management.

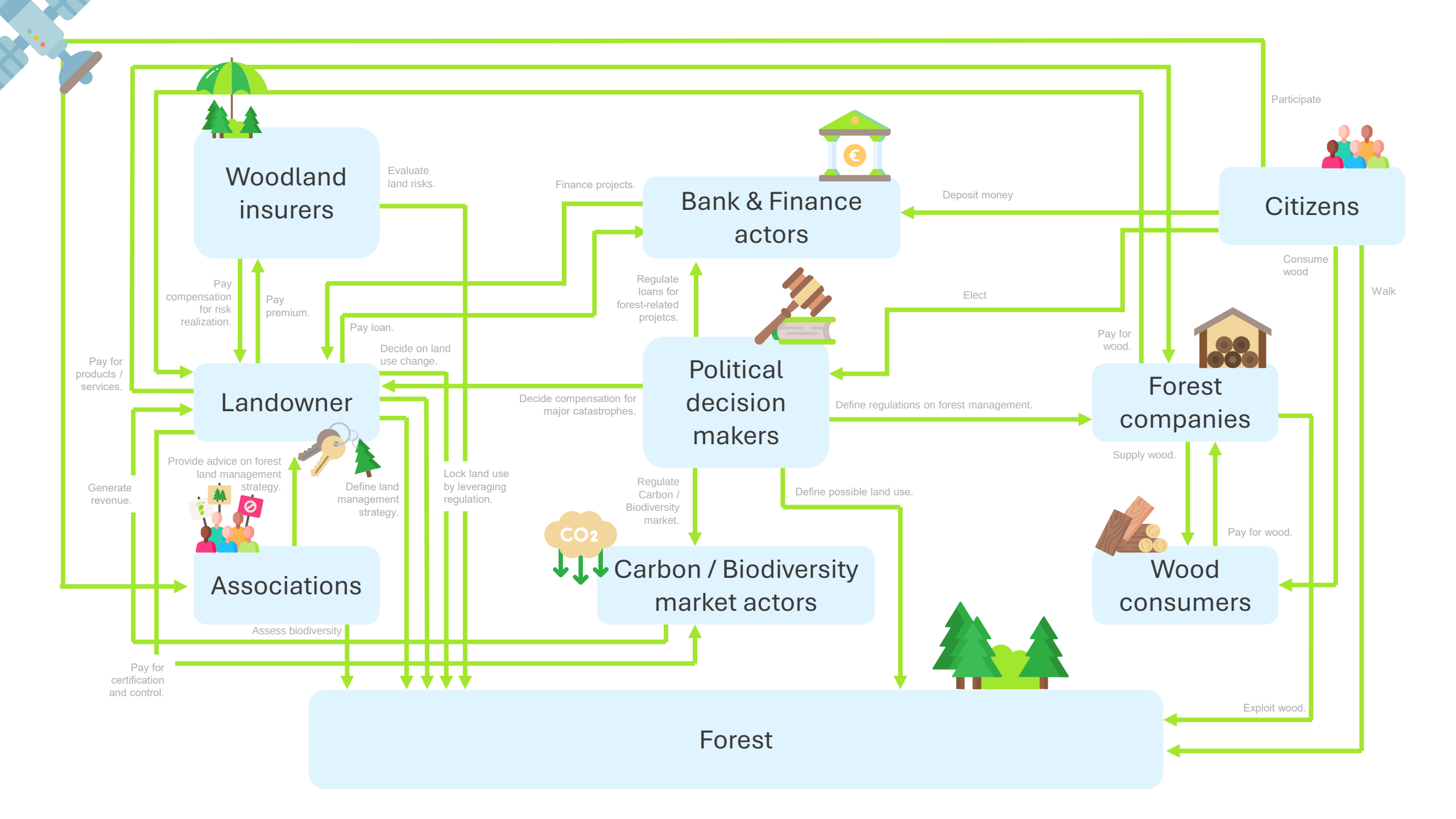
Policy makers

Exploit wood
Decides tree species to plant / exploit.

Evolution of the Forest
Influence on biodiversity, climate change, clean air, diseases spreading, …

Support preservation.

Forest


Woodland insurers
Evaluate land risks.
Finance projects.
Bank & Finance actors
Deposit money
Participate
Citizens
Consume wood
Walk
Pay compensation for risk realization.
Pay premium.
Pay loan.
Regulate loans for forest-related projetcs.
Elect
Pay for products / services.
Landowner
Decide on land use change.
Political decision makers
Pay for wood.
Forest companies
Decide compensation for major catastrophes.
Define regulations on forest management.
Supply wood.
Provide advice on forest land management strategy.
Define land management strategy.
Lock land use by leveraging regulation.
Generate revenue.
Regulate Carbon / Biodiversity market.
Define possible land use.
Pay for wood.
Associations
Carbon / Biodiversity market actors
Wood consumers
Assess biodiversity
Pay for certification and control.
Exploit wood.
Forest

Contact

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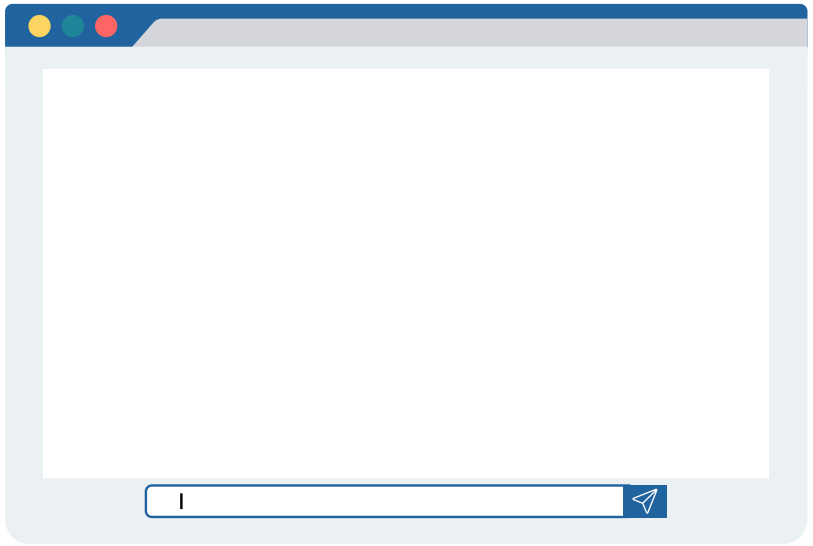
Let's connect on Linkedin!

Unlocking complex climate data for broader audiences.



Meet

DIVA

DestinE Intelligent Visualization AI

Join us at **booth Q14** for a live demo.

Tuesday 11/19 at 1:30 pm

Wednesday 11/20 at 1:30 pm

Thursday 11/21 at 10:00 am