

## *Green finance*

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Course : 18 hours - TP : 0 hours

### *Objectives*

The objective of this course is to explain how financial actors must grasp the environmental issue both (i) to redirect financial flows towards projects with low environmental impact in order to support and strengthen the environmental transition and (ii) to control and mitigate the financial risks represented by the environmental transition.

To understand the modeling of environmental risks, we shall provide a basic introduction to climate change modeling. The aim is not to give full details of the models but to enable the students to understand what kind of information about the future climate and the related risks can be extracted from state-of-the-art climatological models and how to quantify the associated uncertainties. The link of CO<sub>2</sub> concentration with the climate change and the role of the energy sector in climate transition will be addressed. We shall also briefly discuss the integrated assessment models to understand how the climate dynamics can be coupled to the dynamics of the economy, and insist on the role of the financial sector in this process.

This transformation of finance requires an understanding of (i) the assets that finance sustainable development, (ii) the metrics used to understand their environmental impact, and (iii) the practices implemented by sustainable financial players.

This course is designed to provide students with the tools to understand and support the greening of the financial system by articulating concrete examples, academic papers and latest regulations.

Skills acquired during the course:

- Understanding of main climate risks underlying financial assets
- Basic understanding of climate models and ability to manipulate climate scenarios
  
- Identification of the environmental impact of financial assets
- Knowledge of various methods and practices of environmental investing
  
- Knowledge of the latest environmental finance regulations

### *Outline*

Class 1. Traditional finance and some of its limitations (1h30)

Assets, financial markets, market players, valuation metrics, market rationality limits, recent crises and major lessons from these crises. Definitions of sustainable, environmental, climate finance.

Class 2. Introduction to environmental risks in finance (1h30)

A) Transition risks (including legal risks) vs. Physical risks ; Shareholder vs. Stakeholder theory B) Estimation of environmental and climate priced risks, rewards and cost of capital : a) Stocks, b) Bonds. Impact of ESG metrics on the performance of the financial assets.

Class 3. Environmental financial risks 1/3 (Peter, 1h30)

Introduction to climate change modeling and attribution. Link between CO<sub>2</sub> levels in the atmosphere and temperature rise. Regional climate scenarios. Difficulty of forecasting local events. GIEC scenarios and the associated uncertainty measures. The 2 degree scenario.

Class 4. Environmental financial risks 2/3 (Peter, 1h30)

From climate scenarios to integrated assessment models. Sector-based scenarios. The role of the energy sector. Asset stranding.

Class 5. Environmental financial risks 3/3 (Peter, 1h30)

The tragedy of the horizons. Evaluating the impact of physical and transition risks on the financial system. Evaluating physical risks along the production chain. Climate stress tests. Role of central banks.

Class 6. The need to build a resilient financial system for the environmental transition (1h30)

Transforming the global economy to limit environmental impact of investments. Public initiatives. Re-directing private capital. Regulations. Environmental finance and development: World Bank Climate Finance initiatives and OECD Climate Finance. Corporate engagement. Etc.

Class 7. Financing green assets and measuring the climate impact of investments (1h30)

Financing green assets

Climate and Green bonds. Project bonds. Real estate labels. Fund labels. The problem of taxonomy: how to define green assets?

Measuring the environmental and climate impact of investments

Definitions ESG/CSR/SRI. Environmental impact KPI. Metrics and tools. Case study with different scopes. Green funds and ETF. Towards environment-aware accounting.

Class 8. The practice of major players (1h30)

Different major market players (pension fund and insurances, asset managers, banks). Different practices: Exclusion, ESG integration, Corporate engagement, Impact investing. Toward a green optimal asset allocation (Practical application: Andersson, Bolton, Samama (2015)).

Class 9. Practitioner course: Integration of environmental risks into financial asset management (1h30)

Class 10. Practitioner course: How do banks deal with environmental risks (1h30) Class 11. The environment: A systemic stake for the financial system (1h30)

Public intervention to integrate the environment into finance. The frontiers of environmental finance: (i) Transparency and taxonomy (Task Force on Climate-Related Financial Disclosures, European Union High Level Group on Sustainable Finance, European Commission Action Plan), (ii) What role for prudential supervision and regulation authorities? (see debate on the Green supporting factor).

Class 12. Practitioner course: Central Banks Network for Greening the financial system (1h30)

## Références

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