

Geo-resources for the Future:

SOCIAL, ECONOMIC, ENVIRONMENTAL AND
POLITICAL CHALLENGES



**Universiteit
Leiden**
The Netherlands

 **TU Delft** Delft
University of
Technology

**Erasmus
University
Rotterdam**

Erasmus



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FOR WHOM?

All 3rd year Bachelor students from TU Delft, Leiden University, Erasmus University Rotterdam. Students from various disciplines interested in social, economic, environmental and political aspects of the exploitation and trade in geo-resources

SETUP OF THE MINOR

Language:	English
Type of programme:	Full time
Period:	September - end of January
ECTS:	30

MORE INFORMATION

minors.tudelft.nl

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Geo-resources are used everywhere in our daily life, it's not just the petrol that drives our cars and the gas that warms our houses. Geo-resources can also be found in sustainable energy sources. Metals are for instance used for solar cells, wind turbines, electric motors, and in your mobile phone.

We are facing challenges: Increasing CO₂ emissions are causing climate change and call for an energy transition towards renewable energy sources. In addition, the supplies of fossil fuels and minerals are limited and their availability and prices strongly depend on global politics. In order to tackle this complex societal challenge, various viewpoints have to be considered.

In this Minor, you will learn about the various disciplines that are involved in a responsible exploitation and trading of geo-resources and practice their integration. You will work on economic, environmental and social aspects that are needed to achieve a 'licence to operate'. How is it done today and what do we need to change tomorrow? We need your active participation in group work and interactive work forms.

WHAT WILL YOU LEARN?

- A taste of all disciplines involved in responsible exploitation of geo-resources. Geo-resources are not to be left to the geologists – they are an issue of social scientists, economists, politicians, and environmentalists;
- The complex nature of extracting and trading geo-resources and how to tackle this responsibility;
- How the topic of circular economy links to geo-resources;
- The technological, institutional and economical value chain per geo-resource, including historical knowledge;
- The impact of climate policies, consequences for fossil fuels and subsidies.

WHAT WILL YOU DO?

- Hear stories from the real world and discuss with experts in the field;
- Disassemble scrapped mobile phones and search for the precious metals;
- Excursions;
- Build a Wiki;
- Write an essay on a pressing problem;
- Play the game Oasistan and find out the cultural dimension of resource extraction.

STRUCTURE OF THE MINOR

In **Quarter 1** the minor consists of the Forum, in which three modules and self-study are embedded. All modules will be **blended**, i.e. partly face-to-face (e.g. lectures) and partly online (e.g. part of MOOCs, web lectures, online documents).

To start with, we will align the knowledge base of students from the various disciplines by guided self-studies. Knowledge acquired in the three modules will be integrated in weekly activities in the so-called Forum (debates, stories from experts in the field, excursions, games, workshops, preparation by self-study).

• **Module 1 Geo-resources 1.0: Past & Present (5 EC)**

Geosciences and engineering aspects: what are resources, where are they found, how are they exploited; competition between use of resources, environmental impact of exploitation; historical perspective and state-of-the-art.

• **Module 2 Political Economy of geo-resources (5 EC)**

Political economy, geo-politics, energy trading, institutional economics, governance, regulations, impact on prosperity, international relations.

• **Module 3 Geo-resources 2.0: towards the future (5 EC)**

Energy transition, Resource Scarcity, Security of supply, Circular Economy, Geo-(risk) management, management of innovations, Social Corporate Responsibility.

In **Quarter 2**, students will work in groups of 4 to 5 students on a specific topic/case study. Each topic falls within one theme that combines a number of case studies; the Forum remains as a place to interact between groups.