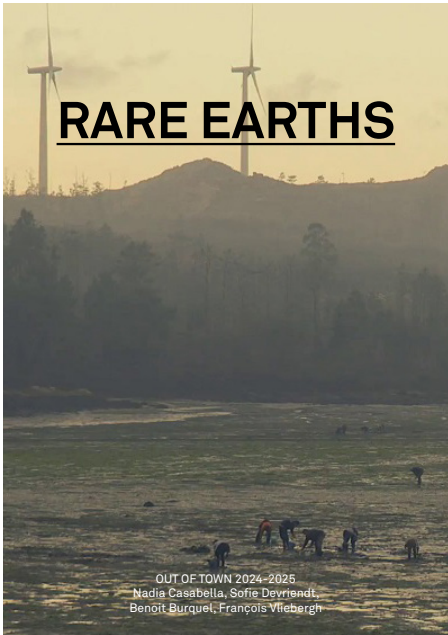
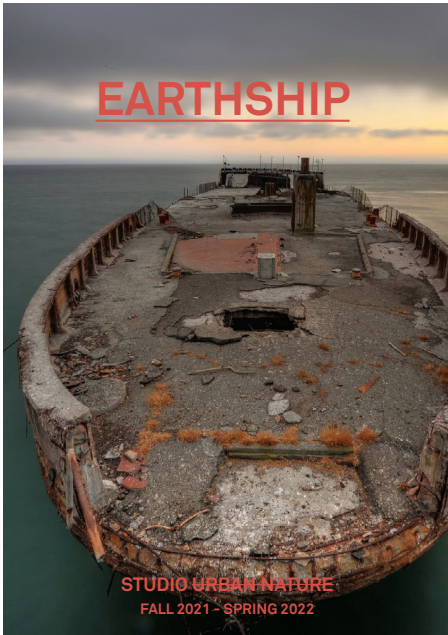
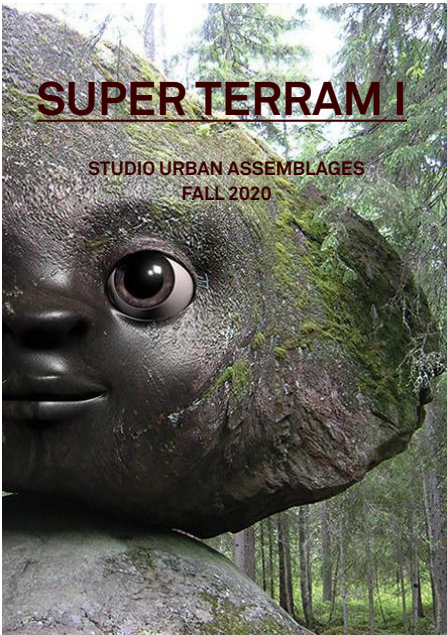
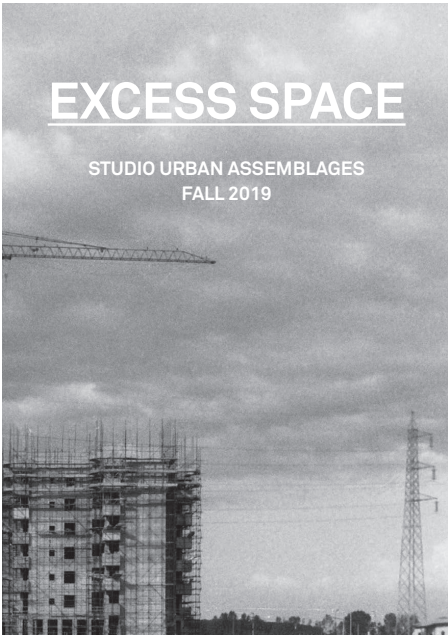


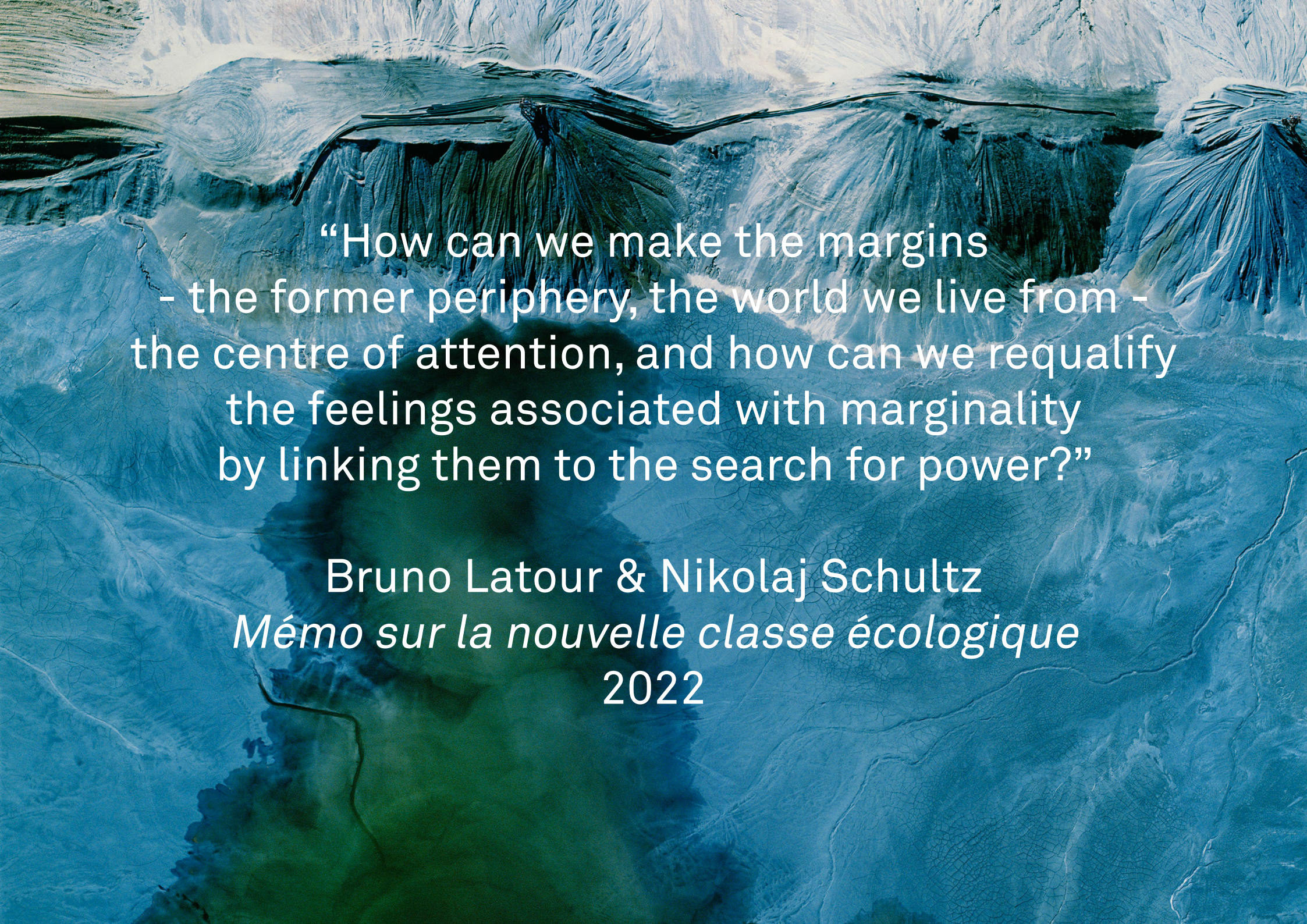
A landscape photograph featuring several wind turbines in the background against a hazy, sunset sky. In the foreground, a herd of cattle is grazing in a field. The overall tone is warm and atmospheric.

# RARE EARTHS

OUT OF TOWN 2024-2025  
Nadia Casabella, Sofie Devriendt,  
Benoit Burquel, François Vliebergh

# urban assemblages - urban nature - out of town



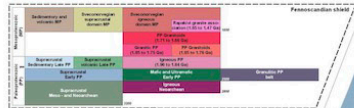
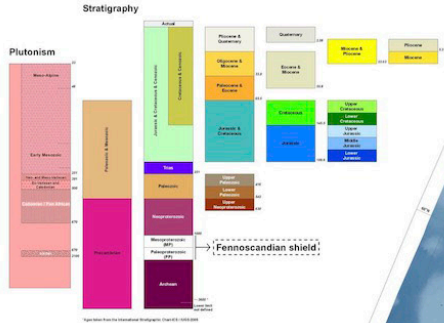


“How can we make the margins  
- the former periphery, the world we live from -  
the centre of attention, and how can we requalify  
the feelings associated with marginality  
by linking them to the search for power?”

Bruno Latour & Nikolaj Schultz  
*Mémo sur la nouvelle classe écologique*  
2022

# rare earths

## MAIN MINERAL DEPOSITS OF EUROPE



- Specific lithologies**
- Granite
  - Basalt
  - Schist
  - Slate
  - Sandstone
  - Limestone
  - Quartzite
  - Chert
  - Gneiss
  - Amphibolite
  - Mylonite
  - Metakonglomerate
  - Metasandstone
  - Metasiltstone
  - Metashale
  - Metasiltstone
  - Metashale
  - Metasandstone
  - Metasiltstone
  - Metashale

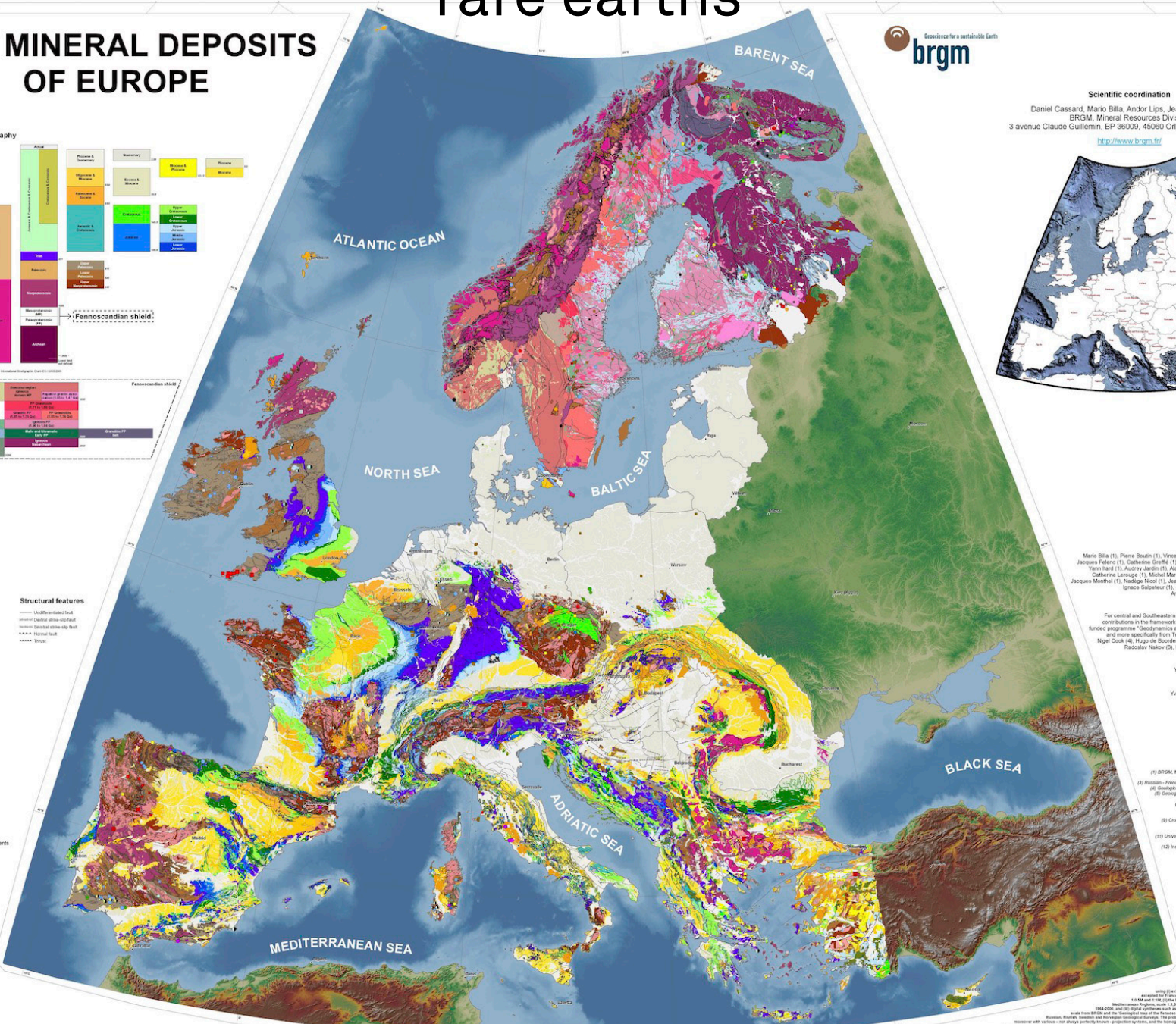
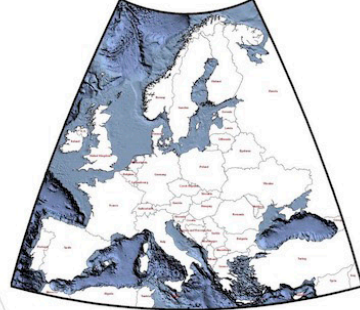
- Structural features**
- Undifferentiated fault
  - Central strike-slip fault
  - Special strike-slip fault
  - Normal fault
  - Thrust

- Main commodity**
- Aluminum
  - Antimony
  - Arsenic
  - Barite
  - Bismuth
  - Chromium
  - Cobalt
  - Copper
  - Diamond
  - Fluorite
  - Gadolinium, Gallium
  - Gold
  - Iron
  - Lithium
  - Lead
  - Manganese
  - Mercury
  - Neodymium
  - Nickel
  - Phosphate
  - PGE, Platinum Group Elements
  - Pyrite
  - Silver
  - Tantalum
  - Tin
  - Titanium
  - Vanadium
  - Vanadium
  - Tungsten
  - Zinc
  - Zirconium

- Deposit size**
- Class A
  - Class B
  - Class C



**Scientific coordination**  
 Daniel Cassard, Mario Billa, Andor Lips, Jean-Marc Leistel  
 BRGM, Mineral Resources Division  
 3 avenue Claude Guillemin, BP 36009, 45060 Orléans cedex 2, France  
<http://www.brgm.fr>



**Authors**

Mario Billa (1), Pierre Boutin (1), Vincent Bouchou (1), Yves Deschamps (1), Jacques Felret (1), Catherine Grenif (1), Claude Henry (1), Yves Husson (1), Yann Jaret (1), Audrey Jardin (1), Adrien Lambert (1), Elisabeth Le Goff (1), Catherine Leroux (1), Michel Marethier (1), Jean-Louis Martonille (1), Jacques Monthel (1), Nadège Nocol (1), Jean-Claude Pooil (1), Françoise Rabay (1), Ignace Salpeutier (1), Gilbert Stroh (2), Nicolas Stojanov (1), Audrey Teucher (1), Patrick Viallet (1).

**Collaborators**

For central and Southeastern Europe, this work has benefited from contributions in the framework of the European Science Foundation funded programme "Geodynamics and Ore Deposit Evolution" (GEODE) and more specifically from Todor Bezica (2), Chiriana Cobaru (3), Nigel Cook (4), Hugo de Boorder (5), Frits Ekerdt (6), Jacobo Franco (7), Radoslav Nakov (8), Kamen Popov (9), Ioan Ghemhi (10).

**Cartographic layout**

Yves Husson (1), Frédéric Maitton (1).

**GIS design**

Yves Husson (1), Jean-Marc Leistel (1).

- (1) BRGM, Mineral Resources Division, Orléans, France
- (2) UMR 6524, Valenciennes, France
- (3) Russian - French Metallurgical Laboratory, Moscow, Russia
- (4) Geological Institute of Norway, Trondheim, Norway
- (5) Geological Survey of Norway, Trondheim, Norway
- (6) University of Leoben, Austria
- (7) Working Metallurgy School of Geodynamics, Belgrade University of Sciences, Belgrade
- (8) Croatian Academy of Sciences, Zagreb, Croatia
- (9) Bulgarian Academy of Sciences, Sofia, Bulgaria
- (10) University of Mining and Geology "St. Ivan Rilski", Sofia, Bulgaria
- (11) Institute of Geodynamics, Bucharest, Romania

WARNING:  
 This cartographic map of Europe was compiled using data from several different sources. It is not a scale map. It is not a geological map. It is not a mineral resource map. It is not a deposit size map. It is not a commodity map. It is not a deposit type map. It is not a deposit distribution map. It is not a deposit classification map. It is not a deposit identification map. It is not a deposit location map. It is not a deposit description map. It is not a deposit evaluation map. It is not a deposit management map. It is not a deposit planning map. It is not a deposit monitoring map. It is not a deposit reporting map. It is not a deposit auditing map. It is not a deposit certification map. It is not a deposit registration map. It is not a deposit taxation map. It is not a deposit insurance map. It is not a deposit financing map. It is not a deposit investment map. It is not a deposit production map. It is not a deposit distribution map. It is not a deposit trade map. It is not a deposit marketing map. It is not a deposit sales map. It is not a deposit distribution map. It is not a deposit trade map. It is not a deposit marketing map. It is not a deposit sales map.

back to mining ?



rural exploitation



urban mining



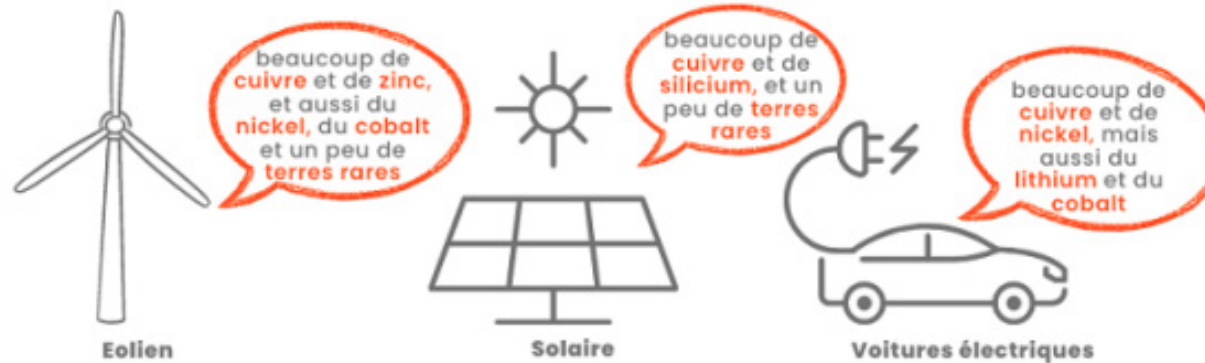
environmental justice



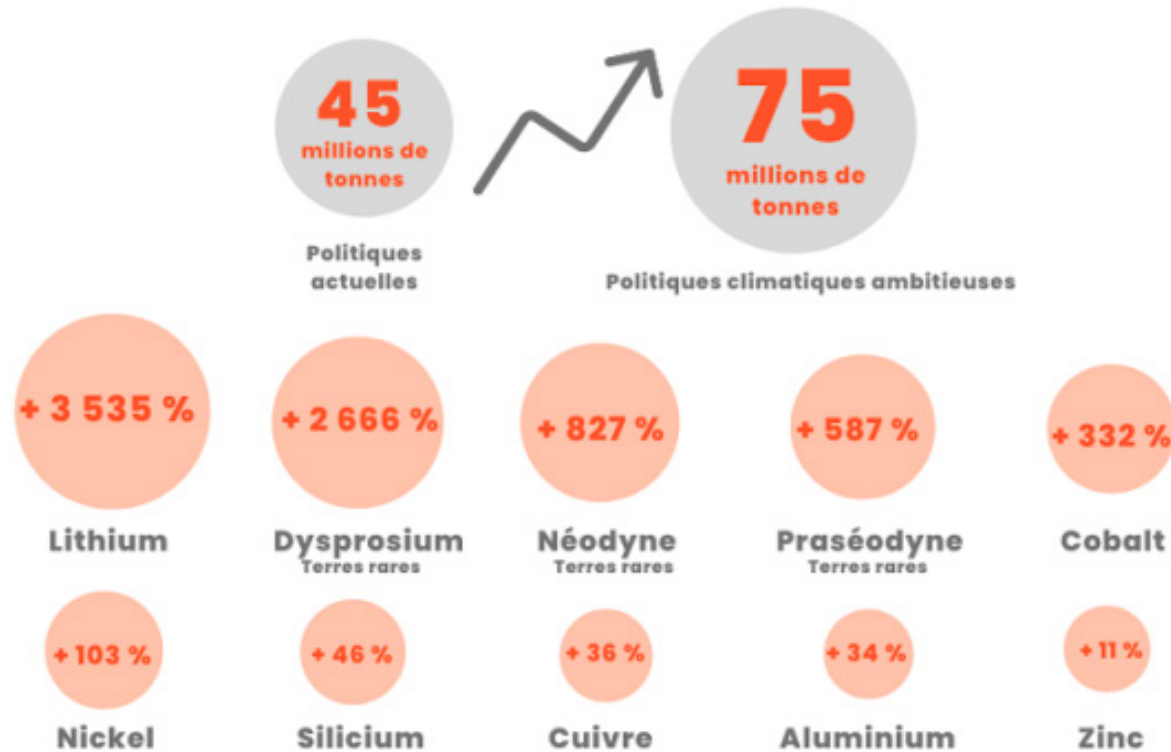


# the new green deal

## De quels métaux a-t-on besoin pour la transition énergétique ?



## La demande en métaux va exploser d'ici 2050



the new green deal



the new green deal



resources are not, they become



**Sc. Y. La. Ce.**

**Pr. Ne. Pm.**

**Sm.**

Sc - Scandium  
Y - Yttrium  
La - Lanthanum  
Ce - Cerium  
Pr - Praseodymium  
Ne - Neodymium  
Pm - Promethium  
Sm - Samarium

# EU-28 Member States - Early and Late Stage Properties

## Development Stages

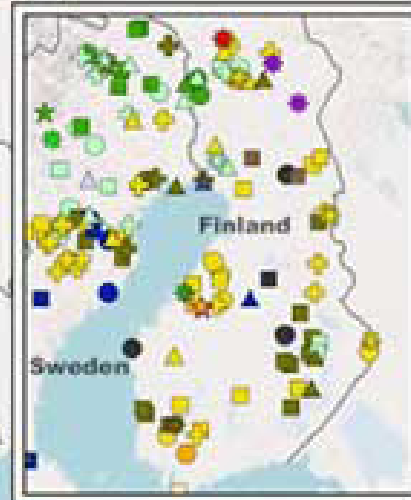
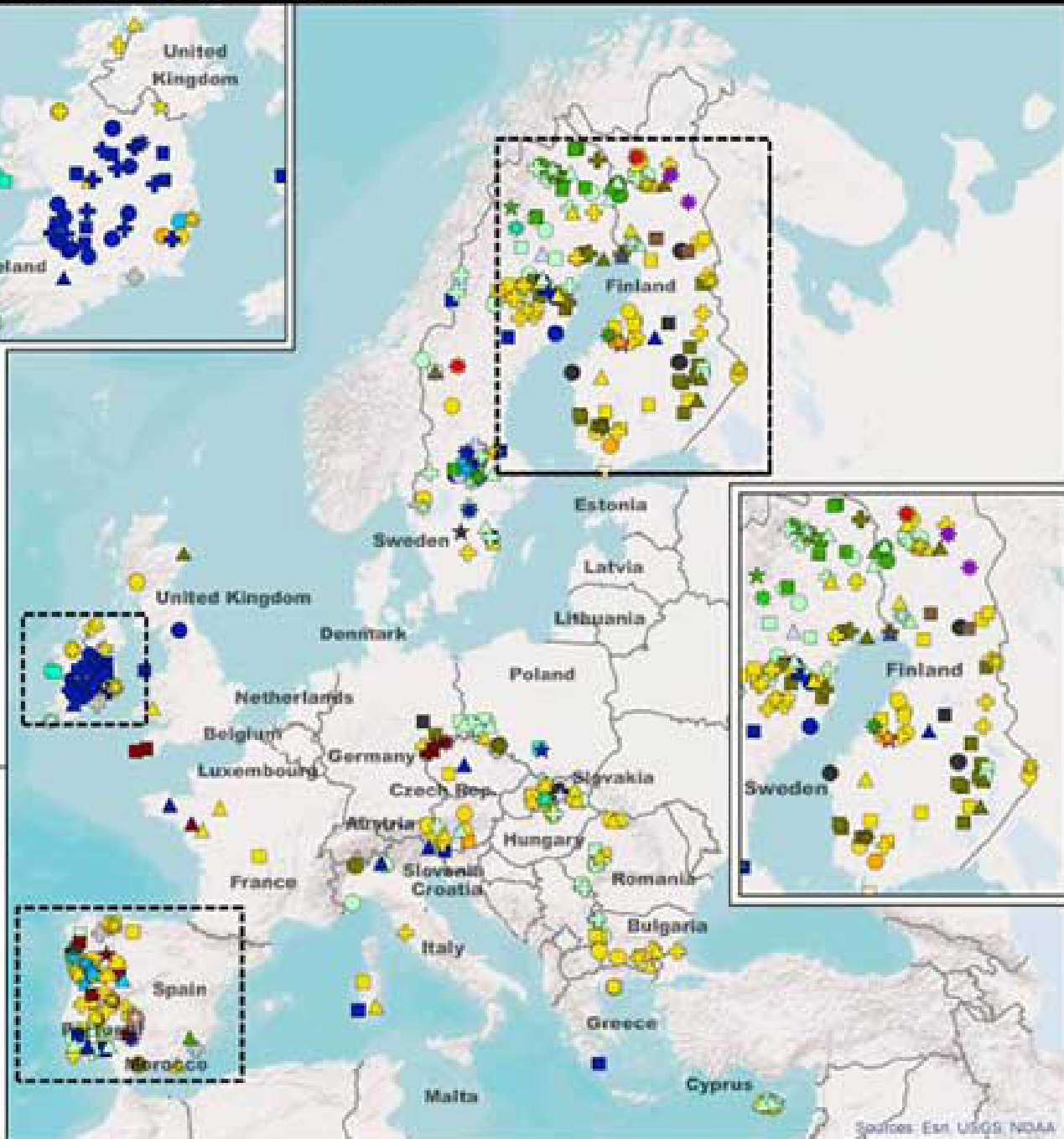
- Grassroots
- Exploration
- Target Outline
- Advanced Exploration
- Reserves Development
- Prefeas/Scoping

## Primary Commodities

- |            |                                   |
|------------|-----------------------------------|
| Antimony   | Palladium                         |
| Chromite   | Platinum                          |
| Copper     | Rare Earth Elements (Lanthanides) |
| Gold       | Silver                            |
| Ilmenite   | Tantalum                          |
| Iron Ore   | Tin                               |
| Lead       | Tungsten                          |
| Lithium    | Vanadium                          |
| Molybdenum | Zinc                              |
| Nickel     |                                   |

SNL Metals & Mining

© Copyright by SNL Metals & Mining 2016.  
All rights reserved.  
Source Date: Jan. 11, 2016



Sources: Esri, USGS, NOAA

resources are not, they become



resources are not, they become





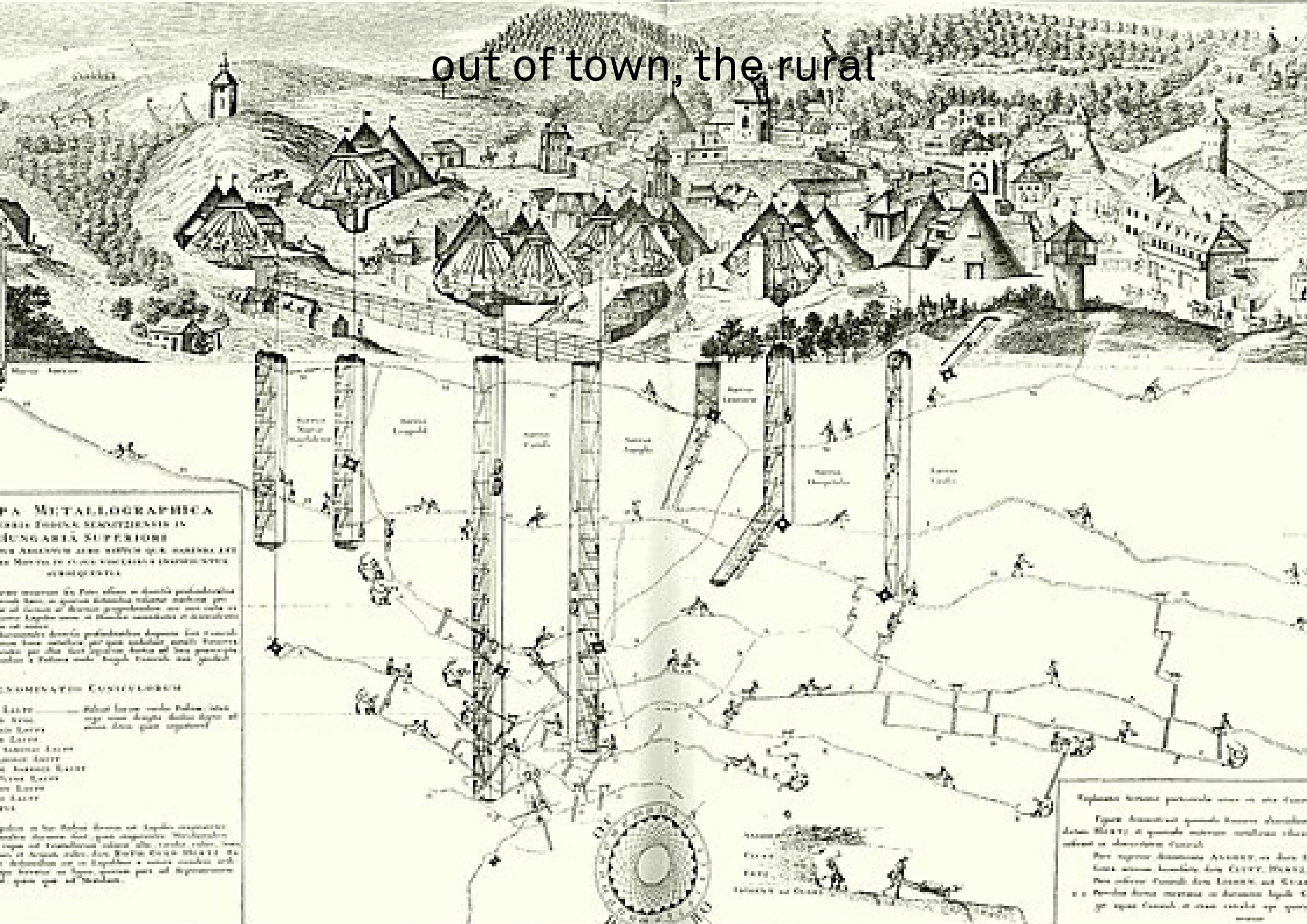
# toxic and invisible legacy



toxic and invisible legacy



out of town, the rural



**PA METALLOGRAPHICA**  
CIRCUITUS IUDICIS SCOTIENSIS IN  
HUNGARIA SUPERIORE  
SIVE METALLORUM ET MINERALIUM QUAE IN HUNGARIA SUPERIORE  
AD HUNC USQUE TEMUS REPERTAE SONT  
METALLORUM ET MINERALIUM QUAE IN HUNGARIA SUPERIORE  
AD HUNC USQUE TEMUS REPERTAE SONT  
METALLORUM ET MINERALIUM QUAE IN HUNGARIA SUPERIORE  
AD HUNC USQUE TEMUS REPERTAE SONT  
METALLORUM ET MINERALIUM QUAE IN HUNGARIA SUPERIORE  
AD HUNC USQUE TEMUS REPERTAE SONT

**LEGENDA CIRCULORUM**  
Circulus 1. — Metallum ferreum  
Circulus 2. — Metallum cupreum  
Circulus 3. — Metallum argentum  
Circulus 4. — Metallum aurum  
Circulus 5. — Metallum stannum  
Circulus 6. — Metallum plumbum  
Circulus 7. — Metallum zincum  
Circulus 8. — Metallum cadmium  
Circulus 9. — Metallum cobaltum  
Circulus 10. — Metallum nickelum  
Circulus 11. — Metallum manganum  
Circulus 12. — Metallum vanadium  
Circulus 13. — Metallum arsenicum  
Circulus 14. — Metallum antimonium  
Circulus 15. — Metallum tellurium  
Circulus 16. — Metallum bismutum  
Circulus 17. — Metallum strontium  
Circulus 18. — Metallum barium  
Circulus 19. — Metallum calcium  
Circulus 20. — Metallum magnesium

In hoc metallo...  
Hic metallo...  
Iste metallo...



Explicatio...  
Figurae...  
Sunt...  
Hic...  
Iste...

out of town, the rural



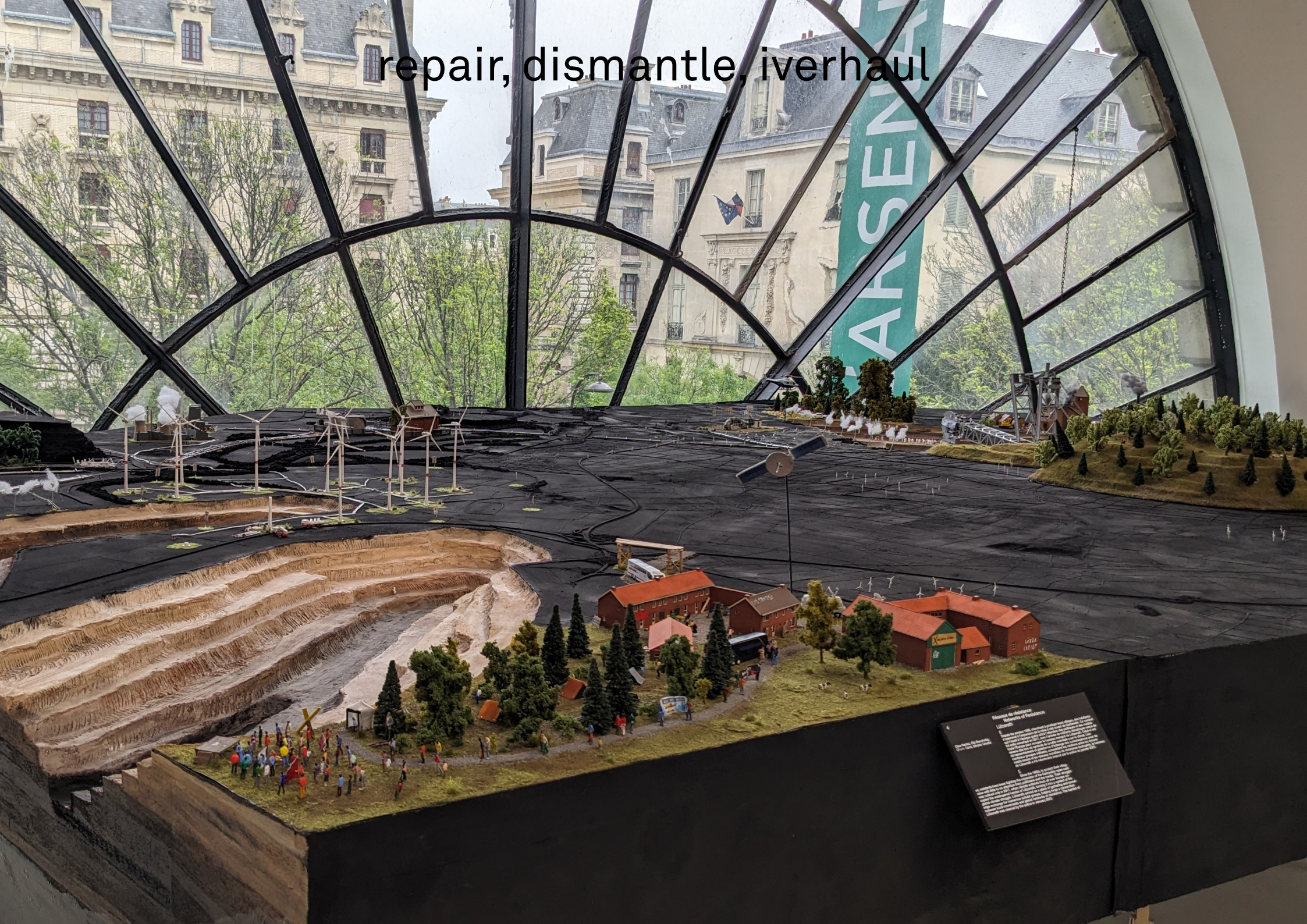
out of town, the rural



beyond patrimonialization



repair, dismantle, overhaul



**Planung der Entwicklung**  
**Städtebau der Vergangenheit**  
Lithographie:  
Die Stadtentwicklung der Vergangenheit ist ein Prozess, der sich über Jahrhunderte erstreckt hat. Er ist das Ergebnis von sozialen, wirtschaftlichen und politischen Veränderungen. Die Stadtentwicklung der Vergangenheit ist ein Prozess, der sich über Jahrhunderte erstreckt hat. Er ist das Ergebnis von sozialen, wirtschaftlichen und politischen Veränderungen. Die Stadtentwicklung der Vergangenheit ist ein Prozess, der sich über Jahrhunderte erstreckt hat. Er ist das Ergebnis von sozialen, wirtschaftlichen und politischen Veränderungen.

heal, requalify, reflect





# from the margins

**Les organismes habitants**  
Entités vivantes qui contribuent à maintenir la régénération du sol : aération, respiration, décomposition, stabilisation, régulation, infiltration.



- 1  
- lombrics  
- bactéries  
- micro-organismes  
- champignons



- 2  
- racines  
- gel, lixiviation  
- non stabilisés  
- bouillottes  
- grilles, herbes



- 3  
- fossiles

## CARTE 1 SOL



**Les objets hébergés**  
Éléments inertes qui élaborent la composition du sol vivant et qui constituent le sol réel des territoires arctiques à l'ère de l'Anthropocène.



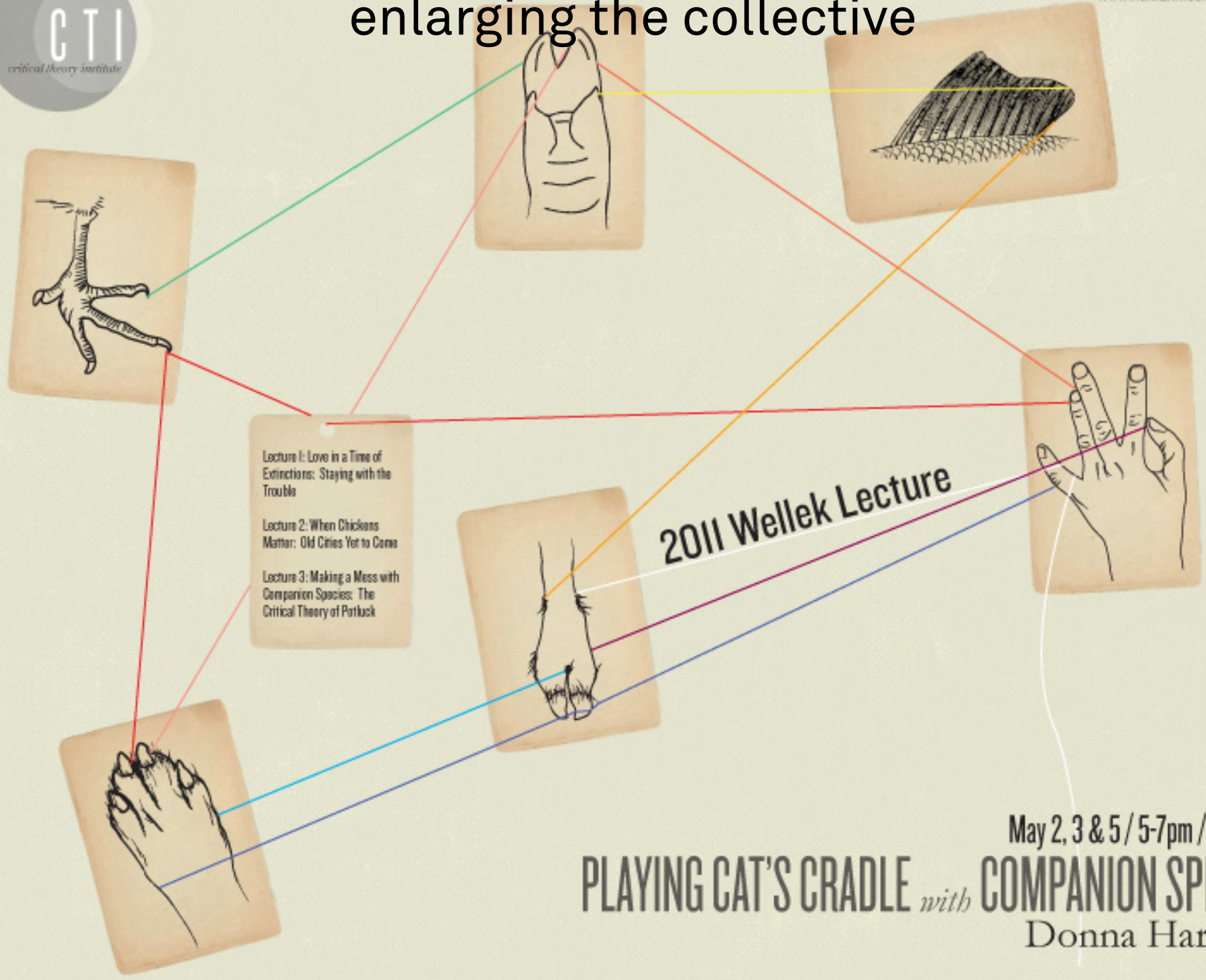
- 4  
- réseau de pipelines  
- pollutions diverses et contamination des sols aux hydrocarbures  
- vestige en pierres des premiers hommes



- 5  
- extraction gaz et pétrole, forages  
- enfouissement des déchets nucléaires  
- caves de stockage  
- fermes  
- mines  
- trous  
- fondations



# enlarging the collective



May 2, 3 & 5 / 5-7pm / HG 1030  
**PLAYING CAT'S CRADLE** *with* **COMPANION SPECIES**  
Donna Haraway

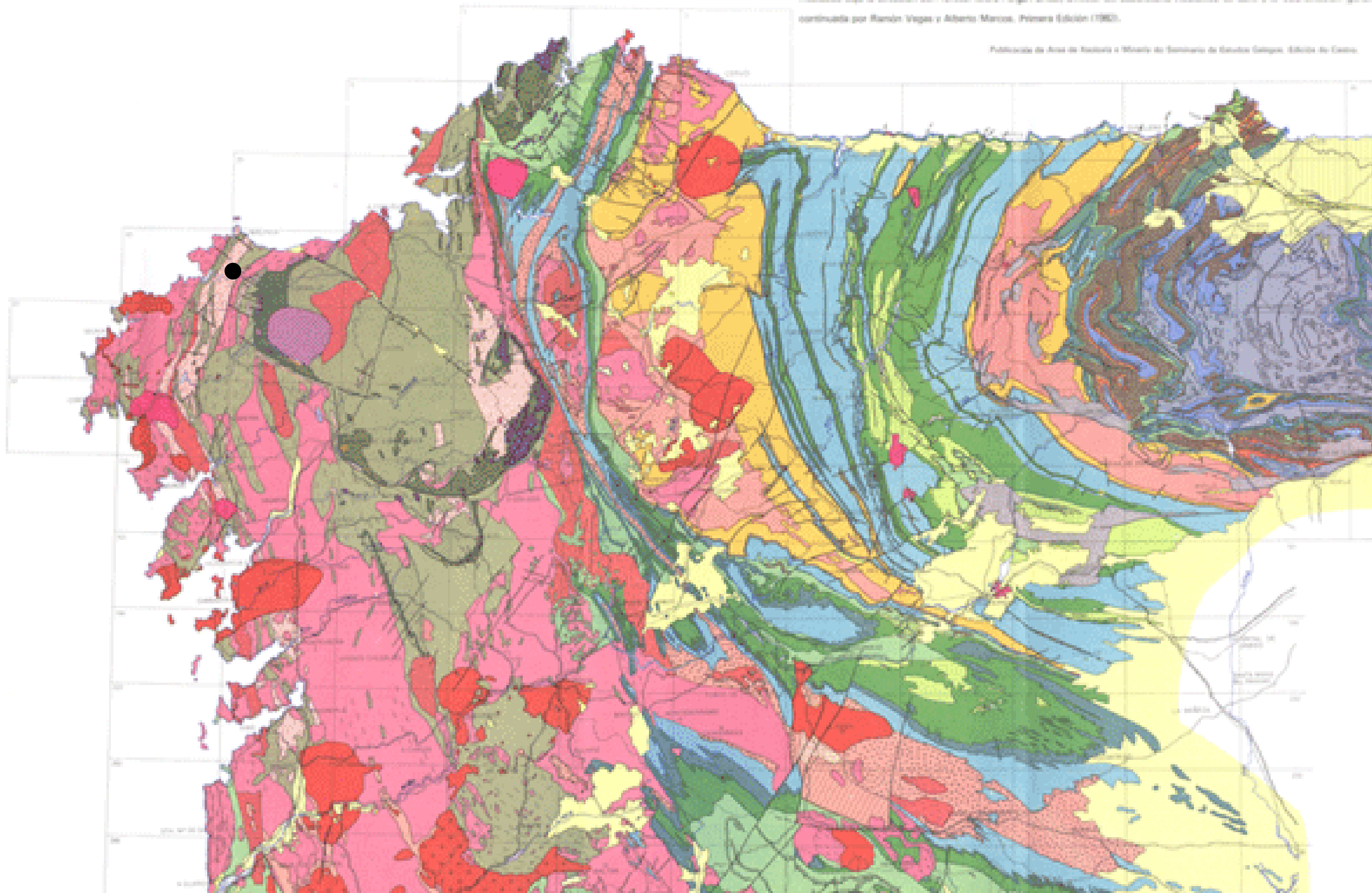
# Monte Neme



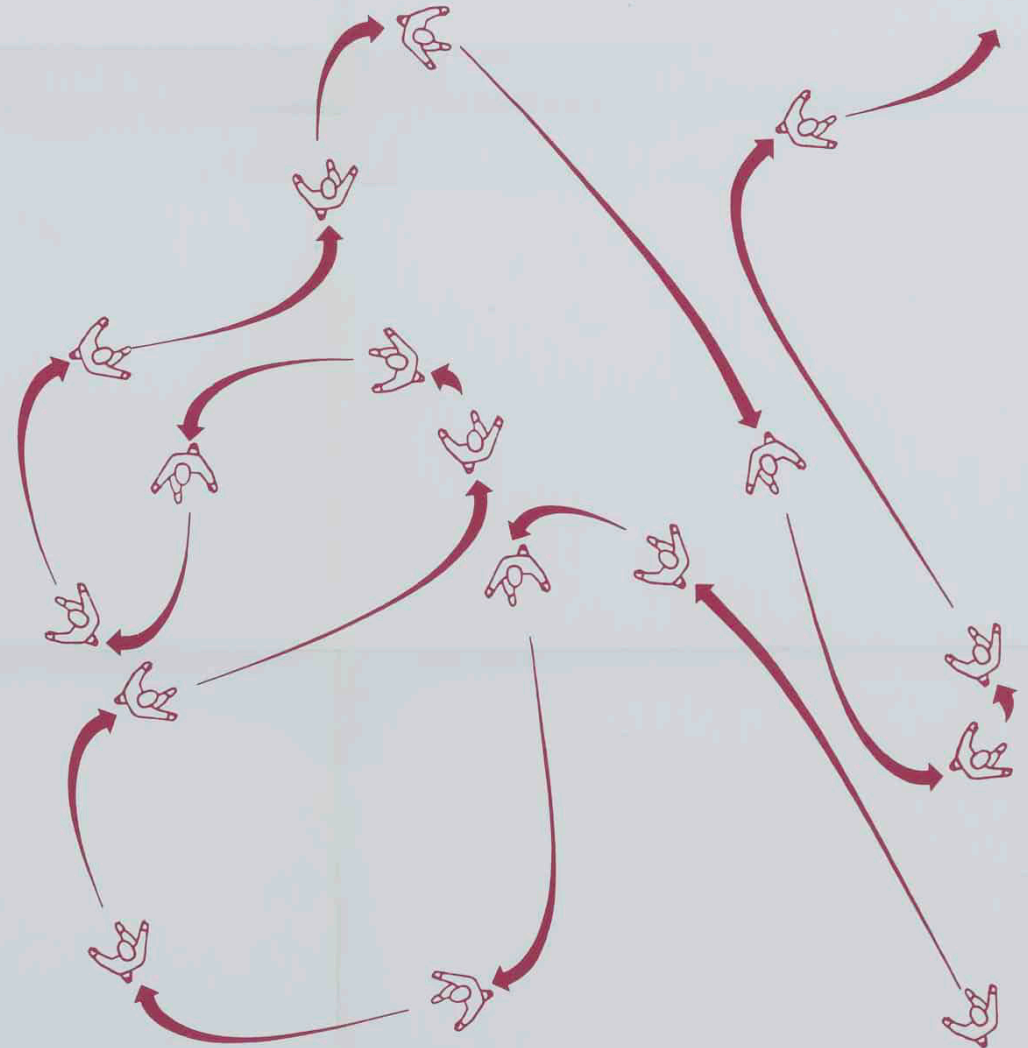
# Galicia MAPA GEOLOGICO DEL MACIZO HESPERICO

Realizado bajo la dirección del Profesor Isidro Parga-Panfili, Director del Laboratorio Geológico de Laxe y la coordinación general continuada por Ramón Vegas y Alberto Marcos. Primera Edición (1982).

Publicado por Arca de Estudios e Museo do Seminario de Estudos Galegos. Edición de Galicia.



# drawing lines



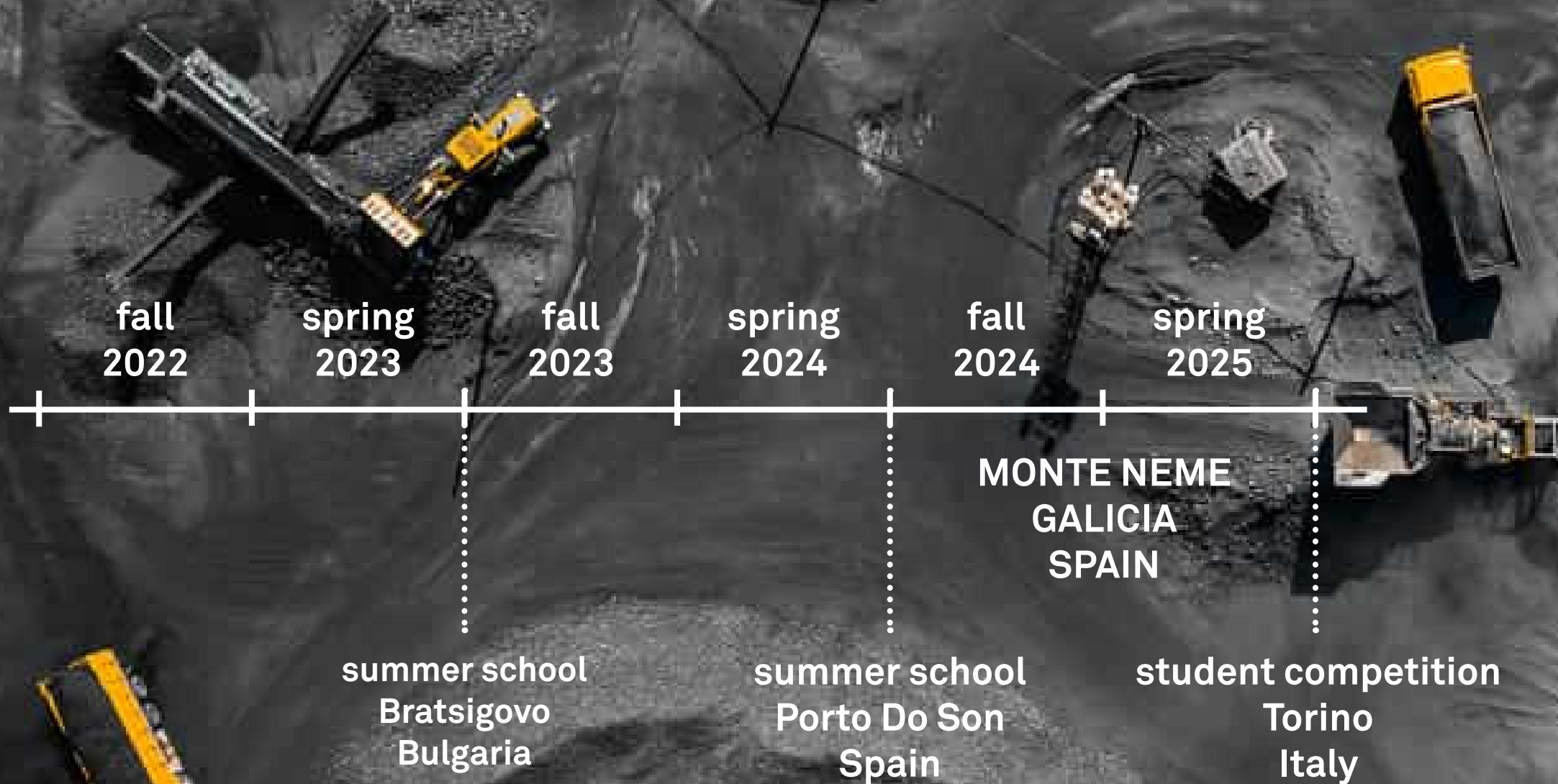
creating worlds



# fall semester

|            |                 |
|------------|-----------------|
| W1: 16/09  | PROBING PLACES  |
| W2: 23/09  | DRAWING LINES   |
| W3: 30/10  | DRAWING LINES   |
| W4: 07/10  | CREATING WORLDS |
| W5: 14/10  | CREATING WORLDS |
| W6: 21/10  | FIELD WORK      |
| W7: 28/10  | AUTUMN BREAK    |
| W8: 04/11  | ASSEMBLING      |
| W9: 11/11  | ASSEMBLING      |
| W10: 18/11 | LANDING         |
| W11: 25/11 | REFINING        |
| W12: 02/12 | REFINING        |
| W13: 09/12 | REFINING        |
| W14: 16/12 | JURY            |

# erasmus + new ruralities





A landscape photograph featuring several wind turbines in the background against a hazy, sunset sky. In the foreground, a herd of cattle is grazing in a field. The overall tone is warm and atmospheric.

# RARE EARTHS

OUT OF TOWN 2024-2025  
Nadia Casabella, Sofie Devriendt,  
Benoit Burquel, François Vliebergh