Petronavit a.s

Udate on the Nordic UNFC project

UNECE Expert Group on Resource Classification

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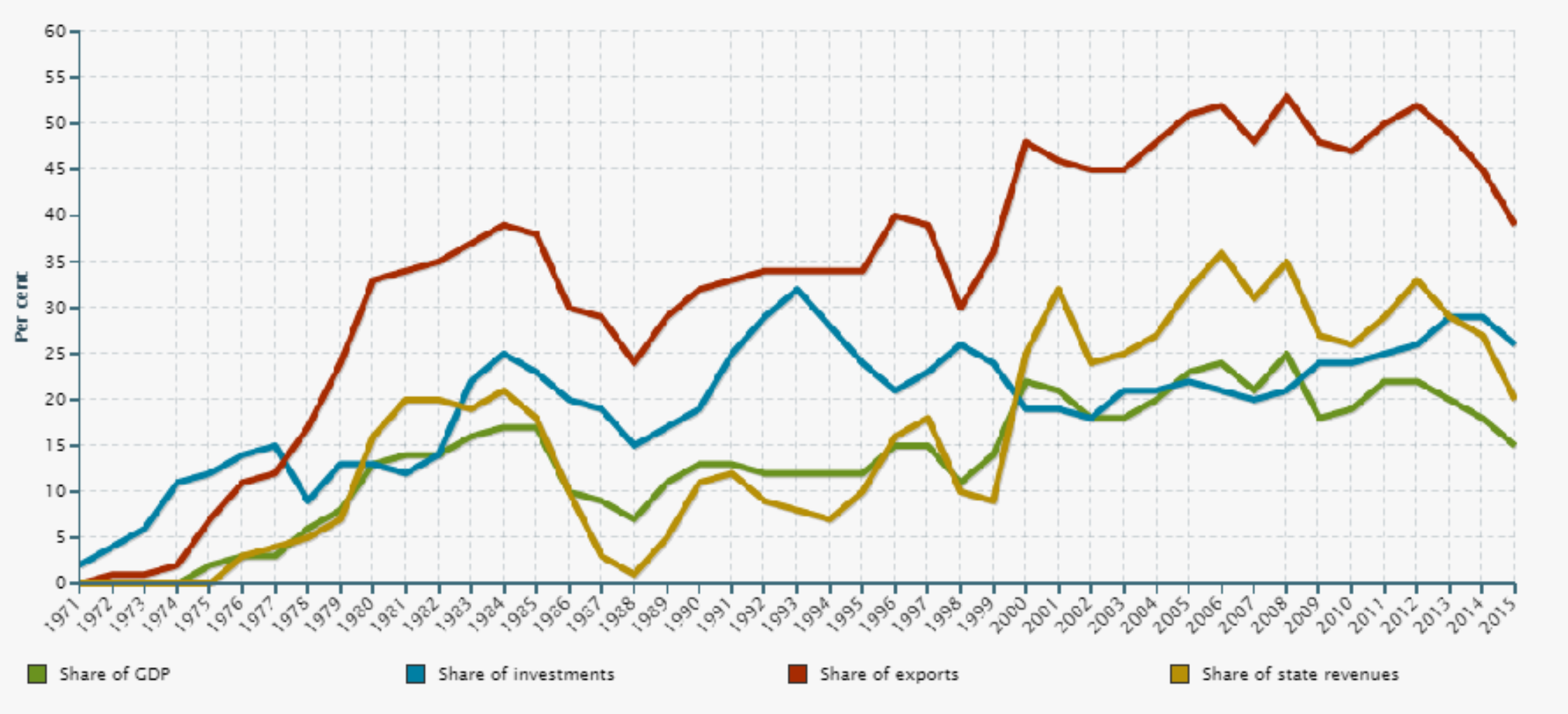
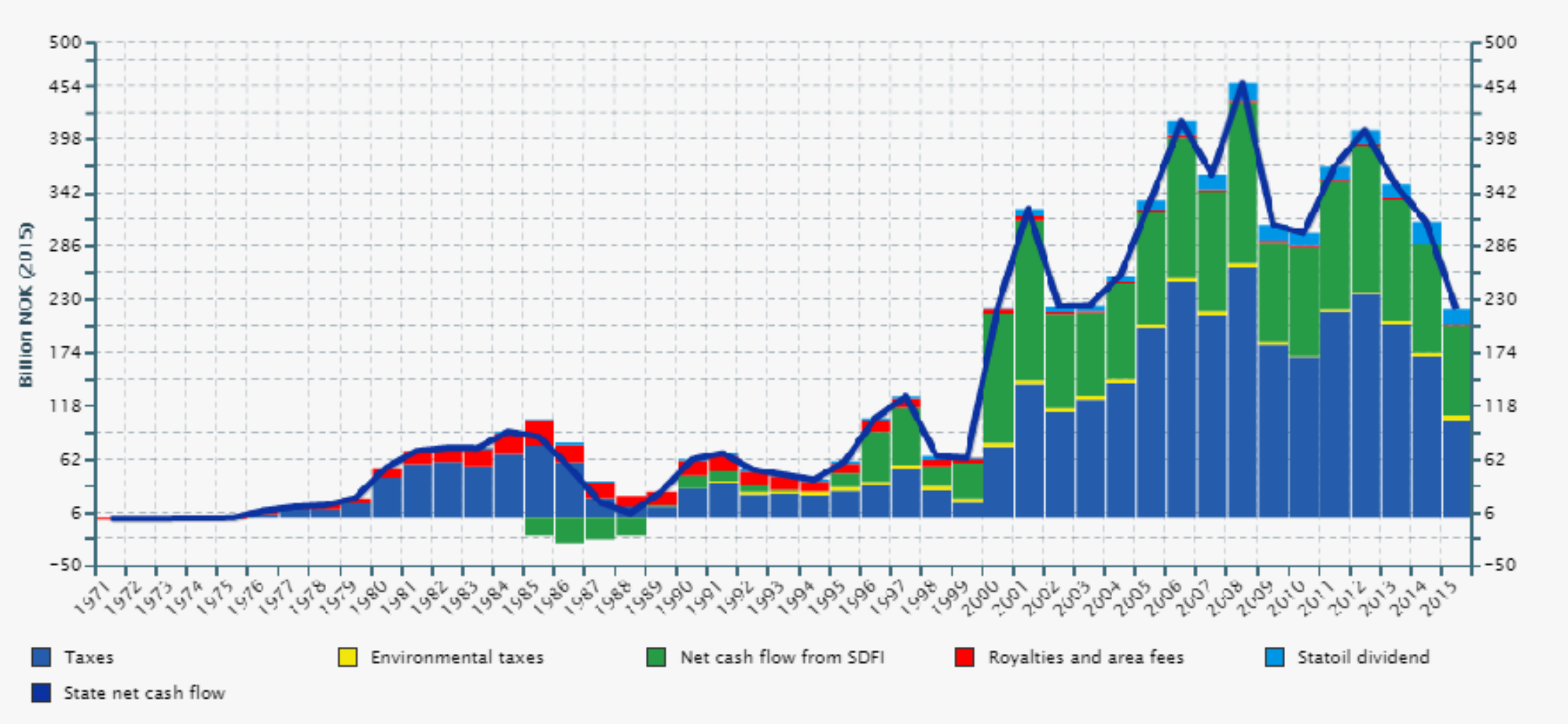
MACROECONOMIC INDICATORS FOR THE PETROLEUM SECTOR, 1971-2015



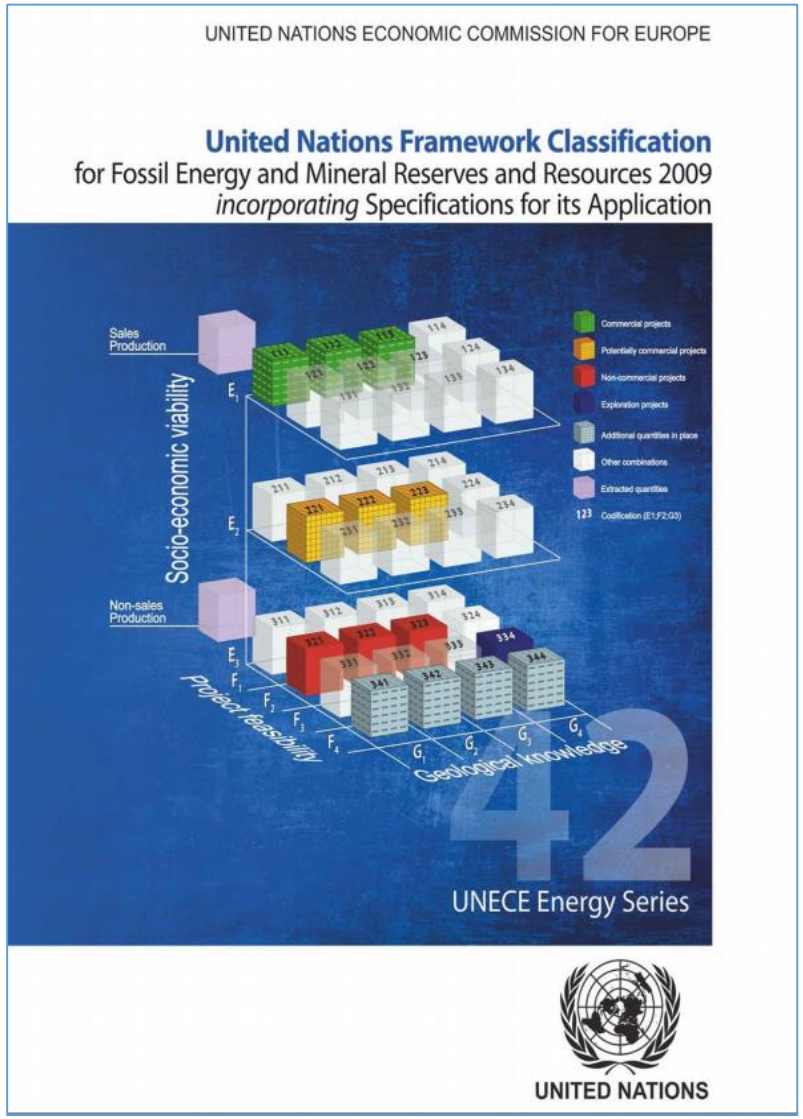
Source: Statistics Norway, Ministry of Finance

THE NET GOVERNMENT CASH FLOW FROM PETROLEUM ACTIVITIES, 1971-2015

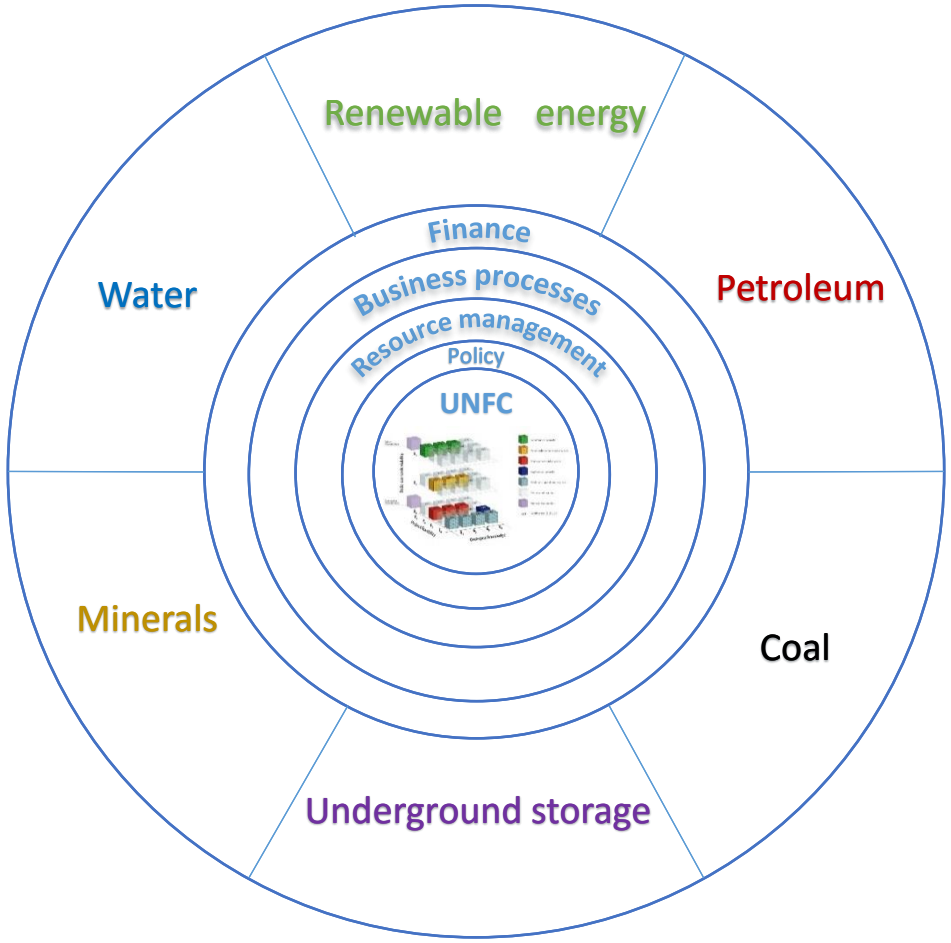


Application of the Nordic UNFC project

- Produce UNFC inventories using the professional community competencies
- Apply them for:
  - Regional and global studies
  - Government resources management
  - Industry business process management
  - Finance
    …and
- Produce disclosures in other systems mapped to the UNFC by transposing UNFC inventories.



Domains of application of the UNFC



The mineral strategy of Sweden

Updated 17 May 2015

1 A mining and minerals industry in harmony with the environment, cultural values and other business activities.

2 Dialogue and cooperation to promote innovation and growth.

3 Framework conditions and infrastructure for competitiveness and growth.

4 An innovative mining and minerals industry with an excellent knowledge base.

5 An internationally renowned, active and attractive mining and minerals industry.

http://www.government.se/contentassets/78bb6c6324bf43158d7c153ebf2a4611/swedens-minerals-strategy.-for-sustainable-use-of-swedens-mineral-resources-that-creates-growth-throughout-the-country-complete-version

Issues of application – Decision support

- Global, regional and national resource studies:
  - How do we build the future we want
- Government resources management
  - Legal, fiscal, regulatory, contractual frameworks
  - Environmental management
  - Administrative practices (licensing, permitting ..)
  - Infrastructure development (transport, social development, education, health, safety…)
  - Revenue and cost management
- Business process management
  - Shaping portfolios through aquisitions and divestments
  - Capability deployment in exploration, development and production
  - Portfolio optimizations in time and space
- Financing
  - Capital allocation
  - Financial reporting - ESMA
  - Checking that the numbers are useful for and used in the capital market

Issues of categorization – examples

- Reference points:
  - Coherence with national, regional (Nordic and EU) and international statistics
  - How to address multiple products and product substitution
  - Non-sales production for household economy and residuals (waste)
  - Circular economy – waste hierarchy
- E-axis:
  - International, national and local hard and soft framework conditions
- F-axis:
  - Conformity between the capital value processes in Government and industry
  - Distiguishing between producing and non-producng developed fields.
  - Adressing development as processes rather than projects – distinguish modifications from initial development – a legal requirement in Norway for improved extraction efficiency.
- G-axis:
  - Basic education is required to bring common exposure to the commmunity
  - Management of opportunities and risks arising from uncertianty
  - Aggregation

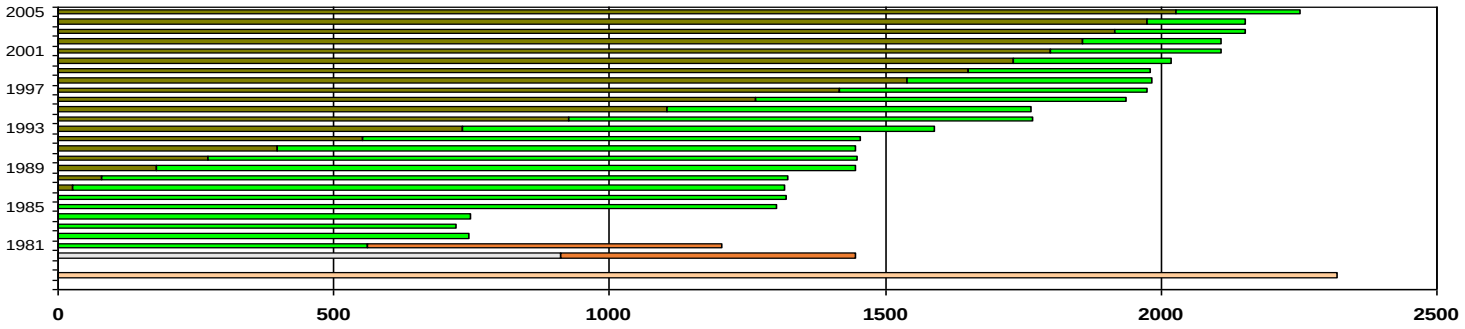
Conclusions

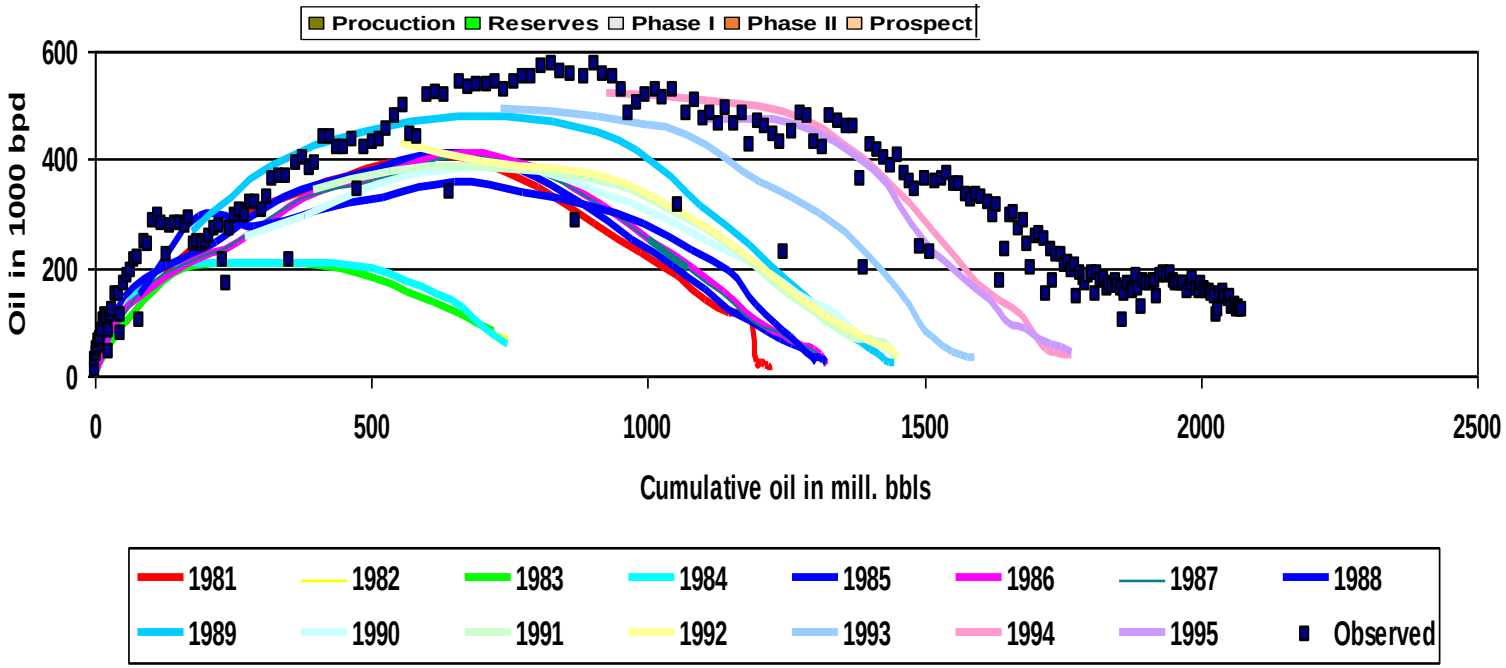
- The UNFC is designed to support decisions at the global, regional (in our case – Nordic and EU), national, corporate and financial levels, **and it must**.
- The time is right to develop guidelines for how to achieve this.
- The Nordic region is a good place to start
- Governments and industries must both engage
- Other regions are be welcome to replicate the exercise taking into account the conditions they face.

Thank you

Backup

Gullfaks was a program, not a project

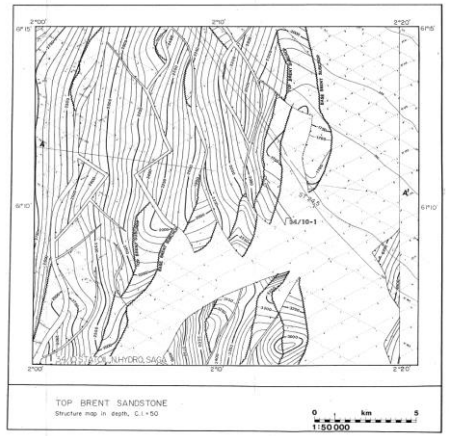




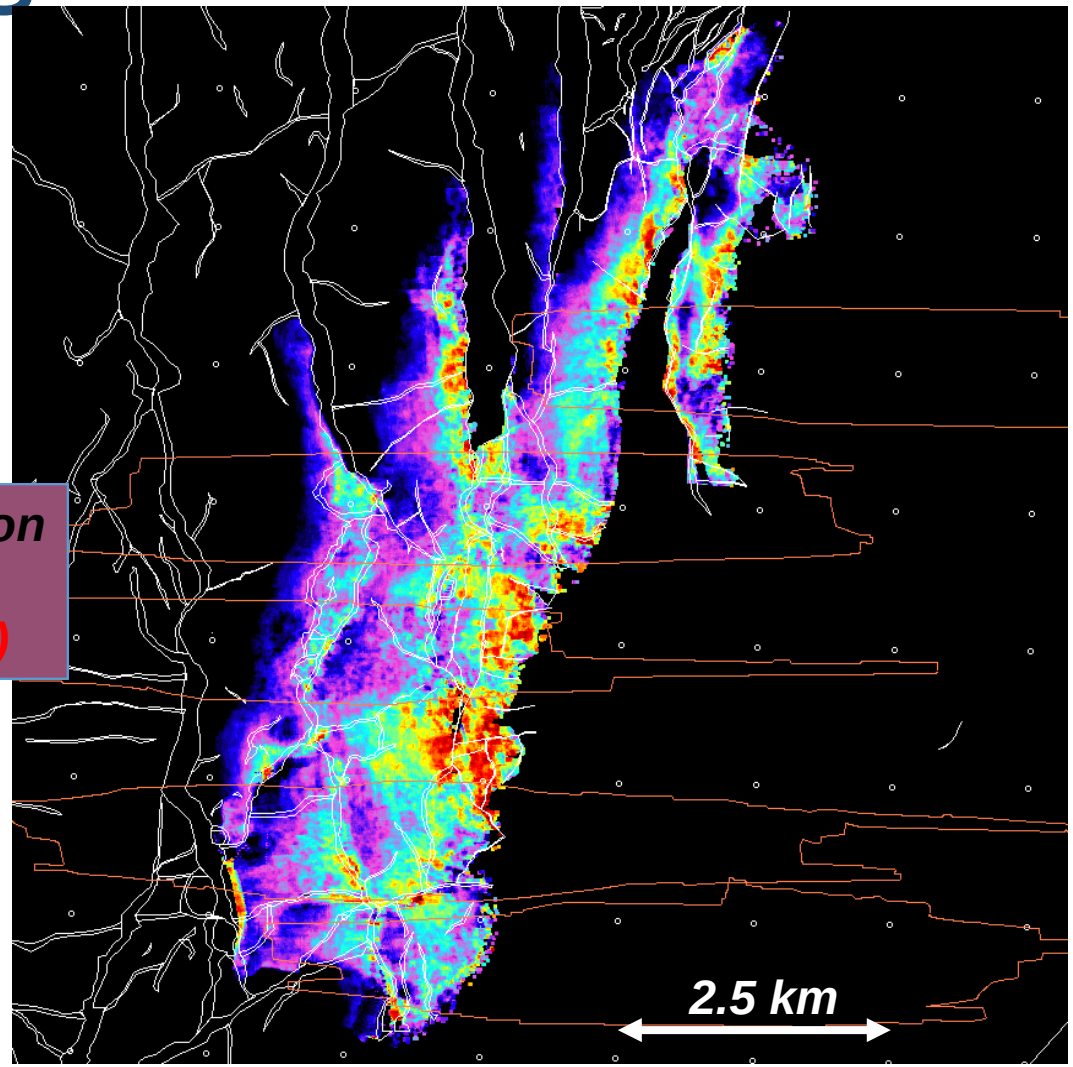
Gullfaks performance plans and actuals

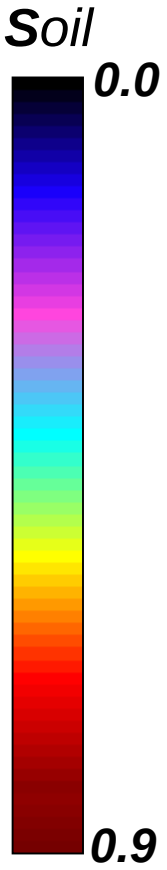
Source: NPD personal information

Options are required for adjustment to future change



Average Oil saturation - Tarbert Fm – 2005 (4D inversion)

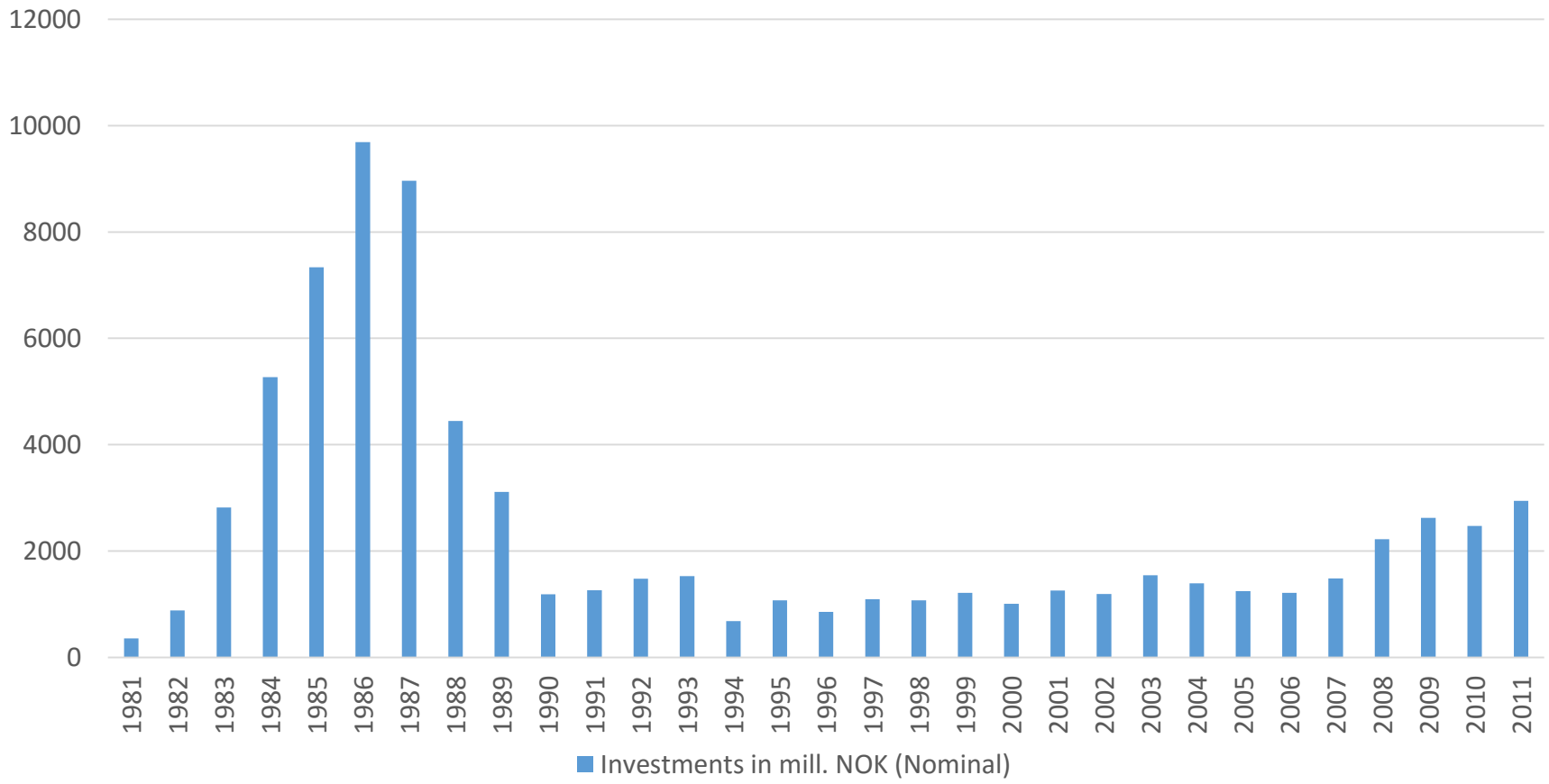




Maps of the Gullfaks field in 1981 and oil saturation inversion 2005

Source: 2-D map as delivered by Statoil to the NPD. Courtesy of the NPD; R. Helland of Statoil, "Gullfaks," World Petroleum Congress, 2008

Annual investments show the importance of initial engineering system design – facilitating continuous adaptation.



Source: NPD Factpages 2013

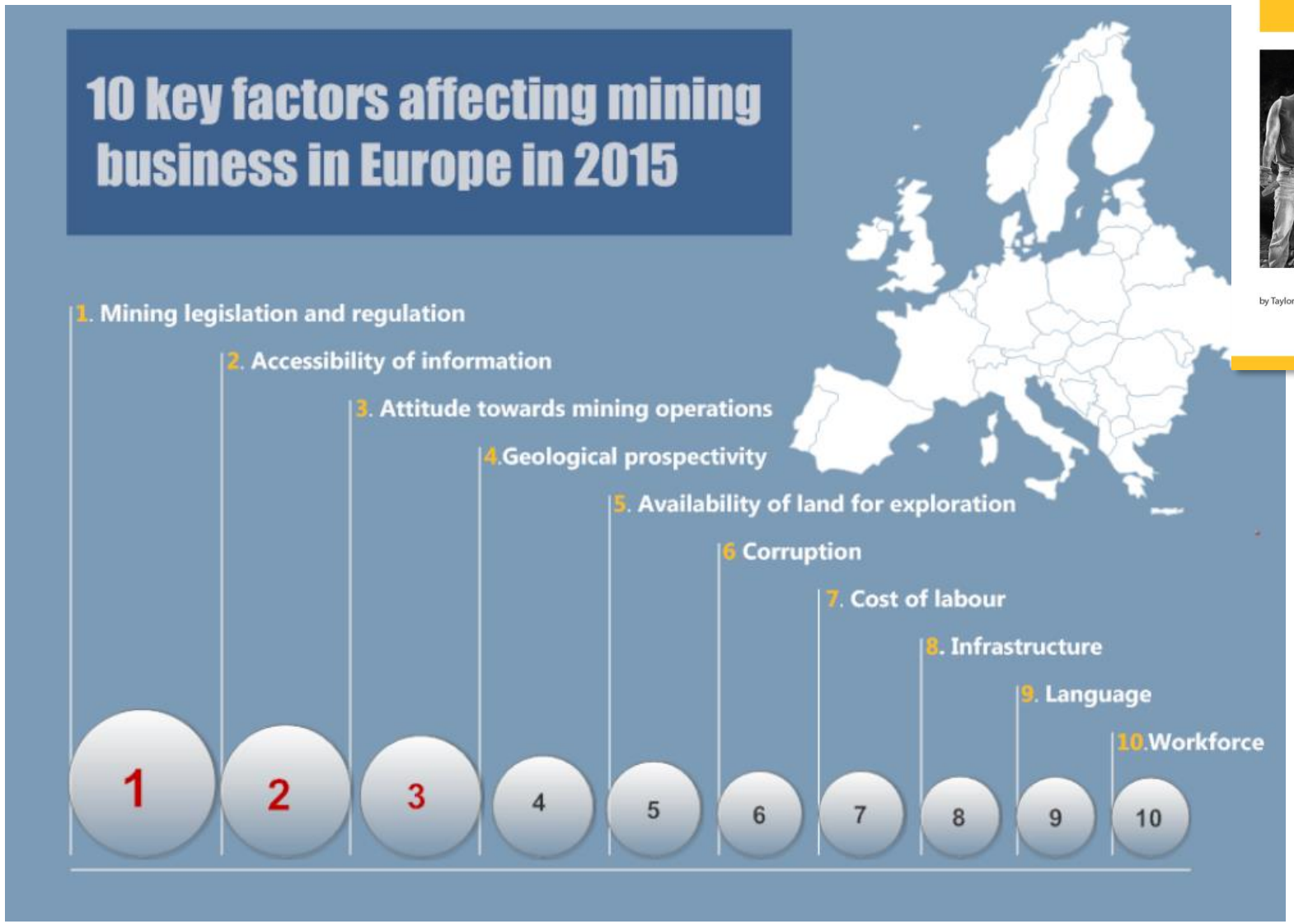
Renewable energy sectors

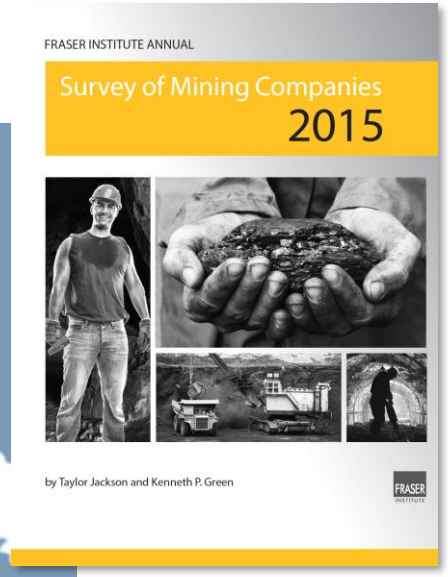
- Wind energy sector of Denmark
- Hydropewer sector in Norway and Sweden
- Geothermal energy of Iceland

- These sectors could be added to the project once the basic texts are released by the UNECE and resources to do it are identified.

UNFC Solid Minerals Project

NORGES
GEOLOGISKE
UNDERSØKELSE
- NGU -





http://minex-forms.s3.amazonaws.com/2015/MXEU2015/slides/Europe_mining_survey.pdf

(1) Why be involved in UNFC

1. Need for standardized reporting (EGS MREG survey)
2. Unified classification (diff. resource types & reporting standards)
3. Covers non-sales production and inventories (incl. mining wastes)
4. Granularity can be adapted to data availability and requirements
5. Growing international support (e.g.China, India, Argentinia, Malawi)
6. Allows multilingual translation (number coded terminologies)
7. In-line with INSPIRE goals (GeoSciML / ERML / EDGI)
8. Clarifies organizational roles in the minerals development process
9. Makes socio-economic aspects and the project stage explicit
10. Facilitates material life-cycle integration
11. Oriented towards SDG, resource governance, scenarios, policies
12. Framework for reporting transparency (EITI, Dodd-Frank)

Vision

Mineral resources and reserves data is collected, stored, aggregated and reported on a national level, based on internationally agreed standards and conventions.

This information allows for assessing the resource endowment, developing national policies and making strategic decisions concerning individual projects.
It improves data availability, systems understanding, and integration into long-term resource development and land-use planning processes.

Government authorities have defined procedures and provide transparent information about the degree of uncertainty concerning geological knowledge, the technical project stage, and identified socio-economic aspects which may influence project gateway decisions.

The industry benefits from clarity about the resource development status and can use this information for business planning and for communicating project relevance to investors, key decision makers, and the general public.

(2) NGU aims towards UNFC

Resource data inventory

- classification according to international conventions
- integration of non-sales production and byproduction
- link geology, mineral statistics and anthr. resources (Mineral stat., COST MINEA)
- time domain management (project cycle: exploration, on-production, closed)
- determine R&D focus (data availability check and QC)

Communication

- clarify national, regional and local responsibilities (ownership, access rights)
- develop common language with industry and regional/local planning authorities
- international partners and statistical organisations (Minerals4EU, USGS, BGS)
- potential investors

Data availability and transparency

- multilingual information, cross-compatibility
- exploration data management
- improve long-term land-use planning procedures (ranking criteria, scenarios)
- transparency about in-ground resources (and resource flows and financial flows)

(3) Approach

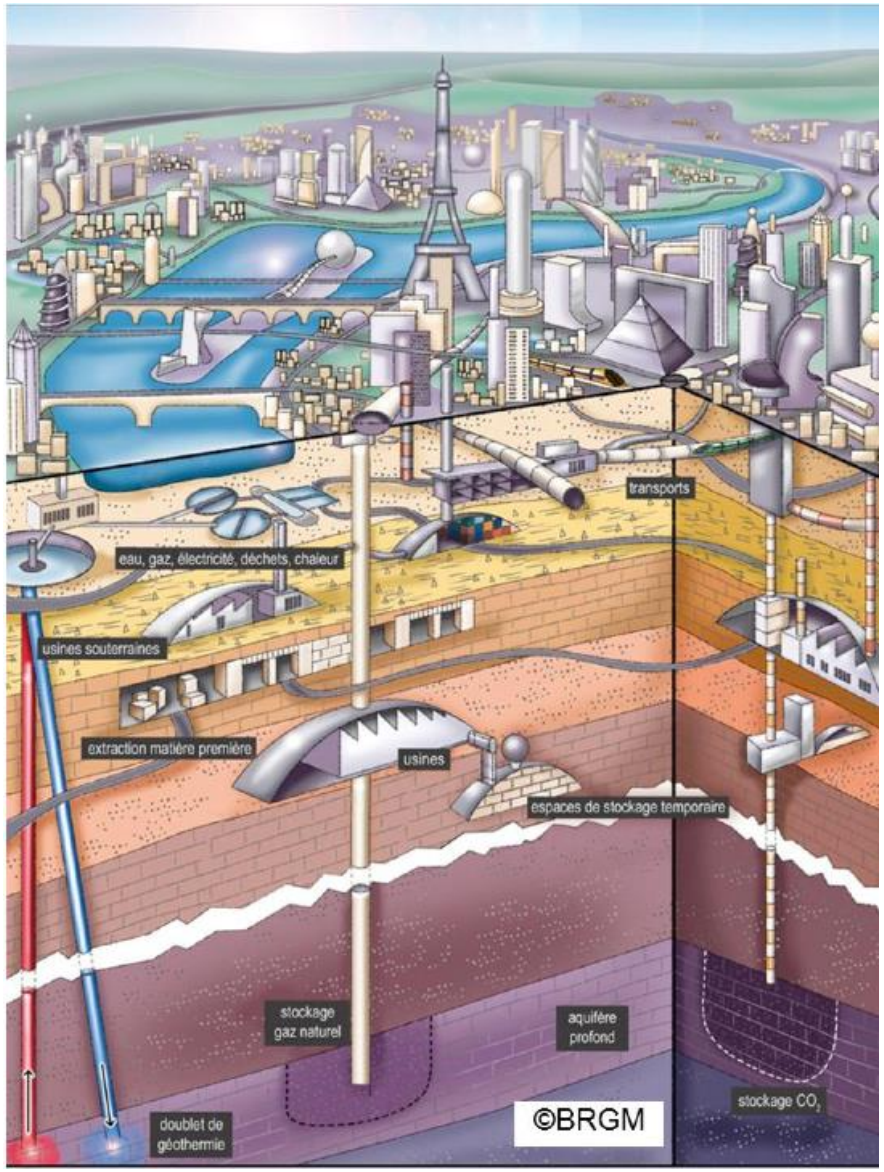
Establish project baseline

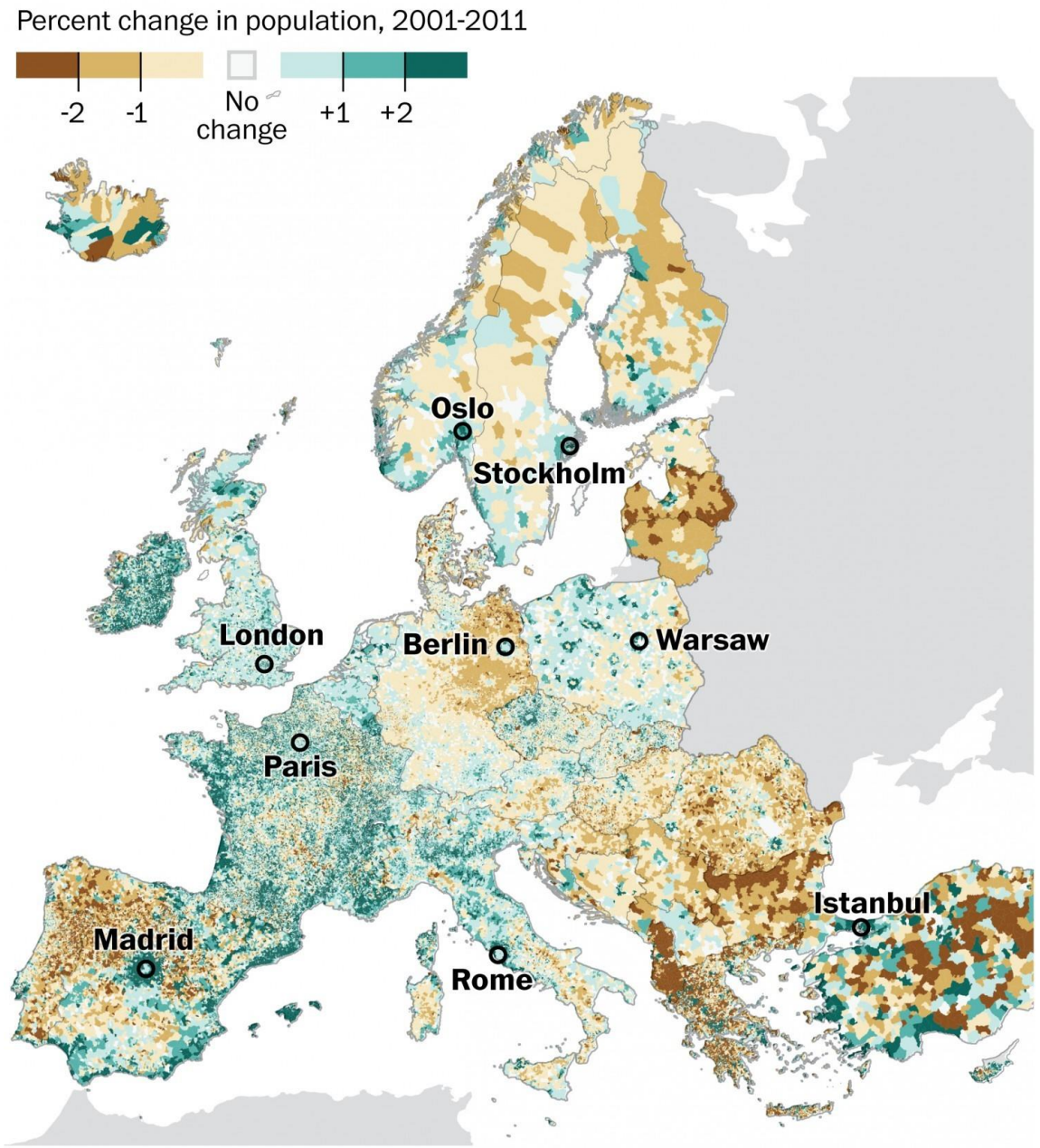
- define tangible and intangible outcomes: case studies and collaboration
- prepare project outline
- engage partners (based on choice of case studies)
- agree on mode of funding acquisition for 2017 / 2018
- define parameters for a proposal to the

Next steps

- use EGRC Meeting in Geneva to prepare article in ”Mineralproduksjon”
- evaluate synergies with existing / planned mapping projects
- map the main challenges / discussion points concerning solid minerals in UNFC
- select NGU case studies, international case studies
- involve industry and associations
- integrate research institutions
- research proposal

Urbanisation in Europe





http://www.sustainablecitiescollective.com/big-city/214791/maximising-potential-subterranean-cities

https://img.washingtonpost.com/blogs/worldviews/files/2015/06/ed-overview.jpg&w=1484

Anthropogenic resources

- Move on compehensive mining concepts and helical economic development