60 years of subsurface data access in the Dutch E&P industry

Lessons learnt and getting ready for the Energy Transition

Audrey ROUSTIAU / NDR Congres Utrecht/ 15th of October 2019

EBN as a company – who are we?

- EBN is a state participation company founded 55 years ago to represent the Dutch State in the gas and oil extraction industry.
- 3 strategic pillars:

Our Dutch Gas

EBN develops solutions to stimulate gas exploration and optimise sustainable and safe exploitation of existing gas fields.

www.ebn.nl

Return to Nature

EBN co-ordinates the efficient decommissioning or re-use of obsolete oil and gas platforms.

ebn

New Energy

EBN builds partnerships for efficient exploitation of geothermal energy and development of energy storage.

Key messages of this presentation

- We need to acknowledge the important role of NDRs as enabler for the Energy Transition.
- NDRs to provide access to a richer subsurface dataset in a cost-effective way.
- We need to make sure that we collaborate across industries and national boundaries.

Agenda

60 years of subsurface data access in the Dutch E&P industry

Lessons learnt and getting ready for the Energy Transition

- Introduction: Exploring the subsurface, a long history in the Netherlands
- Subsurface E&P data access in the Netherlands
- The energy transition and its expected impact on the (Dutch) NDR
- Conclusions

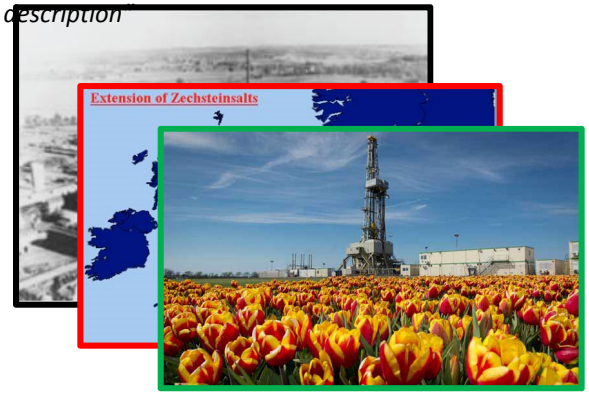
ebn

Exploring the subsurface, a long history in the Netherlands

1700 1800 1900 2000 2100

COAL

1605
First well with "geological description"



SALT

Coal mining first exploration wells

1918
Salt mining first exploration wells

OIL&GAS • • •

1923
First "Oil" exploration well: Corle-1

1949
First 2D seismic survey

1959
Groningen field discovery

1963
Groningen field production start

GEOTH.

CCS

1976
First 3D onshore seismic survey (NAM)

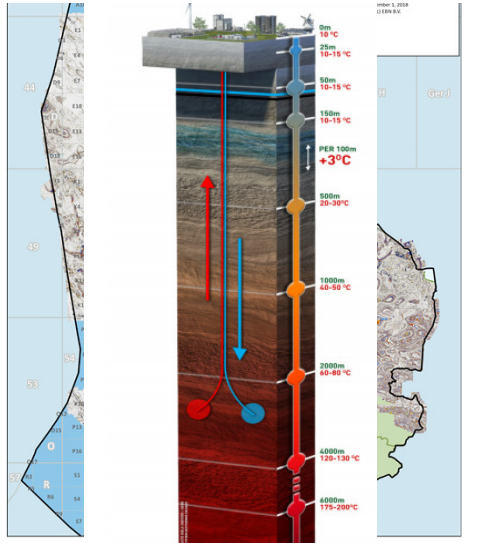
~1980
First 3D offshore seismic survey (NAM/Pennzoil)

> 2000 TB?

Master Plan Geothermal Energy in the Netherlands

A broad foundation for sustainable heat supply

Platform Geothermie · DAGO · WarmteNetwerk · ebn



Subsurface data access in the Netherlands

1800 — 1900 — 2000

21-04-1810
Loi concernant les Mines, les Minières et les Carrières


TEXTE ANNOTÉ
DE
LA LOI DU 21 AVRIL 1810,
CONCERNANT
LES MINES, LES MINIÈRES, LES TOURBIÈRES,
LES CARRIÈRES ET LES USINES MINÉRALURGIQUES,
PAR
E. LAMÉ FLEURY,
PARIS.
IMPRIMERIE IMPÉRIALE.
M DCCC LVII.

2003

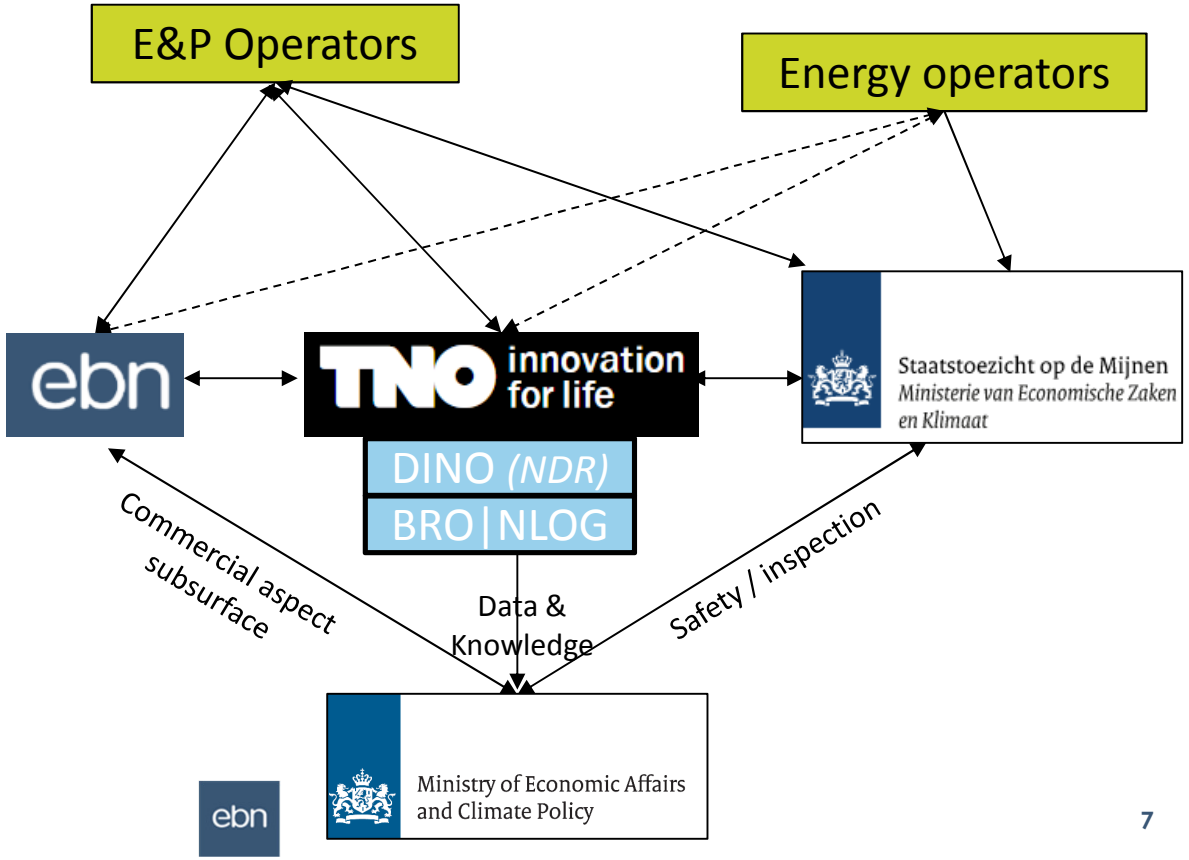
- Mining Act
- Mining Decree
- Mining Regulation


MINING DECREE OF THE NETHERLANDS
EFFECTIVE 1ST JANUARY, 2003 (as amended per 1st January 2017)
CHAPTER 7 PROVISION, MANAGEMENT AND USE OF
§ 7.1 Provision of data
Article 108

Data type	Release in public domain
Exploratory data collected after 01/01/2003 *(reports, logs & seismic signal data)*	5 years *(except spec surveys)*
Exploratory data collected before this date	?

Subsurface data access in the Netherlands

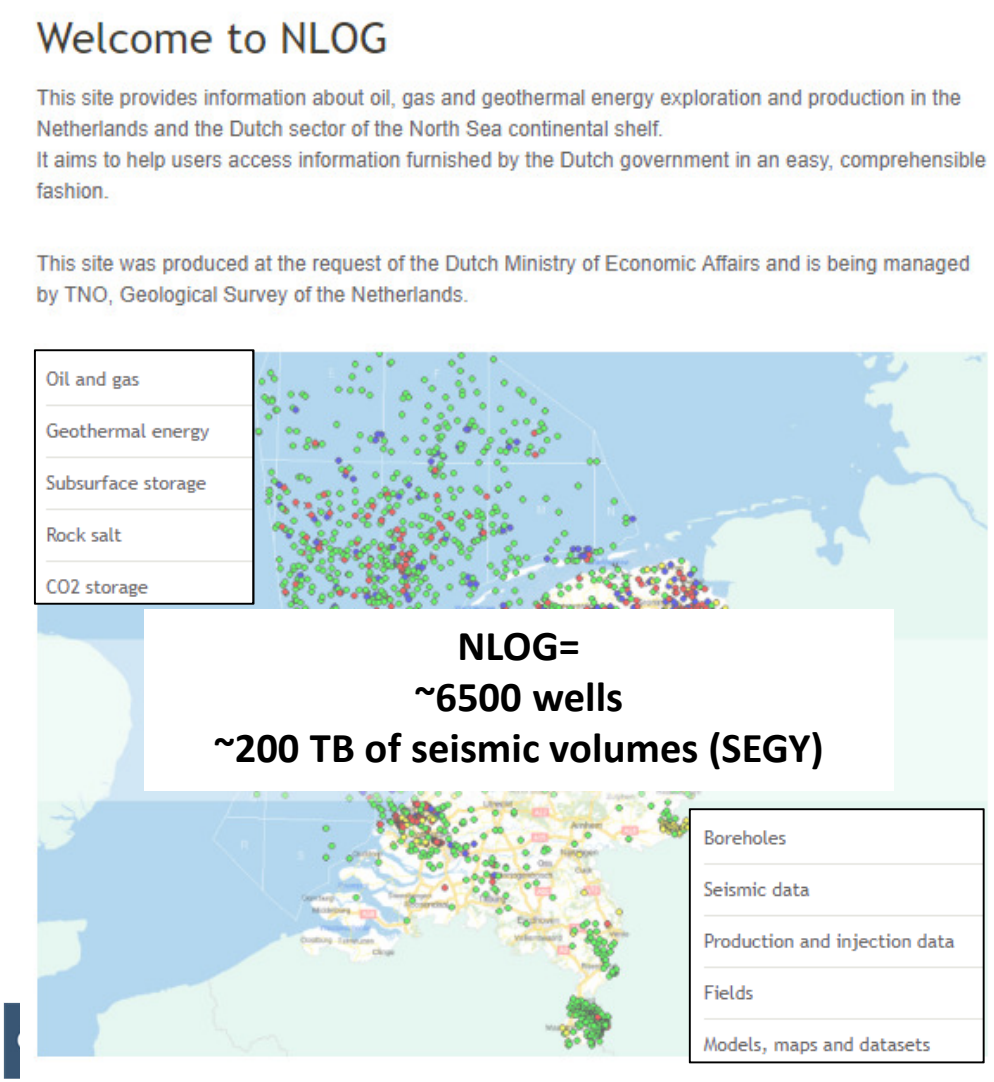
- TNO = governing institute for the Dutch NDR.
- Many stakeholders involved in the subsurface data flow in the Netherlands,



Where do we stand after 60 years of subsurface data access in the Dutch E&P industry ?

The NLOG Portal

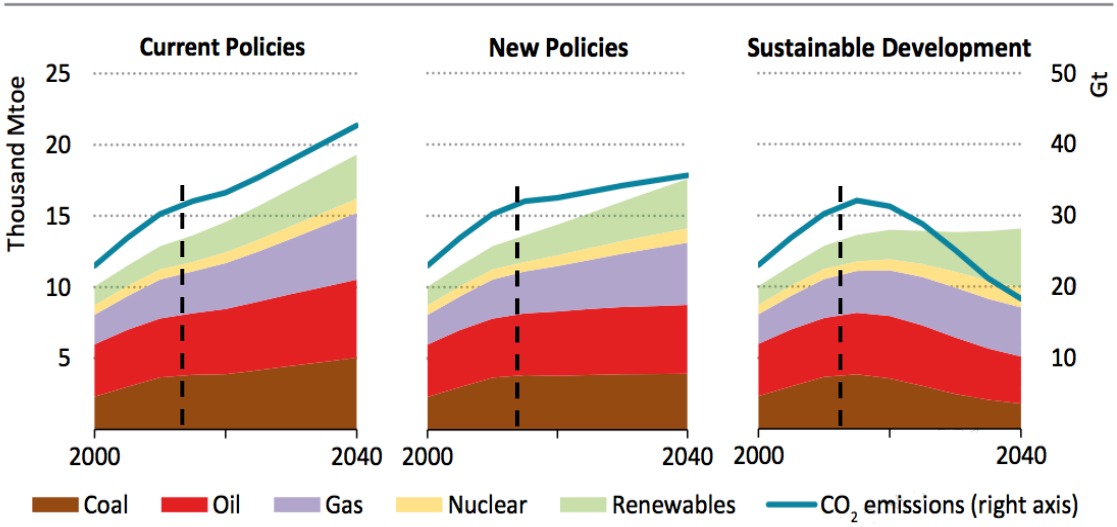
- NL Oil & Gas Portal, for deep underground subsurface data (>500m)
- Efficient, reliable and free portal, accessible to public and private parties,
- Provides a wide (meta)database of subsurface data at low (no) costs,
- Energy transition already anticipated.



Impact of the energy transition on the subsurface data needs and quality

- Increase of world primary energy demand in all scenarios,
- Increase in diversity of subsurface usage and subsurface users,

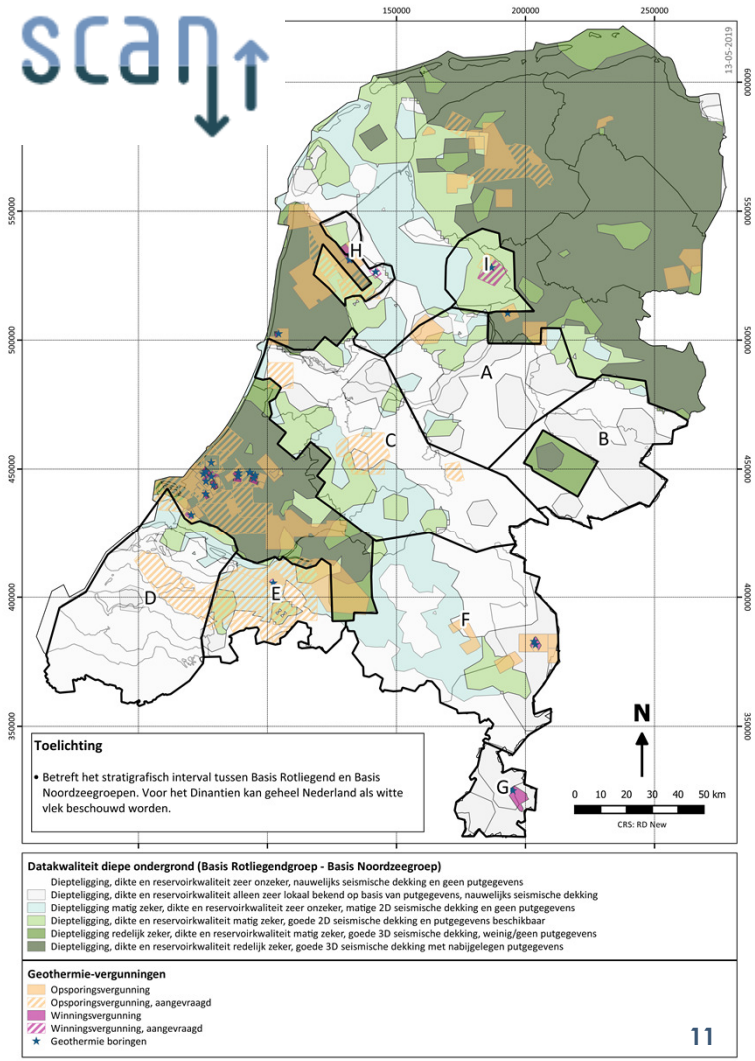
⇒ **NDRs are still required for the future energy needs and should deliver easy access to more, better and richer subsurface data!**



World primary energy demand by fuel and energy-related CO_2 emissions by scenario.
Source: International Energy Agency World Energy Outlook 2017

The Dutch E&P NDR and geothermal activities

- E&P subsurface database is a great starting point but…
- Need access to legacy (full stack) pre-2003 seismic data,
- Need to access pre-stack data for seismic data reprocessing and 2D seismic survey design,
- Many new & lean parties involved.
  Can NDRs be used as a corporate database?



The Dutch E&P world – a changing industry

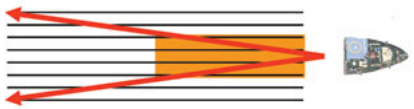
Future?

- How to secure subsurface data access when an operator leaves the country?
- **NDRs as legal curator of the data?**
- Legal adjustment of the current laws for data transfer.

The Dutch E&P world – an ever-improving industry

NAZ

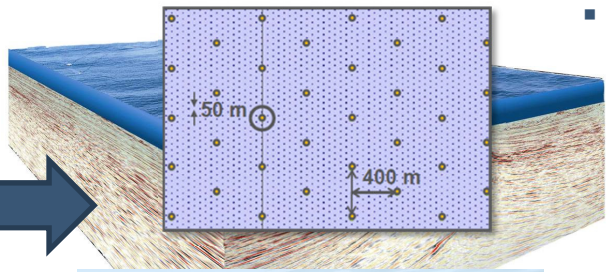
Narrow-Azimuth (conventional)

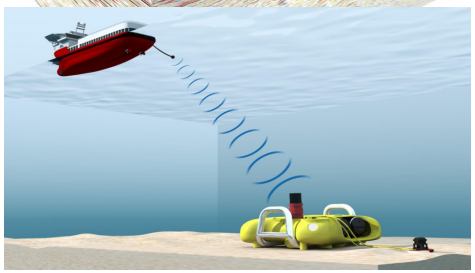


Narrow range of azimuths

OBN

Ocean Bottom Nodes Surveys

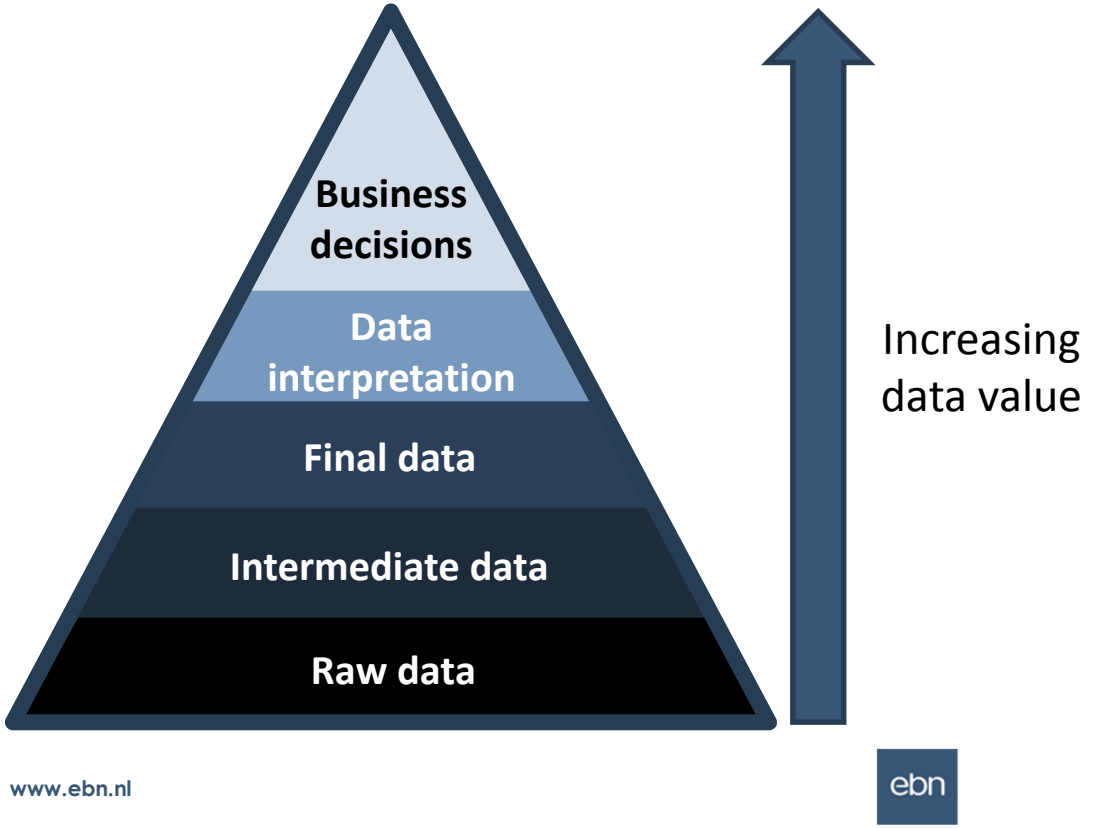




- One 3D OBN survey (1500 km^2)= 1,5 PB (10^{15} bytes !) per output volume…

- **How to ingest so much data at once in a cost effective way in NDRs?**
- **How to offer access to these huge datasets?**

The data maturity hierarchy



- Data demand and data value has changed throughout time,
- Need to access the full maturity scale to make high quality business decisions,
- Innovative use of data & algorithms necessary to gain new insight
- **NDRs should provide a solid data starting position and support this shift in data access demands**

Conclusions: getting NDRs ready for the future!

- **Drivers:**
  - Need for richer subsurface data access will grow
  - Cover the full data maturity hierarchy
  - Maximize the reuse of data by including raw seismic data asap
- **Key enablers:**
  - Industry commitment
  - Cost efficient
  - Improved data transfers
  - Appropriate data models
  - Clear data ownership
- **Call for action to:**
  - Acknowledge the important role of NDRs as enabler for the Energy Transition
  - Collaborate across industries and national boundaries
  - Jointly identify success factors for efficient NDRs
  - Share best practices

Questions?

Acknowledgement to my EBN colleagues for helping me putting this presentation together:

Kees van Ojik, Guido Hoetz, Barthold Schroot & Henk Koster

And TNO for providing some useful inputs: Ad Meinster & Sjef Meekes

energising
the transition

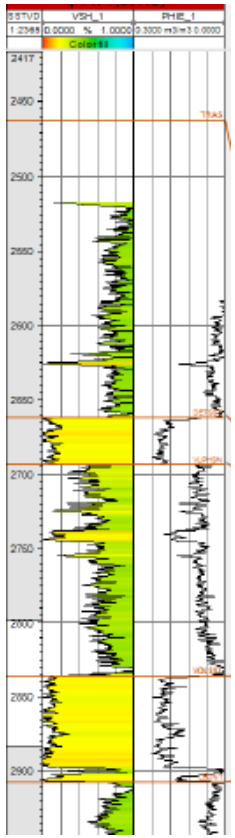
Data vrijgave (put + seismiek)

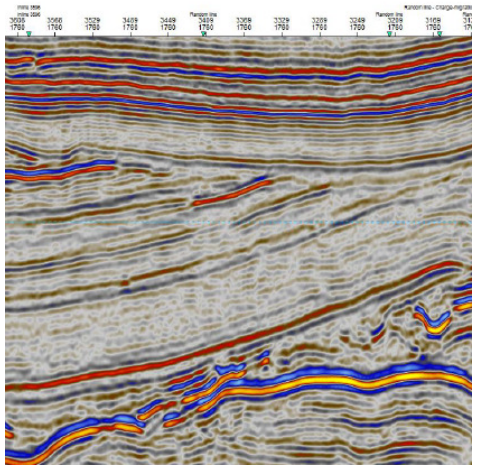
MBW 2003:

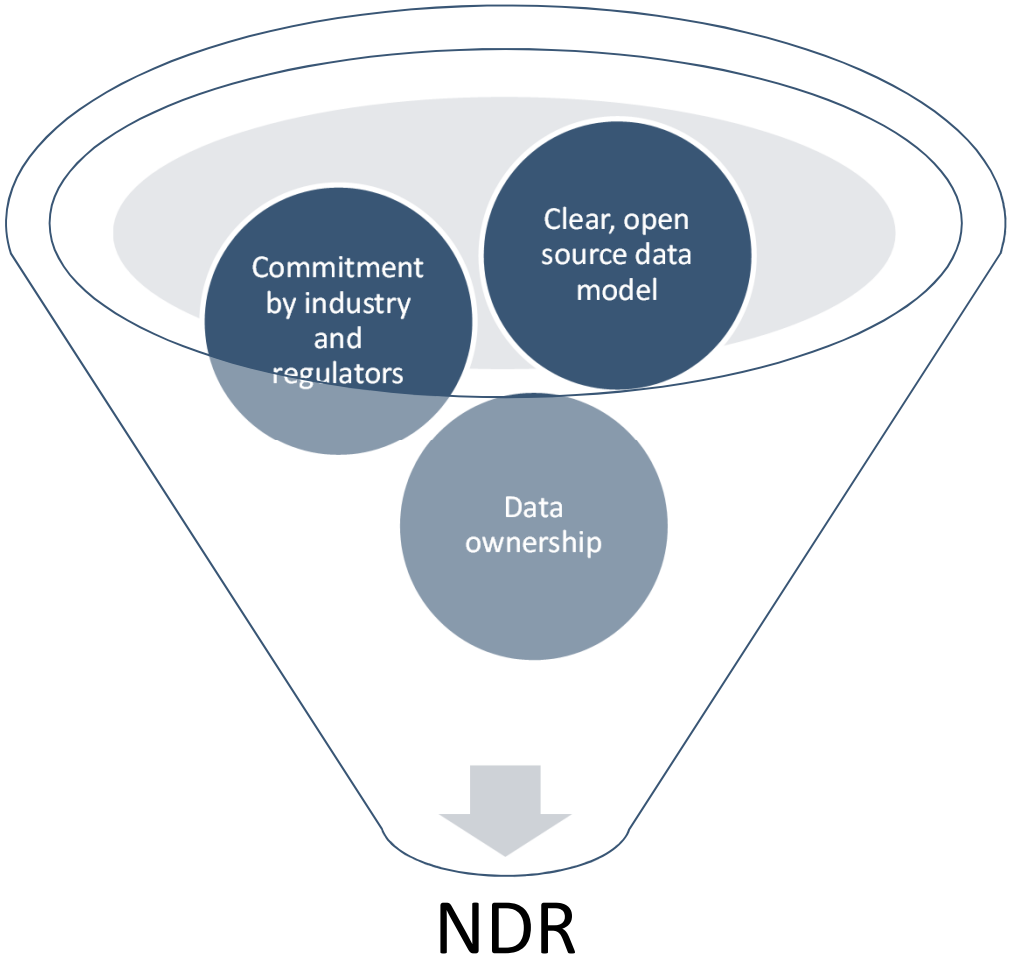
- Tot 2003 per convenant (vanaf ca. 1988)
- Termijn voor vertrouwelijkheid teruggebracht van 10 naar 5 jaar, ook voor onshore seismiek. Onduidelijk of dat ook voor spec surveys gold.
- Onshore putten en seismiek waren totdan toe 'voor eeuwig' vertrouwelijk
- Verplichting voor aanleveren field tapes seismiek aan TNO knullig opgeschreven, in 2013 beter.

MBW 2013/2017:

- Termijn blijft 5 jaar (put + seismiek), voor spec surveys 10 jaar.
- Ook gereproceste seismiek wordt publiek.
- Verplichting om field tapes aan TNO te leveren *als zij daar om vragen*.
- Niet retroactief?
- Zie ook TNO website







Drivers | Enablers | Call for Action

Key enablers

Higher efficiency of

- Data gap and quality analysis
- Data loading (I/O) and sharing of large datasets
- Single, national corporate data warehouse, rather than several individual (company proprietary) storage locations