

Gullet og det sorte gullet

– om gruvedrift og miljøhensyn på Svalbard



Morten Often,
Letesjef, Store Norske

957 km

Tromsø

Bangkok

3043 km

London



Store Norske Spitsbergen Kulkompani



Store Norske Spitsbergen Kulkompani







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Store Norske today

- The only Norwegian coal producer
- The world's northernmost active mining company
- The oldest mining company at Svalbard
- Founded 1916
- 99,9 % government owned
- 370 employees
- 316 claims
- 2006 km² property

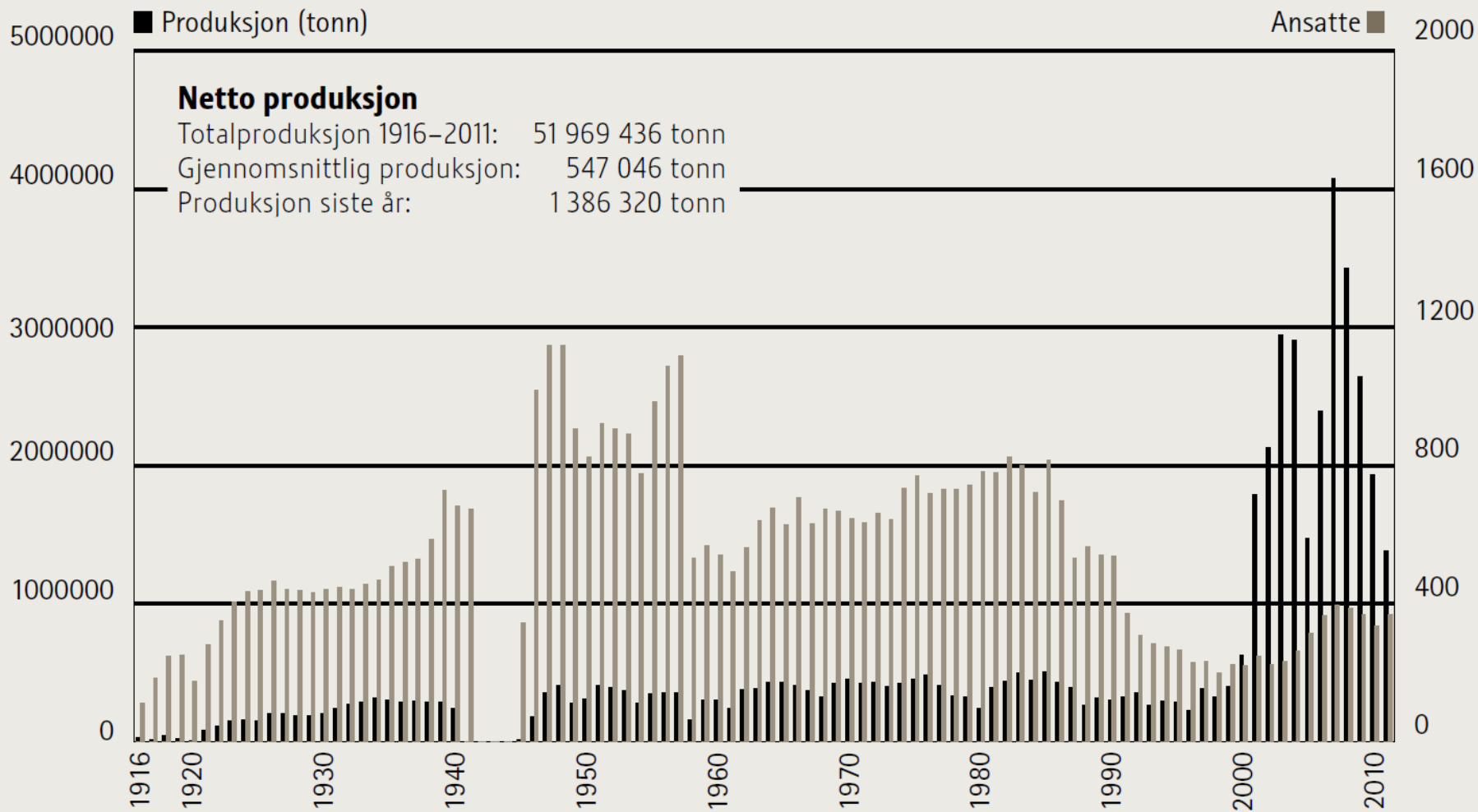


Store Norske today



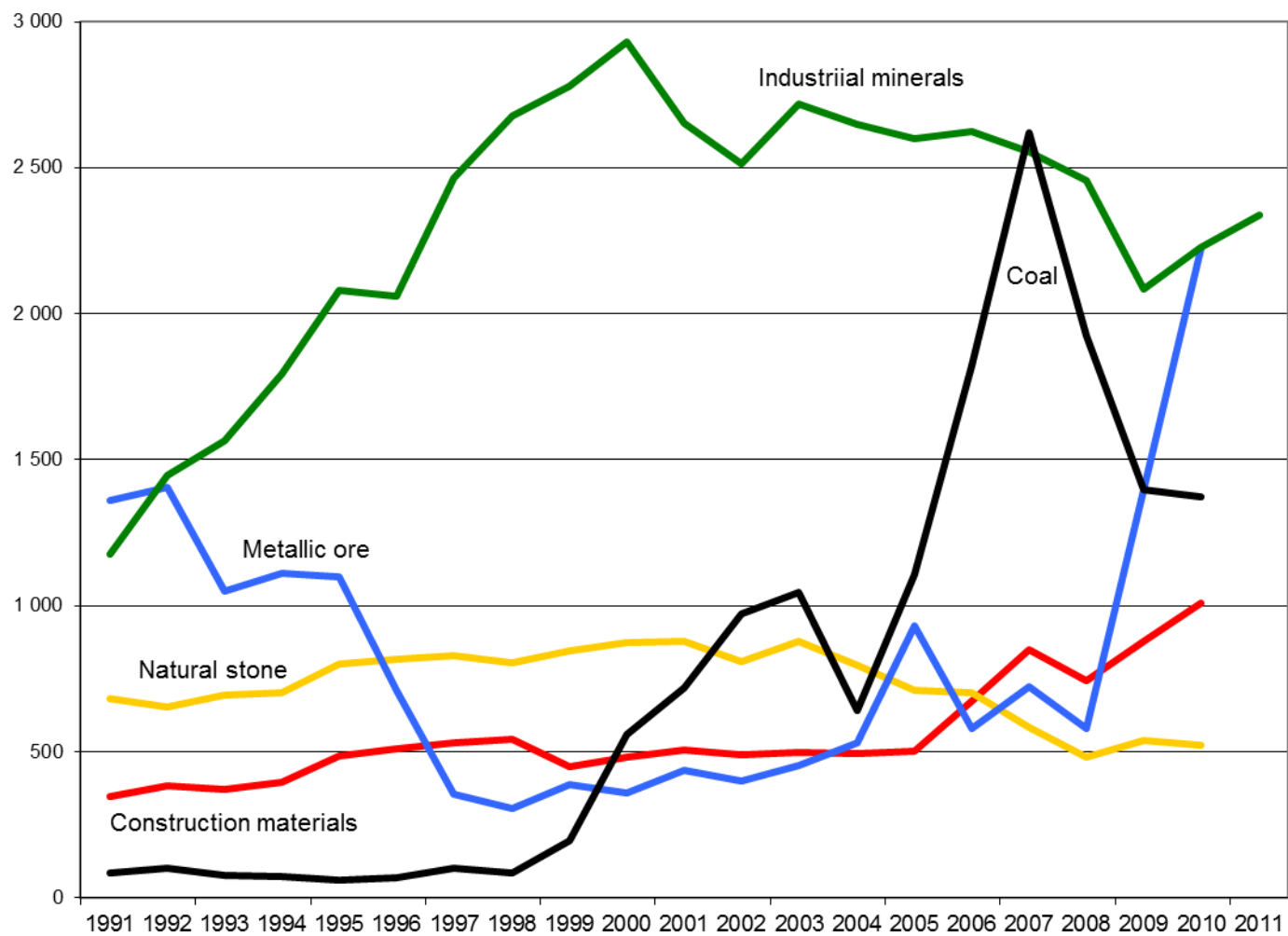
- Producing from 2 mines; Svea Nord and Gruve 7
- Peak production in 2007: more than 4 Mt
- Production 2011: 1,5 Mt
- Future production level: 1,8-2,0 Mt
- Turnover 2010: 1 507 MNOK = 251 M\$
- Result after tax 2010: 276 MNOK = 46 M\$
- Average employment period: 8 years
- Average employee age: 38 years







Export value 1992 - 2011
(mill. NOK 2008)
Norwegian mining industry



Source: Directorate of Mining and Geological Survey of Norway

Store Norske – Main aims



- Exploit coal from our reserves in a safe and profitable manner.
- Match the high environmental requirements and expectations at Svalbard.
- Take the company's high competence and potential further, and develop new and exciting possibilities.



History

What a glaring derogation of this lone wilderness. These horrendous workers' barracks in the valley, cableways and power lines up the mountain sides. It cries.

-And what life of all these people, with strikes and discomfort, all under such rude management. This was certainly no place to stay (...)

Fridtjof Nansen on Longyearbyen (1912)







About 1936



Today

- A well organised society of 2000 inhabitants
- Based heavily on mining, as well as tourism and science & education



Lovgrunnlaget

Svalbardtraktaten

- 9. februar 1920, i Paris.
- Opprinnelig 9 land, signatarmaktene. I dag mer enn 40.
- Trådte i kraft først 14. august 1925, fordi det var et krav fra signatarmaktene at en bergverksordning skulle være på plass før traktaten kunne gjelde, artikkel 8 i svalbardtraktaten.
- Traktaten ble inngått i forbindelsene med fredskonferansene etter første verdenskrig.
- Slår fast Norges «fulle og uinnskrenkede høihetsrett» over Svalbard, inklusive Bjørnøya, og norske lover og regler gjelder for området.
- Lik rett til næringsutøvelse, jakt og fangst.

Bergverksordning for Svalbard

- 7. august 1925.
- Bergverksordningen gir alle undersåtter av de stater som har sluttet seg til Svalbardtraktaten, samt selskaper som er hjemmehørende og lovlig stiftet i disse, rett til å lete etter, erverve og utnytte kull, jordolje og andre mineraler og bergarter som utvinnes gjennom bergverksdrift.

Svalbardmiljøloven (Lov om miljøvern på Svalbard)

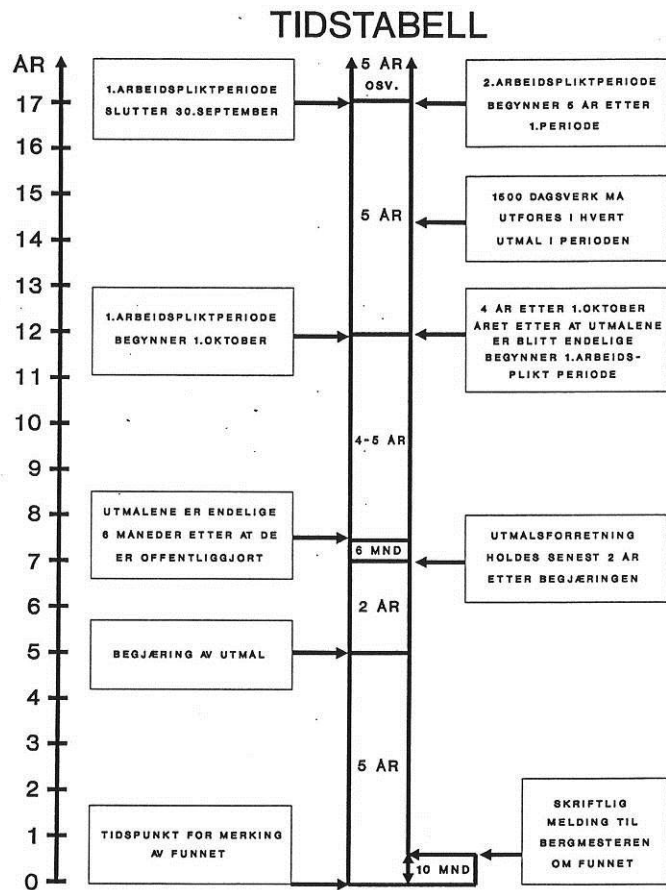
- Norsk lov av 15. juni 2001.
- Revidert 1. juni 2012.
- Lovens formål, §1: ..å opprettholde et tilnærmet uberørt miljø på Svalbard når det gjelder sammenhengende villmark, landskap, flora, fauna og kulturminner.





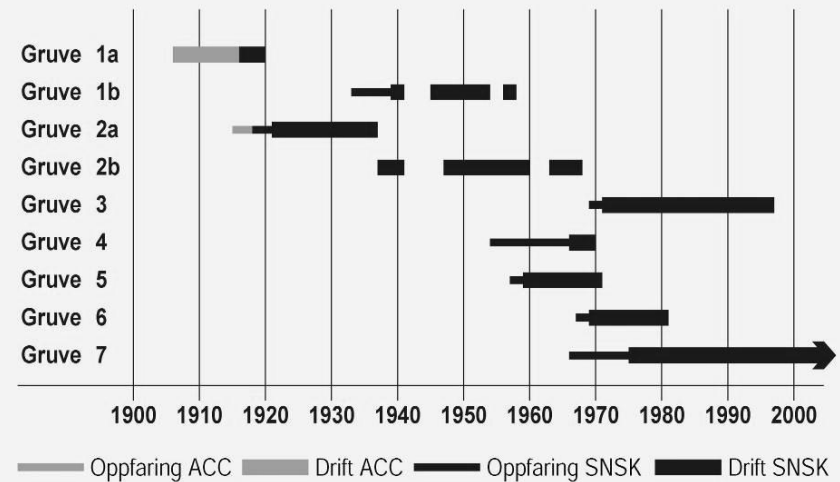
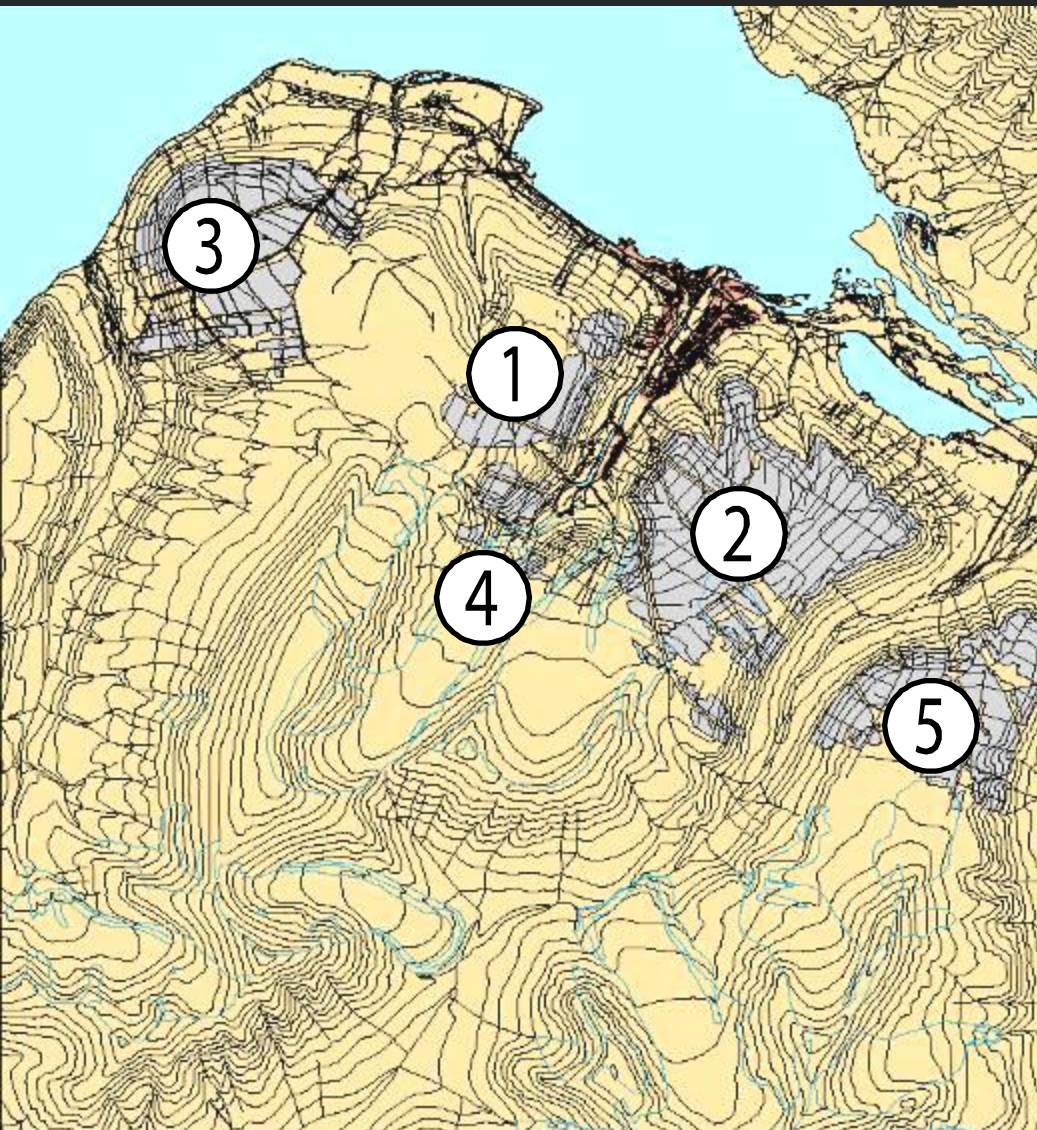
- 6 nasjonalparker
- 6 naturreservater
- 15 fuglereservater
- 1 geotopverneområde
- Utgjør tilsammen 65% av Svalbard
- 316 utmål
- 93 utmål vernet
- 6 utmål Svansen
- Små områder som ikke er kartlagt og tilgjengelig

Funnpunkt og bergrettighet (utmål)



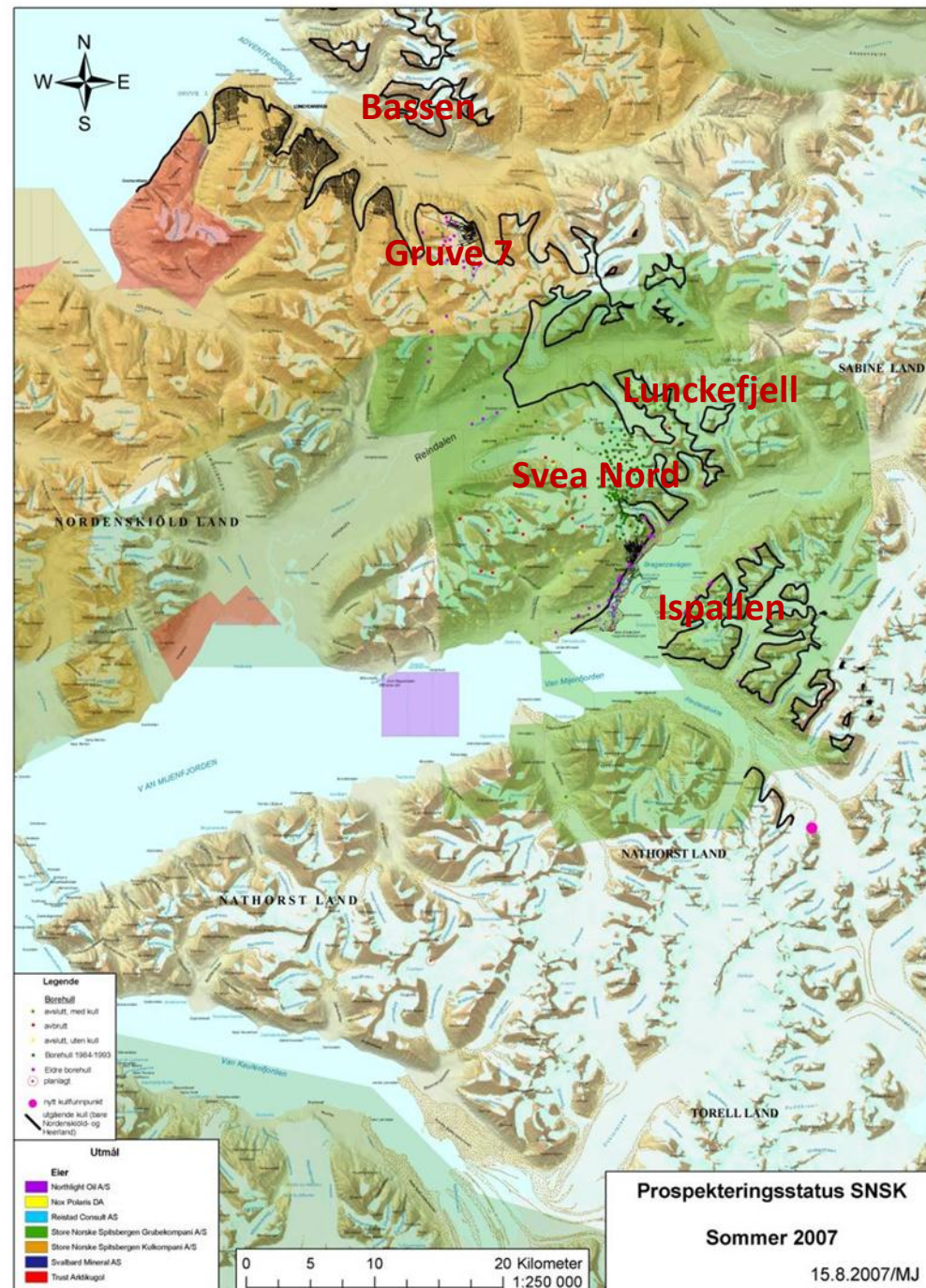
BERGVESENET
MED BERGMESTEREN FOR SVALBARD

A long mining history: 24,5 km² depleted area



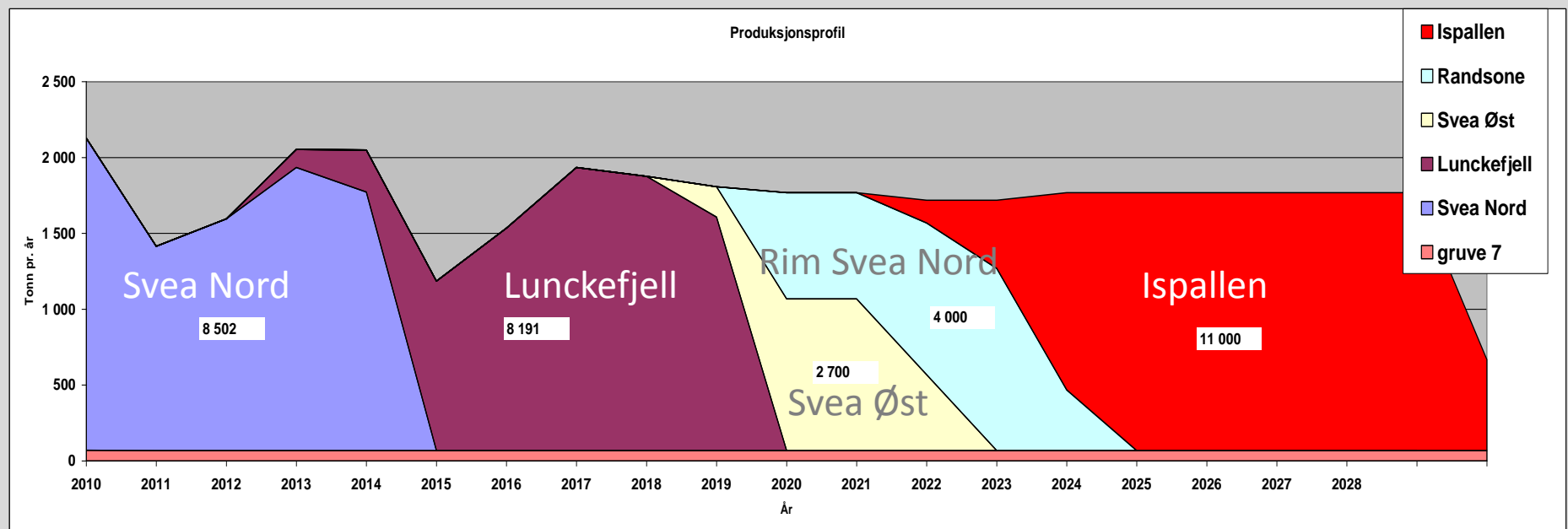
Our coal deposits, present and future

- Gruve 7, mining
- Svea Nord, mining
- Lunckefjell, under construction
- Svea Nord randsoner
- Svea Øst
- Ispallen
- Bassen (Operafjellet)
- ?



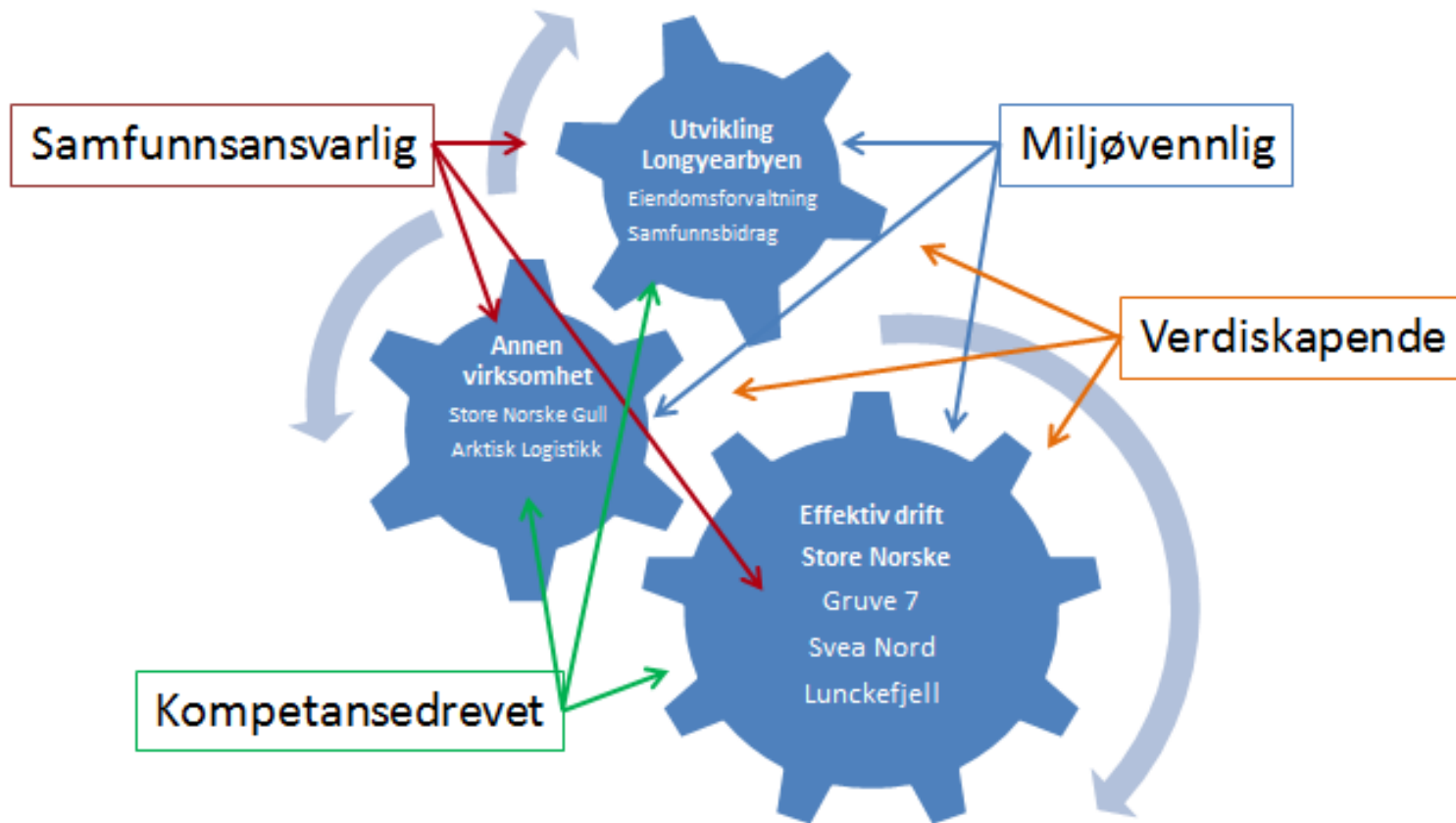
Production and development plan

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Totalt	
Svea Nord	2 058	1 347	1 527	1 866	1 704																	8 502	
Lunckefjell				118	277	1 117	1 466	1 866	1 808	1 539													8 191
Svea Øst										200	1 000	1 000											2 700
Randsone											700	700	1 000	1 200	400								4 000
Ispallen													150	450	1 300	1 700	1 700	1 700	1 700	1 700	600		11 000
gruve 7	70	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	1 430
Total	2 128	1 415	1 595	2 052	2 049	1 185	1 534	1 934	1 876	1 807	1 768	1 768	1 718	1 718	1 768	1 768	1 768	1 768	1 768	1 768	668	35 823	



Store Norske anno 2013

Virksomhetsområder



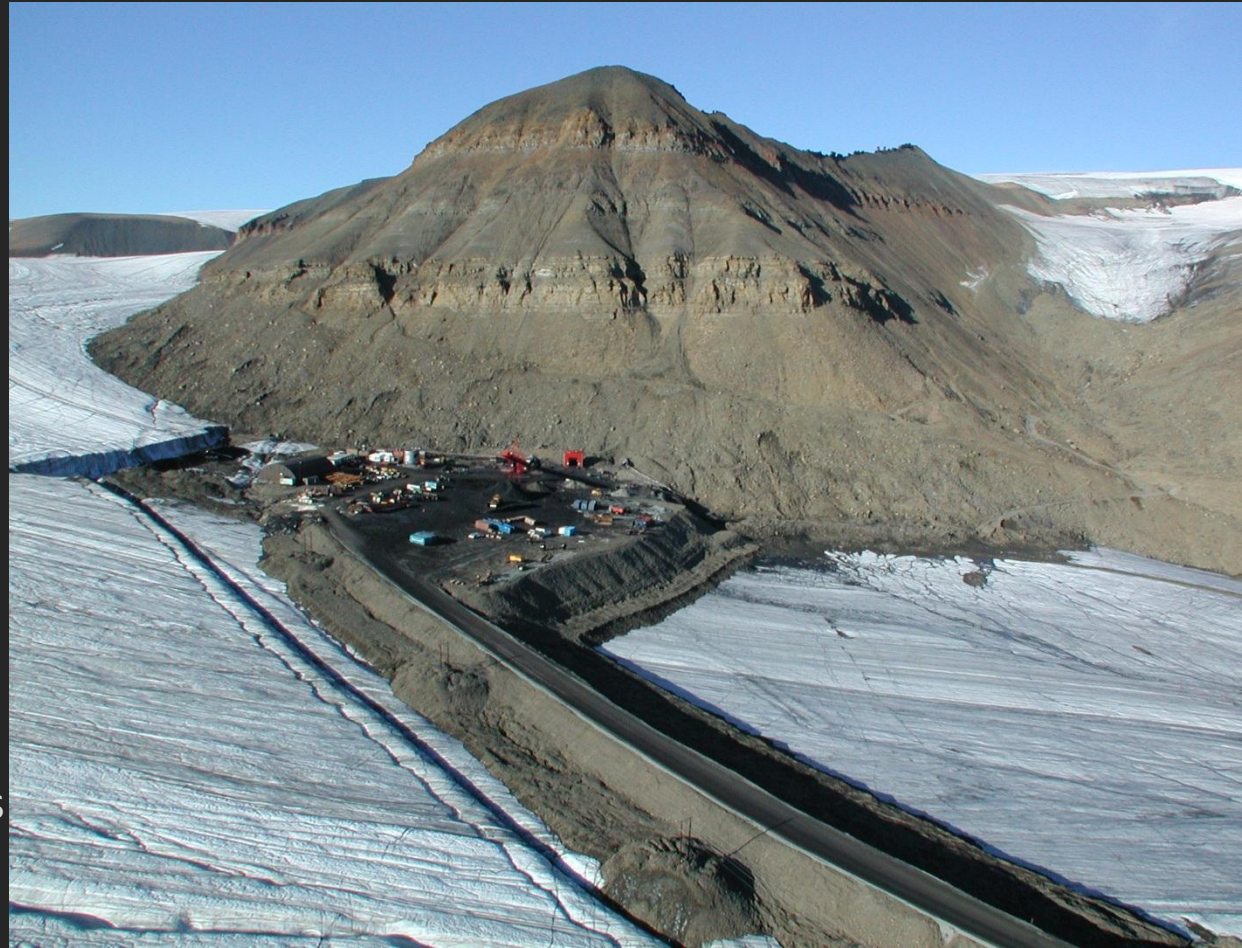
Gruve 7: the small mine near Longyearbyen

- Room and pillar
- 75 000 t/y
- High quality coal
- Feeding the local power plant
- Metallurgical industry
- Coal seam 1-1,6 m
- Remaining mine life: 20+ years

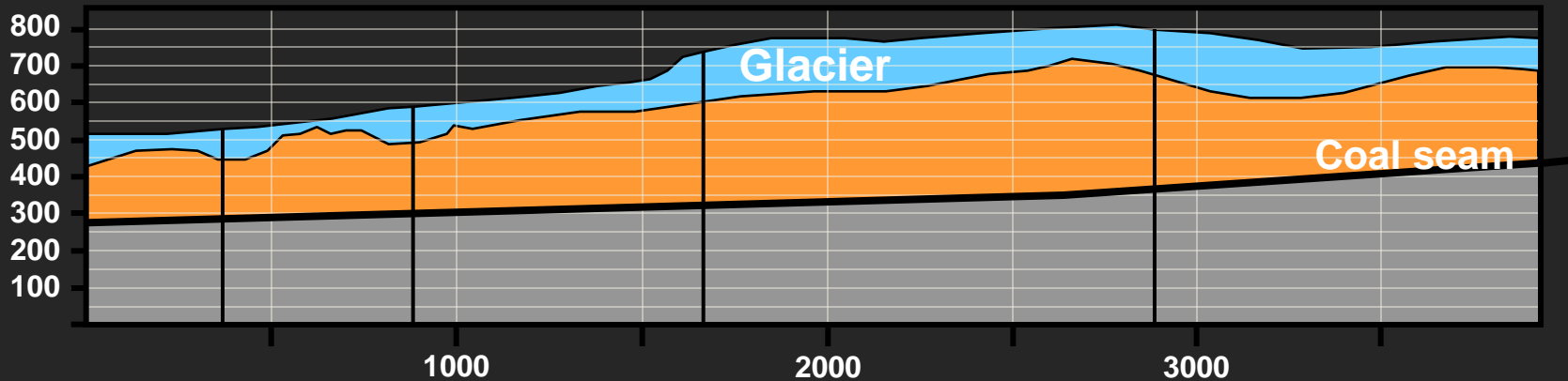


Main mining today: Svea Nord

- 60 km S of Longyearbyen
- No road connection
- Started mining 2001
- Coal seam: 2,8 – 5,2 m
- Working thickness: 3,6 m
- Longwall mining
- Production: 7 000 t/day
- Shipping season: July – Nov
- Remaining mine life: 3 years



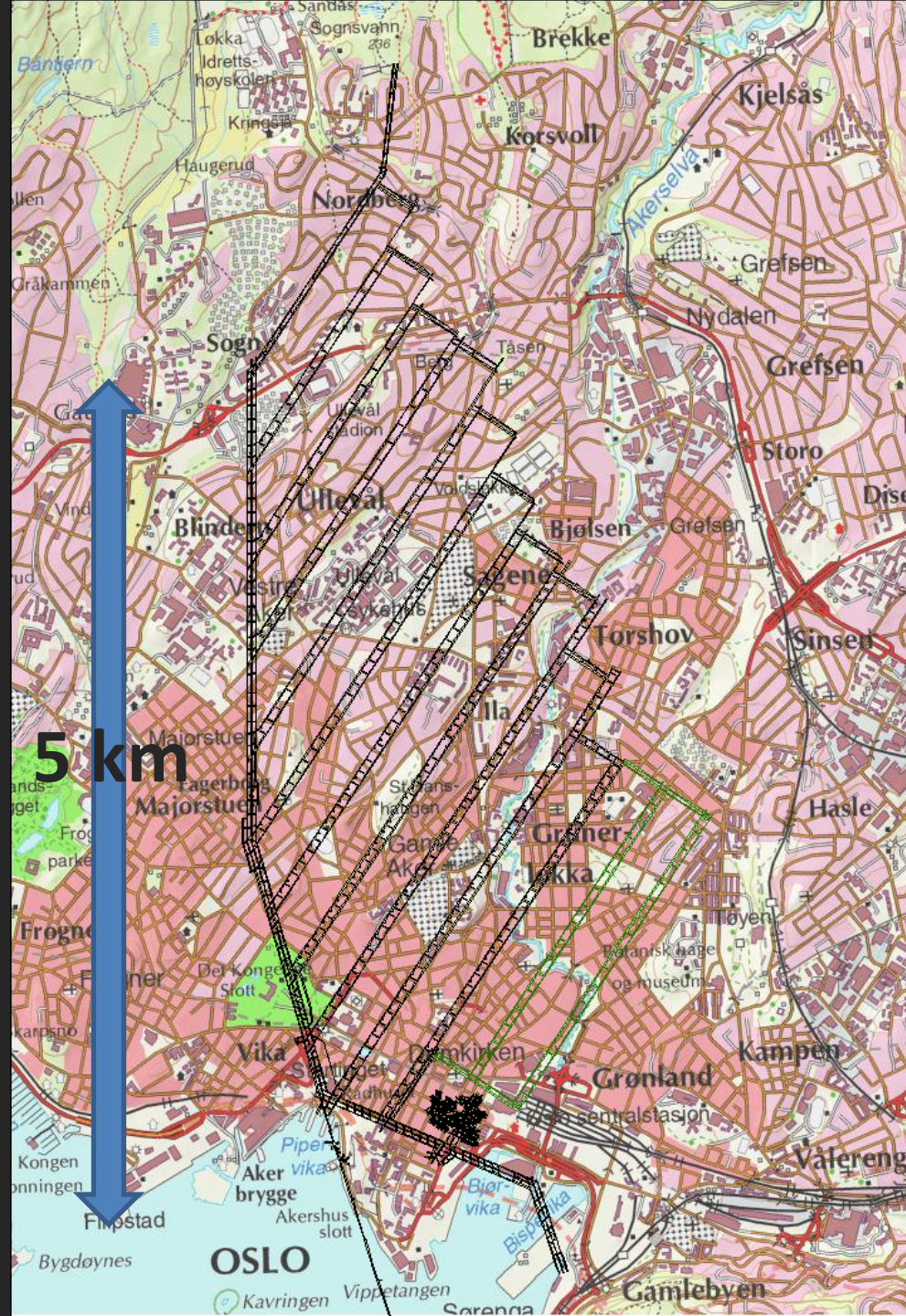
Glacier above most parts of the mine



- Overburden:

- Ice : 0 - 200 meter
- Rock : 60 - 400 meter
- Coal thickness : 2.5 - 5 meter

A sizable operation..

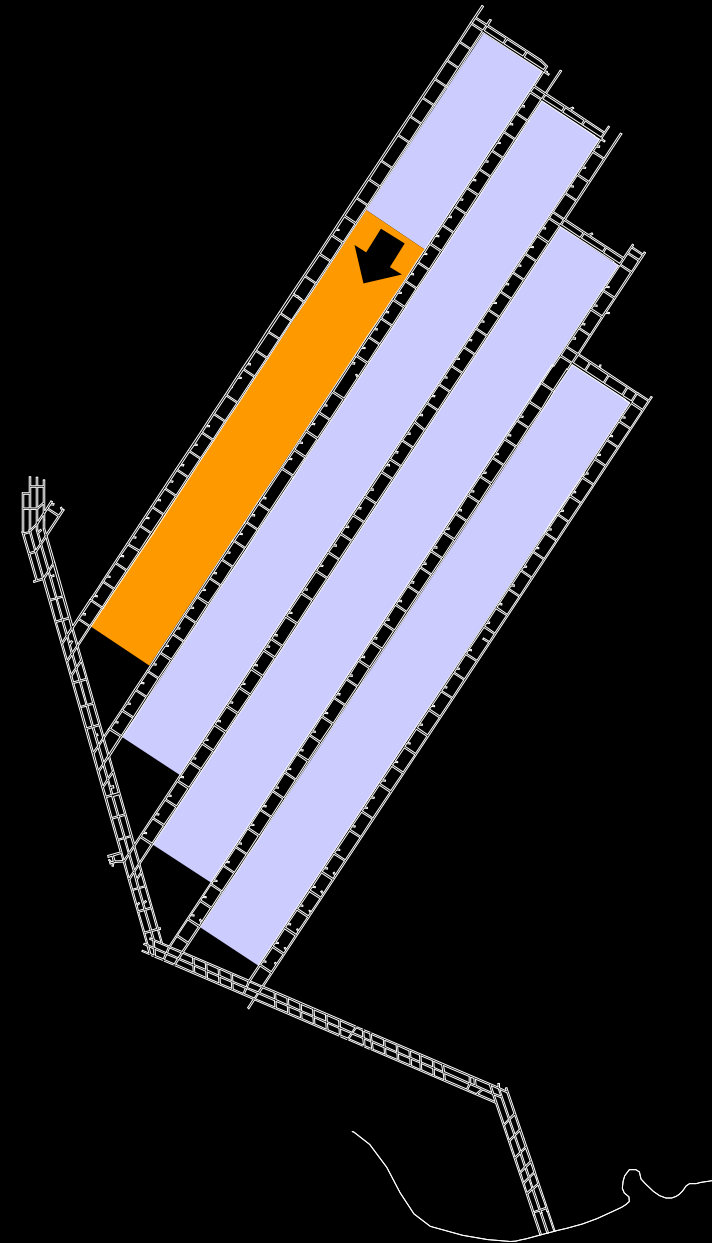


Store Norske Spitsbergen Kulkompani

Svea Nord - layout

Longwalls: 12
Panel lengths: 1,6 – 3,4 km
Panel width: 250 m

Development: *ABMs, CMs*
Main production: *Longwall*

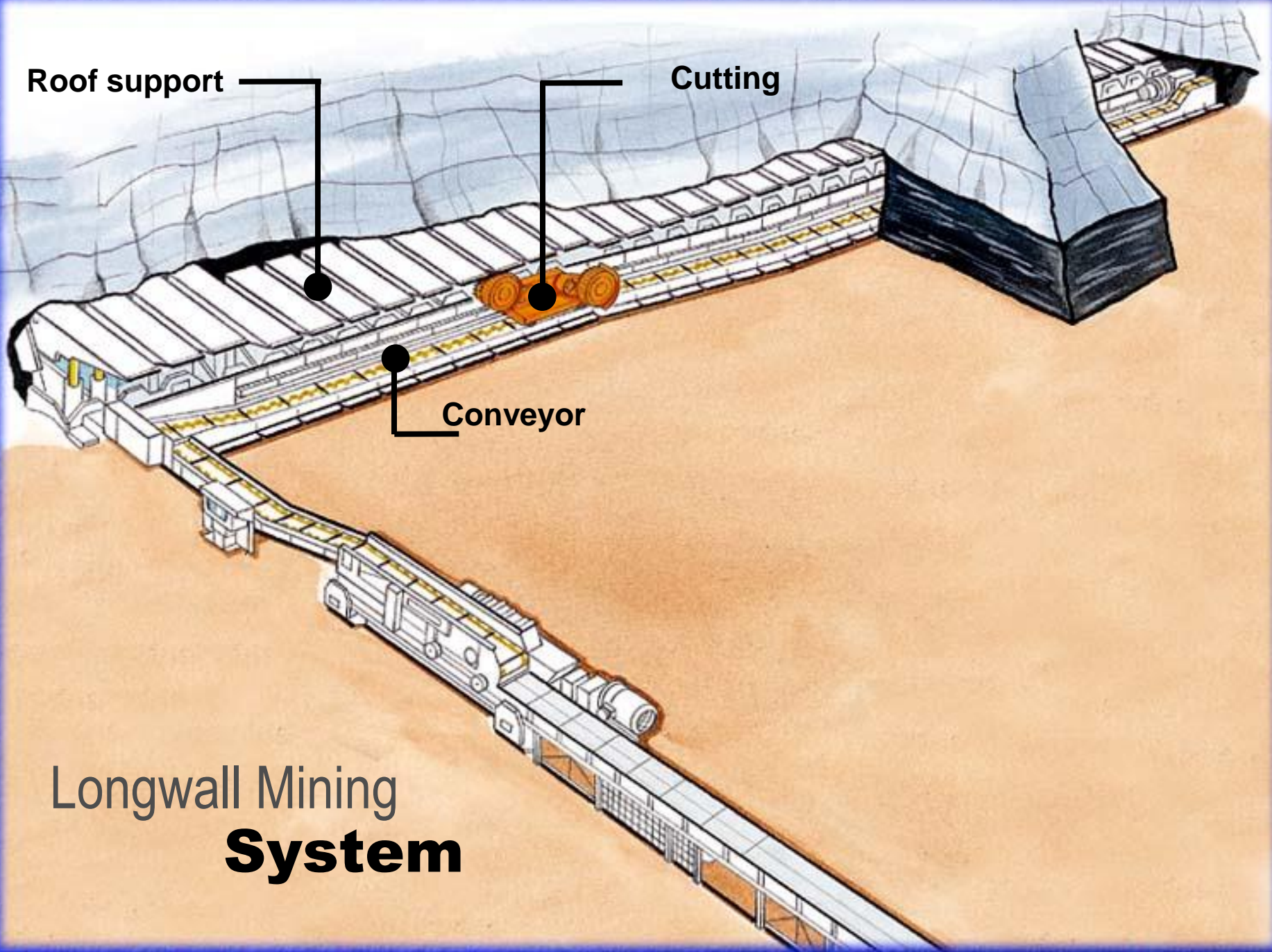


Roof support

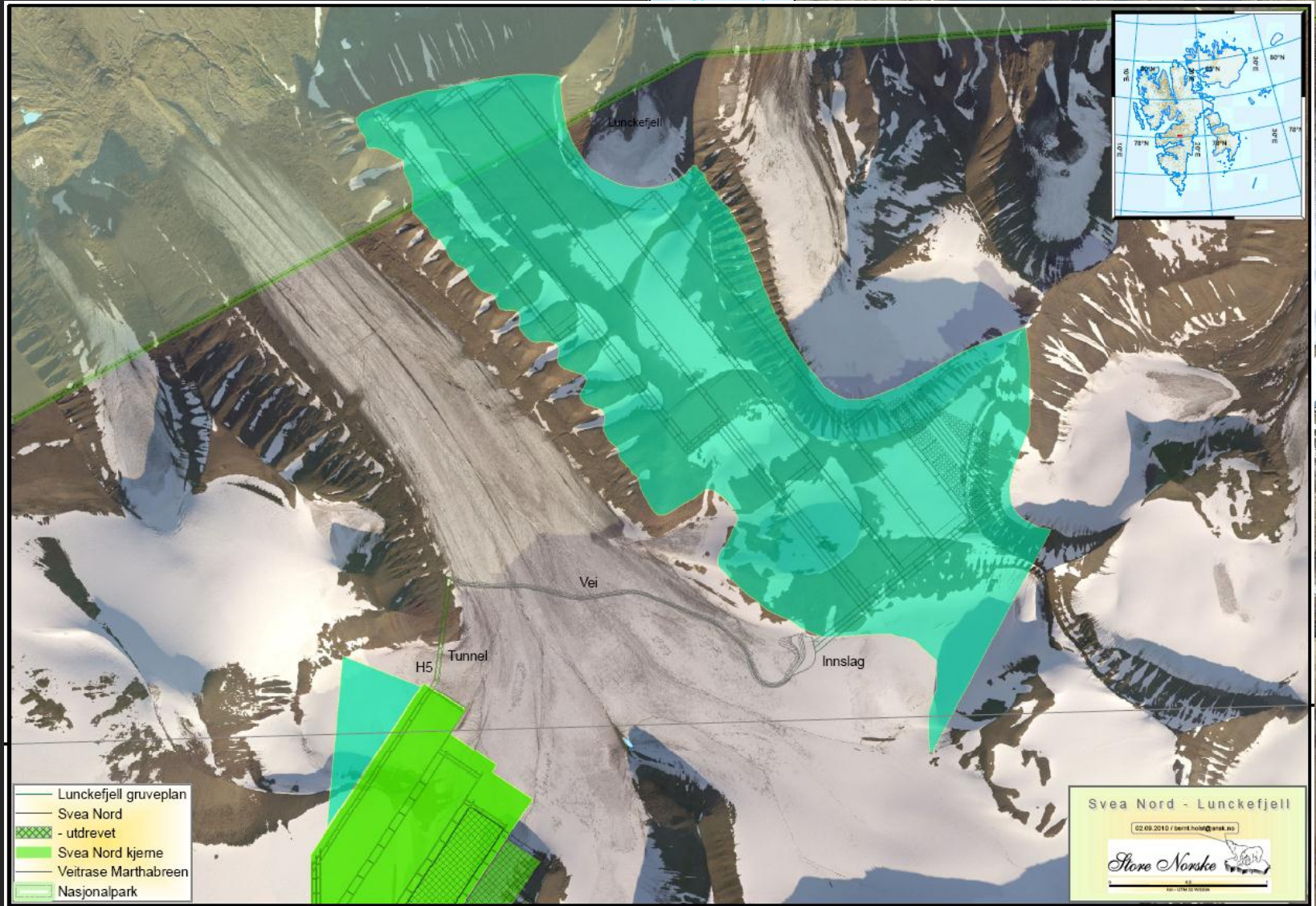
Cutting

Conveyor

Longwall Mining
System



The Lunckefjell mine



- Lunckefjell gruveplan
- Svea Nord
- utdrevet
- Svea Nord kjeme
- Veitrase Marthabreen
- Nasjonalpark

Svea Nord - Lunckefjell

02.09.2010 / bernt.holst@snsk.no

2:1

utdrevet

Kullmektighet (m)
< 1,3 meter
1.3 - 1.5
1.5 - 2.0
> 2.0 meter

Status...



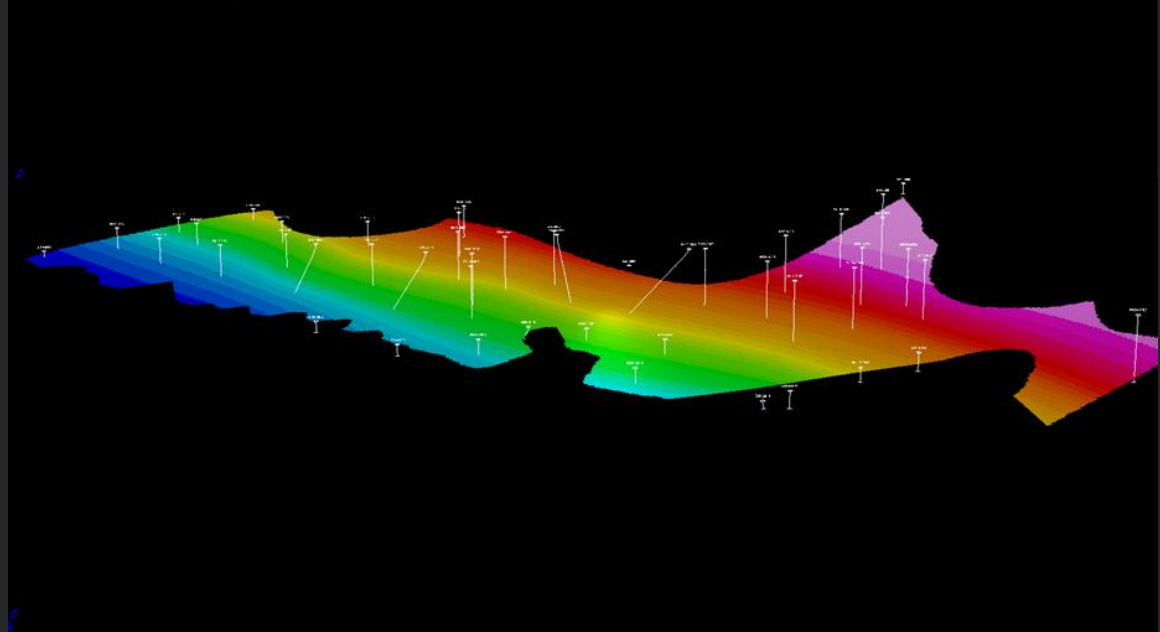
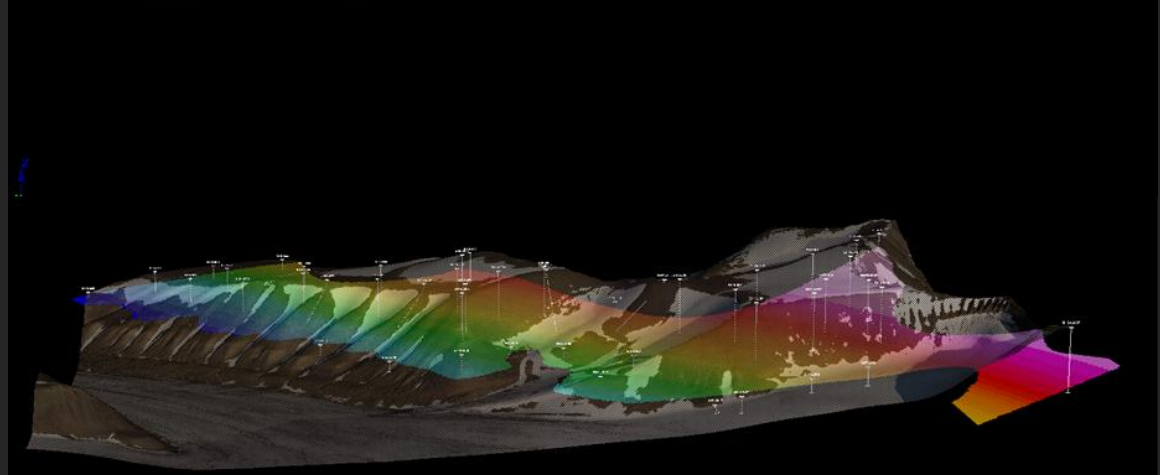
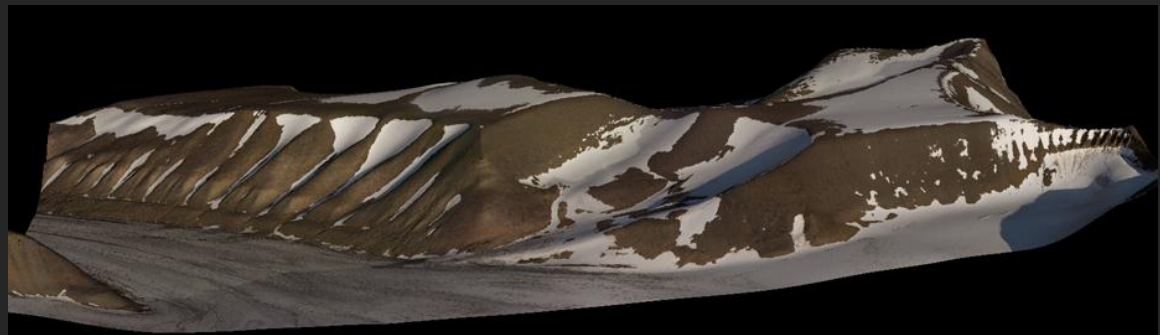
Svalbard coal and the environment

- **Interference**
 - Local physical interference
- **Emissions**
 - Dust (local)
 - Acid Runoff (local)
 - Climate gases (global)

	Emission type	Svalbard coal	World coal
Production	Methane	0,7 m ³ /ton	20 m ³ /ton
Land transport	CO ₂	5 km	300-5000 km
Sea transport	CO ₂	3000 km	10000-20000 km
Combustion	CO ₂	7200 kcal/kg	6200 kcal/kg



Mapping of Lunckefjellet



Store Norske anno 2013

Produksjonssted Sveagruva

OPPREDNINGSVERK - ORV

Driftssatt Q4-2011

Rensing av kull for å bedre produktkvalitet og pris. (Justering av dimensjon, fjerning av stein , «vasking»).

Rensing innvirker også positivt på forurensning ved avbrenning i kullkraftverk.

Renser kullet fra Svea Nord, og vil bli brukt på deler av Lunckefjell produksjonen.

Kapasitet : 30 000 til 40 000 tonn per uke



Store Norske anno 2013

Produksjonssted Sveagruva



- Avtale med Lufttransport AS (Dornier 228/17/19 seter)
- Gjennomsnittlig 20-25 fly pr uke
- Ca 18.000 flypassasjerer pr år
- ca 400 tonn gods og post
- Banevedlikehold/brøyting utføres av AF Arctic
- Egne AFIS fullmektiger for luftkontroll



Logistikk og skipning Svea. Isforhold i Van Mijenfjorden gir kort skipningssesong (Juli-November), produksjon for lager.

2012: 17 skip (Panamax)

Our product

- Power plants, metallurgical industries, cement
- Main market: Europe



Hva er kull egentlig?



60 millioner år siden...

Tidevannsletter, delta-områder og laguner med masse skog og myr



Metasequoia

En levende fossil som utgjør en stor del av vårt kull





Bjørk





Metasequoia
(Mammut-tre)

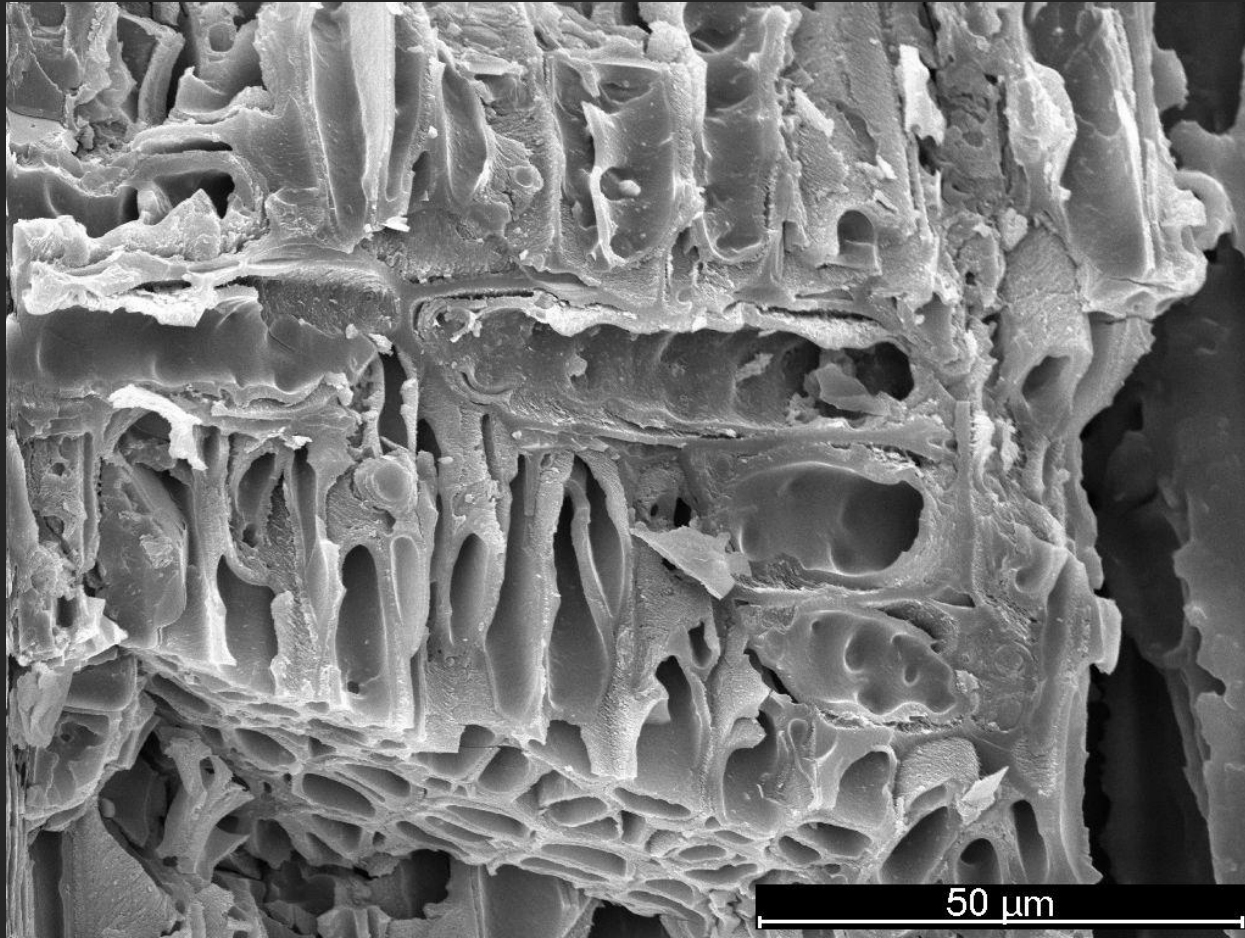




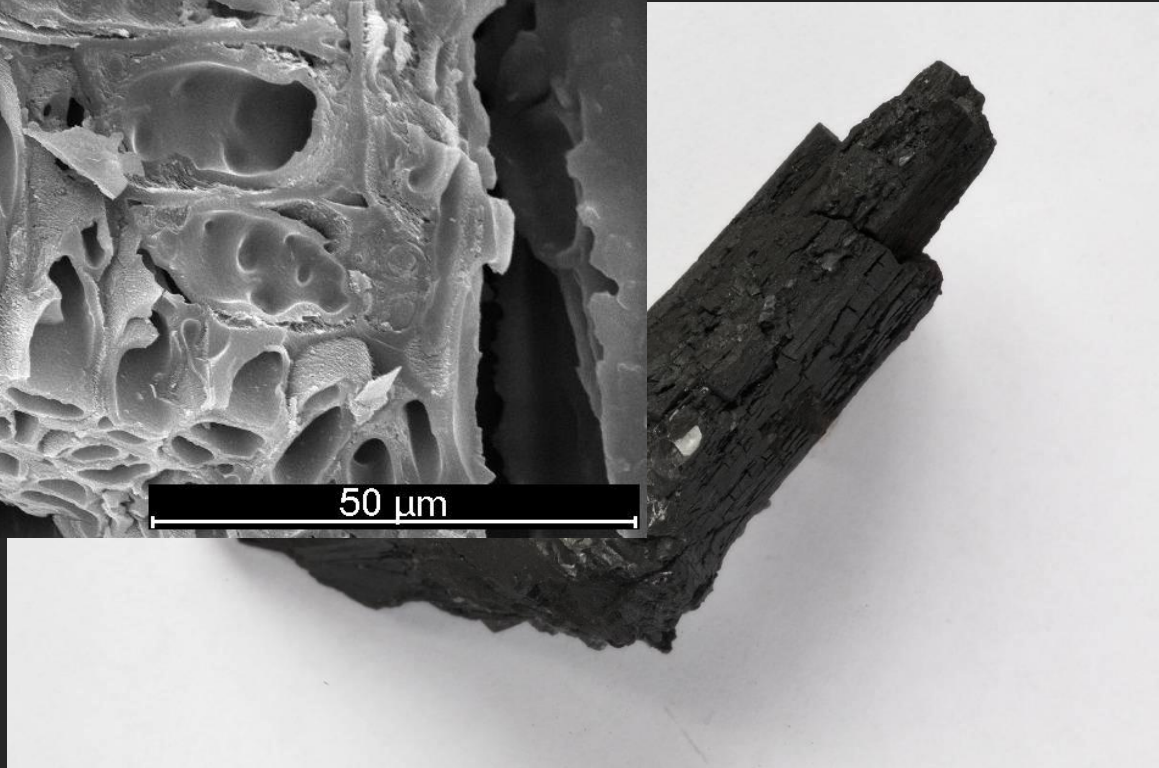
Kjerringrokk



Forkullet kvist
fra Gruve 7



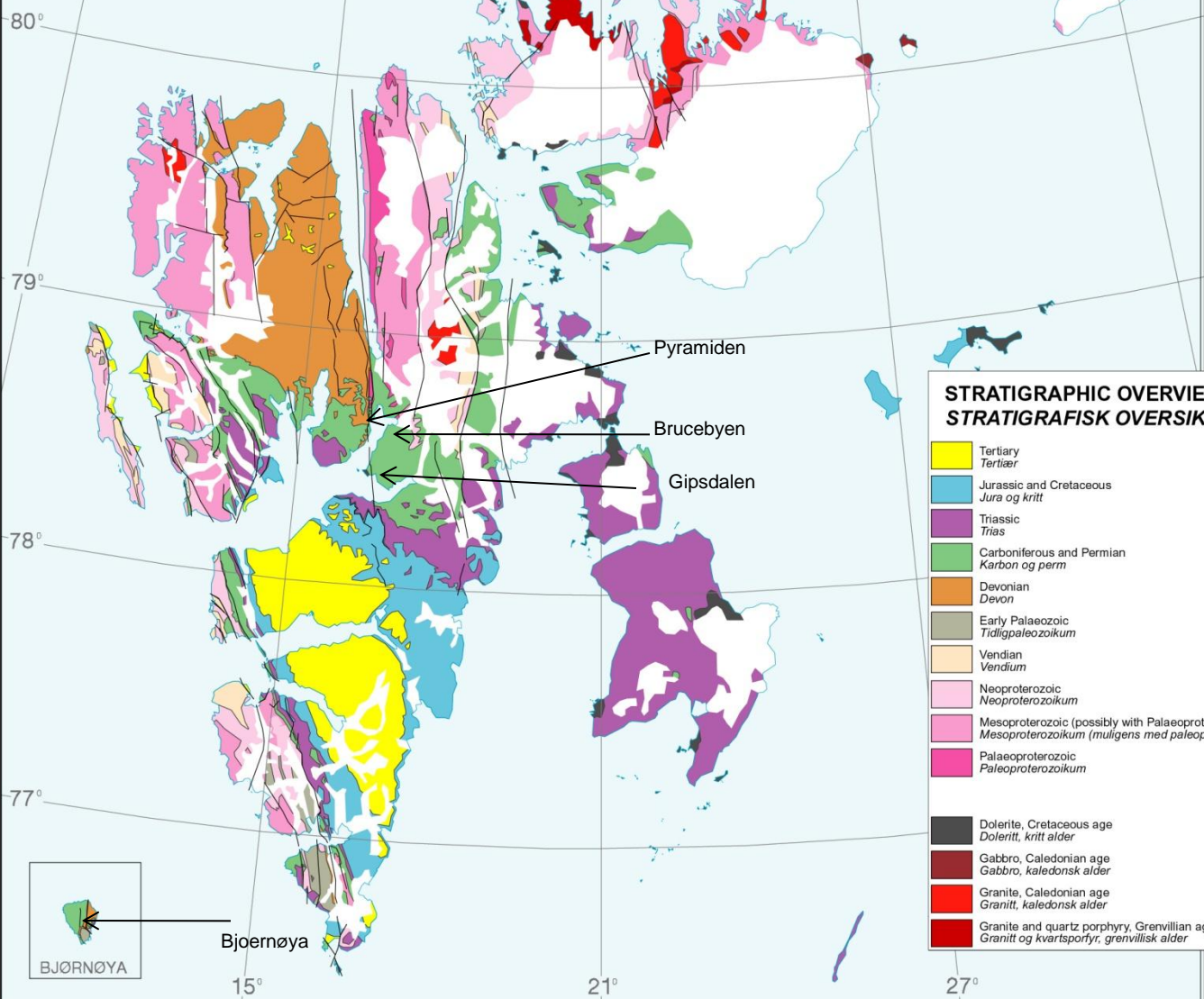
50 μm



SCALE / MÅLESTOKK 1:3 000 000

0 20 40 60 80 100
km

Coal in Spitsbergen – Devonian and lower Carboniferous



STRATIGRAPHIC OVERVIEW STRATIGRAFISK OVERSIKT

- Tertiary
Tertiær
- Jurassic and Cretaceous
Jura og kritt
- Triassic
Trias
- Carboniferous and Permian
Karbon og perm
- Devonian
Devon
- Early Palaeozoic
Tidligpaleozoikum
- Vendian
Vendium
- Neoproterozoic
Neoproterozoikum
- Mesoproterozoic (possibly with Palaeoproterozoic)
Mesoproterozoikum (muligens med paleoproteroz.)
- Palaeoproterozoic
Paleoproterozoikum

- Dolerite, Cretaceous age
Doleritt, kritt alder
- Gabbro, Caledonian age
Gabbro, kaledonsk alder
- Granite, Caledonian age
Granitt, kaledonsk alder
- Granite and quartz porphyry, Grenvillian age
Granitt og kvartsporfy, grenvillisk alder

359 – 303 Ma

Carboniferous – Coal and Delta-sediments *Pyramiden – Brucebyen – Gipsdalen - Bjørnøya*



SCALE / MÅLESTOKK 1:3 000 000

0 20 40 60 80 100
km

Coal in Spitsbergen – Cretaceous and Paleogene

80°

79°

78°

77°

Ny Aalesund

Bohemannaset

Barentsburg

Camp Morton

Calypsobyen

Advent City

Longyearbyen

Grumant

Svea

Davishamna

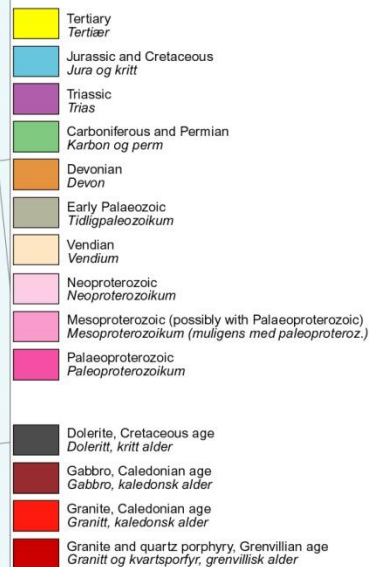


15°

21°

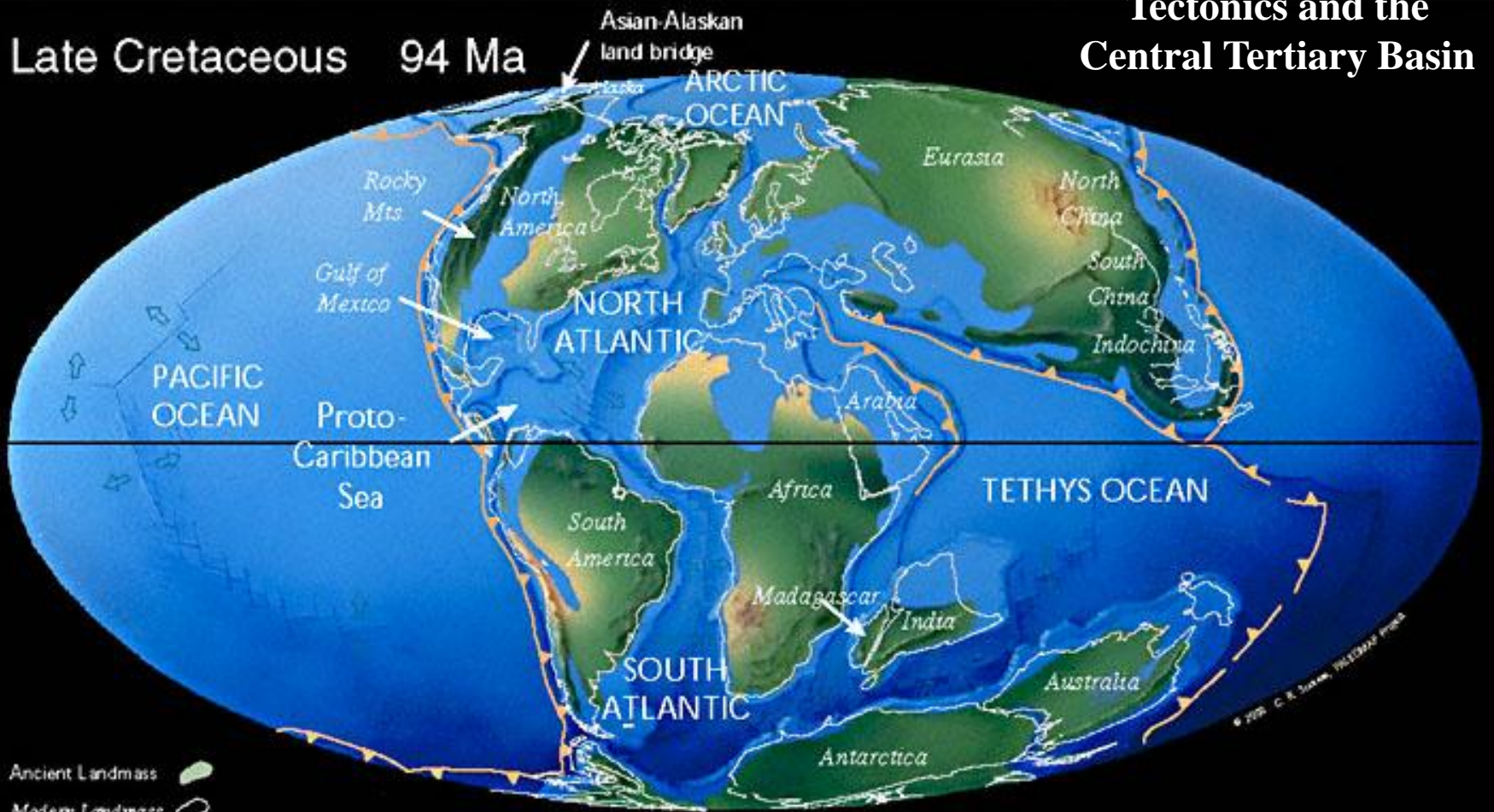
27°



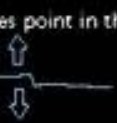
STRATIGRAPHIC OVERVIEW STRATIGRAFISK OVERSIKT



Tectonics and the Central Tertiary Basin

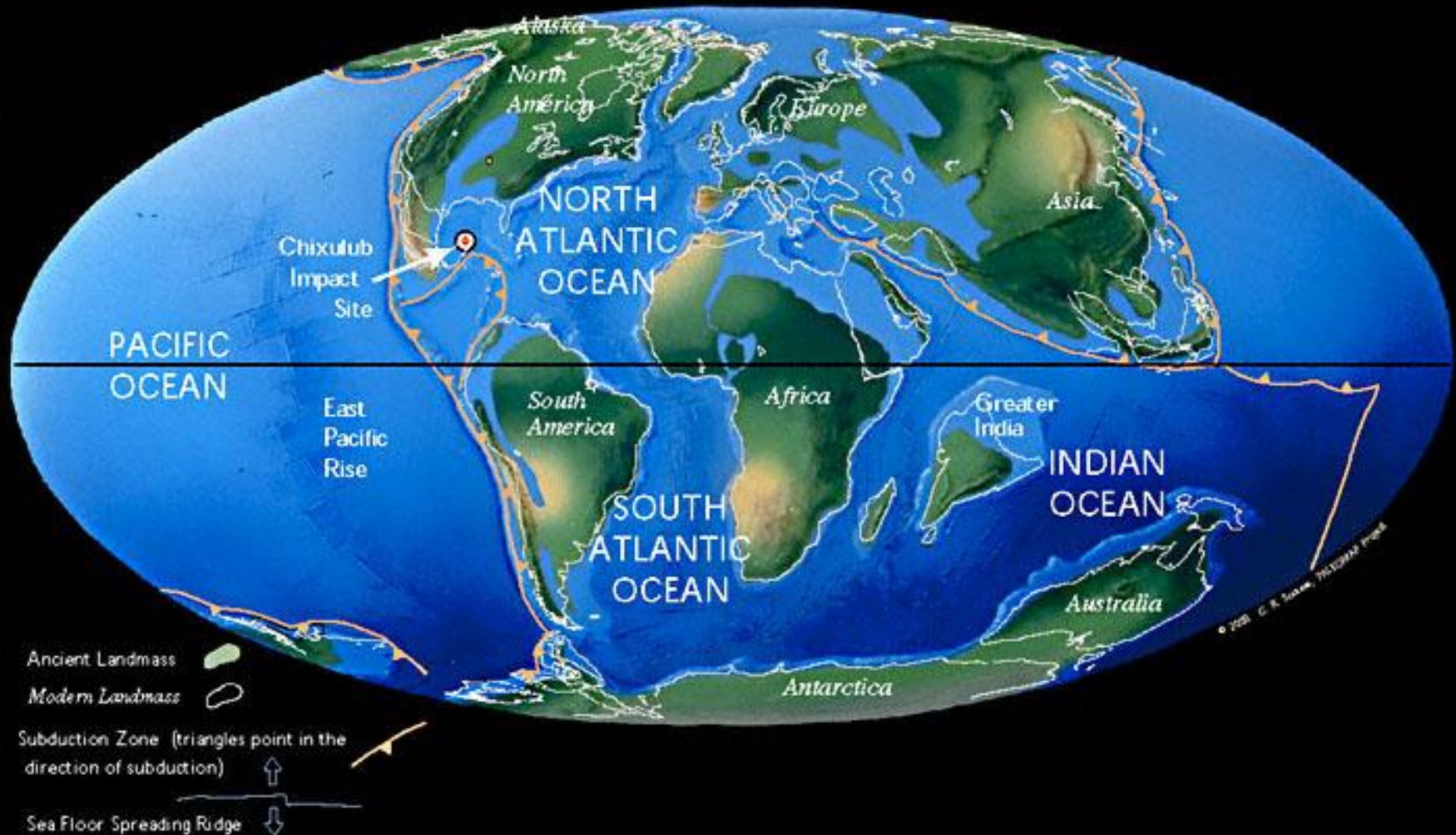
Late Cretaceous 94 Ma



Ancient Landmass 
Modern Landmass 
Subduction Zone (triangles point in the direction of subduction) 

© 2005 C. R. Scotese, Paleogeographic.com

K/T Boundary 66 Ma



Coal in the world

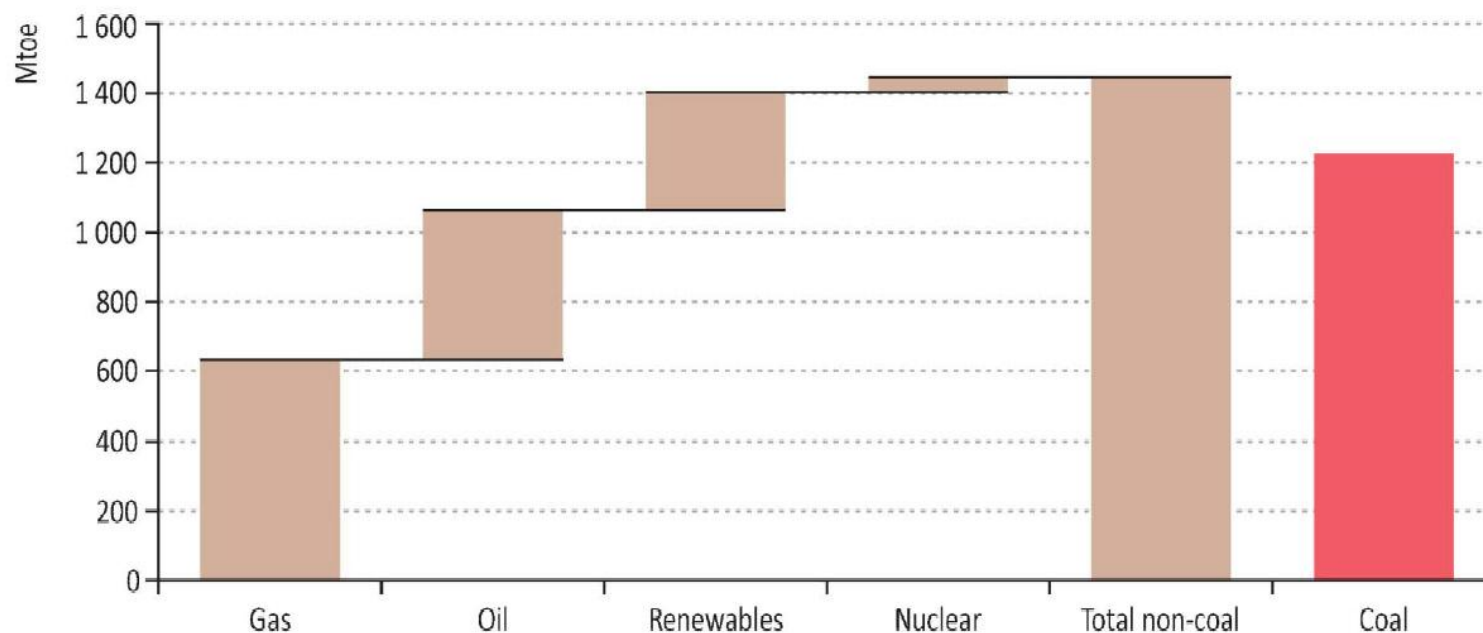


- 6,75 billion t/y
- 40% of the world's electricity
- 80% of the world's steel production
- The most increasing energy carrier, expected to increase by 60% over the next 20 years
- 2 billion people are lacking electricity, 1,6 billion will still be without electricity in 2030
- China, India and USA are planning 850 new coal based electricity plants by 2025

Coal won the energy race in the first decade of the 21st century

WORLD
ENERGY
OUTLOOK 2011

Figure 10.1: Incremental world primary energy demand by fuel, 2000-2010



Coal accounted for nearly half of the increase in global energy use over the past decade, with the bulk of the growth coming from the power sector in emerging economies

Coal in the world

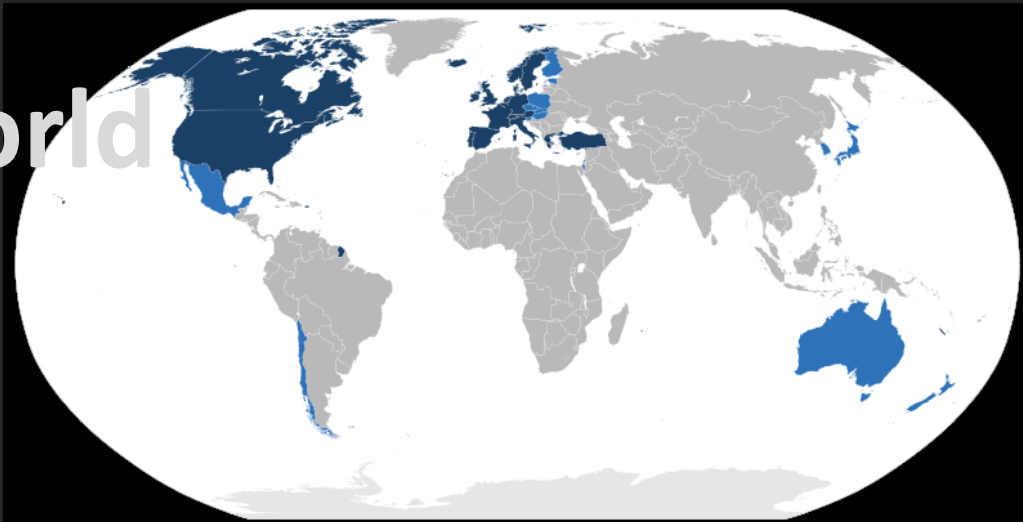
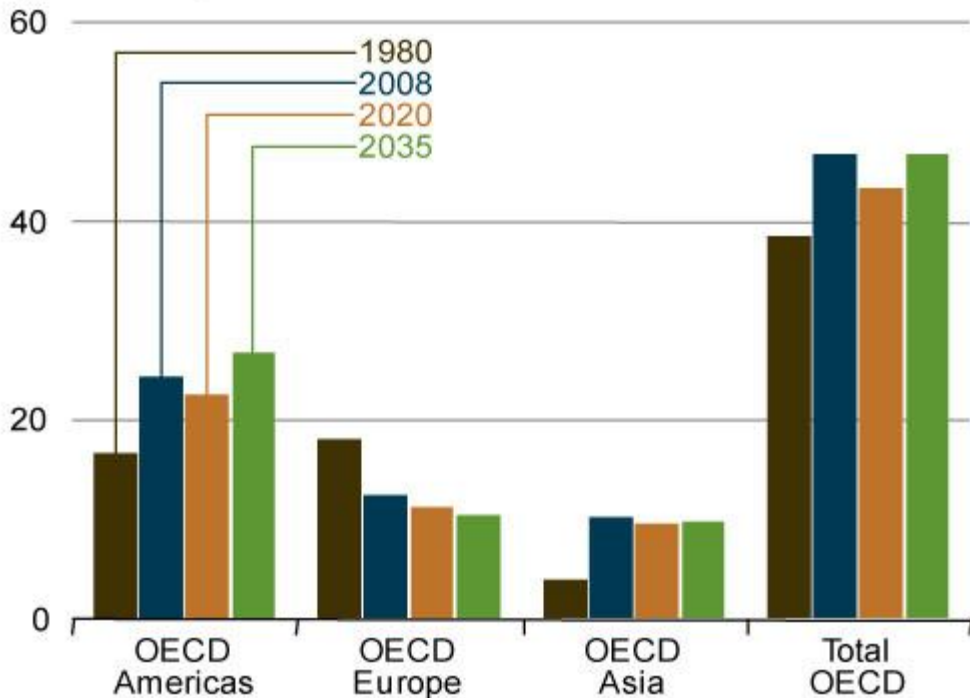


Figure 67. OECD coal consumption by region, 1980, 2008, 2020 and 2035 (quadrillion Btu)



Source: US Energy Information Administration

Coal in the world

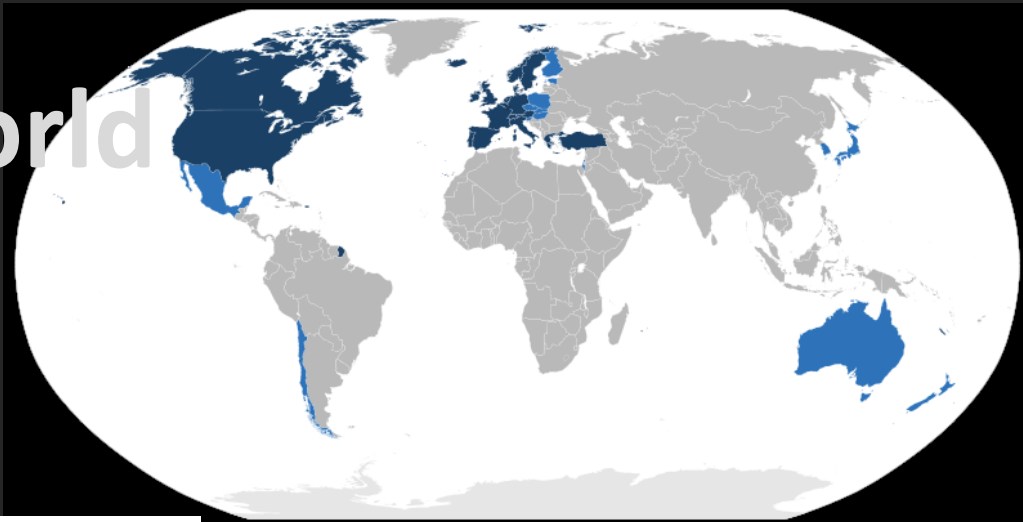
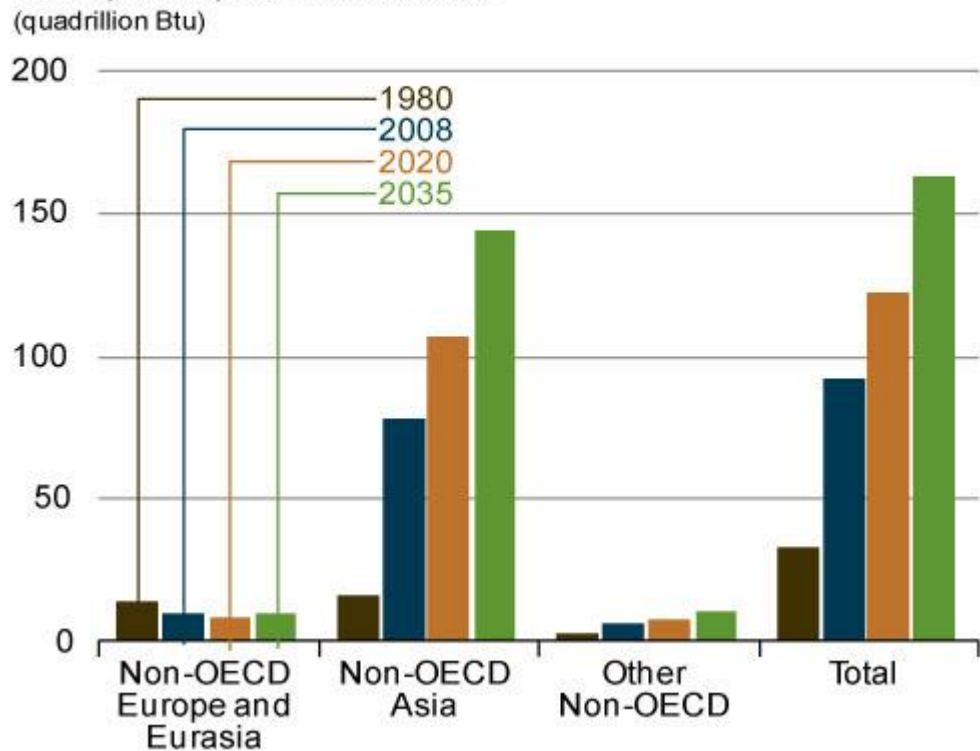


Figure 68. Non-OECD coal consumption by region, 1980, 2008, 2020 and 2035 (quadrillion Btu)



Source: US Energy Information Administration

From Coal to Gold..

STORE NORSKE GULL 



Store Norske Gull AS (SNG)

- 100% owned subsidiary of SNSK
- Established in 2003
- Map, explore and exploit gold and other mineral deposits
- Main focus on metals
- Northern Norway and Svalbard
- Annual budget: 15-30 MNOK = 2,5-5,0 M\$
- Exploration expenditure so far: 114 MNOK = 19 M\$
- Strategy: Employing the best expertise, applying the best available methods with the best available equipment

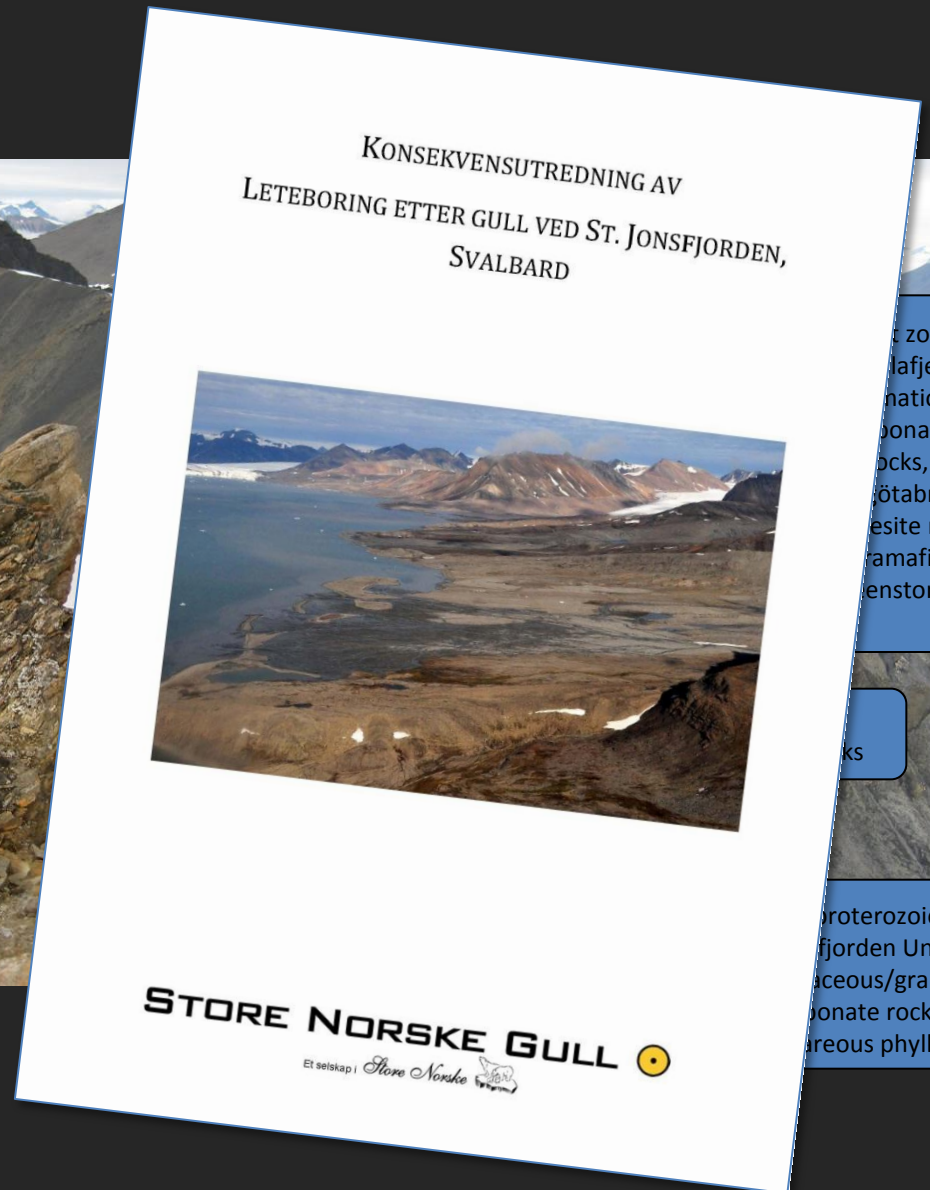
Current projects

- St. Jons fjord, Svalbard. Gold



Current projects

- St. Jons fjord, Svalbard. Gold



zone:
lafjella
nation
onate
ocks,
fötabreen
esite rocks
ramafics),
enstones

ks

roterozoic St
fjorden Unit
aceous/graphitic
onate rocks,
reous phyllite

Myndighetsprosessen Lunckefjell

- Forhåndsmelding til Sysselmannen: 31. Januar 2008.
- Sysselmannen og Bergmesteren utarbeider program for konsekvensutredning: Juni 2008.
- Gjennomføring av utredningsprogrammet og oversendelse til Sysselmannen: Ferdigstilles av Store Norske i årsskifte 2010/2011.
- MD behandling og godkjenning:
Ferdig i desember 2011.

Framtid:

- Ispallen
- Operafjellet
- Nye kullforekomster?
- Gull...?