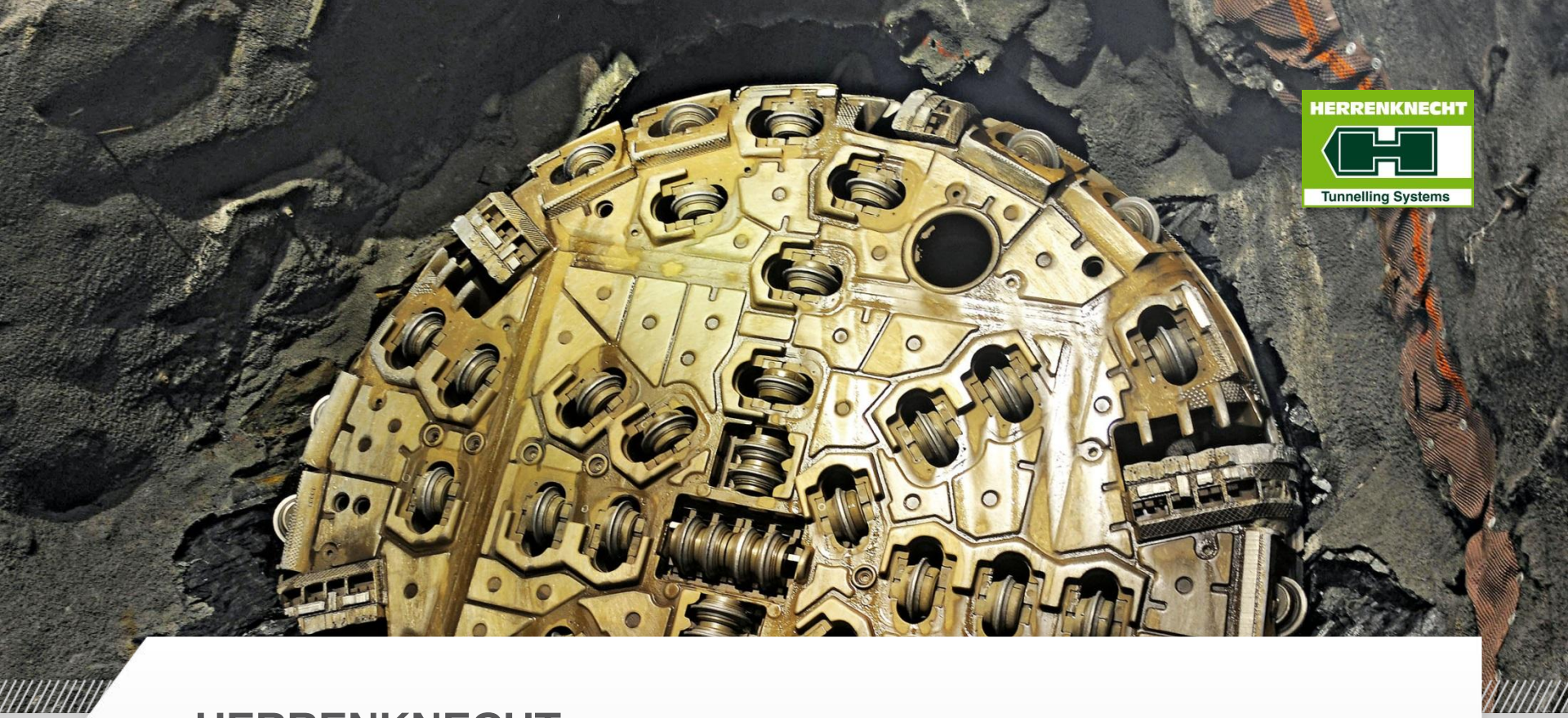


HERRENKNECHT

Trailblazing tunnelling technology for the construction of efficient underground infrastructures in South East Asia.

Gebhard Lehmann, Vice Chairman of the Board of Management.

Schwanau, November 03rd , 2014

Tunnelling, mining and exploration.

Safely advancing in all areas of application.

- High-quality and high-capacity **traffic tunnels** for metro systems, road and railway networks
- Efficient **supply and disposal infrastructures** for water, sewage, electricity and hydropower
- Underground **pipeline systems** for resources, e.g., oil, gas and district heating
- Precise **infrastructures** like shafts and galleries in all directions for **mining**
- **Deep wells** for the exploration of new oil and gas deposits and for geothermal energy sources - onshore and offshore

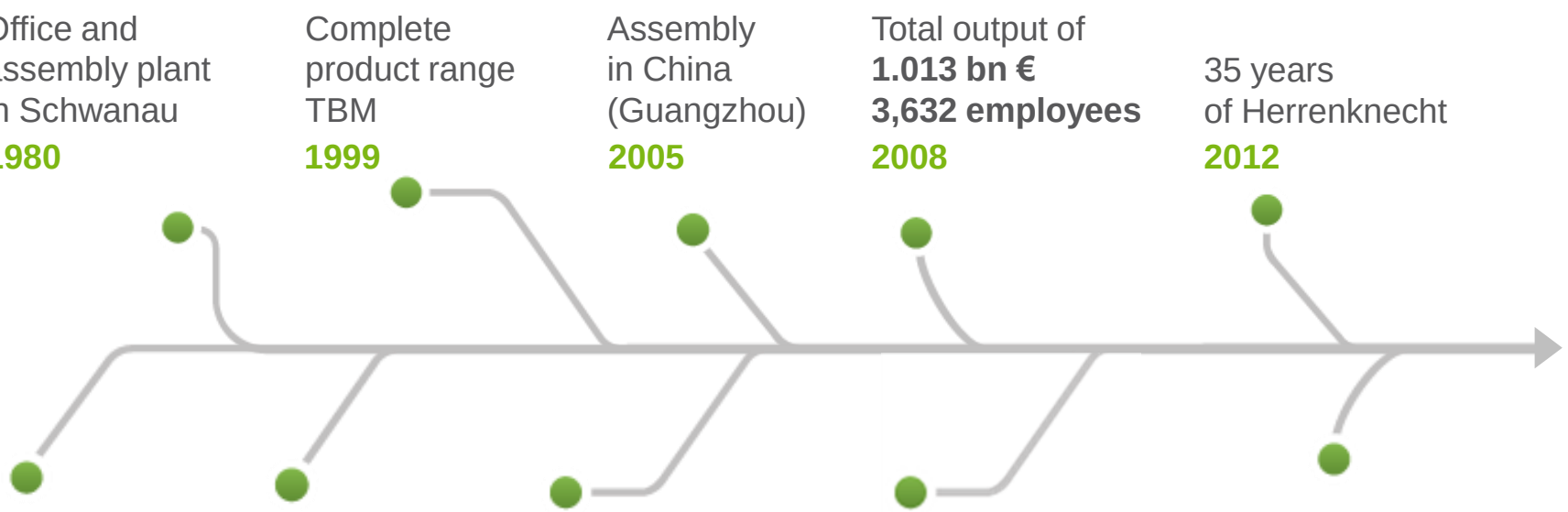
Brand architecture at Herrenknecht

Corporate Brand	HERRENKNECHT		
Core Markets			
Core Brands	HERRENKNECHT Tunnelling Systems	HERRENKNECHT Tunnelling Systems	HERRENKNECHT VERTICAL
Group Brands	**Additional Equipment** H+E LOGISTIK · VMT MASCHINEN- UND STAHLBAU DRESDEN · HERRENKNECHT FORMWORK TECHNI-METAL SYSTEMES · EUROFORM	**Additional Equipment** H+E LOGISTIK · VMT MASCHINEN- UND STAHLBAU DRESDEN · SCHÄFER URBACH TECHNI-METAL SYSTEMES · EUROFORM	**Additional Equipment** SCHÄFER URBACH BOHRTEC VERTICAL
	Additional Services GLOBAL TUNNELLING EXPERTS	**Additional Services** GLOBAL TUNNELLING EXPERTS	**Additional Services** GLOBAL TUNNELLING EXPERTS

- Founded in 1977
- Conversion to Herrenknecht AG in 1998
- Today around 5,000 employees worldwide, 2,000 in Schwanau, around 200 young people in training

Herrenknecht.

Milestones of the company history.



1977
Foundation of Herrenknecht GmbH

1980
Office and assembly plant in Schwanau

1998
Conversion of GmbH in AG

1999
Complete product range TBM

2002
Market leader in mechanized tunnelling technology

2005
Assembly in China (Guangzhou)

2008
Total output of **1.013 bn €**
3,632 employees

2011
Final breakthrough at Gotthard Base Tunnel

2012
35 years of Herrenknecht

2014
World‘s largest TBM for Hong Kong, Ø 17.6m

Herrenknecht worldwide.

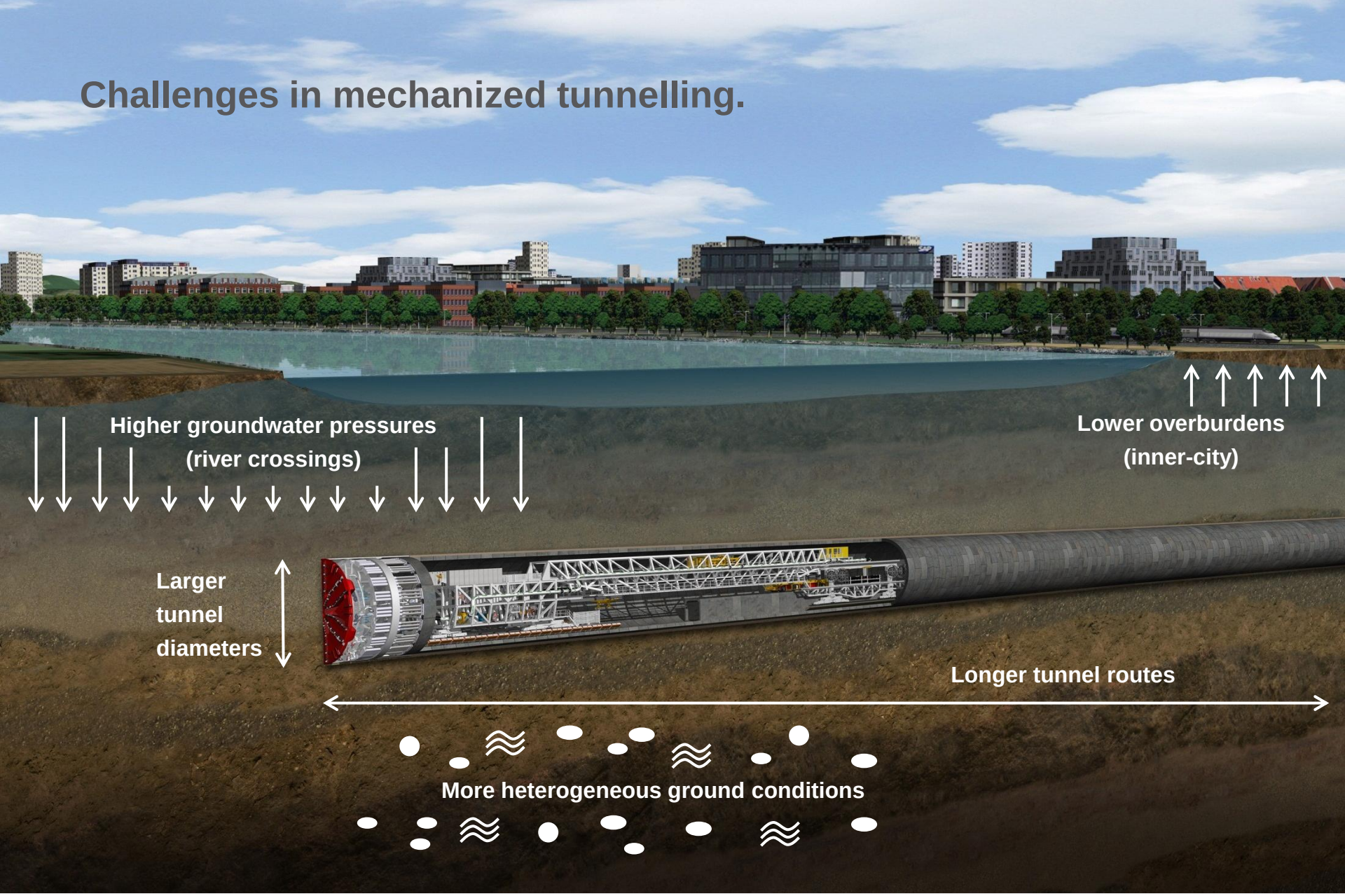
The most important growth markets.

- All diameters
- All geologies
- All applications

The development of infrastructure and global trends.

- Population growth and urbanization
- Shortage of resources
- Industrialization and automation
- Increasing demand of mobilty for people and goods
- Need for new supply and disposal tunnels
- Large, multi-level infrastructure projects

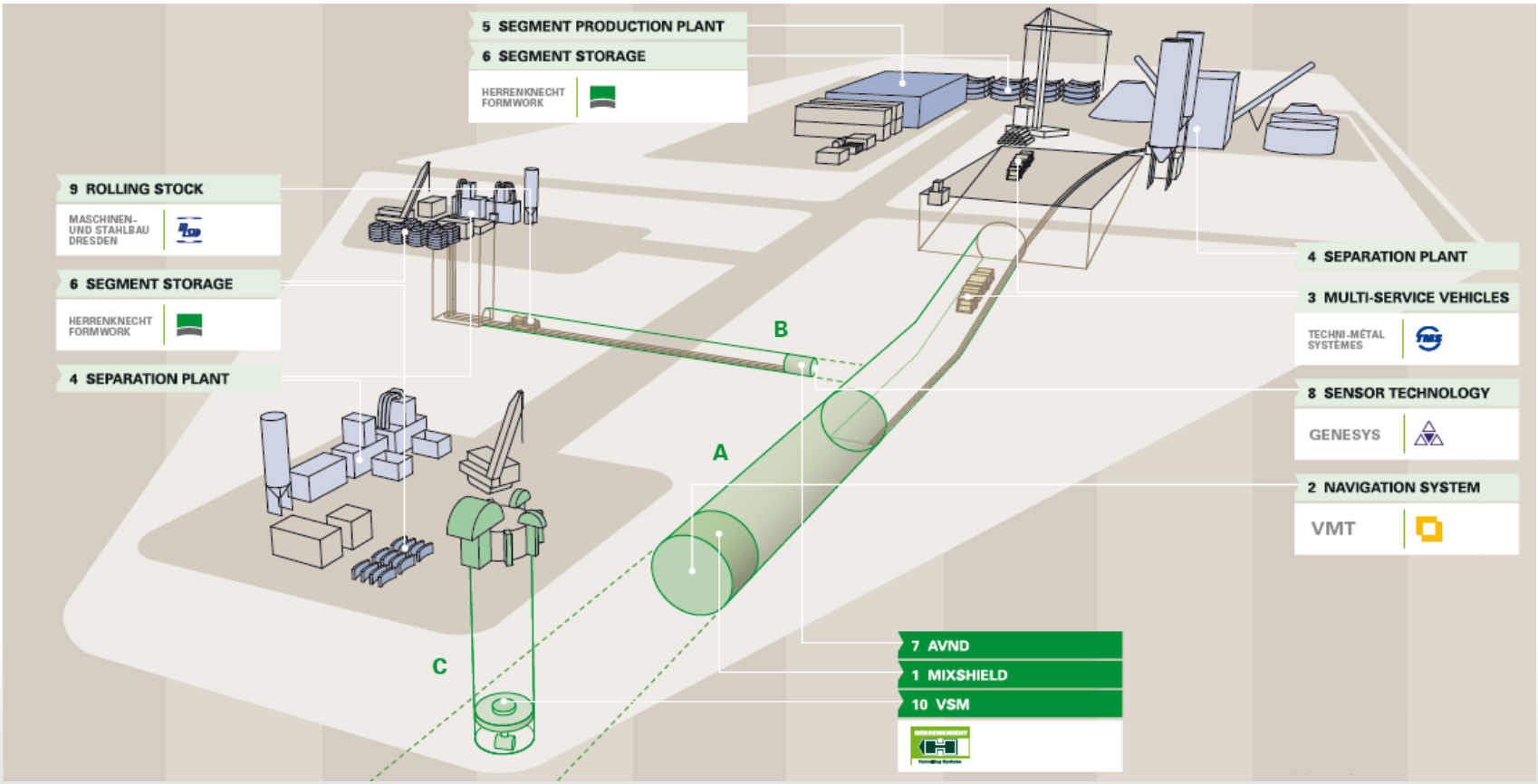
Challenges in mechanized tunnelling.



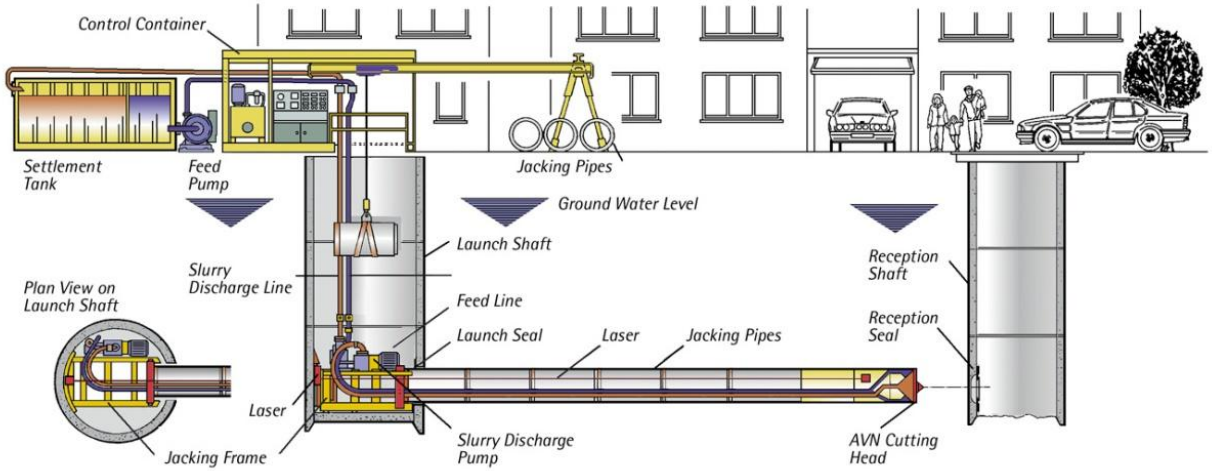
All Around Tunnelling Solutions.

Our additional equipment.

- Full-Range Tunnelling for optimized construction site logistics



Touring the world for Utility Tunnelling.



Pyrenees

London

Mumbai

Buenos Aires

Frankfurt

Jeddah

Large scale operation for utility tunnelling.

Pipelining in Thailand.

Direct Pipe

- 6km pipeline (42“)
- 2 x AVN 800
- 2 x HK500PT Pipe Thruster
- In operation since 2012

HDD

- 10km pipeline (42“)
- HK150T, HK250T, HK400T
- In operation since 2011

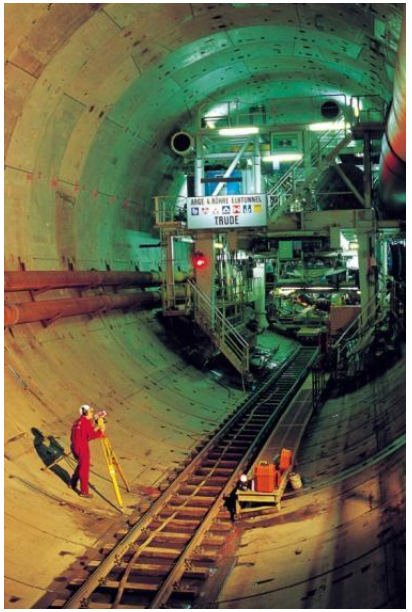
Pipe Express

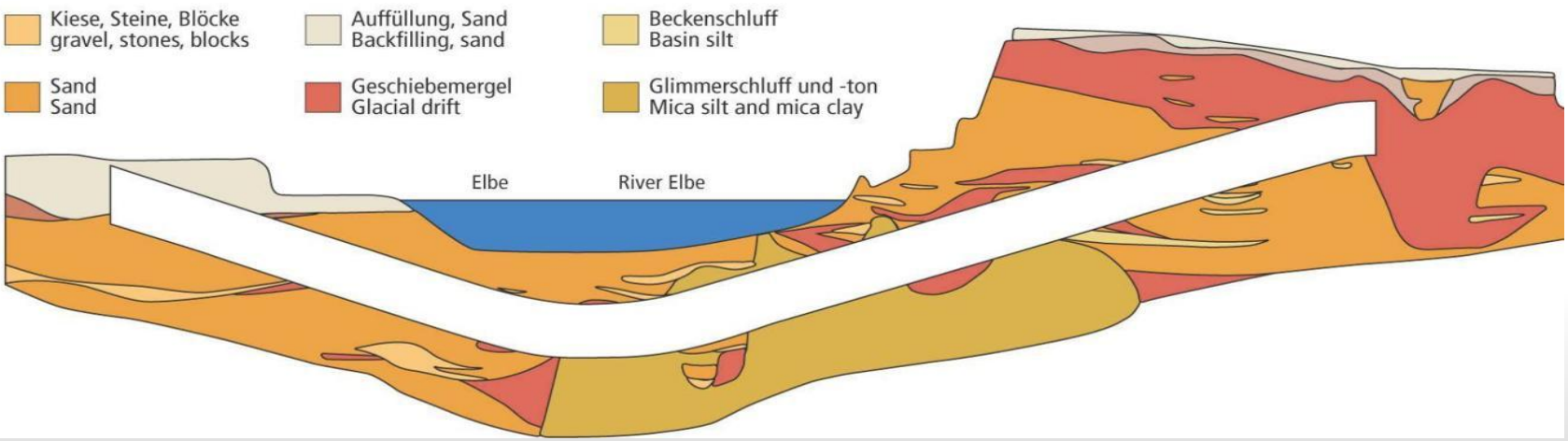
- 7km pipeline (42“)
- 10–12 drives along the highway
- Tunnelling Sep. – Oct. 2013

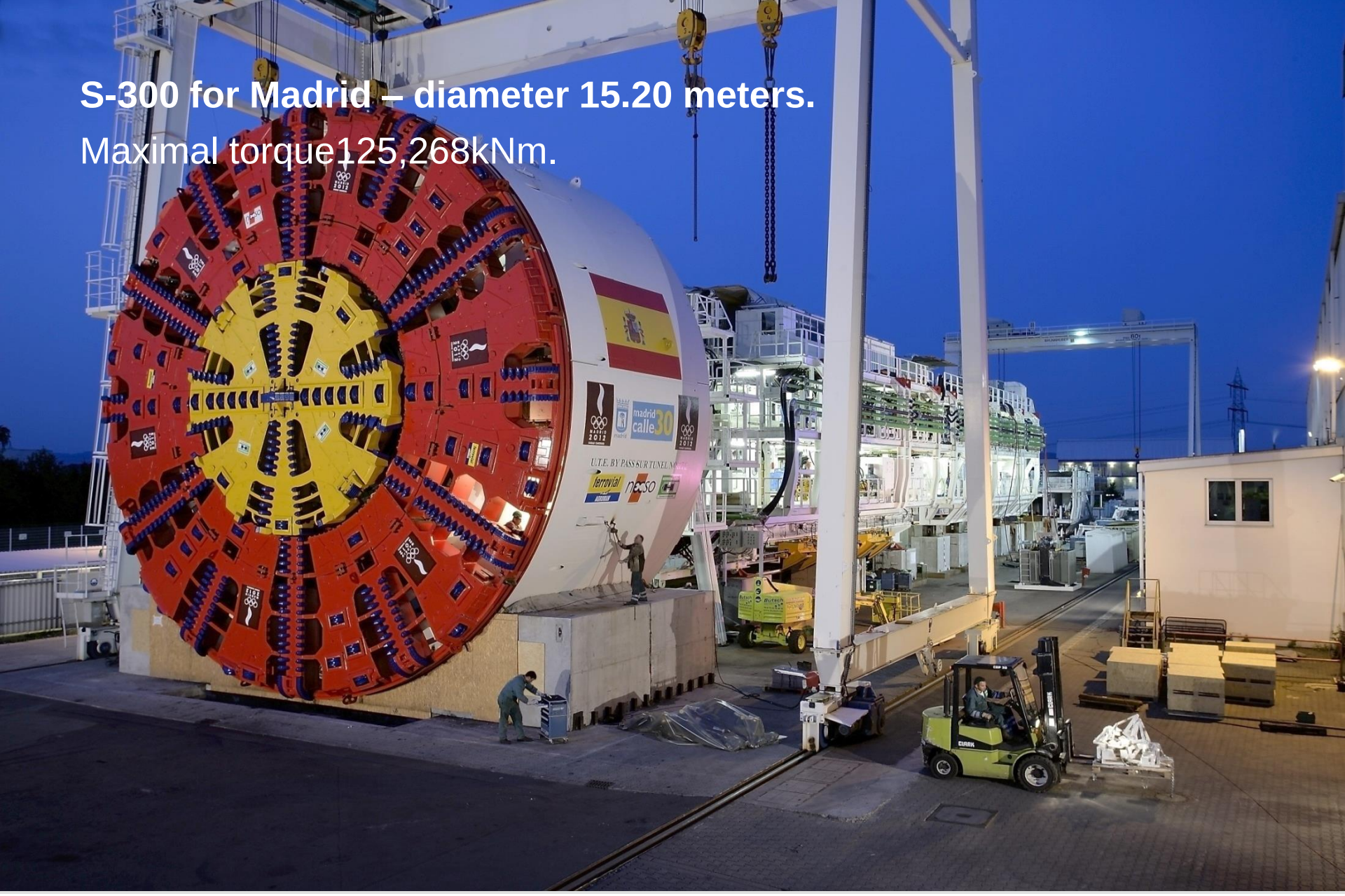
Hamburg:

4th Elbe River Tunnel.

- Mixshield
- Diameter 14,200mm
- 2.6km road tunnel
- Up to 5.5 bar groundwater pressure







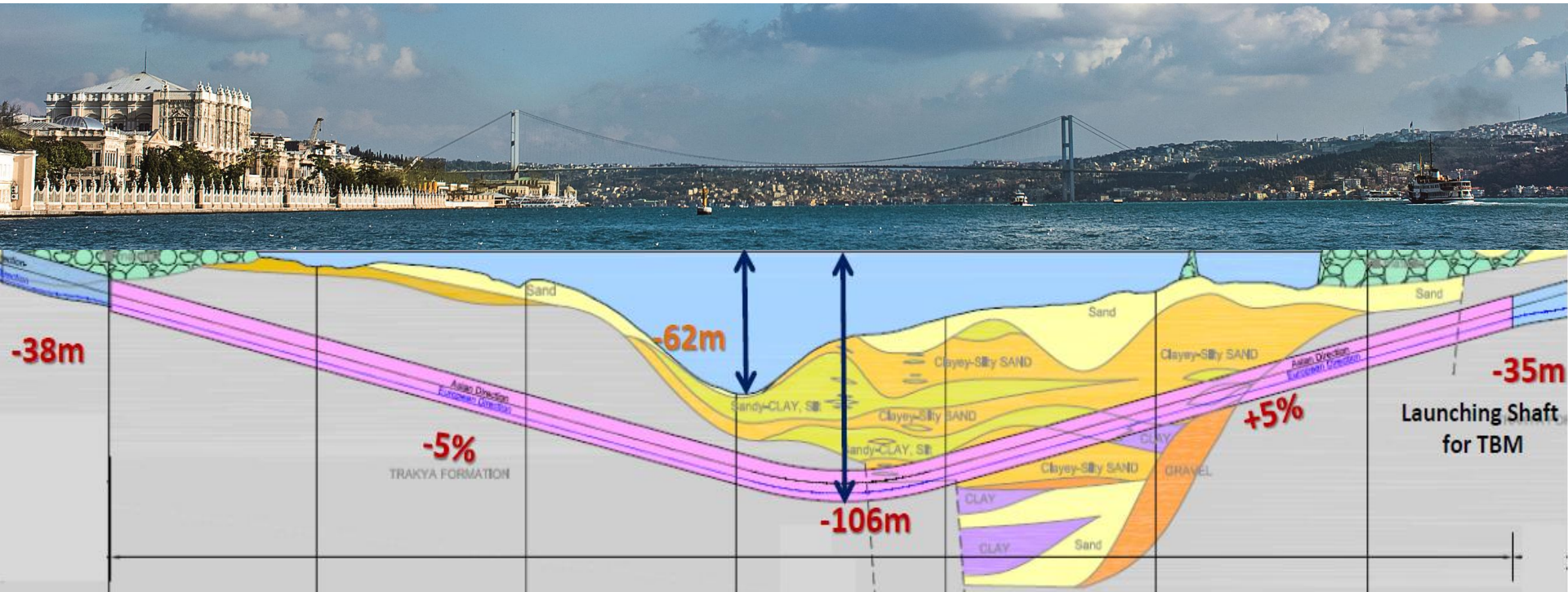
S-300 for Madrid – diameter 15.20 meters.

Maximal torque125,268kNm.

New connection between Europe and Asia.

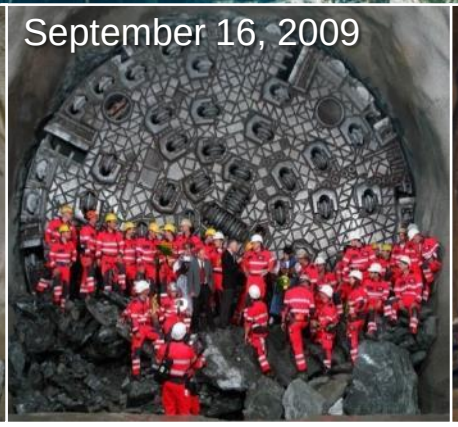
Istanbul Strait Road Tube Crossing project.

- Mixshield, Ø 13,660mm
- First road tunnel (3.34km) under the Bosporus
- Up to 100m below sea level
- Special solutions against high water pressure



Gotthard Base Tunnel.

The Champions League of tunnel construction.



Shanghai Changjiang Under River Tunnel Project.

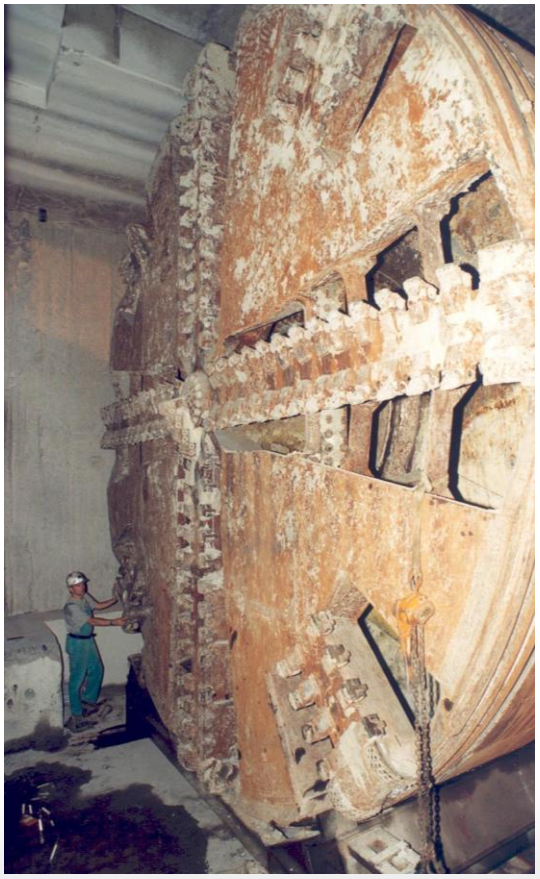
The world‘s largest Mixshields.

- Diameter: 15,430mm
- Tunnel length: 2x 7,470m
- Tunnel route up to 65m deep under the Yangtze river (groundwater pressure up to 6.5 bar)
- Breakthrough 12 and 10 months earlier than planed

Metro Bangkok.

1999 – 2001.

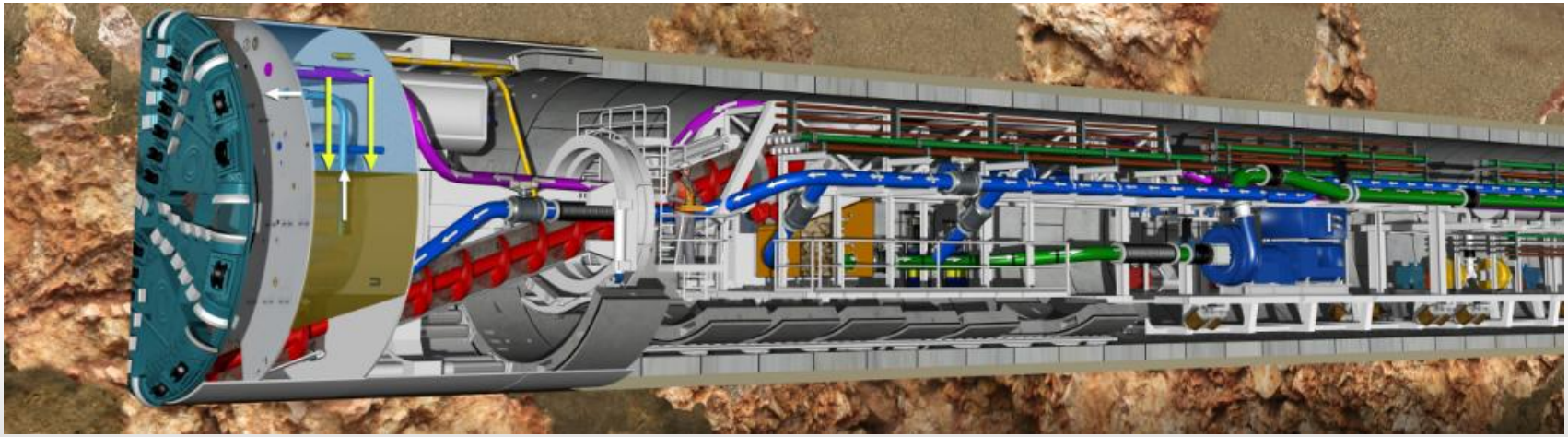
- 2 x EPB Shield
- Ø 6,460mm
- 8.4km tunnel length
- Breakthrough:
  12/2000 and 02/2001



A world‘s first in mechanized tunnelling.

Variable density technology for Kuala Lumpur.

- Klang Valley MRT Project
- 9.8km tunnel
- 6 x Variable Density TBM, Ø 6,620mm
- Combination of EPB Shield and Mixshield
- Variation of density of suspension possible



Multi-purpose tunnel.

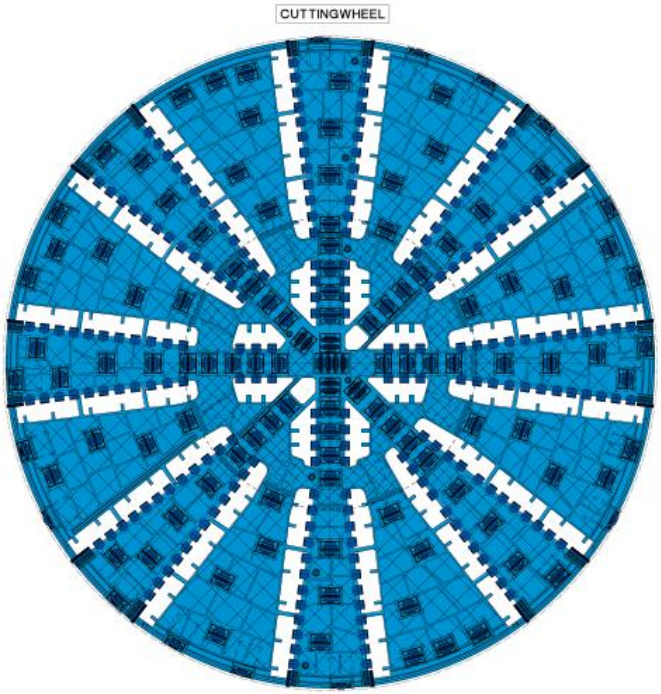
Kuala Lumpur – SMART Project.

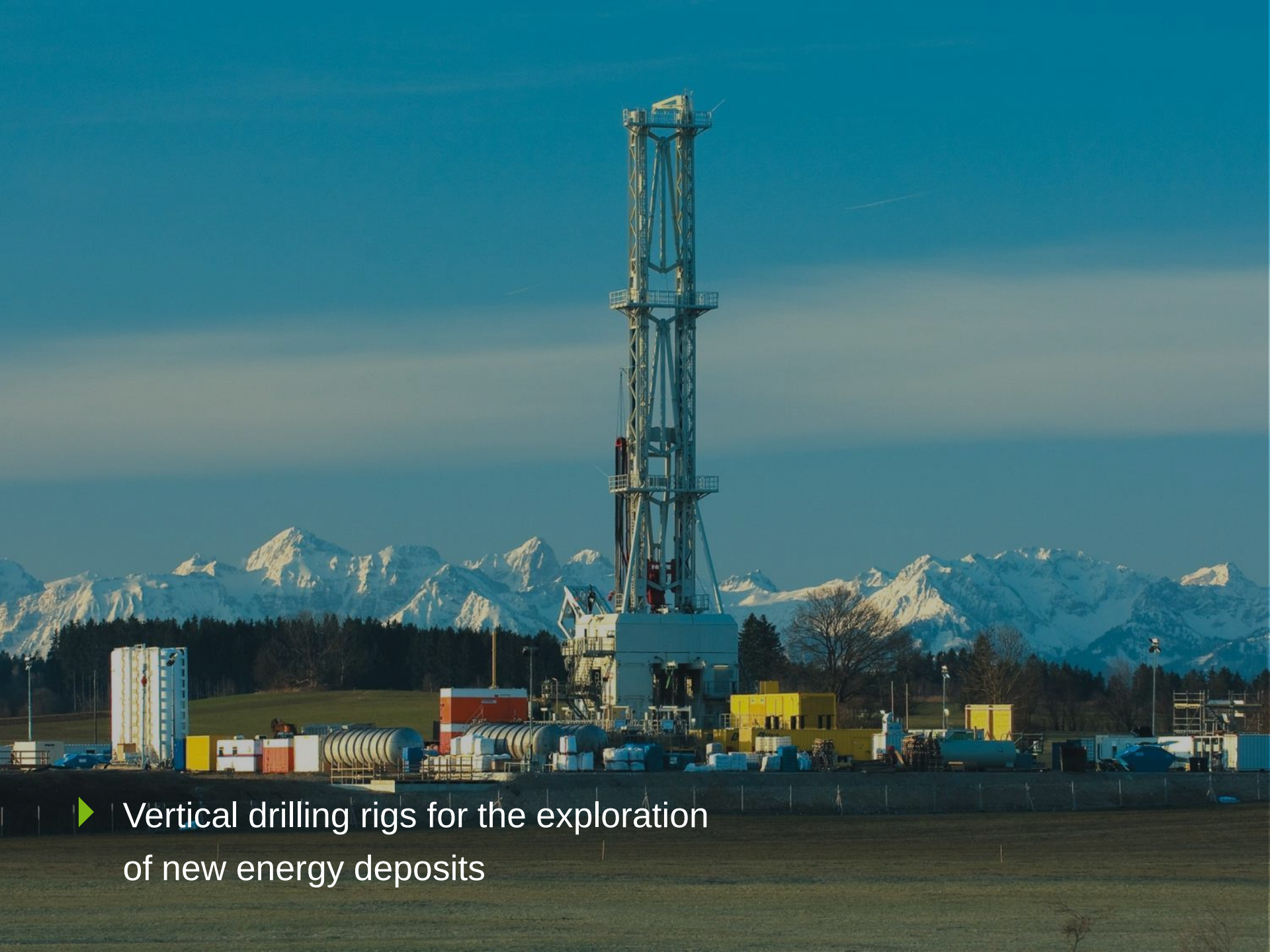
- Combined road and storm water tunnel
- 2 x Mixshield, diameter 13.21m
- Breakthrough April 2006 and April 2007

New diameter world record.

Hong Kong: Tuen Mun – Chek Lap Kok Link (TM-CLKL).

- Mixshield, shield-Ø 17.6m
- 2 parallel road tunnels with two lanes each





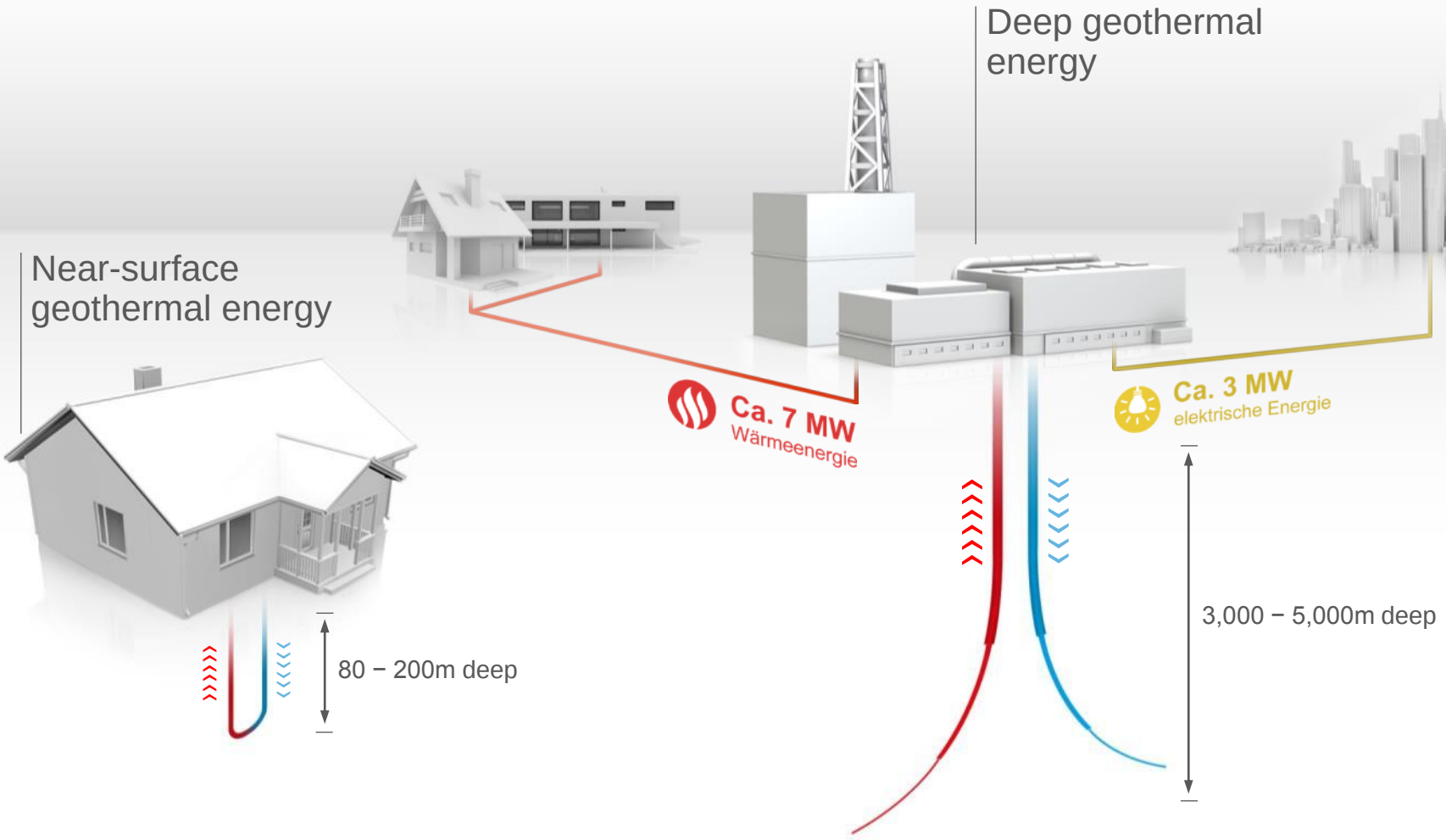
- Vertical drilling rigs for the exploration of new energy deposits

Herrenknecht Vertical GmbH.

- Subsidiary (100%)
  of Herrenknecht AG
- Founded March 2005
- Schwanau
- Deep drilling rigs for the exploration of oil and gas deposits as well as geothermal energy sources
- Advantage in technology thanks to hydraulic drive engineering
- Comprehensive automation
- Staff savings

Geothermal energy.

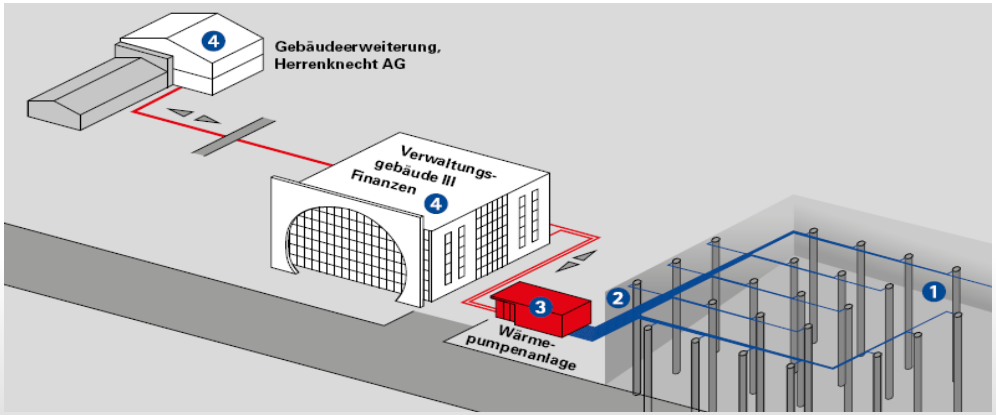
Potential for a clean and stable energy supply.



Utilization of near-surface geothermal energy.

Herrenknecht headquarters in Schwanau.

- Herrenknecht Office Building No. 3
  - 32 drills up to 100m in depth
  - Overall heat / cold release of heat pump system: 324,000kWh +/ year
  - Savings of 31 tons of CO_2 / year compared to conventional heat systems



Deep drilling for geothermal energy.

B-004 in Brühl – 1. geothermal energy project at the Upper Rhine Plain.

- First drill successfully completed with 3,319m
- Productivity test successfully completed (130 – 150°C)
- Very high artesian flow rates
- Second drill in preparation

Deep drilling rigs Terra Invader 350 Slingshot.

In operation in Bahia, Brazil.

- 2 rigs (B-006/B-008) in operation since summer 2009
- More than 40 wells successfully drilled for the exploration of oil fields
- Self-erecting slingshot substructure and telescoping mast for fast rig up and rig down without heavy-duty crane

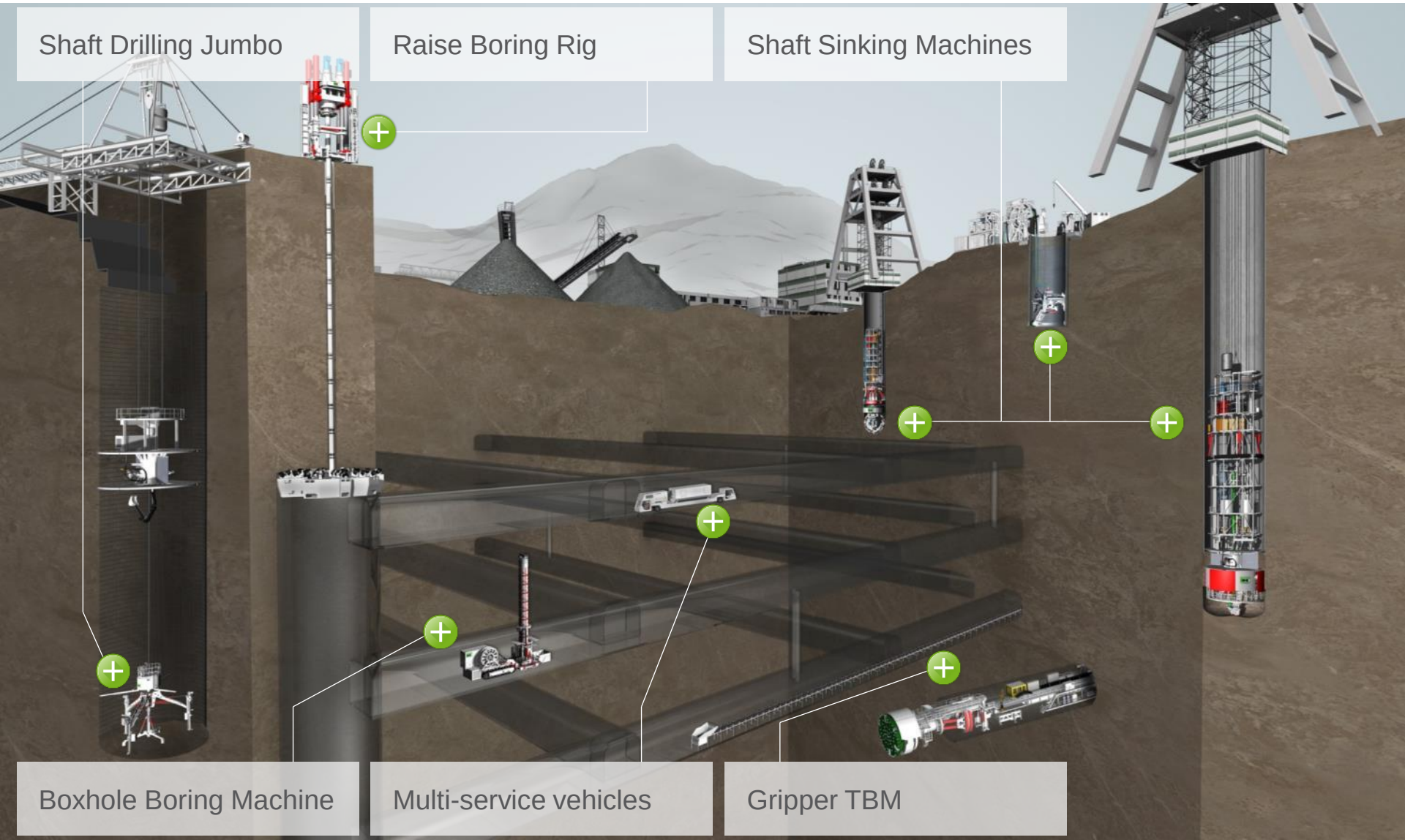
First offshore project for Swift Drilling.

End customer Shell.

- Innovative technology for infrastructures in mining

Herrenknecht Mining.

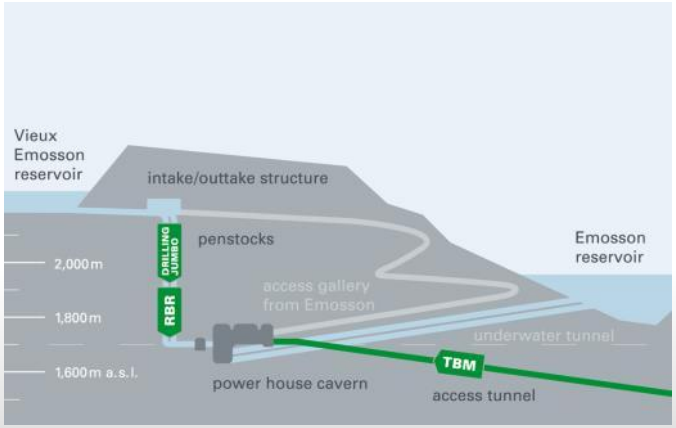
Product portfolio.

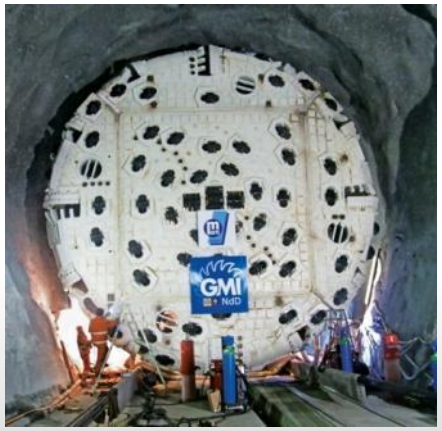


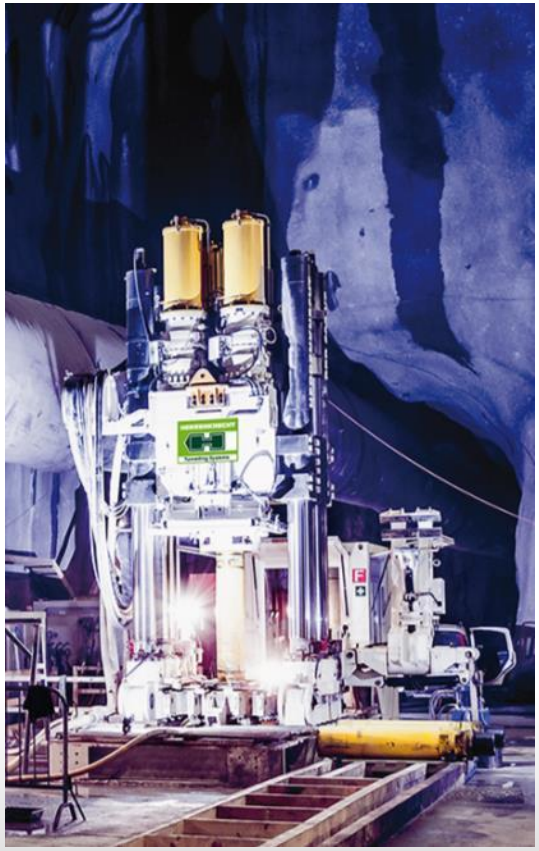
Project Nant de Drance.

Successful application of Herrenknecht Mining technology.

- Pumped-storage power plant in Switzerland
- Raise Boring Rig RBR600VF
  - 2 x 424m vertical pressure shaft (penstocks)
  - Shaft diameter 2,440mm
- Gripper TBM for 5.6km of access tunnel
- Shaft Drilling Jumbo for shaft enlargement







Shaft Boring Roadheader SBR.

Fast and safe production of blind shafts.

- First project: potash mine in Canada
- Blind shafts for service and production
- Shaft depth up to 1,000m
- Diameter up to 10.6m
- Geology: medium hard rock & frozen ground
- 2 x SBR in operation

HERRENKNECHT

SHAFT BORING ROADHEADER SBR

Incorporating Rio Tinto
Mine of the Future™ Technology

- **Together we are building our future.**