



**NEW GENERATION
PRODUCT &
ONE-STOP
PRODUCTION
SERVICE**

Company Profile & Drilling Business

Jun. 2022

N.E.S.

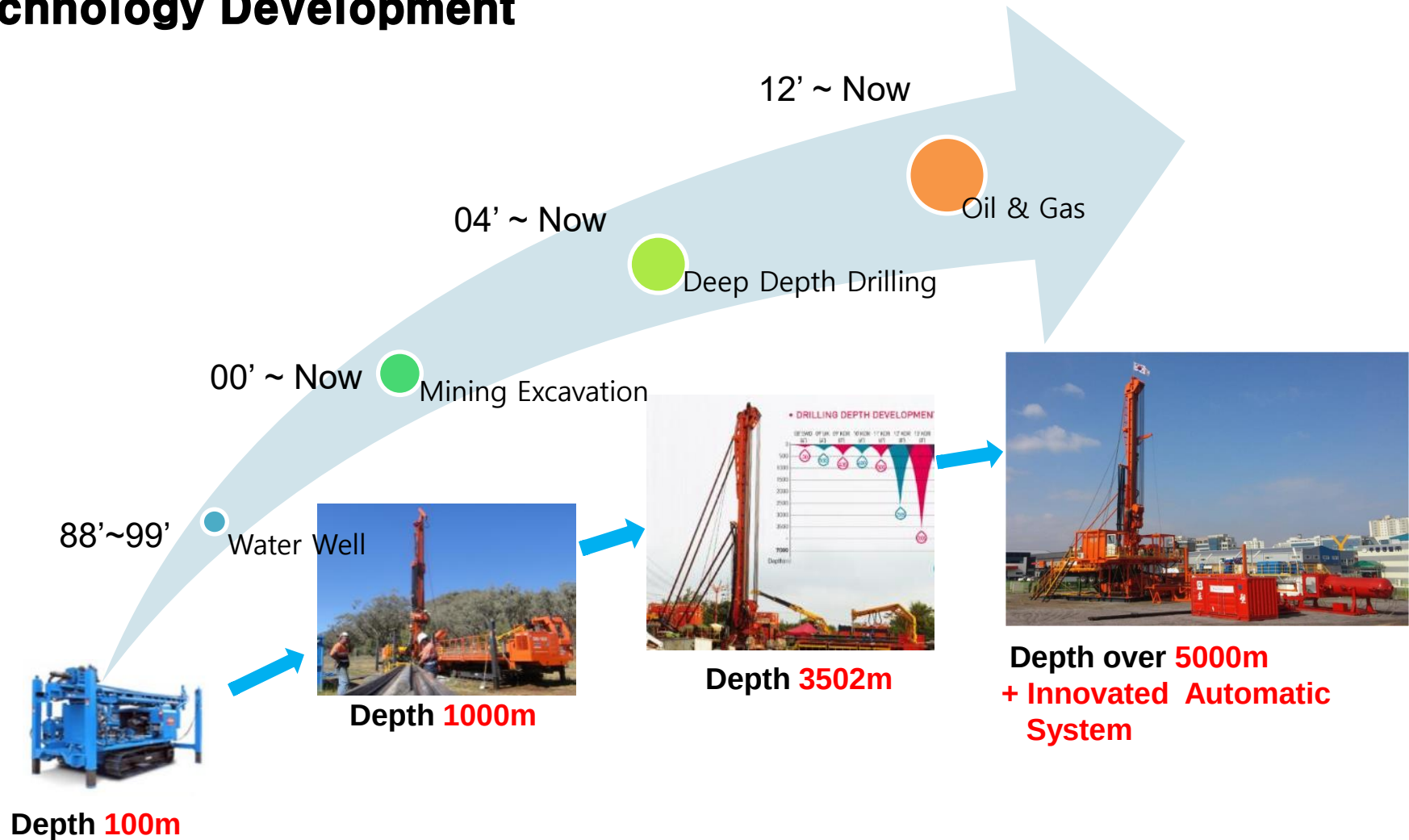


HANJIN D&B
Drilling Equipments Co., Ltd.
www.hanjindnb.com

1. COMPANY PROFILE

Brief

Technology Development



1. COMPANY PROFILE

Business Area

- Oil & Gas / CBM Drilling
- Mining & Construction
Exploration Drilling
- Water Well / Geothermal Drilling
- Horizontal Directional Drilling
- Blast Hole Drilling
- Drilling Solutions



1. COMPANY PROFILE

Competitiveness

Production PROCESS(One Stop Production System)

- Fast Service(A/S)
- Best Production & Maintenance

Frame
production
(2nd factory)



Painting
(2nd factory)

Hydraulic
assembly
(5th factory)



Test
(5th factory)



Parts
processing
(1st factory)



Equipment
assembly
(3rd,4th
factory)



2. MAIN PRODUCTS

Drill Rigs

- D&B 8W, 10W, 16W, 30W
- D&B 45W, 80W, 250W, 350W, 450W
- D&B 16WCP500, 16WCP750
- D&B 30WCP900



Water/
Geothermal



- D&B-16HDD, 30HDD, 50HDD, 80HDD
- D&B-120HDD, 150HDD
- D&B-250HDD, 550HDD



HDD



E&P

- D&B 8D, 10D, 16D
- D&B 30D, 40D
- D&B 16RC, 30RC
- D&B 35RC Special
- D&B 16, 30Multi
- D&B 30Multi CP900
- D&B 35Multi
- D&B 37Multi
- D&B 45, 90, 125CBM
- D&B 250OG, 350OG



Blasting

- D&B 16BT500
- D&B 16BT750
- D&B 16BT900



D&B

2. MAIN PRODUCTS

Drill rigs & Equipment

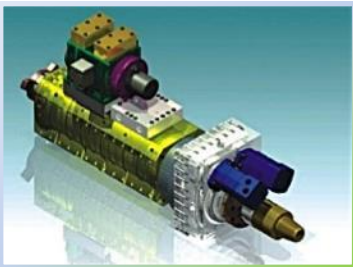
- D&B 35WH, 40WH, 50WH, 60WH, 80WH
- D&B 100WH, 120WH, 170WH



Water
Hammer



- D&B 100Sonic
- D&B 150Sonic



Sonic
Hammer

Oil &
Gas



- Air compressor : 900CP, 1070CP, 1170CP
- Carrier : CR(4, 7, 10, 15, 25)
- Mud pump, DTH Air hammer, RC hammer
- High pressure water pump

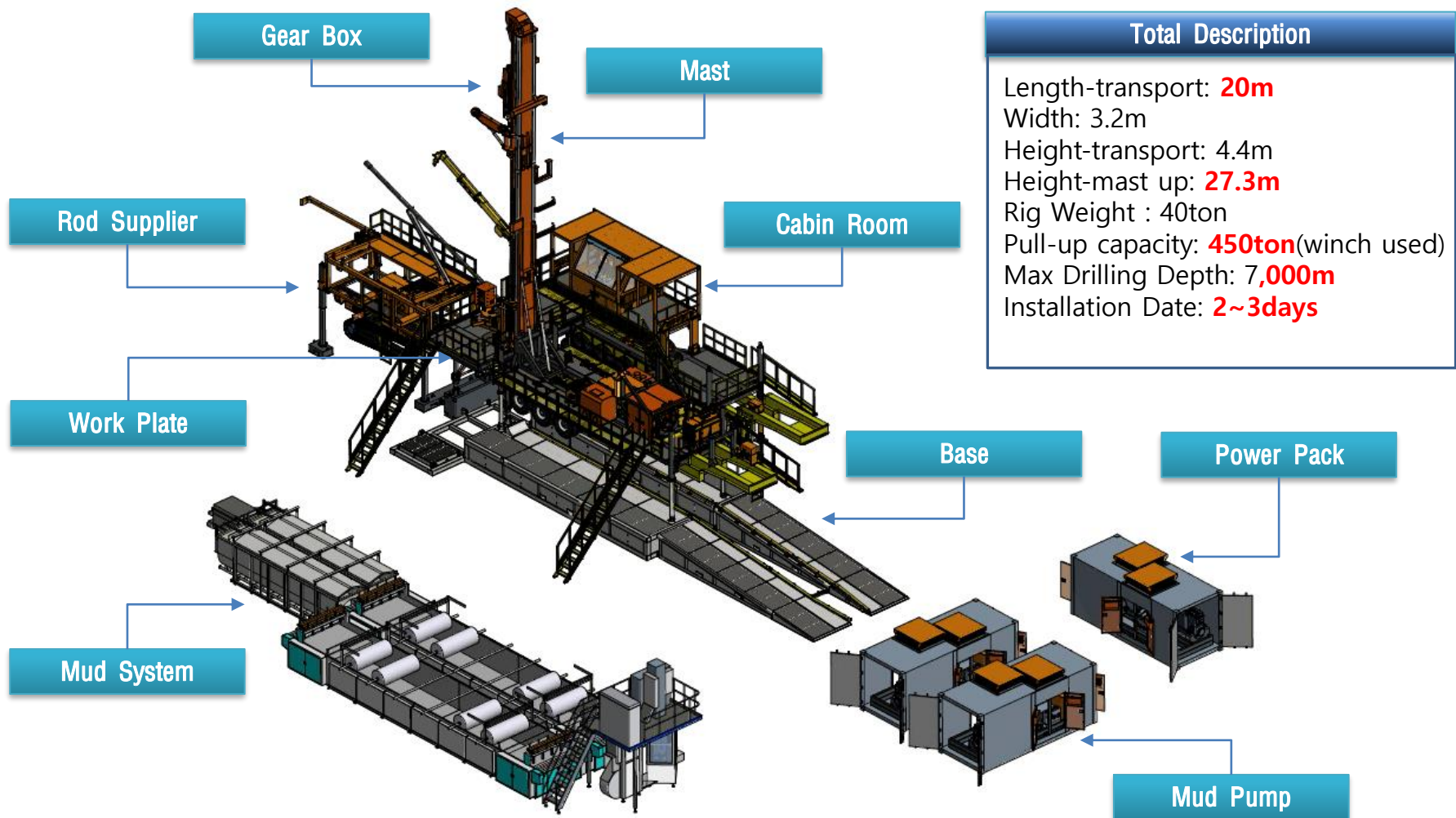


Accesorries



3. DEEP DRILLING SYSTEM

Layout of Drilling System



3. DEEP DRILLING SYSTEM

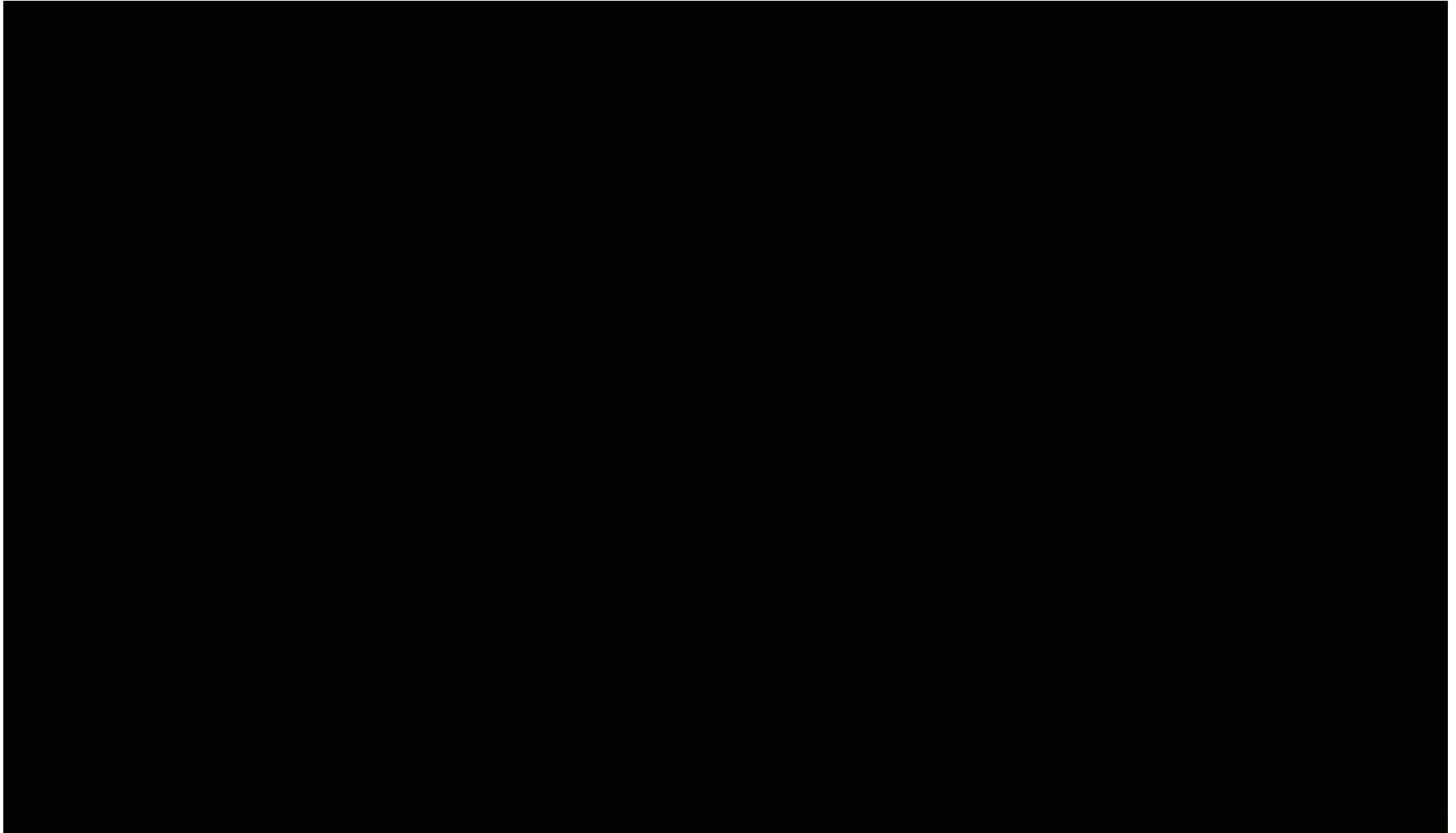
Fast & Effective

Rod Handling & DMA_(Disassemble-Mobilize-Assemble)



3. DEEP DRILLING SYSTEM

Automatic Drill Pipe Handling System



3. DEEP DRILLING SYSTEM

D&B-450W Drilling System



3. DEEP DRILLING SYSTEM

Oil & Gas, Geothermal Drilling

 **D&B-45CBM (45 Ton) Indonesia**



3. DEEP DRILLING SYSTEM

Oil & Gas, Geothermal Drilling



D&B-90CBM(Ton) Indonesia



3. DEEP DRILLING SYSTEM

Oil & Gas, Geothermal Drilling

 **D&B-450W(Ton)**



3. DEEP DRILLING SYSTEM

Water Hammer(Deep Hole Drill)

➤ 1st Gener. : Rotary Wash



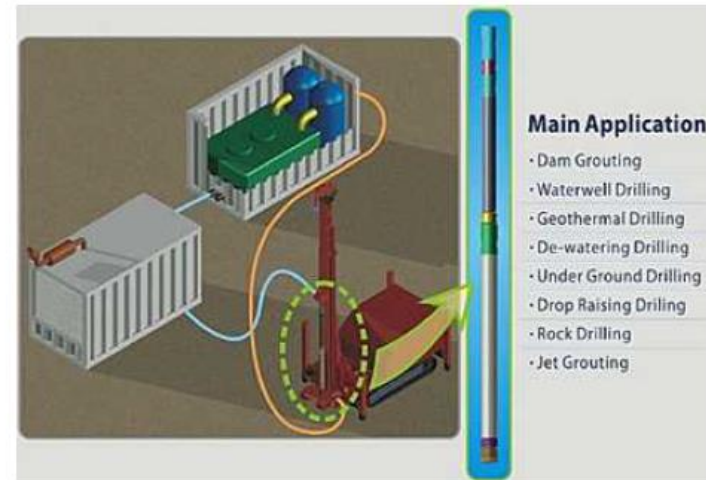
- Most general but slow speed

➤ 2nd Gener. : Air Hammer



- Depth, Environmental limit

➤ 3rd Gener. : Water Hammer



➤ Drilling speed **Up**, Water inflow **Overcome**

3. DEEP DRILLING SYSTEM

Drilling Comparison

Water Hammer(Deep Hole Drill)



➤ Tri-cone bit(rotary wash)

- rotation torque
- heavy weight on bit



➤ Water Hammer(percussion)

- impact loading
- light weight on bit

3. DEEP DRILLING SYSTEM

Water Hammer(Deep Hole Drill)

Drilling Process

Drilling

Discharge of
water, cuttings

Separation
of particles

Purification
S.S

Store
(Water tank)

Water pump
(Recycling)



3. DEEP DRILLING SYSTEM

Water Hammer(Deep Hole Drill)

Drilling System Component

➤ Water, Mixing Pump



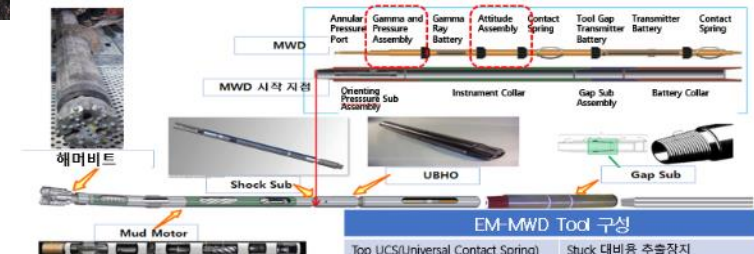
➤ Drill Pipe



➤ Recycling Unit

➤ MWD

➤ Water Hammer, Tricone



- EM-MWD tool을 이용한 모놀 위치확인
- UBHO를 이용하여 방향성 시추장비 시작
품과 연결
- Shock Sub 연결을 통해 워터해머에서 생
성되는 충격이 EM-MWD tool로 전달되는
것을 축소 및 방지

EM-MWD Tool 구성	
Top UCS(Universal Contact Spring)	Stuck 대비용 추출장치
Transmitter Battery	송신기 파워공급
Transmitter	신호 통합 송신
Attitude assembly	Inclination, Azimuth, Acceleration, Vibration(G-Force) 측정
Gamma Ray Battery	감마 센서 파워공급
Gamma Ray and Pressure Assembly	Gamma 측정
Annular Pressure Assembly	Annular Pressure 측정

3. DEEP DRILLING SYSTEM

Water Hammer(Deep Hole Drill)

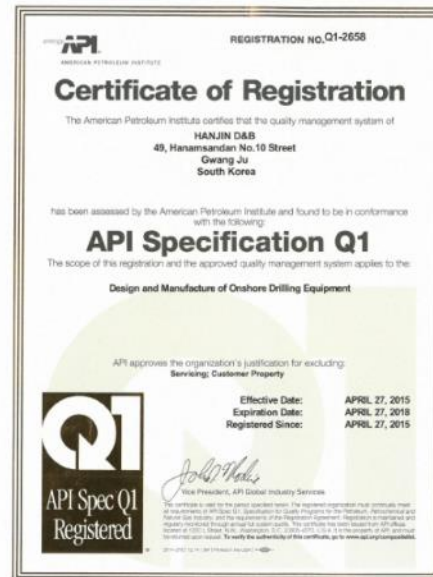


Certification & Awards

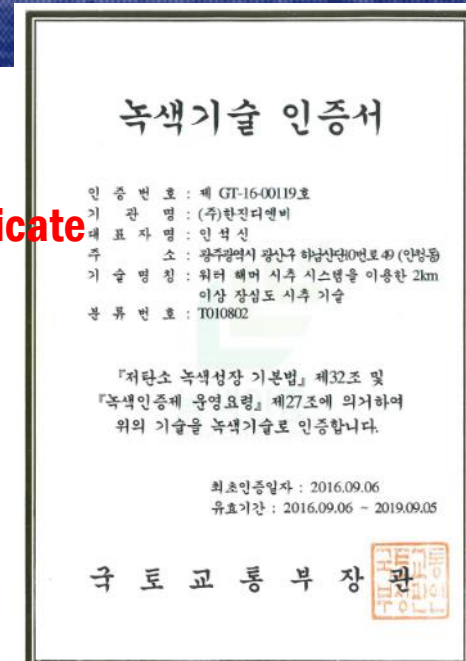
● **2012' National Green Technology (Prime Minster Citation : 2012')**



● **2015' API Q Certificate**



● **2016' Green Technology Certificate**



● **2016' Korea World Class Product**



4. DEEP DRILLING PROJECT



History

- 2004 : Developing of Water hammer system
- 2006 : Water hammer patent
- August 2009 : Gyeongsangbuk-do Uiryeong-gun, Korea(8 inch, 430m)
- June 2008 : Stockholm, Sweden(Jet grouting site)
- March 2009 : Liverpool, England(4 inch, 100m, Geothermal drilling)
- July ~ Dec. 2012 : Gwangju, Korea(8 “, 2505m, Deep geothermal drilling)
- August 2013 : Gwangju, Korea(8 “, 3502m, Deep geothermal drilling)
- Nov. 2015 ~ Feb. 2016 : Deep geothermal direct use technology(8.5”, 2002m)
- Apr. 2017 ~ Jun. 2017 : Deep geothermal direct use technology(12.25”, 2002m)
- 2nd Stage, 2021 ~ : Ultra deep depth drilling(5,000~7,000m), Finland & Kor.
High Temp(>200°C) & Large drilling(17.5”, >1300m), Japan

4. DEEP DRILLING PROJECT

 2.5km Drilling(Gwangju, Kor)

Aug 2012' 8" , Korea 2,505m

The Deepest Depth in the world using Water Hammer Drilling



date	rod no .	depth(m)	elapsed time(hr)	Drill rate(m/hr)
06. 29	94	853	0.48	18.62
	95	862	0.45	20.00
	96	871	0.47	19.29
	97	880	0.50	18.00
	98	889	0.47	19.29
	99	898	0.52	17.42
	100	907	0.52	17.42
	101	916	0.37	24.55



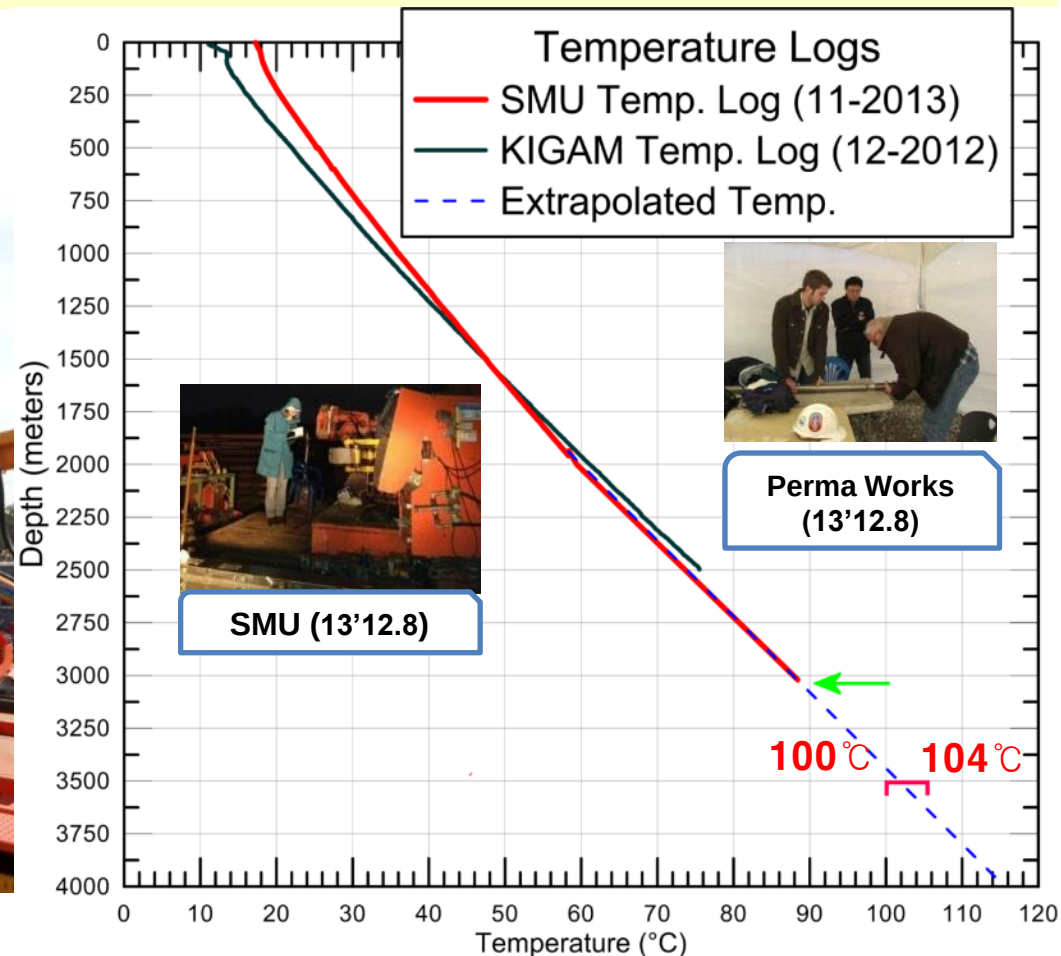
4. DEEP DRILLING PROJECT



3.5km Drilling Performance

Dec 2013' 8" , Korea 3,502m

The Deepest Depth in the world using Water Hammer Drilling

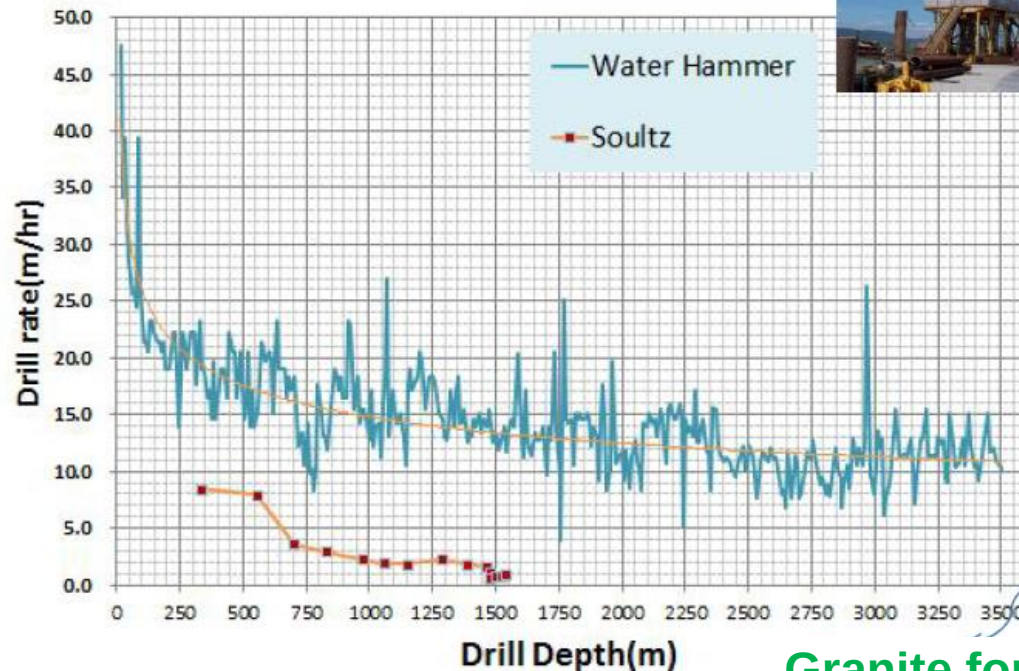


4. DEEP DRILLING PROJECT

3.5km Drilling Performance Comparison

- 2013' D&B WH vs 2007 Soultz RW
- WH drill rate: Over 12m/hr
- RW drill rate: Under 1m/hr

Soultz(EGS)



Granite formation

Depth(m)	Rate(m/hr)
332.25	8.4302
551.49	7.9744
703.49	3.6
829.16	2.9387
976.11	2.2792
1057	1.8908
1148.5	1.859
1284.6	2.2263
1382.6	1.7998
1463.5	1.609
1474.2	1.1356
1476.5	0.5824
1504.1	0.7429
1525.4	0.8237
1538.1	0.8643

4. DEEP DRILLING PROJECT



2.0km Drilling Performance

Dec 2016 8.5" , Korea 2,002m

Drilled 8.5", 2002m Granite, 2016



4. DEEP DRILLING PROJECT



2.0km Drilling Performance

Feb 2017 12.25" , Korea 2,002m

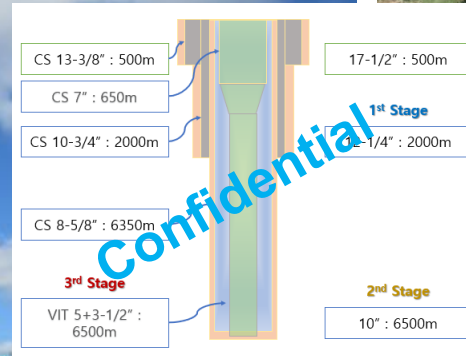


4. DEEP DRILLING PROJECT

D&B-450W(Ton), Finland

Tarastejärvi Drilling place (draft):
Hyötyvoimankatu 8, 33680 Tampere, Finland

Finland : Drilling start : Jun.21'~ , with 12.5",
over 7000m target



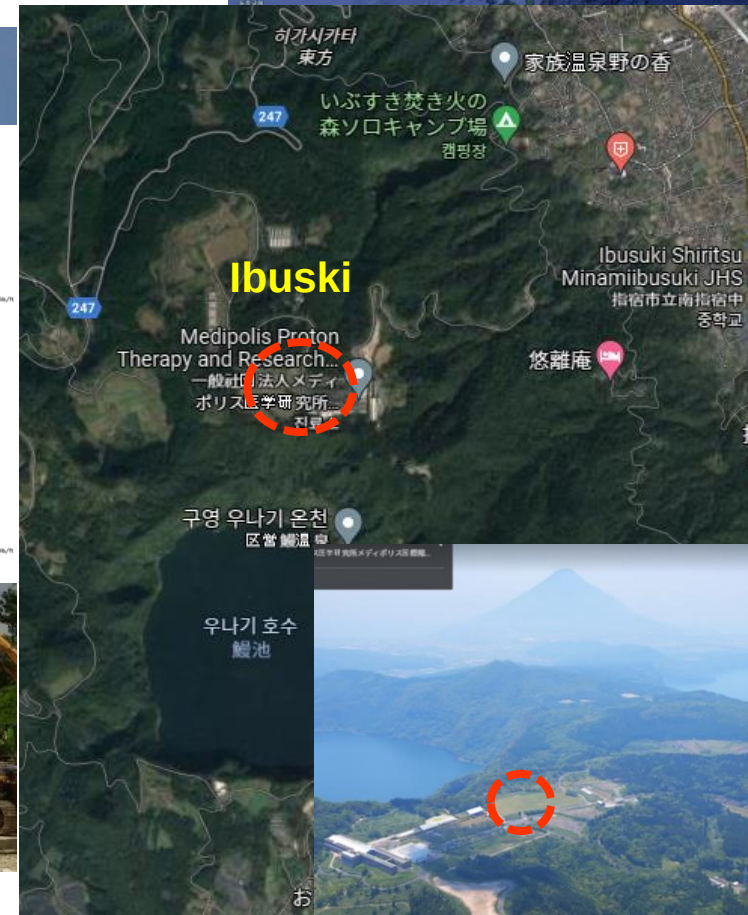
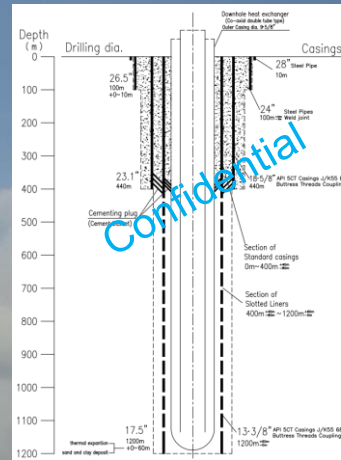
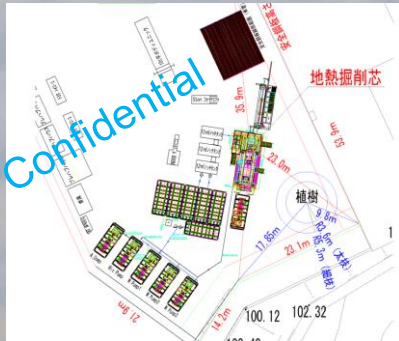
Geolämpö voisi
lämmittää jopa
sata kerrostaloa

4. DEEP DRILLING PROJECT

D&B-150W(Ton), Japan

- Ibusuki Geothermal Power, Japan(23", Ø584mm)

Ibusuki : Drilling start : Mar.22'~ , for 17.5", over
1300m target

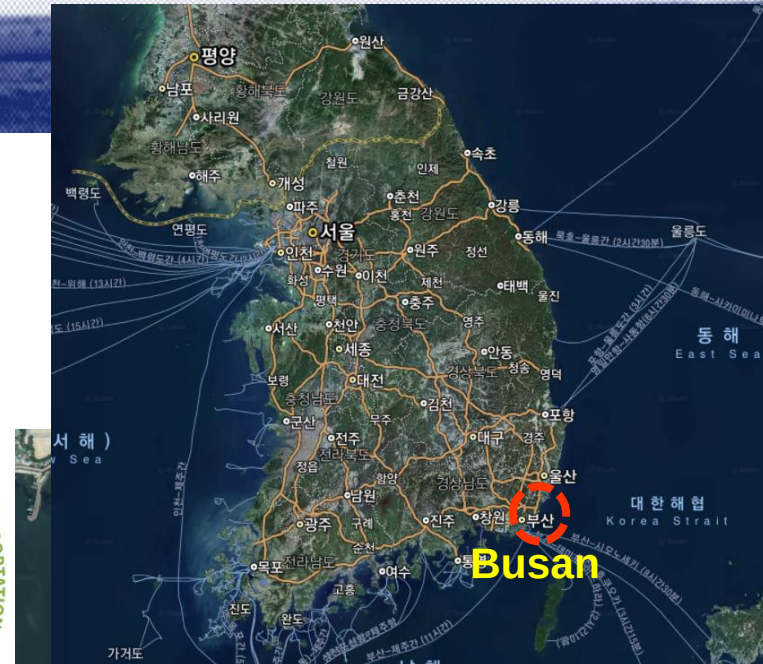
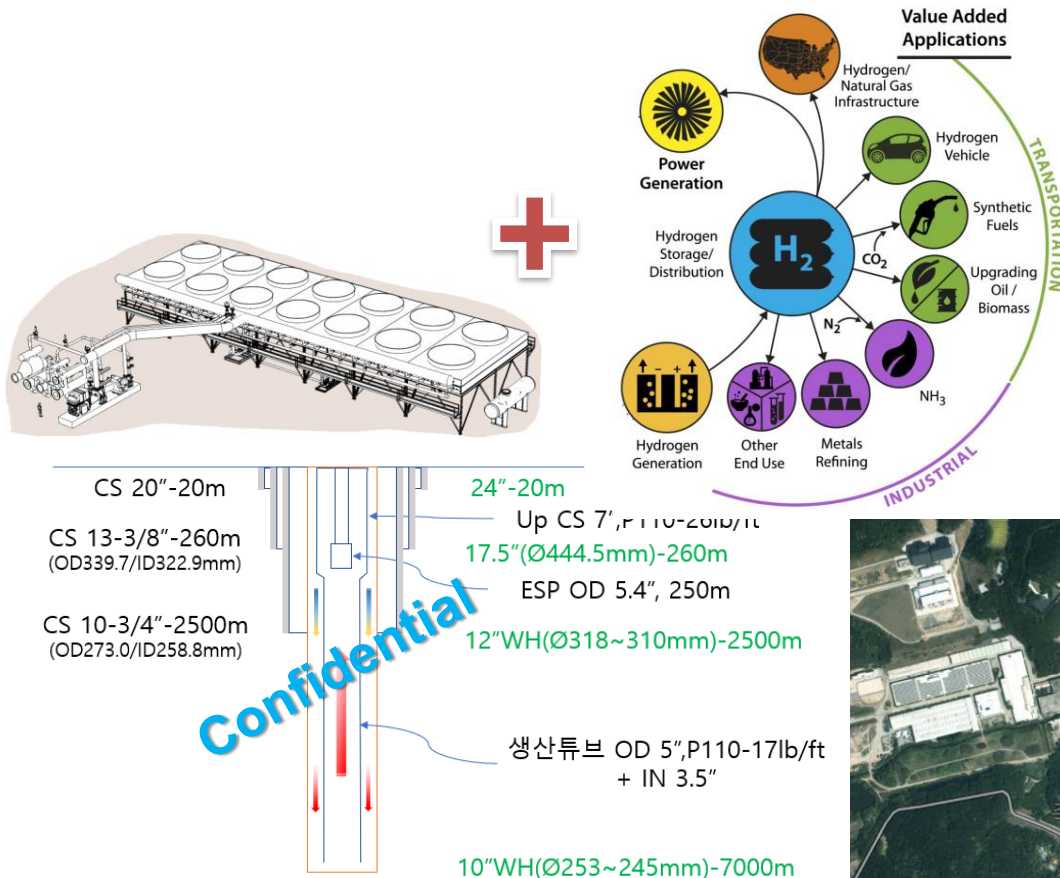


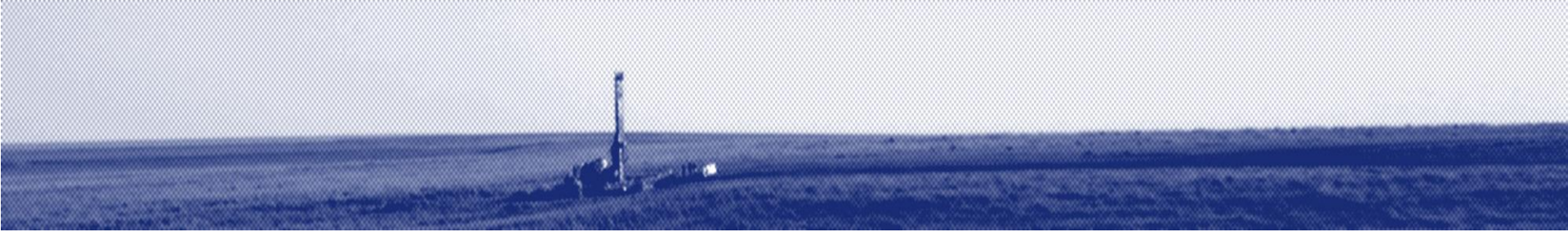
4. DEEP DRILLING PROJECT

D&B-450W(Ton), Korea

➤ Gijang Geothermal Power, Korea

Drilling start : Dec.22'~ , for 10", over 7000m target





Thanks



N.E.S.

- Innovative **T**echnologies

- Best **R**esults