

## Electro-Pulse Power Drilling Tool Development Geertjan van Og



Deep  
Light

# Advancing geothermal energy

**Faster deep  
hard rock  
drilling**

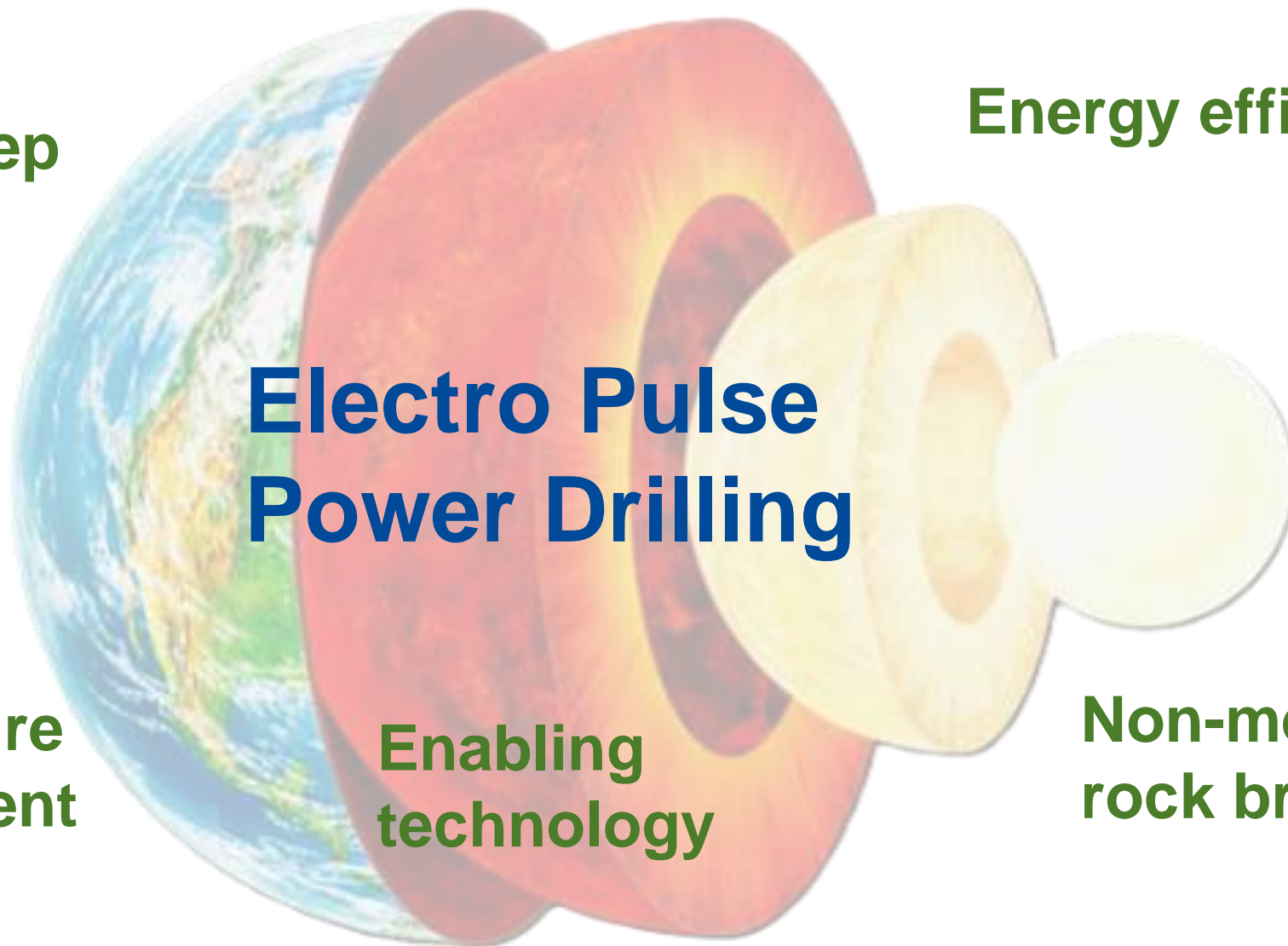
**Energy efficient**

## **Electro Pulse Power Drilling**

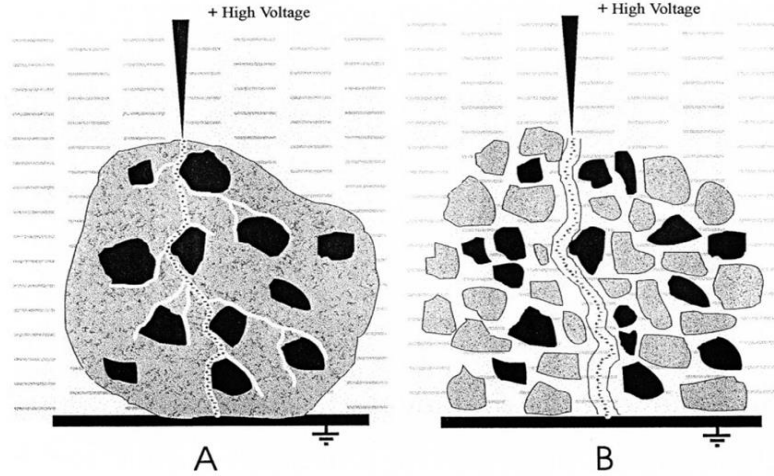
**High-  
temperature  
environment**

**Enabling  
technology**

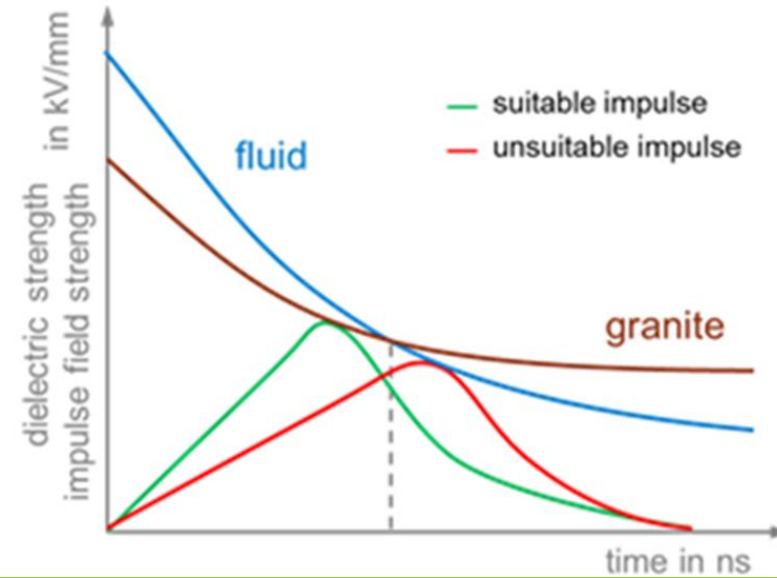
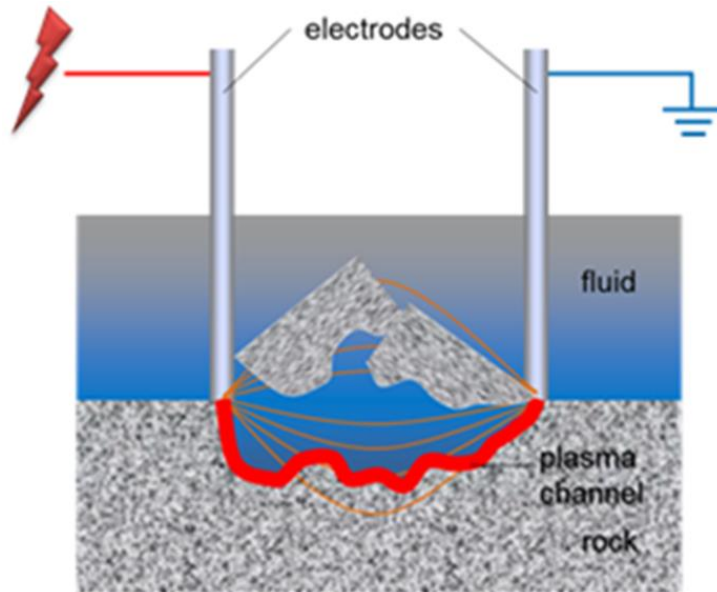
**Non-mechanical  
rock breaking**



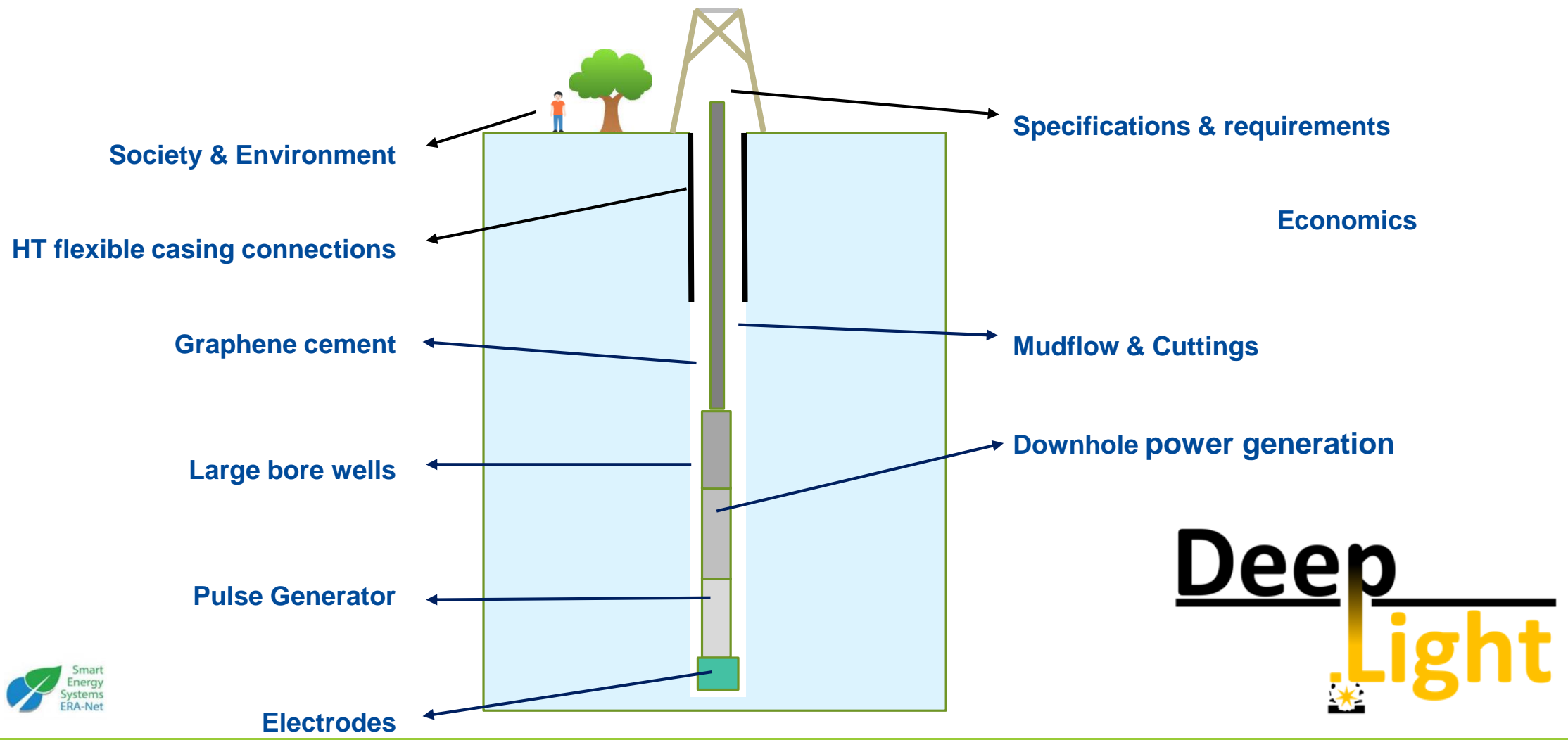
# EPP principle



**Voltage** ↑  
**Pulse-rise time** ↓  
**Reliability** ↑

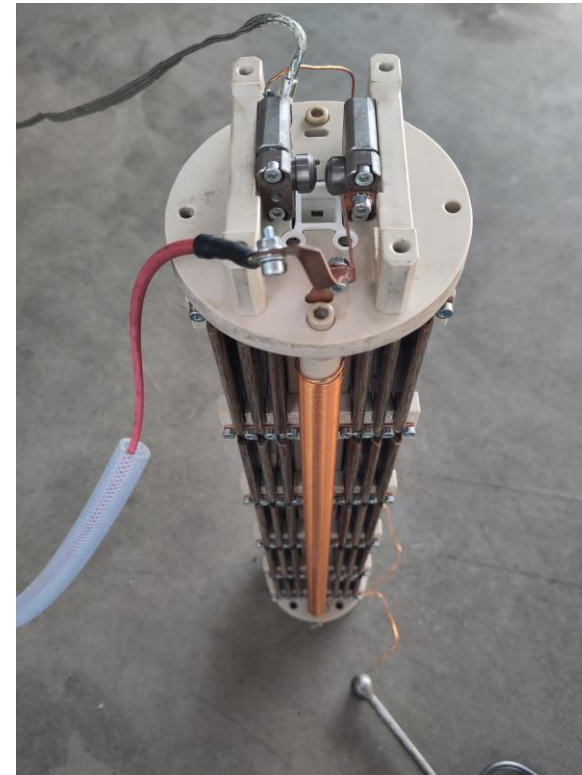


# System development

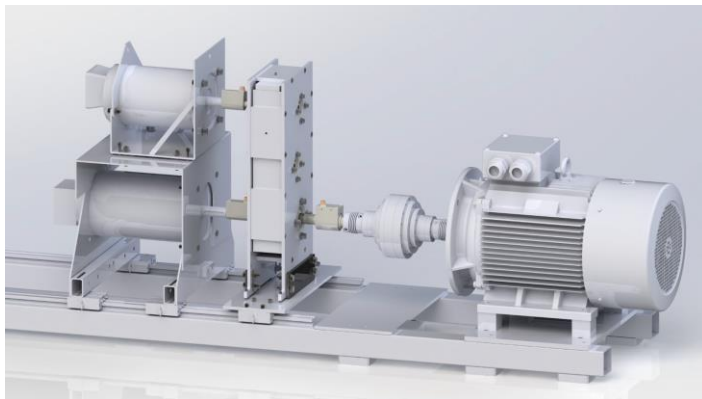
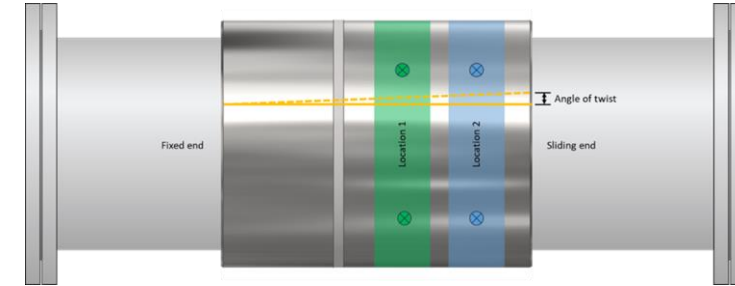


# Deep Light

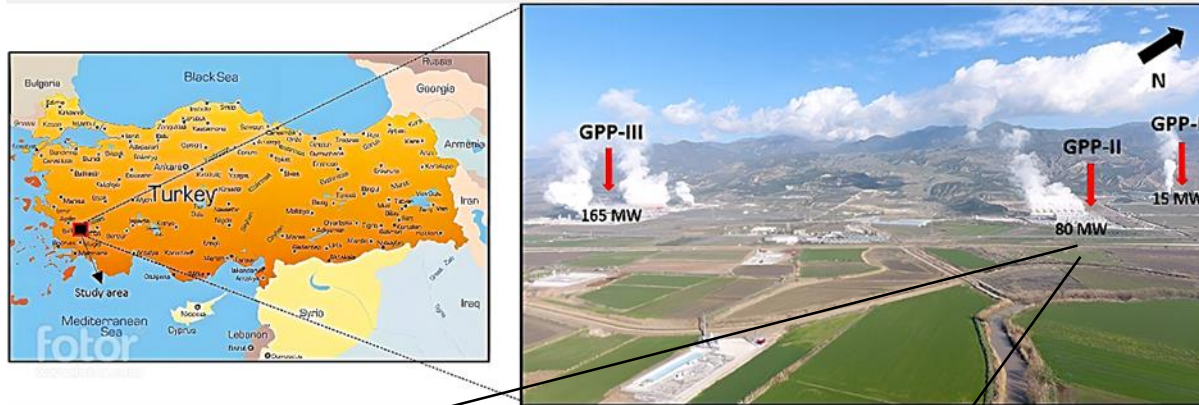
100 kV @ 15Hz



# Ongoing development work



# Applications – hard rock



- Complex & hard formations

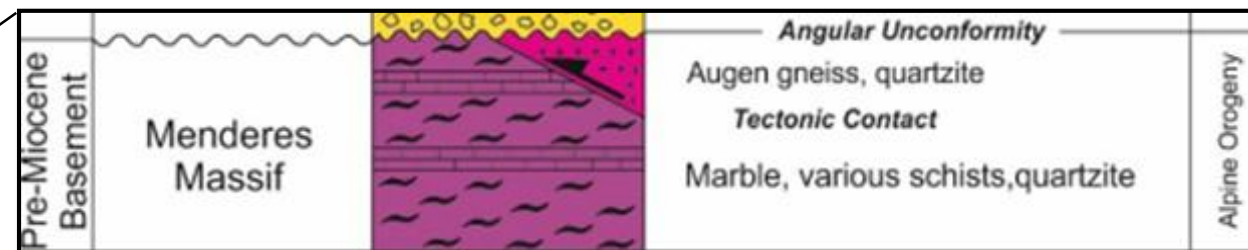


- ROP: 1 - 6 m/hr
- Bit runs: ~5

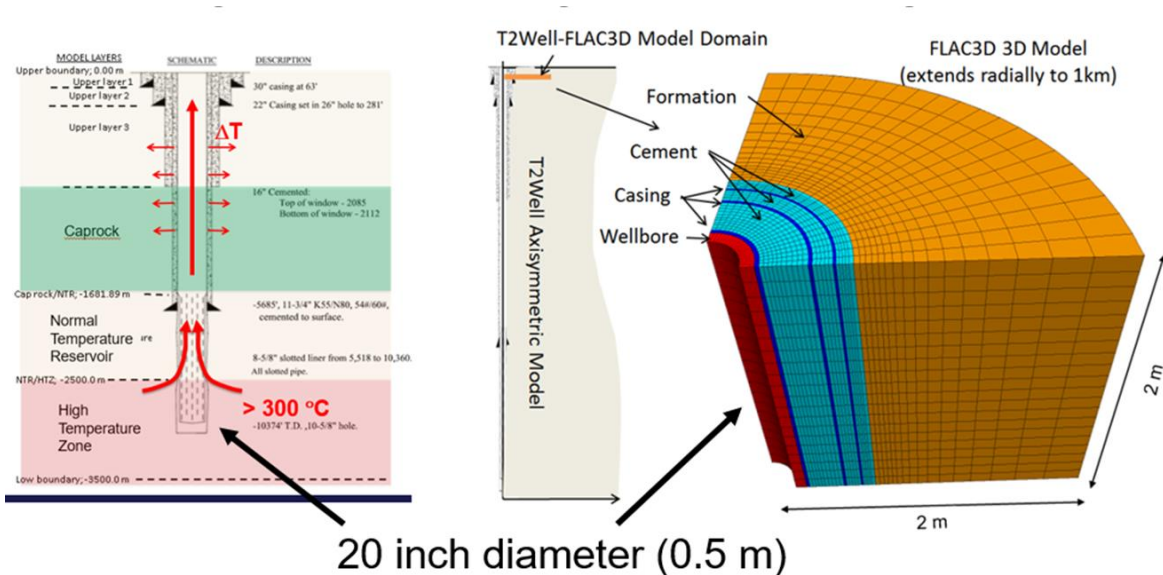


- ROP: >10 m/hr
- Bit runs: <5

Age	Unit/Thickness	Lithology
Quaternary	Alluvium, Alluvial fan	
	Tosunlar Formation (~50 m)	
Late Miocene - Late Pliocene	Kolankaya Formation (~500m)	
	Sazak Formation (~300m)	
Early - Middle Miocene	Kizilburun Formation (~300m)	
Pre-Miocene Basement	Menderes Massif	

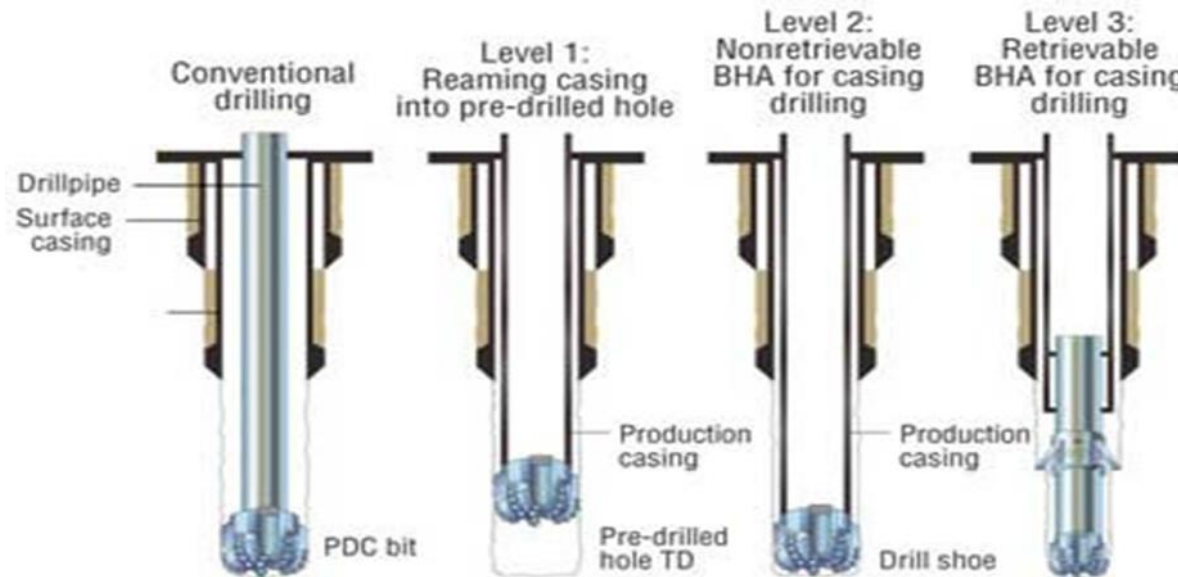


# Applications – hole enlargement



Casing installation while drilling to lower risk, rig power & cost

Very high-power wells





Novel concepts to construct cost effective geothermal wells  
with Electro Pulse Power Technology

# Deep Light

Thank you for your attention