

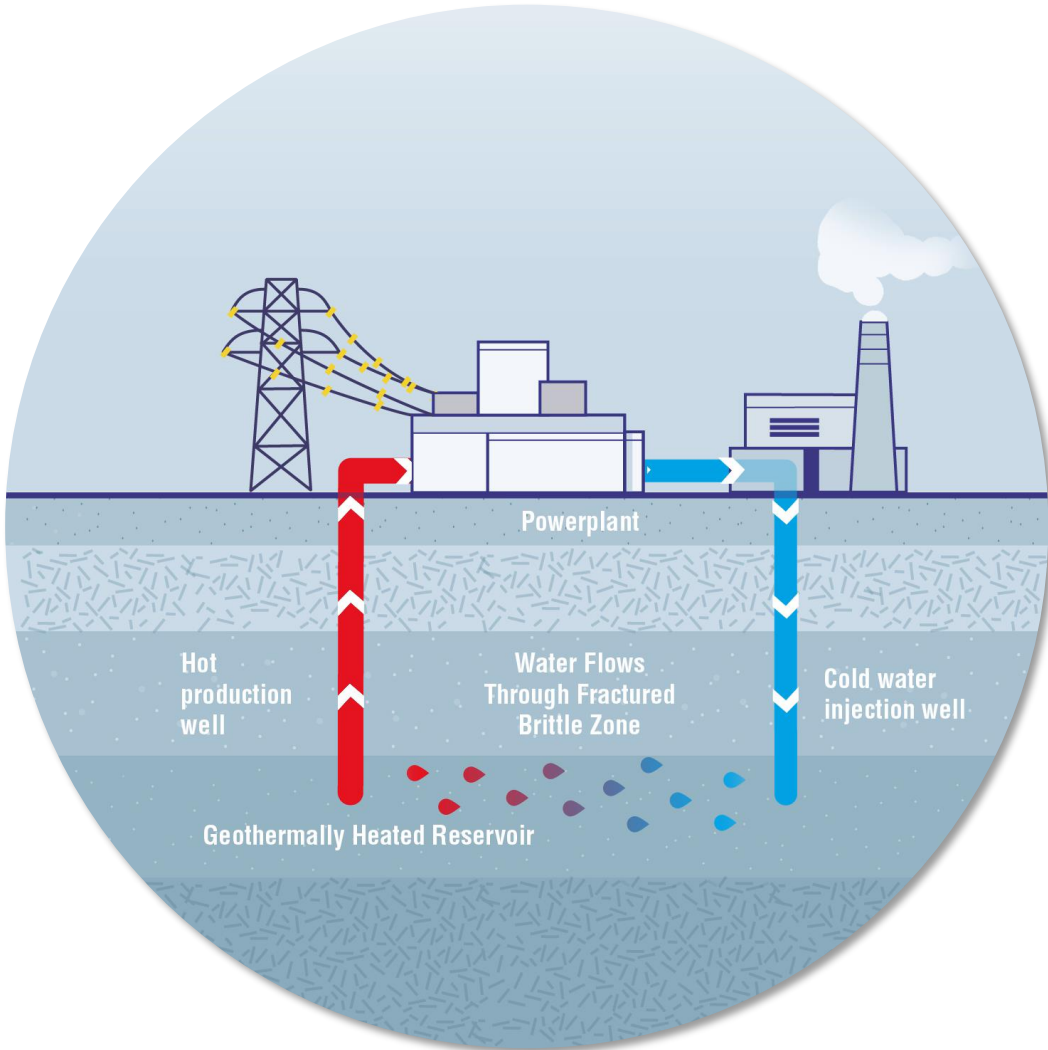
The background of the slide is a large, blue-tinted image of a massive industrial pipe, likely made of metal, with a ribbed texture. The pipe is shown in a perspective view, curving from the foreground towards the background. The lighting creates highlights and shadows, emphasizing its cylindrical form and the texture of its surface.

# USING VACUUM INSULATED TUBINGS FOR GEOTHERMAL APPLICATIONS

**Pierre-Etienne BOUGON**

Geothermal Business Development Manager

# THE CASE FOR CLOSED LOOP GEOTHERMAL

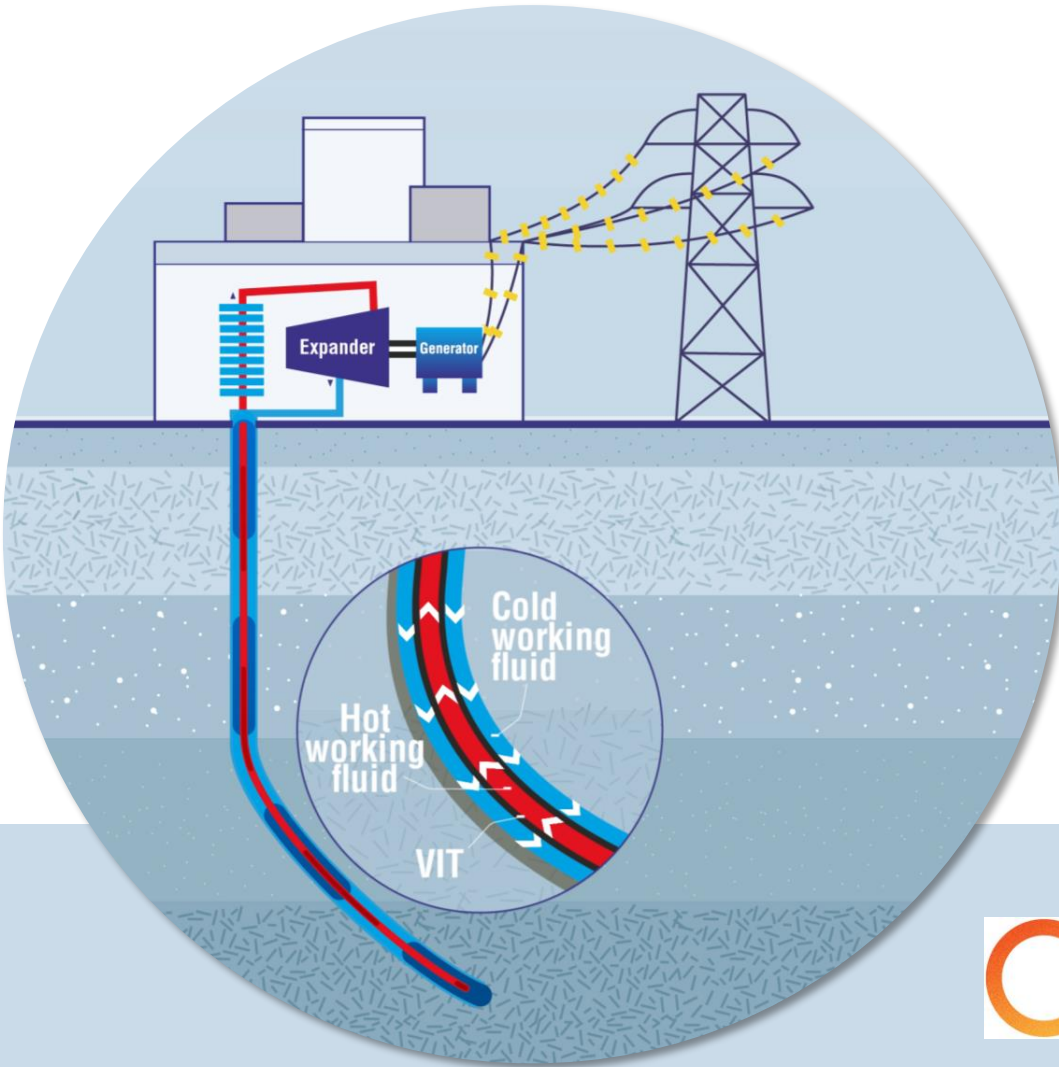


- ▶ **A versatile, low-carbon source of baseload energy with limited impacts**

Geothermal represents today less than 1% of the world power mix – well below Wind or Solar power

- ▶ **Development impaired by**
  - High subsurface risks
  - High Capex
  - Limited potential for scalability
  - Location specific

# THE CASE FOR CLOSED LOOP GEOTHERMAL



## ▶ Unlocking geothermal potential thanks to Closed Loop Geothermal

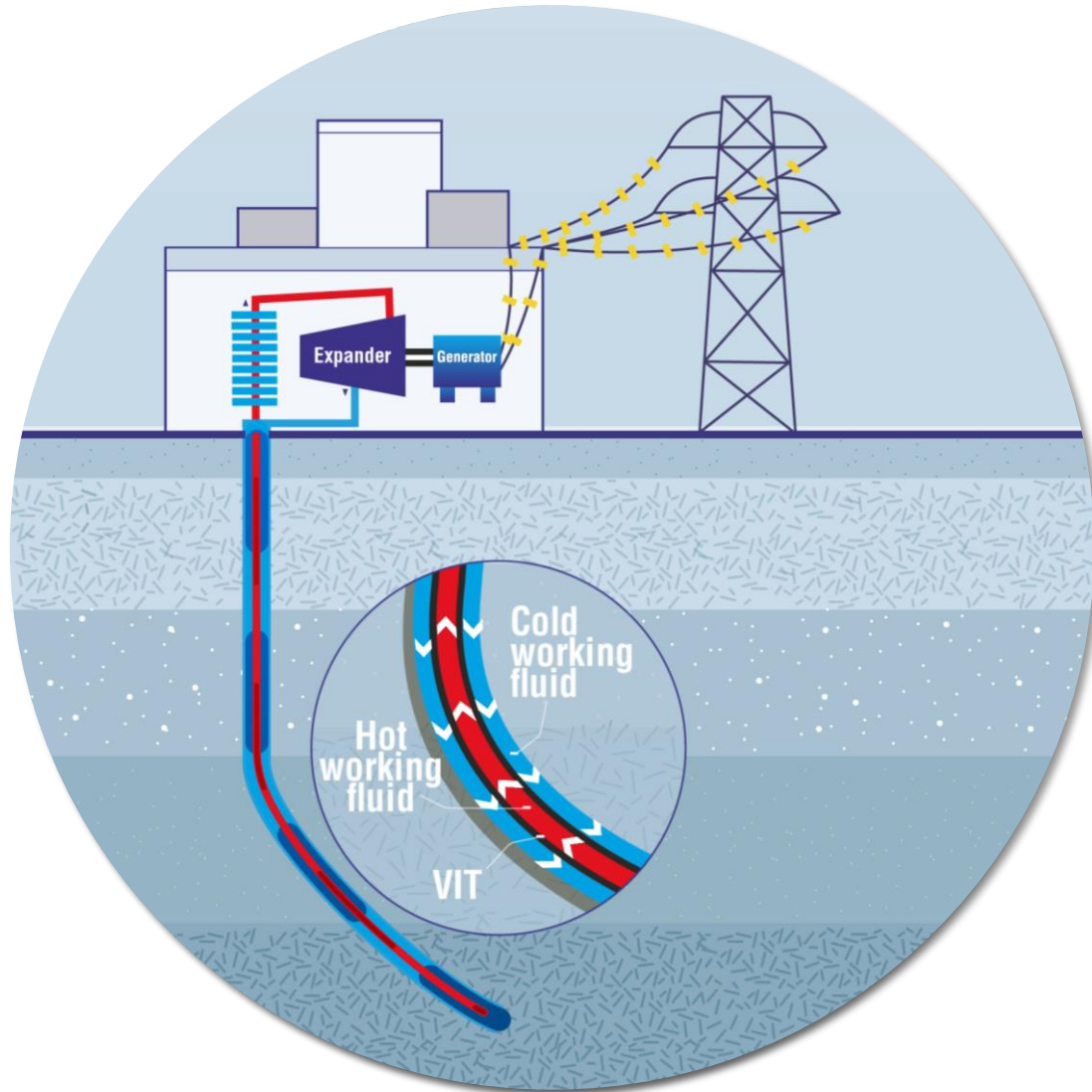
- Limited Sub-surface risks
- No reservoir depletion
- Can be implemented virtually everywhere
- Truly scalable
- **Lower efficiency than traditional geothermal**



**GreenFire Energy**



# FOCUS ON CO-AXIAL DESIGN



## ▶ Single well set-up

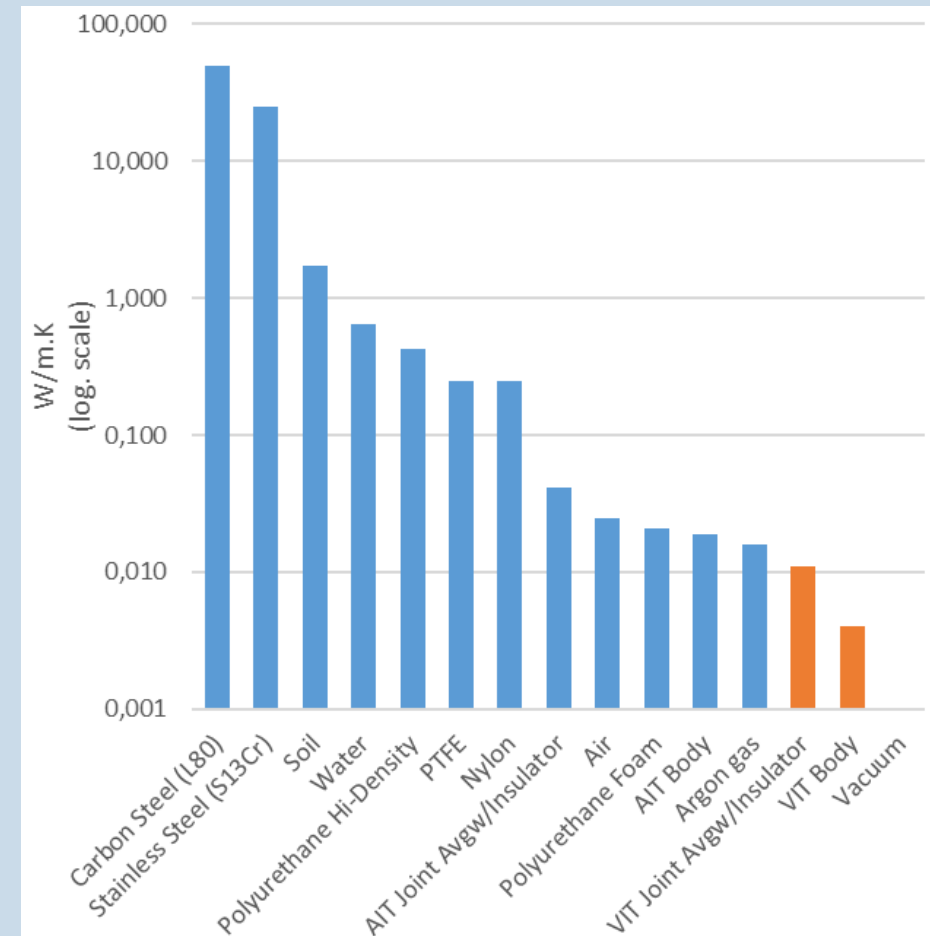
- Upwards hot flow
- Downwards cold flow
- Flows segregation thanks to **VIT: Vacuum Insulated Tubings**

# INTRODUCING THERMOCASE ® VIT

- ▶ A Vacuum Insulated Tubing is a pipe-in-pipe tubular product that thermally insulates the fluid that circulates within



- ▶ 3 main components to limit thermal transfers
  - Vacuum + Getters → limit conductive transfer
  - Multi-Layered Insulation → limit radiative transfer
  - Centralizers → avoid thermal bridges



**Best-in-class insulation properties**

- $k_{VIT}=0,004$  W/m.K

# RISING TO THE CHALLENGE



- ▶ **Coaxial closed loop design successfully tested in the US and in Asia in the past 2 years.**
- ▶ **Some challenges ahead for VIT to unlock potential**
  - Improve the ageing performance of VIT (> 30 years)
  - Develop a « HT/HD » solution : 450°C / 10km TVD
  - Expand availability to Larger Ods: > 16" OD



**WANT TO KNOW MORE ABOUT VIT'S?  
FEEL FREE TO CONTACT ME**

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