

Summary of New Drilling Technologies

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1.2 Requirements for new Drilling Technologies

Reaching the following targets is crucial for the successful development and deployment of new deep drilling technologies:

- vertical or inclined well bores up to a true vertical depth of 10 km and more have to be routinely possible
- large diameter wellbores – multiple times (up to 5x) larger than oil and gas wells at the final drilling depth
- casing while drilling and/or monobore cased with very long stretches of expandable tubulars
- ultimate goal in economic terms: the specific unit well cost (€/MWh) needs to increase linearly with depth.

1.3 Examples of new Drilling Technologies

There are more than 20 research efforts dealing with a wide variety of innovative drilling technologies such as: enhanced rotary, laser, spallation, plasma, electron beam, electric spark and discharge, electric arc, water jet erosion, ultrasonic, chemical, induction, nuclear, forced flame explosive, turbine, high frequency, microwave, hammer and several others. Some promising approaches are presented in the following sections.