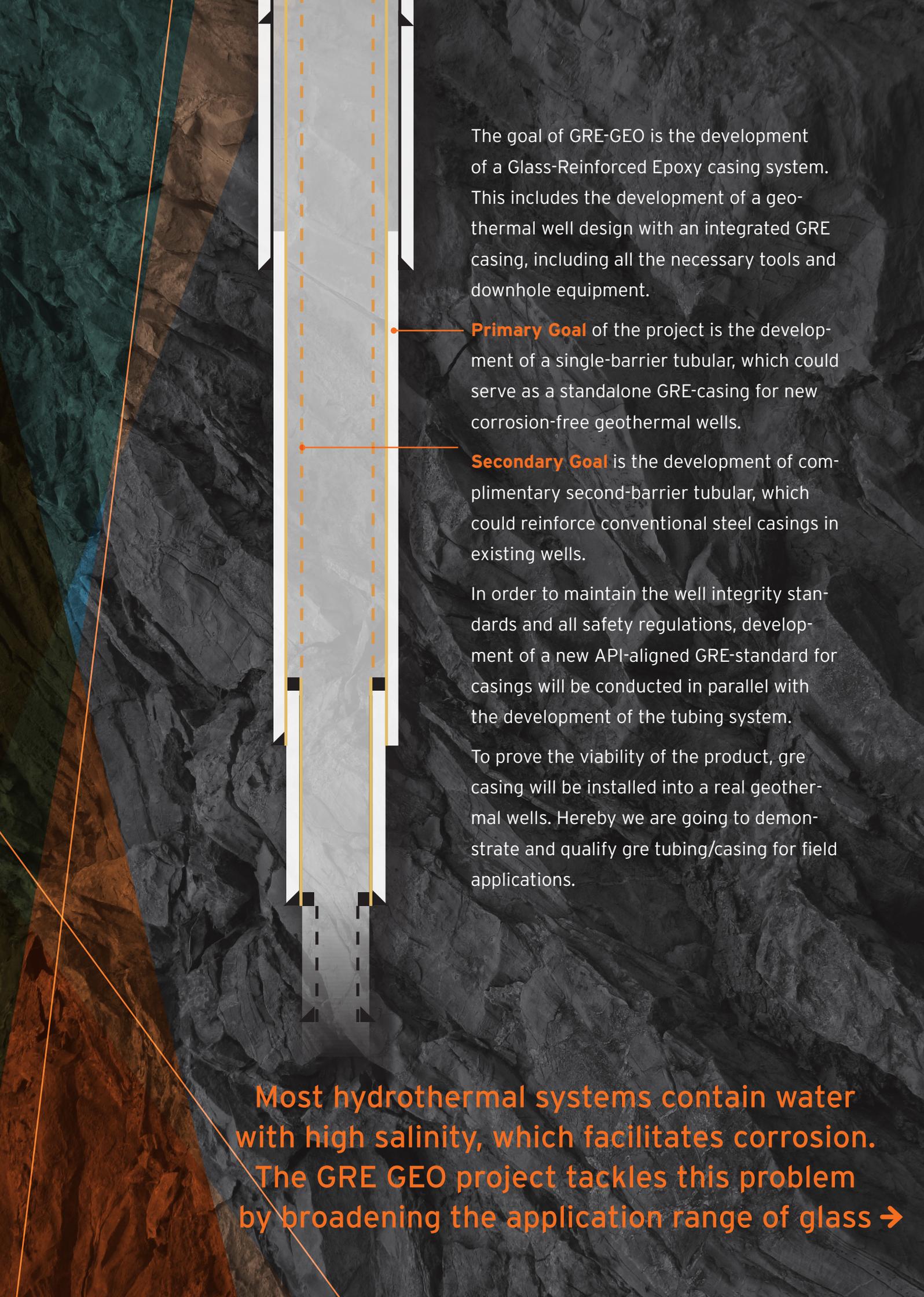


Glass Fiber Reinforced Epoxy Casing System

for Geothermal Application

- Corrosion-Free Casing
- Minimal Maintenance Well
- Minimal Scaling Well
- Long-Term Integrity Solution





The goal of GRE-GEO is the development of a Glass-Reinforced Epoxy casing system. This includes the development of a geothermal well design with an integrated GRE casing, including all the necessary tools and downhole equipment.

Primary Goal of the project is the development of a single-barrier tubular, which could serve as a standalone GRE-casing for new corrosion-free geothermal wells.

Secondary Goal is the development of complimentary second-barrier tubular, which could reinforce conventional steel casings in existing wells.

In order to maintain the well integrity standards and all safety regulations, development of a new API-aligned GRE-standard for casings will be conducted in parallel with the development of the tubing system.

To prove the viability of the product, gre casing will be installed into a real geothermal wells. Hereby we are going to demonstrate and qualify gre tubing/casing for field applications.

Most hydrothermal systems contain water with high salinity, which facilitates corrosion. The GRE GEO project tackles this problem by broadening the application range of glass →

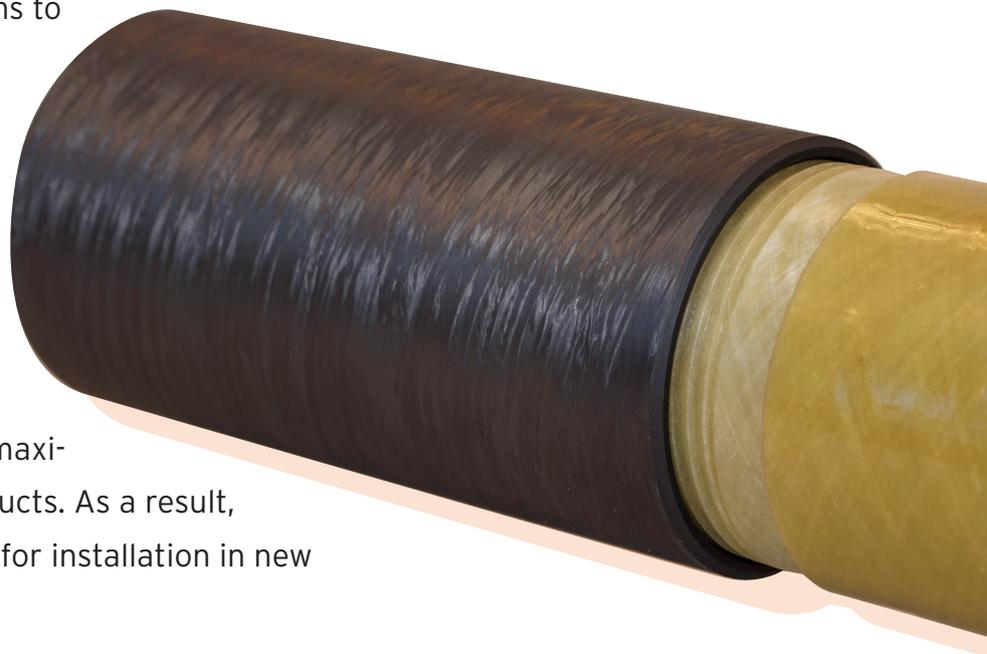
The success of the project implies development of a GRE pipe fit to utilization in subsurface conditions.

In the design stage of the project, a new tubular design along with a corresponding well design will be developed. During this phase geothermal well GRE-casing and GRE-tubing concepts are to be created and numerically verified.

In the following testing phase, the designed pipes are to be constructed and sent through a number of testing procedures. The goal of the test phase is to re-create real subsurface condition in a geothermal well and monitor the GRE-Pipe performance. Testing program includes short-term and long-term examination, which is going to serve as a basis for a pipe service envelope.

Parallel to testing procedures a set of new standards for GRE downhole tubulars are to be developed. In order to achieve the optimal performance and to ensure safety of operation, this work package aims to describe product verification as well as GRE specific well design and -installation, all based on existing API and ISO standards for GRE piping.

Last but not least the project will also review all the downhole tools and equipment to ensure maximal compatibility with new products. As a result, the end-product will be suitable for installation in new as well as the existing wells.



→ fiber reinforced pipes to casings and tubing in geothermal wells. GRE casings increase the life expectancy of wells to over 30 years, effectively reducing the need for workover operation and saving costs on the long run.



Global Engineering & Consulting - Company GmbH (gec-co)

Germany, Main Applicant and national consortium leader

gec-co is an engineering company focused not only on the development and execution of deep Geothermal projects worldwide but also on the development of drilling-related technologies. It specializes in providing basic and detail engineering services for surface installations of geothermal plants, including thermal water systems, feed pumps and reinjection pumps, geothermal power plants, as well as heating plants.



Future Pipe Industries B.V. (FPI)

The Netherlands, Co-Applicant and national consortium leader

FPI B.V. is part of Future Pipe Industries, headquartered in Dubai, UAE. FPI is a global leader in the research, design, manufacturing, supply and site assistance of glass fiber reinforced thermosetting plastic (GRP) pipe systems.



Clausthal University of Technology, Institute of Petroleum Engineering (ITE)

Germany, Co-Applicant

The ITE at Clausthal University of Technology (TUC) possesses a dedicated workshop specializing in testing and verification of subsurface Tubulars. It has been conducting research in several areas of subsurface energy since its founding in 1943. The "Drilling and Production" (D/P) department has its focus on drilling technology, well integrity, and production optimization.



DrillTec GUT GmbH Großbohr- und Umwelttechnik (DrillTec)

Germany, Co-Applicant

Based on the experience of the execution of deep geothermal wells and the implementation of innovative technologies with highest safety standards and automation of processes (Hands-off), DrillTec has become a well-known partner of the E&P, Geothermal and other drilling related industries.



Dynaflow Research Group B.V. (DRG)

The Netherlands, Co-Applicant

Dynaflow Research Group is a consulting firm specialised in the advanced end of the engineering spectrum. DRG delivers technical consultancy services that requires a multi-disciplinary approach: encompassing the static and dynamic analysis of both fluids and gases. Since 1983 DRG is involved in the design, R&D, engineering and implementation of fiberglass systems in the industry and is a founding member of ISO14692.



Eartha

Switzerland, Co-Applicant

Eartha is a one-person firm providing technical consultancy services for the development of geothermal energy projects worldwide focusing on Reservoir Engineering and Technical Due Diligence. It specializes in the development of dynamic reservoir simulations for green fields to evaluate the well operating parameters, production performance and temperature.



Nuclear Research and consultancy Group (NRG)

The Netherlands, Co-Applicant

NRG is a research organization in radiation protection, with dedicated expertise in the field of natural radiation. NRG is active with their expertise in the oil and gas sector, energy power plants and process industry such as steel and phosphate. In addition, NRG provides operational support in these sectors to oversee any risk of unwanted exposure from natural radiation e.g. during maintenance and decommissioning of installations and production sites.

