



4. Quality standards for the management of shallow geothermal energy systems

Success criteria determine the achievement of the management objectives (see list in chapter 2) for the use of shallow geothermal energy. Whether a shallow geothermal energy project is successful or not depends on internal and external influence factors. Internal influence factors cover aspects, controllable or modifiable by the parties involved in the design and realization, like installation design, choice of material and methods, and the intention to comply with all regulations and adhere to high quality standards. The latter point is of particular importance in countries where quality standards for shallow geothermal energy installations are absent or where the standards are low.

Quality standards must cover:

- The application of state of the art procedures for planning, installing, operating and monitoring of shallow geothermal energy use
- Technical standards including the application or provision of tools and knowledge referring to the state of the art
- Fulfilling of specifications to ensure a safe and low environmental impact operation of shallow geothermal systems
- The definition of quality control measures
- The definition of key terms

A legally binding status for these documents must be mandatory since this guarantees compliance. Moreover, such defined quality standards are valid for the whole country and are a big step towards harmonization.

Parties involved in design and realization cannot influence external influence factors. Examples for external influence factors are the political will of introducing binding management routines by decision makers, the general market situation and energy prices, geothermal potential at the chosen location, and already existing technical standards. External influence factors are not considered in this document. The outputs of GeoPLASMA-CE work package 4, in particular [deliverable D.T4.1.2](#) *Draft strategies for the use of shallow geothermal energy in the investigated target regions and cities* and [deliverable D.T4.4.1](#) *Strategy report for future energy planning and management concepts to foster the use of shallow geothermal methods*, touch some external factors.



Legislation should provide regulations on procedures, quality standards and thresholds. Technical standards should not be laid down in legal regulations directly. However, legal regulations should specify which documents are considered state of the art. These documents are thus legally binding but bear the advantage that they can be adjusted more easily and quickly than legislation, i.e. they can be updated regularly to reflect advancements in technology and knowledge.