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The Future lies Underground: Georesources & Geotechnique

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The following hypothesis will be discussed and tested: “The pressing challenges for the 21st century are directly linked to the limited (geo-)resource underground.”
* Fresh water and sufficient food for a growing population are required in a sustainable manner, for our and for following up generations. Securing groundwater resources and soil are therefore of special interest.
* The growing of economies worldwide is based on the exploitation of georesources; whereas ore minerals and low cost energy resources are limiting factors for economic growth.
* Infrastructure in megacities needs to go underground – as through surface installations alone neither public transportation nor energy and water-management can be sufficiently secured for cities exceeding several million inhabitants.
* The predicted increase in extreme weather conditions, due to global change, will increase the risk of e.g. flooding and landslides.

Surprisingly, contrary to the pressing need of geoscience and geotechnique for the future, many European countries have reduced the support of geosciences over the past decades dramatically. Nevertheless, geoscientists need to address the following challenges:
* For a secure and environmental energy supply, geothermal energy and unconventional hydrocarbons are required as well as greenhouse gas reduction technologies such as CCS (Carbon Capture and Storage), asap.
* The transformation to a carbon poor energy supply requires the development of new technology to produce the materials which are the basis of energy converters (Si, Ga, REE etc.) and for energy storage (e.g. Li, V).
* Improved geophysical methods are a must for the development of an efficient underground development and a focused exploration.
* A better process understanding will be necessary to specifically fight the hazards related to global warming.