Title: Natural Hydrogen – will it be the next game changer in our energy system?

Dr. Jürgen Grötsch, Lecturer Geo-Energy at FAU, Erlangen, Germany

Abstract

In order to change the current energy system, alternative resources need to replace wood, coal, oil and gas. The Paris 2015 agreement has resulted in significant efforts to develop such known and new sustainable energy resources. One of the recent new findings in the Geo-Energy sector is natural hydrogen which can be found in many places around the globe as emanations. During 2024, it has made the news in many media. A recent example is the Albanian chromite mine of Bulqizë which is venting some 200 tons/year from its shafts - clearly a resource which could be used in the energy transition.

Reasons for the lack of interest in hydrogen exploration so far were multi-fold, like nobody considered natural hydrogen as a viable option, hydrogen cannot be detected easily, gas chromatographs used H₂ as carrier gas, other energy resources were available in large quantities and at low cost and more. However, many indications point towards a major clean energy resource of the future considering that in the last few years more than 300 seeps have been reported. One of the most famous ones is the eternal fires of Chimaera near Antalya in Turkey, know to burn since more than 2500 years. In the meantime, the first hydrogen exploration companies have formed, however, key information like long-term production tests are still missing.

Natural (white) hydrogen was until now not considered in the energy transition. If further developments turn out to be successful, this may result in another unexpected game changer in the energy industry similar to coal replacing peat in the 1880s. However, the question remains, what such a potential new energy opportunity could look like as part of the future energy mix. An estimated 40 companies are now exploring for natural hydrogen around the globe, however, like in geothermal developments, regulatory frameworks are missing in most countries and sparse digital geoscience data availability hampers progress. Therefore, it is time to add natural hydrogen to the national mining laws as one of the starting points.

The presentation will highlight the current status of knowledge and potential ways forward on this "new" energy resource which was actually already produced for the 1st time in 1907 to fire a lighthouse on Keri Island, more than 100 years ago.