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Natural Hydrogen – an Overlooked Energy Source?

The Potentials of Natural Hydrogen in Germany and France

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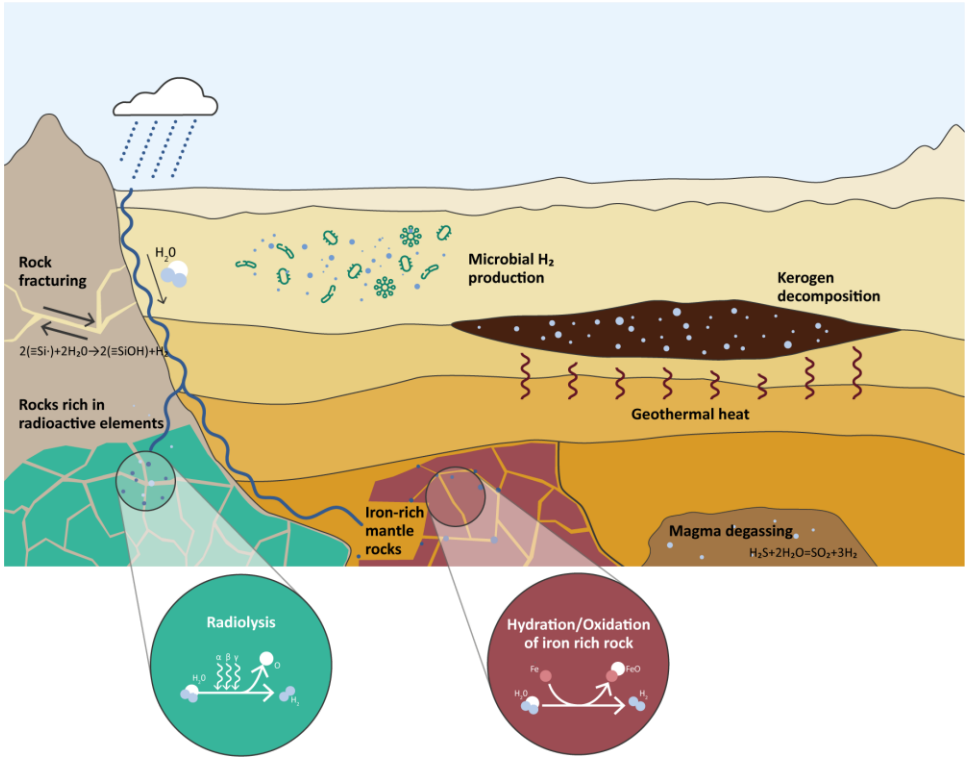
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What is natural hydrogen?

Hydrogen is generated in the geological subsurface by a number of geochemical reactions

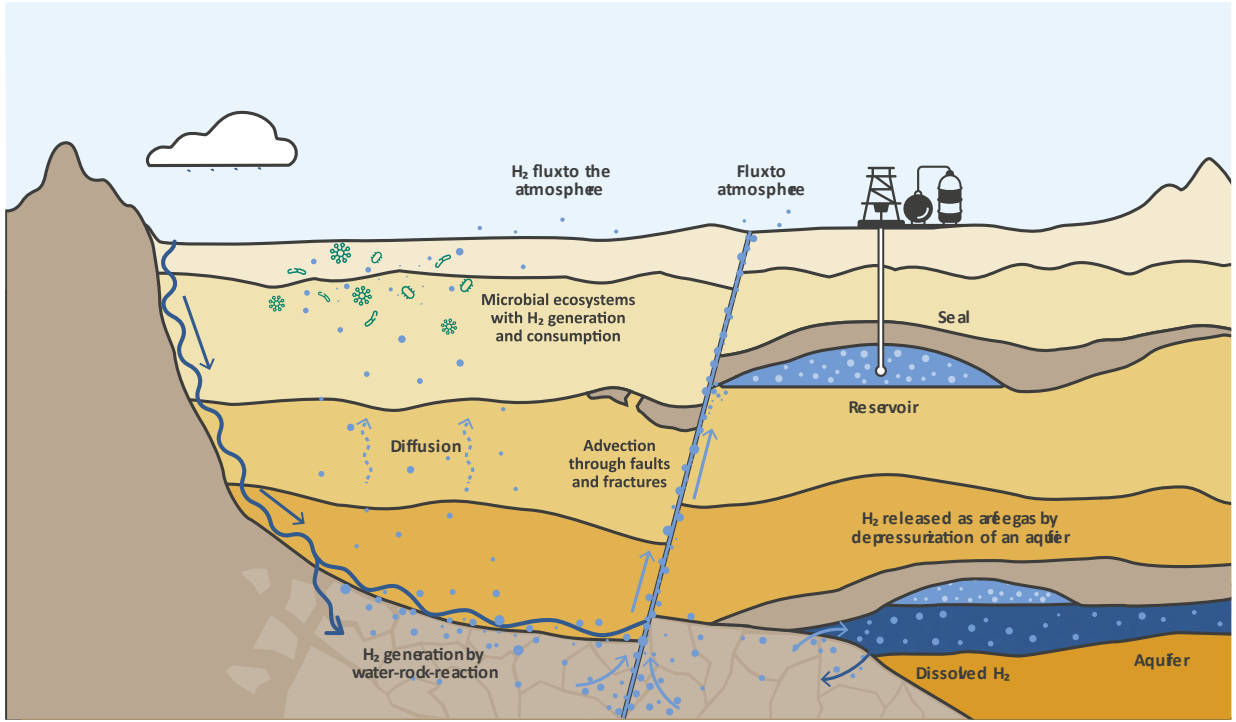


- Estimates vary widely, but it is plausibel that large amounts of hydrogen are generated underground
- The most interesting processes for potential extraction are
  - serpentinization and other hydration/oxidation reactions of iron-rich rock
  - radiolysis

Source: acatech/Leopoldina/Akademienunion 2026: Geological Hydrogen – An Overlooked Energy Source?

Natural hydrogen systems

Migration, accumulation and consumption are poorly understood



- It has not yet been established whether natural hydrogen accumulations exist that are economically recoverable at scale
- Exploration methods need to be developed

Source: acatech/Leopoldina/Akademienunion 2026: Geological Hydrogen – An Overlooked Energy Source?

Can natural hydrogen play a role in decarbonization?

- Only **one (small) production facility in Mali**, operational since 2014.
- Activities by **more than 100 companies** worldwide; initial **exploratory drilling** has taken place in France, the U.S., Canada, Australia, China.
- **Lack of reliable measurement data**; most findings are incidental (from oil and gas exploration, mining, and well construction) and do not allow conclusions about the size of the hydrogen deposits.
- Potentially **cheaper** than green hydrogen.
- **Decentralized applications** and **co-production** (helium, geothermal energy) seem most promising in the short to medium term.
- **Legal framework**: adjustments to mining laws may be required (country-specific).

Natural hydrogen can be a building block of the energy transition, but it is unlikely to be a game-changer

Natural hydrogen in Germany

- **Hydrogen Acceleration Act** (April 2026) states that hydrogen and helium are now included in the list of “bergfreie” (free to mine) raw materials
  → legal framework now facilitates exploration
- First **scientific exploration license** granted in July 2026 (Tellus Energy Solutions GmbH):
  - covering an area of 3,129 km² in Northern Bavaria
  - focus on subsurface modeling and minimally invasive exploration methods
  - targeted at geothermal energy, hydrogen and helium
- **Research projects** by several institutions including Federal Institute for Geosciences and Natural Resources (BGR), GFZ Helmholtz Centre for Geosciences, Fraunhofer Research Institution for Energy Infrastructures and Geotechnologies IEG, Universität Erlangen-Nürnberg (FAU)

Natural hydrogen is still in a very early phase in Germany

Discussion paper



Geological Hydrogen – An Overlooked Energy Source?

- published April 2026 in German and English
- provides an overview of the current state of scientific knowledge regarding geological hydrogen

https://energiesysteme-zukunft.de/en/publikationen/stellungnahme/geological-hydrogen

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