



H2Valley

Pioneering Natural Hydrogen (H₂) and Helium (He) Exploration and Extraction

[H2Valley - home](#)

CEO, Founder: Sergey.Frolov@h2valley.tech

mob. + 90-534-285-97-04



Introduction to H2Valley

We are

professionals
in exploration and extraction
of **GEOLOGICAL HYDROGEN***
AND HELIUM

Geological H₂ is
inexhaustible, clean
and most efficient

significantly cleaner and
more efficient than **green**
and **blue** hydrogen

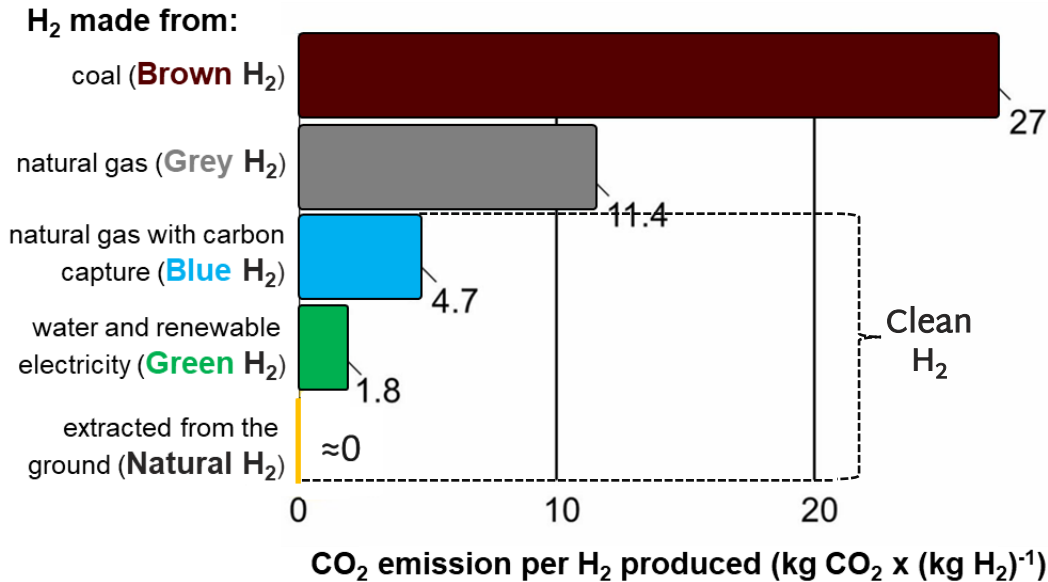
We use unique and
proven geological
model

revealing **inexhaustible and
abundant** H₂&He resources at
low exploration and extraction
costs

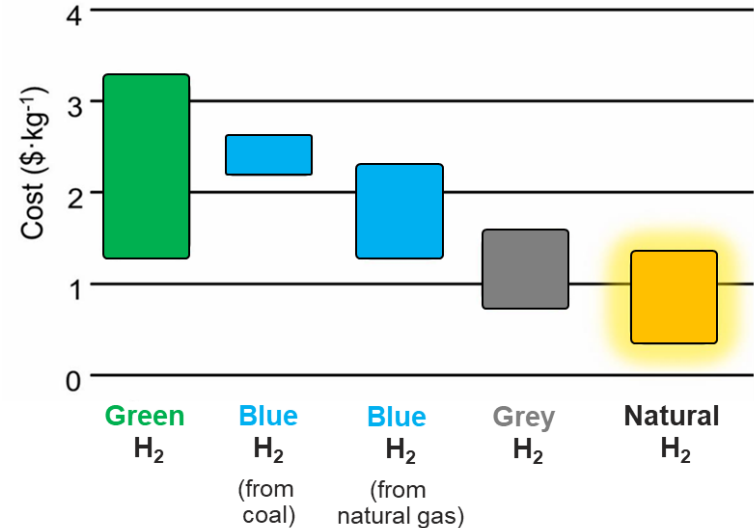
*also known as white, golden or natural hydrogen

Natural H₂ is Cleaner and The Most Efficient

Carbon footprint comparison (2021)



H₂ estimated cost in 2050



Unique and Proven Geological Model

One of our founders, Nikolay Larin,
drilled the

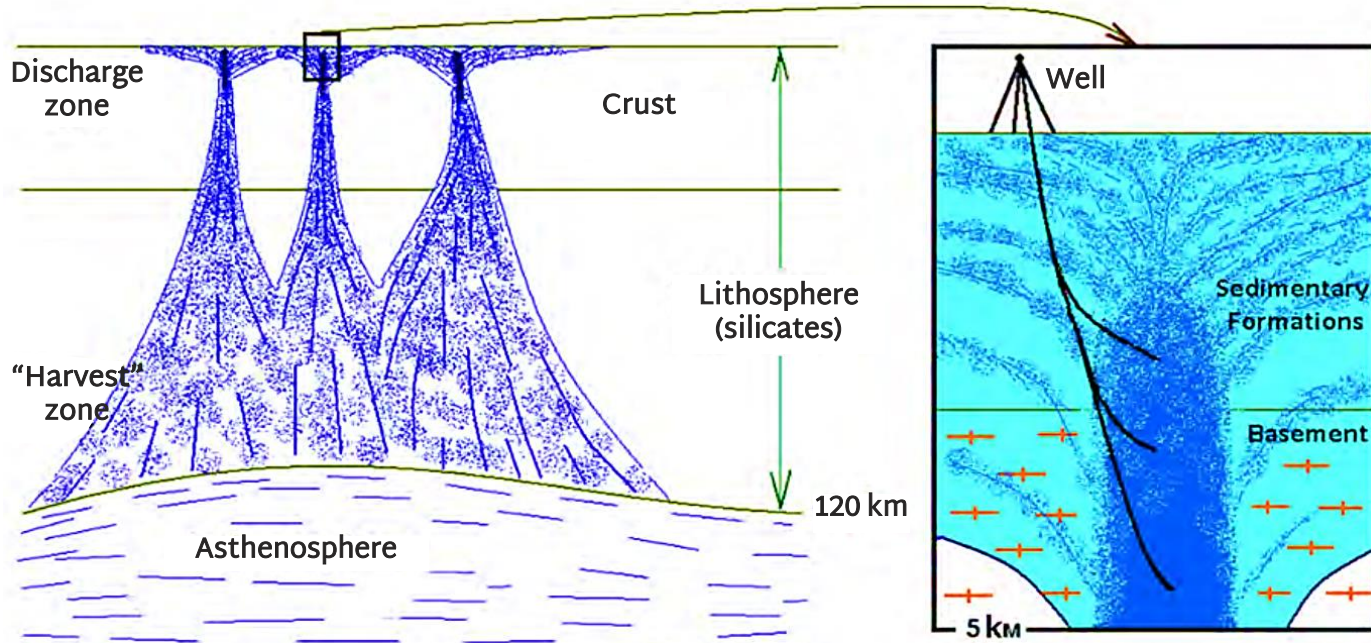
FIRST DESIGNATED H₂&He WELL

as a chief geologist of the legal entity operating the
Hoarty-3 well in Nebraska, USA

This well, drilled in 2019, marked a historic milestone in
successful exploration and extraction of natural H₂&He



Our Geological Model for Extraction



H₂ Market

Global H₂ market

\$174B

in 2023

or 94M tonnes

\$700B

by 2030

6-9% annual growth

\$1T

by 2050

or 212M tonnes

Clean H₂ market by 2030

25%

share of total H₂

=

\$175B

clean H₂

→

\$50B

natural H₂

He Market

Semiconductor industry will drive the market

Global He
market

\$2,3B

in 2022

or 29k tonnes

\$3,4B

by 2030

or 34k tonnes

\$6B

by 2035

or 57k tonnes

Target H₂ Customers



Chemical Manufacturers

such as **Yara** (ammomia) and **Methanex Corp.** (methanol) are looking for low-carbon alternatives of natural gas and coal



Steel Manufacturers

such as **ArcelorMittal**, and **thyssenkrupp**, need clean hydrogen to decarbonize operations lowering natural gas and coal consumption



Refineries

such as **BP** and **Shell**, shifting toward cleaner operations replacing **grey** and **green** H₂



Energy Companies

such as **EDF**, **Enel** and **Duke Energy**, could use natural H₂ for power generation and grid balancing during the time when there is no wind or sun

Target He Customers



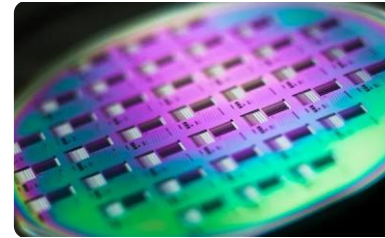
Medical & Healthcare

Medical, Imaging centers and hospitals consume He mainly for cooling in MRI machines



Aerospace

such as NASA, ASA, CNSA, ISRO, JAXA and Space X use He for cooling rocket fuel and pressurizing fuel tanks



Electronics & Electrical

such as Intel and TSMC use He for cooling and as an inert environment in fabrication processes, CERN uses He for cooling super conducting magnets



Metal Fabrication

Metal processing companies use He as an inert atmosphere in specialized welding applications for metals like aluminum and titanium

Industry Problems

Unaffordably high electrolysis costs

Green H₂ production is hindered by high costs due to inefficient process – **1 kg of H₂ consumes 55 kWh but it yields only 33 kWh**

High costs of carbon capture

Blue and **turquoise** H₂ production relies on carbon capture technology, which is expensive and unreliable (leaks)

Limited nuclear energy availability

Pink (or **purple** or **red**) H₂ production depends on nuclear energy, which faces challenges related to availability and safety

High costs of carbon footprint

Gray, **black**, and **brown** H₂ production relies on fossil fuels, leading to greenhouse gas emissions, covered by carbon credits

Lack of H₂ infrastructure

prevents the widespread adoption of hydrogen as a fuel source

Helium supply scarcity

due to lack of exploration, depleting existing reserves and geopolitical turbulence leading to drastic price volatility (by 2-4 times)

Clean H₂ Projects Challenges

Green H₂ project delays and cancellations

due to:

- huge investments,
- extremely energy inefficient production process leading to high costs,
- lack of infrastructure
- and decreasing government incentives

Money wasted on natural H₂ random drilling

due to:

- misleading geological concepts (serpentinization and biogenesis)
- and lack of natural H₂ exploration and extraction know-how

leading to unsuccessful drillings and mistrust from investors and industrial community



Business Opportunities

Extremely high margin and sustainable H₂&He business

with cost-effective business model of natural H₂&He extraction, based on unique and **PROVEN GEOLOGICAL MODEL**

Bringing clean H₂ to every consumer

capitalizing on the opportunity to discover **natural H₂** in almost every country

Skimming clean H₂&He markets

satisfying booming H₂&He market demand in different countries with a highest margin as a new industry pioneer

H2Valley's Proven Solution

Lower investments and costs

Our approach lowers CAPEX (by 30-50%) and OPEX (cash costs: natural H₂ – about \$1/kg, green H₂ – \$4-10/kg and blue H₂ – \$2.3-4.5/kg)

Extremely valuable helium

with 2-4% concentration, \$90 market price and \$12 cash cost (87% margin profit)
BOOSTS PROJECT'S NET PROFIT BY 3-5 TIMES!

Competitive pricing

We aim to sell H₂ at the market price of \$3/kg – **NO NEED FOR STATE COMPENSATION** compared to significantly more expensive green H₂

Infrastructural independence

Our model allows finding natural H₂ sources as close to consumers as possible, **improving** their businesses' bottom-line

Sustainable Business



People

Natural H₂ projects decrease social and countries' disbalance and serve as responsible and sustainable partners to local businesses



Planet

By utilizing geological hydrogen, natural H₂ projects reduce carbon-intensive production methods and contribute to a cleaner energy future



Profit

Natural H₂ projects create long-term value for investors and partners by delivering highly profitable, globally scalable and the environmentally cleanest H₂

Contribution to UN Goals



Zero Hunger



Natural H₂ supports clean ammonia production for fertilizers, reducing emissions. It also enables single-cell proteins and edible oils to boost global food security

Clean Water & Sanitation



Clean water production is a by-product of many natural H₂ usage applications, supporting sustainable water access and management

Affordable & Clean Energy



in almost all corners of the world, decentralizing and enhancing energy security. Natural H₂ storage can stabilize renewable energy grids

Climate Action



Natural H₂ supports decarbonization by substituting fossil fuels and capturing environmentally hazardous natural hydrogen seepage

H2Valley's Competitive Advantages

	H2Valley's advantages	Competitors' disadvantages
Geological basis	<ul style="list-style-type: none">• Operating the proven and working geological model• First to explain the natural H₂ phenomenon	Use unproven and misleading geological models, based on hypotheses
Natural H₂ exploration experience	<ul style="list-style-type: none">• Our founder drilled the first designated H₂ well in the USA (Nebraska) in 2019• Company founders have positive exploration results – H₂ sources identified in the USA, Mongolia, Morocco, India, Oman, Australia and Egypt	<ul style="list-style-type: none">• Lack of natural H₂ positive exploration experience• Use Oil&Gas algorithms not suitable for natural H₂• Wasted random drilling without results

Costs Comparison for 15,000 tonnes/year Clean H₂ Production Project

Type of the H ₂ Project	Initial investments	Operating cash costs (per 1 kg H ₂)
Blue H ₂ production	\$110 – 190M	\$2.3 – 4.5
Green H ₂ production	\$160 – 265M	\$4 – 10
Natural H ₂ extraction by competitors	Unpredictable due to using misleading geological concept	
Natural H ₂ extraction using <u>H2Valley's proven geological model</u>	\$50 – 65M	About \$1

Case Study: JV with Industrial Partner

Location	H2Valley identifies H ₂ &He-rich sites globally near H ₂ consumers (off-takers)
Consumer	Large Industrial company (business partner) seeking affordable H ₂
Project Structure	Joint venture where H2Valley explores and extracts H ₂ &He using partner's (or banks'/investors') financing with a long-term H ₂ offtake agreement
Outcome	Annual extraction of 12-18k tonnes of H₂ and 350-500 tonnes of He (1%) from 7 wells (1 geo-structure)
Financials	\$50-65M CAPEX, \$80-120M annual revenue, 70% EBITDA margin, \$160-340M NPV (12% discount rate), 4-6 years DPP from the start of investments

Standard Project Initiation

Funding stage	Use of proceeds	Results	Timeline
<p>PRE-SEED</p> <p>\$2–2.5M</p>	<ul style="list-style-type: none"> • project company legal setup • staffing • geological surveys • field research • pre-feasibility study • marketing 	<ul style="list-style-type: none"> • project legal entity • project team • pre-feasibility report • exploration license 	<p>5 - 7 months</p>
<p>SEED</p> <p>\$4–5M</p>	<ul style="list-style-type: none"> • staffing • geophysics • geochemistry • feasibility study • marketing 	<ul style="list-style-type: none"> • feasibility report • drilling license 	<p>5 - 7 months</p>

The exact numbers depend on location of the project