



Geothermal prospects in Lithuania

Economics and market fit: the firm, flexible partner for solar, wind and batteries

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Lithuania has built over 6 GW of weather-driven power

3.5 GW

solar installed

2.7 GW

wind installed

0.7 GW

battery storage

68%

of 2025 generation was
renewable

And the pipeline keeps growing

Letters of intent cover 3.2 GW of onshore wind, 3.8 GW of solar and 3.7 GW / 9 GWh of batteries. The government targets 8 GW of wind and solar by the end of 2028.

What the mix still lacks: firm, flexible, low-carbon capacity

01

Firm output when the weather fails

Winter evenings and still, dark weeks leave solar and wind short. Imports and natural gas still fill the hole at **110 €/MWh**

02

Storage that shifts a whole day

Grid congestion makes new solar ever more dependent on storage. Lithium-ion covers hours, not overnight or multi-day gaps.

03

Low-carbon heat

Biomass boilers installed 10–15 years ago are largely worn out, and their heat will struggle to compete.

Geothermal answers all three from the same wells.

The resource under Lithuania is large and well mapped

2.5 GWe · 10 GWt

Conservative estimate with conventional technology
(Ministry of Energy studies, 2008)

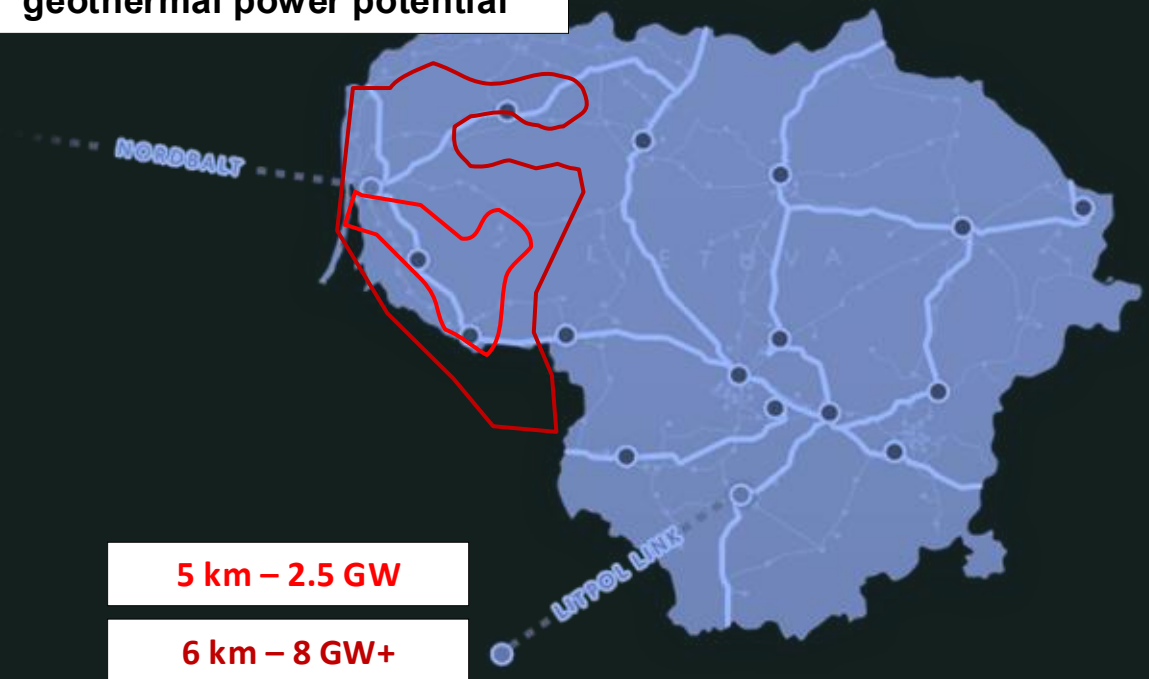
4–6 GWe

Likely potential with modern geothermal technology

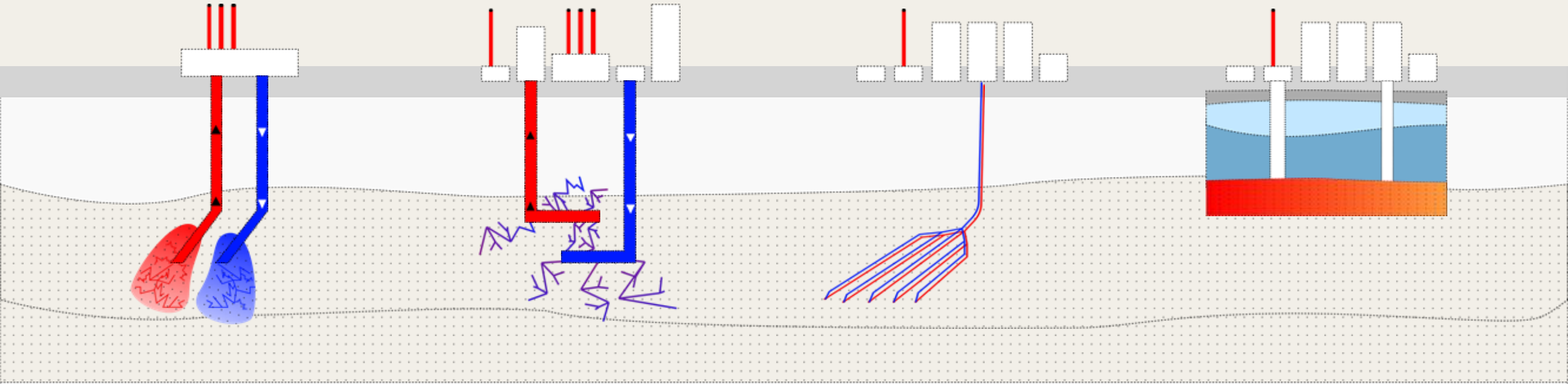
100+ GWt

Heat from 120 °C rock at 3.5-5 km depth

Est. depth to 180°C and
geothermal power potential



Technologies are ready for deployment



Pressure Geothermal System

Up to 25-50% more net power output & Lower CAPEX

Lower risk of induced seismicity

Flexibility for power, storage, and district heating markets



Enhanced Geothermal System (EGS)

Higher subsurface complexities connecting wells in the subsurface

Fracture network causes friction and water losses, increasing parasitic loads and reducing net output.



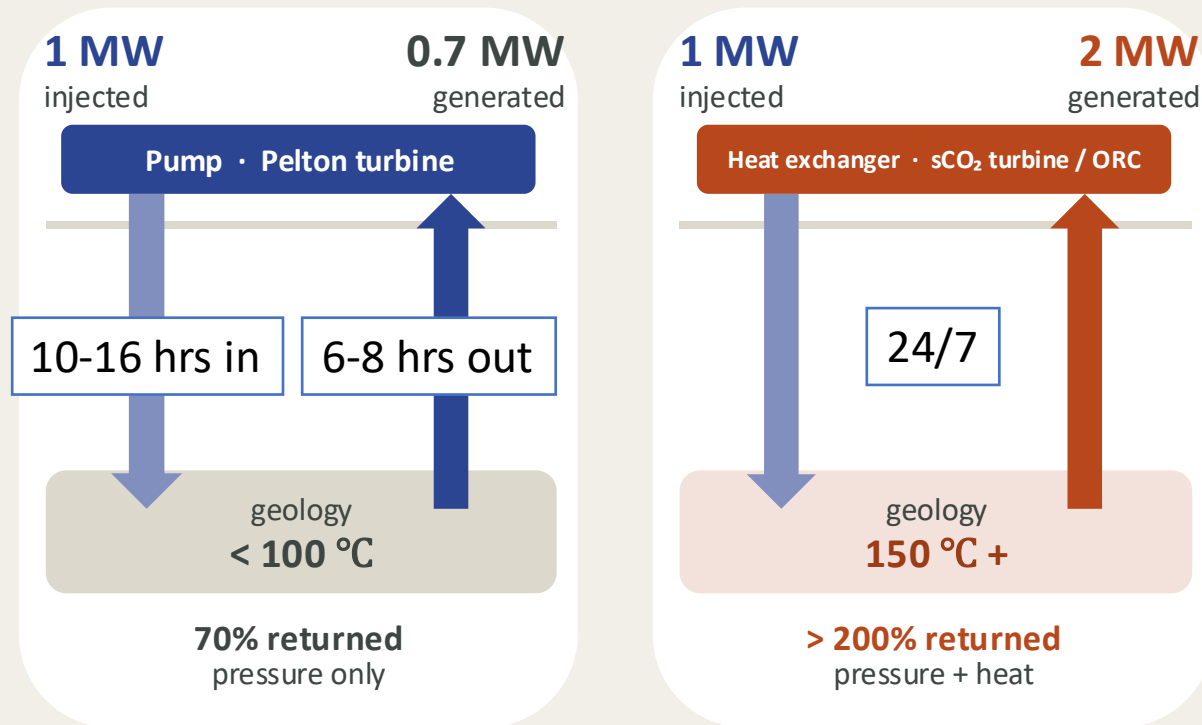
Closed-Loop Geothermal System

Requires tens of thousands of feet of drilling and casing, increasing CAPEX costs and time to onstream.

Conventional Geothermal (ORMAT)

Geographically limited to volcanic and geyser areas, representing only 2% of all geothermal resources. Requires large water volumes. Proven long-term development model (1960's-present).

One pair of wells, two products: heat and storage



< 1 month

to drill and complete a well

25–50% more

net power than hot dry rock systems

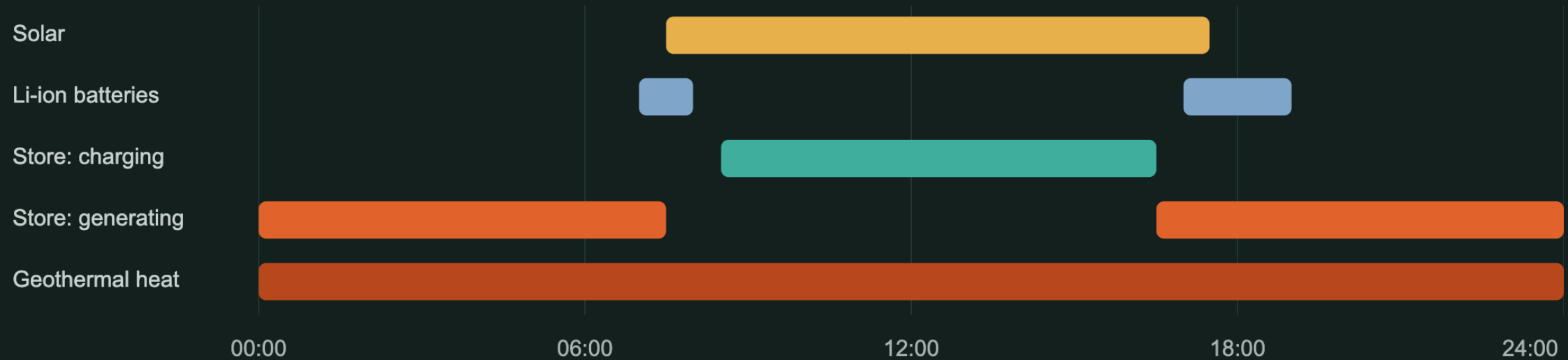
< 2%

water losses, vs 10–20% for traditional EGS

70–75%

round-trip efficiency as storage

Geothermal works alongside solar, wind and batteries



Absorbs the midday surplus that would otherwise be curtailed

Returns it for 4 to 24+ hours when prices rise

Leaves Li-ion free for fast, short-duration balancing

Storage economics: lower capital cost at any duration

Capital cost, € million per MW

Geothermal storage



Stacked Li-ion



Pumped hydro



Geothermal storage cost holds for any duration.

Land for 200 MW, 24/7 from solar

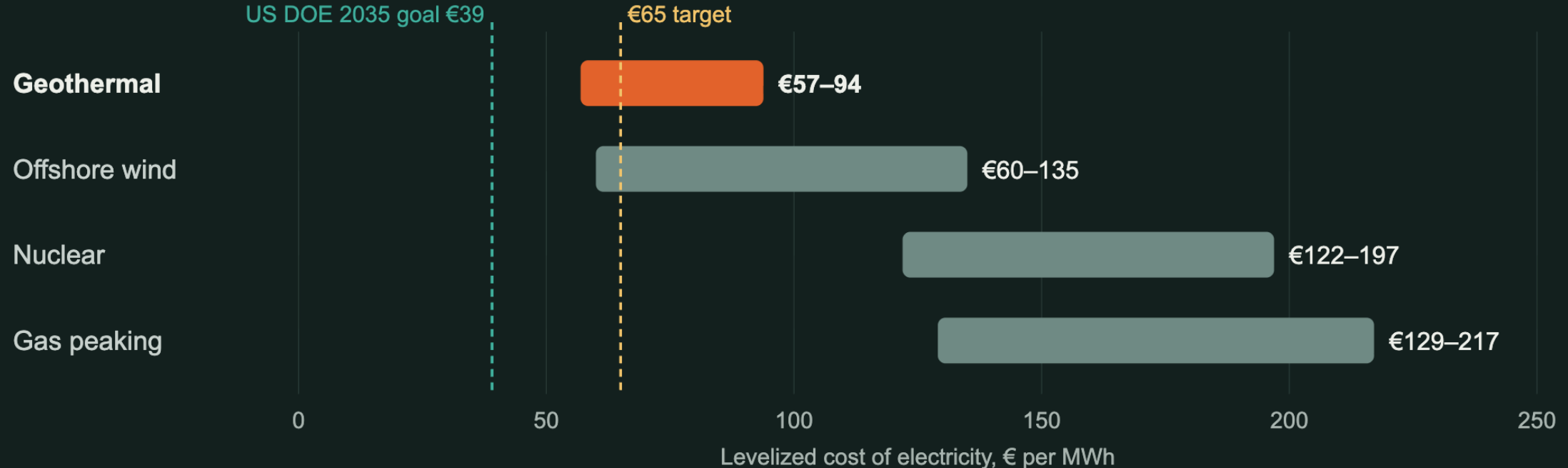
Solar field **1,416 ha**

Water storage **32 ha**

Geothermal storage **8 ha**

No degradation, under 2% fluid losses, low fire risk,
3–5 MW per well.

Firm geothermal power is already cost-competitive. LCOE:



Geothermal delivers **firm baseload** at or below the cost of variable offshore wind, and well below new nuclear and gas peakers.

Versus offshore wind: firm, faster to build, onshore

	Offshore wind	Geothermal
Output	Weather-dependent; adds to the same variable supply as onshore wind	24/7 firm heat and power, plus dispatchable storage
First power	Around 2033 for the second 700 MW park	24–36 months to scale
Procurement	Second tender declared void in October 2025 after a single bid	Modular, 3–5 MW per well, privately financed step by step
Price reference	Tender price cap of €125.74/MWh (2025 relaunch)	Target LCOE of €65/MWh
Siting	About 30 km offshore; needs new export transmission	Next to load and heat networks; about 0.1 ha per MW

Versus SMRs: available this decade, in smaller steps

	Small modular reactors	Geothermal
Timeline	Decision by 2028, first unit by 2038 in the Ministry's planning	Commercial facility completed in Texas in 2025; 24–36 months to scale
Maturity	None operating in the West; BWRX-300 feasibility MoU signed Feb 2026	Off-the-shelf drilling and surface equipment
Cost reference	New nuclear €122–197/MWh; SMR costs still unproven	€57–94/MWh today
Capital at risk	Units of up to about 300 MW each	3–5 MW per well; scale as results come in
Fuel and waste	Imported fuel; repository site decision not expected until 2047	No fuel, no logistics, no geopolitical supply risk

Heat is where geothermal pays first

DISTRICT HEATING

Klaipėda

Heat output	25–35 MWt
Reservoir	2 wells, ~135 °C
Estimated CAPEX	€20–25M
LCOH	<20 EUR/MWh

TOWN AND INDUSTRY · ŠAKIAI DISTRICT

Gelgaudiškis

Heat output	14–17 MWt
Storage	7.5 MWe, 120 MWh
Anchor customer	~5 ha greenhouse
Local jobs	50–100

Plants across western Lithuania, from Klaipėda and Šilutė to Tauragė, Šakiai and Kelmė, would cut biomass demand and ease fuel prices for every heat consumer.

One asset, three revenue streams

Heat offtake

10–20 year contracts with district heating and industry, at a fixed price or indexed to biomass and heat markets.

Trading and balancing

When heat demand is low, the wells become a geological battery: charge on cheap Nord Pool hours, sell when prices rise, bid into balancing.

Green power supply

Fixed or Nord Pool-linked PPAs for energy-intensive industry and data centres. Sage is building 150 MW for a Meta data centre.

Weather-independent income, low variable cost, no fuel to buy.

What would unlock geothermal in Lithuania

- 1 Technology-neutral support**

Revenue support is designed for offshore wind, and storage grants named only electrochemical batteries. Let geothermal compete on equal terms.
- 2 Support for first commercial-scale pilots**

Early projects build investor confidence and lower the cost of capital for larger plants.
- 3 Partnership with US programmes**

Join the DOE Enhanced Geothermal Shot and Utah FORGE, building on KTU's geoenergy lab and its MoU with Colorado School of Mines.

SUMMARY

Solar and wind for volume. Batteries for speed. **Geothermal for firm heat, power and all-day storage.**

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