US Department of Energy highlights next-generation Geothermal as pathway to clean 24/7 base load power

Earths Energy (ASX:EE1) (EE1 or the Company) is pleased to highlight a major new report by the US Department of Energy (DoE) – "Pathways to Commercial Liftoff, Next-Generation Geothermal"[1] (Report), which identifies that next-generation geothermal technologies as a key contributor to secure, domestic, decarbonised power generation. The US is the world's largest geothermal power producer and leader in next-generation geothermal technology. EE1 recently announced a strategic MoU with Baker Hughes[2], a global leader in developing and deploying these technological innovations, to support the development of the Company's geothermal assets.

HIGHLIGHTS

- **The Report highlights the advantages of geothermal over other forms of energy to achieve the clean energy transition, by providing emission free 24/7 baseload power.**
- **Next-generation geothermal has a unique value proposition, including minimal workforce and supply chain risk, low land use, and flexible generating capability**
- **Geothermal power technology has shown compelling advances and has potential to expand the use of geothermal power rapidly.**
    - *The DoE forecasts a more than 20-fold increase in geothermal power, from ~4GW installed in the US today to 90 GW by 2050.*
    - *A 50% reduction in the cost of geothermal generation was achieved in the past two years and a further two-thirds reduction is expected from the already reduced base.*
    - *The DoE projects that next-generation geothermal will be cost competitive with other non-emitting sources of firm power.*
- **EE1 is well positioned to benefit from these technological and commercial advancements.**
    - *EE1 has partnered with Baker Hughes, a major geothermal technology provider, to apply next-generation geothermal technology in Australia.*
    - *EE1 is planning to explore, develop, and commercialise its strategically located Australian geothermal projects by leveraging the technology capabilities of Baker Hughes.*

Managing Director Matt Kay commented: *"We believe clean, 24/7 baseload power provided by geothermal can make a crucial contribution to Australia's clean energy transition. In its Report, the US Department of Energy has recognised the contribution that next-generation geothermal technologies can potentially make to the clean energy transition and forecasts a more than 20-fold increase by 2050. By partnering*

[1] https://liftoff.energy.gov/wp-content/uploads/2024/03/LIFTOFF_DOE_NextGen_Geothermal_v14.pdf
[2] See ASX announcement 18 March 2024

with Baker Hughes, EE1 has unique access to these technologies. We look forward to working with Baker Hughes to apply next-generation geothermal technology to our strategically located tenements in South Australia and Queensland."

US DoE projects more than 20-fold increase in geothermal power by 2050

The DoE Report states that "*Geothermal power technology has shown compelling advances that can enable it to become a key contributor to secure, domestic, decarbonized power generation for the US as a source of clean firm power*[3]."

Economy-wide decarbonisation modelling suggests that the U.S. will need an additional 700-900 GW of clean firm capacity to build a decarbonised grid system capable of supporting increased demand. This compares to an additional 63 GW of firm dispatchable capacity and additional power system security services required to firm up distributed energy PV and utility-scale variable renewable energy in Australia by 2050.[4]

The Report projects 90 GW of power from next generation geothermal projects by 2050 in the "Energy Earthshot" scenario, the lowest case – see Figure 1. This is a more than 20-fold increase from ~4 GW installed in the US today, and a significant contribution to the modelled requirement.

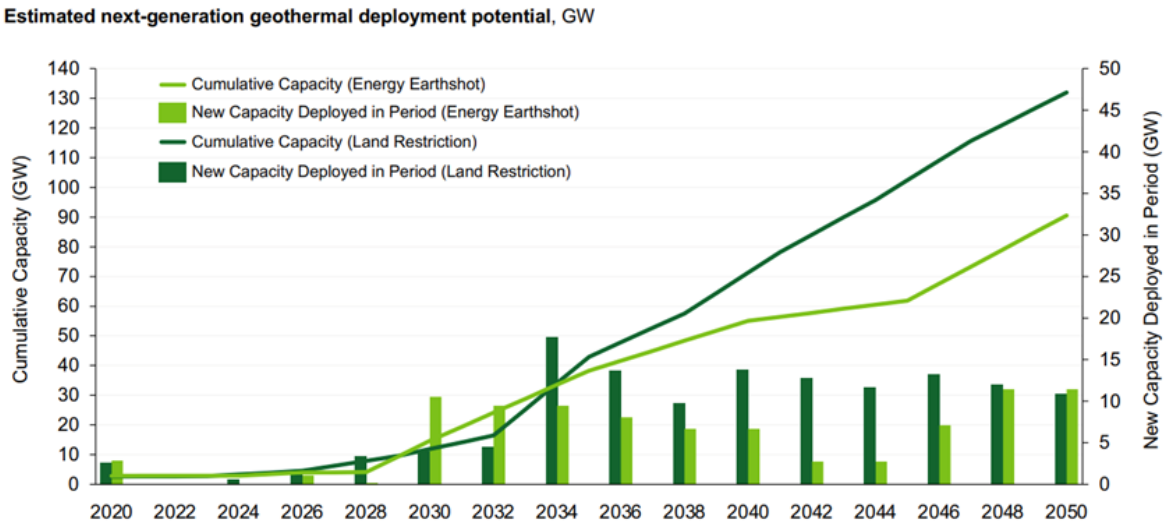

Figure 1 Forecast next generation geothermal deployment

Further, the Report indicates that variation in technical and market factors, such as the availability of land for power generation, the addition of flexible power, and the availability of other nascent technologies, could drive far higher deployment of geothermal power by 2050. Figure 1 also shows the "Land Restriction" scenario, which models constrained build out of solar and wind and results in over 130GW of next generation geothermal by 2050.

[3] https://liftoff.energy.gov/wp-content/uploads/2024/03/LIFTOFF_DOE_NextGen_Geothermal_v14.pdf

[4] https://www.infrastructureaustralia.gov.au/map/national-electricity-market-dispatchable-energy-storage-firming-capacity

Advantages of next-generation geothermal include emission free 24/7 baseload power, minimal workforce and supply chain risk, low land use and flexible generating capability.

Advanced Geothermal Systems provide the potential to unlock material geothermal resources in Australia

Next-generation geothermal technologies create their own reservoirs from ubiquitous hot rock, which expands the availability of geothermal resources. In the United States, these technologies could increase availability from 40 GW currently to over 5,000 GW.

In an Advanced Geothermal System (AGS), 100% of fluid flows in a closed cycle or closed loop, which does not require permeability of hot rocks and has no fluid injection or emissions. The technology has been proven, is currently being deployed commercially and is expected to operate with rock temperatures of less than 180°C.

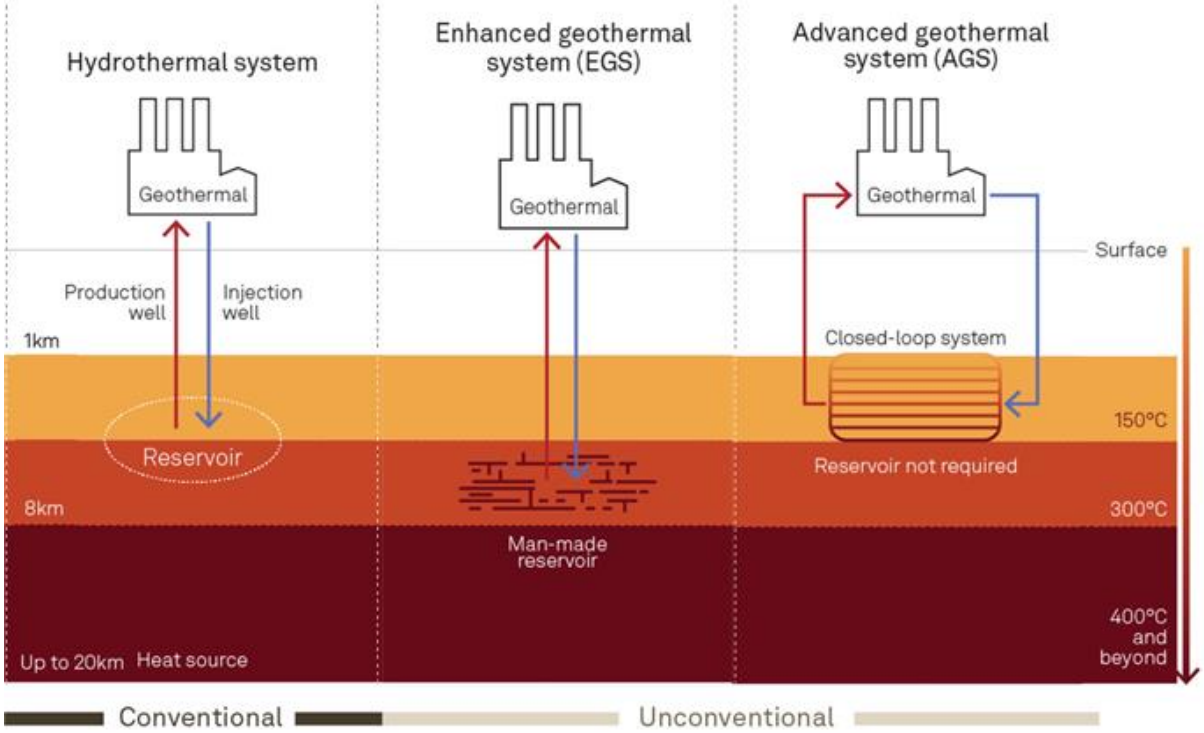

Figure 2 Technological advancements[5]

Given AGS systems are closed loop, there are many advantages, including:

- Improved air and water quality – Closed Loop Geothermal has zero emissions, little or no water consumption and no contact with subsurface water;
- Limited land usage / impact – a very small footprint, minimal visual impact, and no noise pollution;

[5] https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/011124-infographic-next-generation-technologies-set-the-scene-for-accelerated-geothermal-growth-energy-transition.

- High degree of safety – no waste streams, no hazardous chemicals, no risk of fire or explosion; and
- Wildlife protection – not hazardous to birds, animals, or fish.

EE1's core strategy is to assist in unlocking Australia's vast geothermal potential through the application of recently developed Advanced Geothermal System technologies.

Rapid cost reduction for next generation geothermal already in evidence

Advancements at field demonstrations in the last two years have reduced estimated project development costs for enhanced geothermal systems (EGS) by almost 50 percent. Improvements in drilling costs, well stimulation, as well as a lower number of exploration wells required, have all contributed to this reduction. The DoE projects a further reduction by two thirds from the current base. This would result in an unsubsidised Levelised Cost of Energy (LCOE[6]) of US$60-70/MWh, equivalent to A$90-110/MWh, in line with current National Electricity Market prices[7].

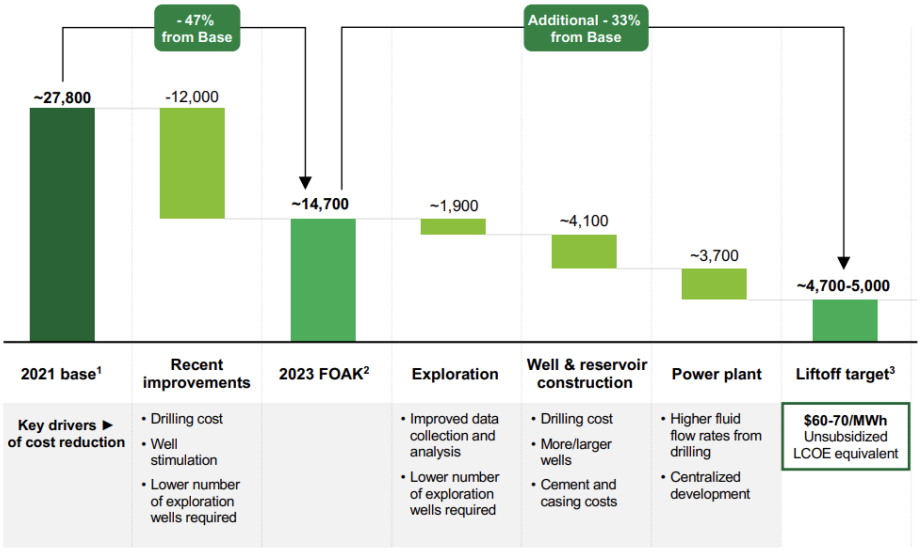

Figure 3 Cost reduction waterfall for EGS, after DoE

DoE best-estimate projections of LCOE show that next-generation geothermal costs will be highly competitive with other non-emitting sources of energy, with the potential to fall below the cost of other clean firm power sources by 2035 – see Figure 4. For reference, the DoE LCOE projections are broadly consistent with CSIRO's most recent electricity cost generation estimates for Australia.[8]

[6] The present value of the total cost of building and operating a generating plant over its economic life, converted to equal annual payments, and adjusted for inflation.
[7] https://opennem.org.au/energy/nem
[8] CSIRO (2023) - GenCost 2023-2024 Consultation draft. Available at: https://www.csiro.au/-/media/Energy/GenCost/GenCost2023-24Consultdraft_20231219-FINAL.pdf

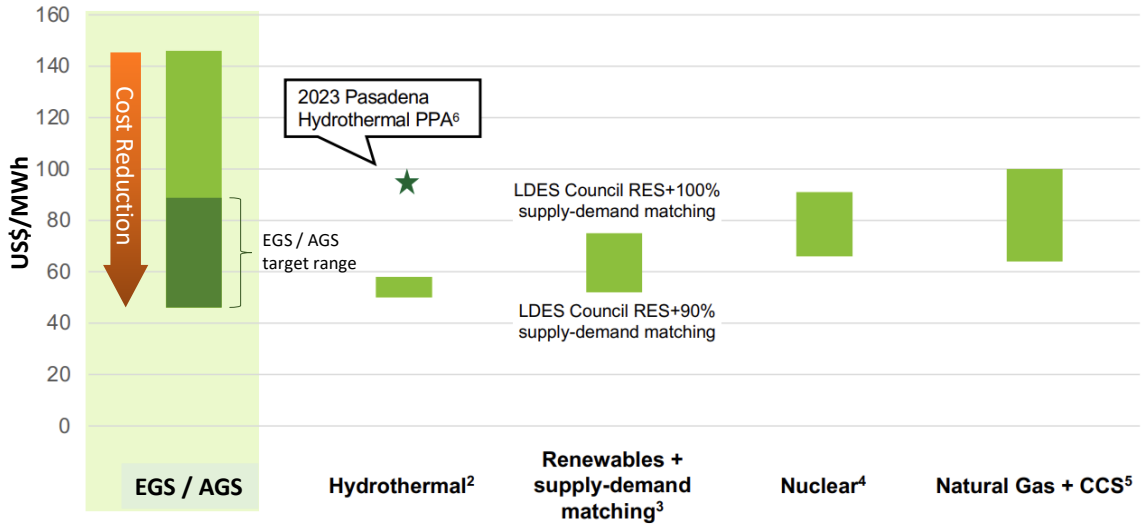

Figure 4 Projected LCOE range (after DoE, 2024)

While these technology benefits are applicable to Enhanced Geothermal Systems (EGS), the Report also expects costs of closed loop AGS to reduce in a similar fashion, with the DoE forecasting a more than two thirds LCOE reduction for AGS over the next decade.

Investment in next generation geothermal is accelerating

Capitalising on the recent technological improvements and demonstrations, the next-generation geothermal market has shown notable market momentum in the last four years, in terms of both capital raised (USD $670 MM since 2021) and deal count.

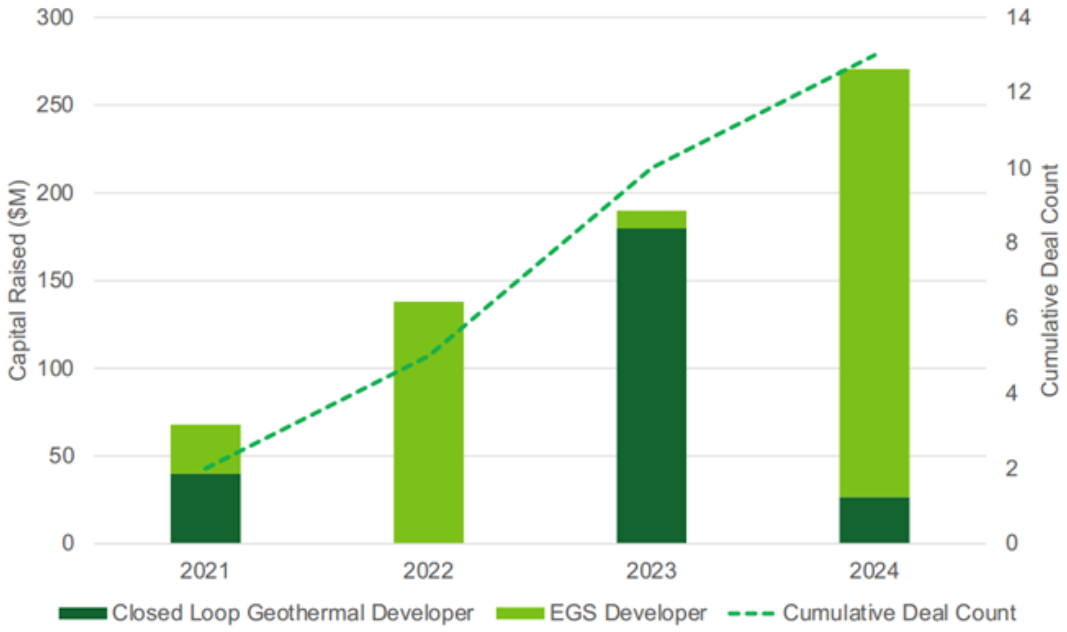

Figure 5 Capital raised and cumulative deal count

Notable investors include energy industry majors and supermajors, mining and steel companies, industry service companies, drilling and drilling materials companies, and power purchasers (see Figure 6).

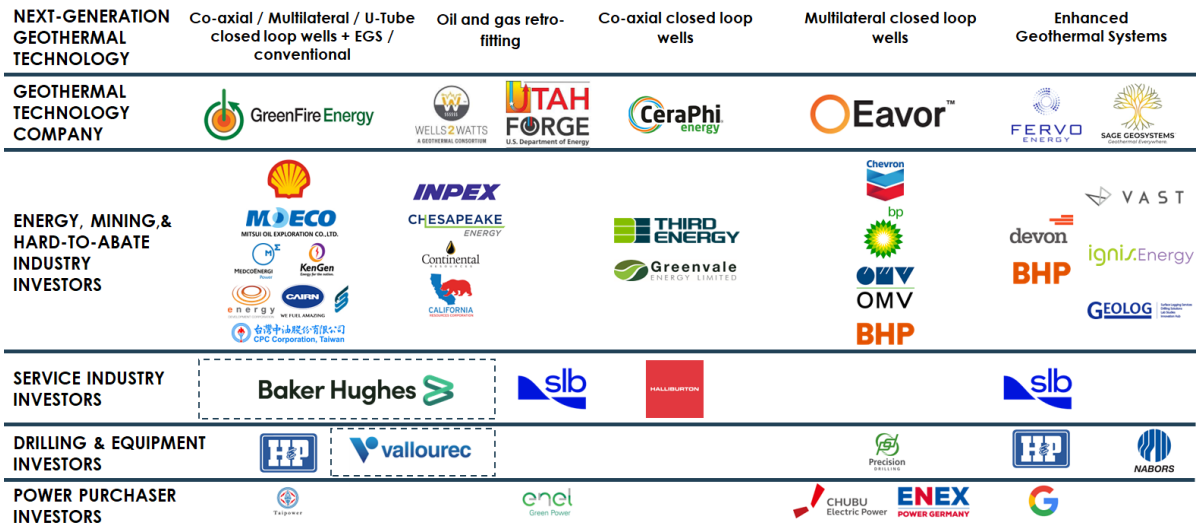

Figure 6 Next-generation geothermal technologies and key investors

Globally significant venture capital investors include Breakthrough Energy, Microsoft's Climate Innovation Fund, Canada Growth Fund, Deep Energy Capital, Temasek, Japan Energy Fund, and Monaco Asset Management.

Next-generation geothermal companies and startups have reached several major milestones since 2021, including demonstration projects such as the Coso closed loop project built by GreenFire Energy[9]. Baker Hughes, EE1's technology partner, is a major investor in GreenFire.

Several Power Purchase Agreements (PPAs) have recently been concluded with prices ranging from US$70-100/MWh, on average US$20-50/MWh more than North American solar power PPAs[10], demonstrating the benefits of 24/7 base load, flexible power generation that geothermal offers.

The Report is available at

https://liftoff.energy.gov/wp-content/uploads/2024/03/LIFTOFF_DOE_NextGen_Geothermal_v14.pdf,

or on EE1's website ee1.com.au

[9] https://www.greenfireenergy.com/research/

[10] https://liftoff.energy.gov/wp-content/uploads/2024/03/LIFTOFF_DOE_NextGen_Geothermal_v14.pdf

Authorised for release by Earths Energy's Board of Directors.

ENDS

To learn more about the Company, please visit www.ee1.com.au, or contact:

Matt Kay
Managing Director
mattk@ee1.com.au

Aiden Bradley
NWR Communications
aiden@nwrcommunications.com.au

About Earths Energy

Earths Energy holds an 84% interest in Volt Geothermal Pty Ltd ("Volt") and Within Energy Pty Ltd ("Within"), who hold geothermal projects in South Australia and Queensland, respectively (collectively the "Projects"). The Projects comprise prospective geothermal exploration licences, surrounded by key existing infrastructure for electricity generation, including powerlines and sub power stations. The Company plans to focus on systematically exploring early-stage geothermal targets and developing geothermal resources at the Projects. This will involve a fit-for-purpose exploration programme analysing subsurface geology to identify thermal resource potential at different well depths, undertaking preliminary survey and resource assessments based on offset well data, exploration location definition and exploration drilling. This will determine priority targets for exploration drilling for geothermal resources.

Board & Management

Grant Davey
Executive Director

Matt Kay
Managing Director

Chris Bath
Director and Chief Financial Officer

David Wheeler
Non-Executive Director

Dr Lawrence Meckel
Head of Subsurface