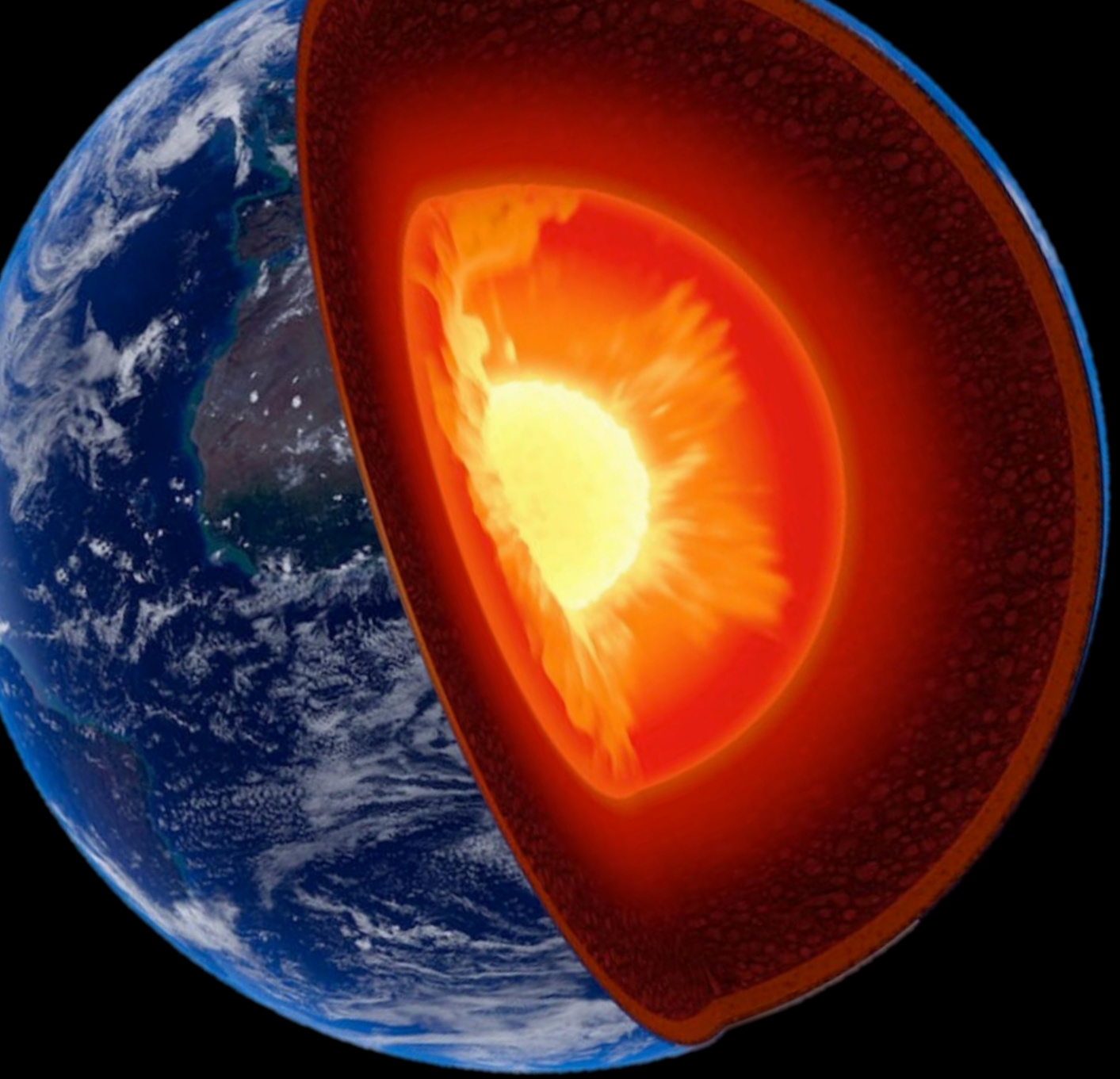
Geothermal Energy is on the Brink of a Boom:
And it's because society's energy transition needs it

Will Pettitt, PhD
Executive Director

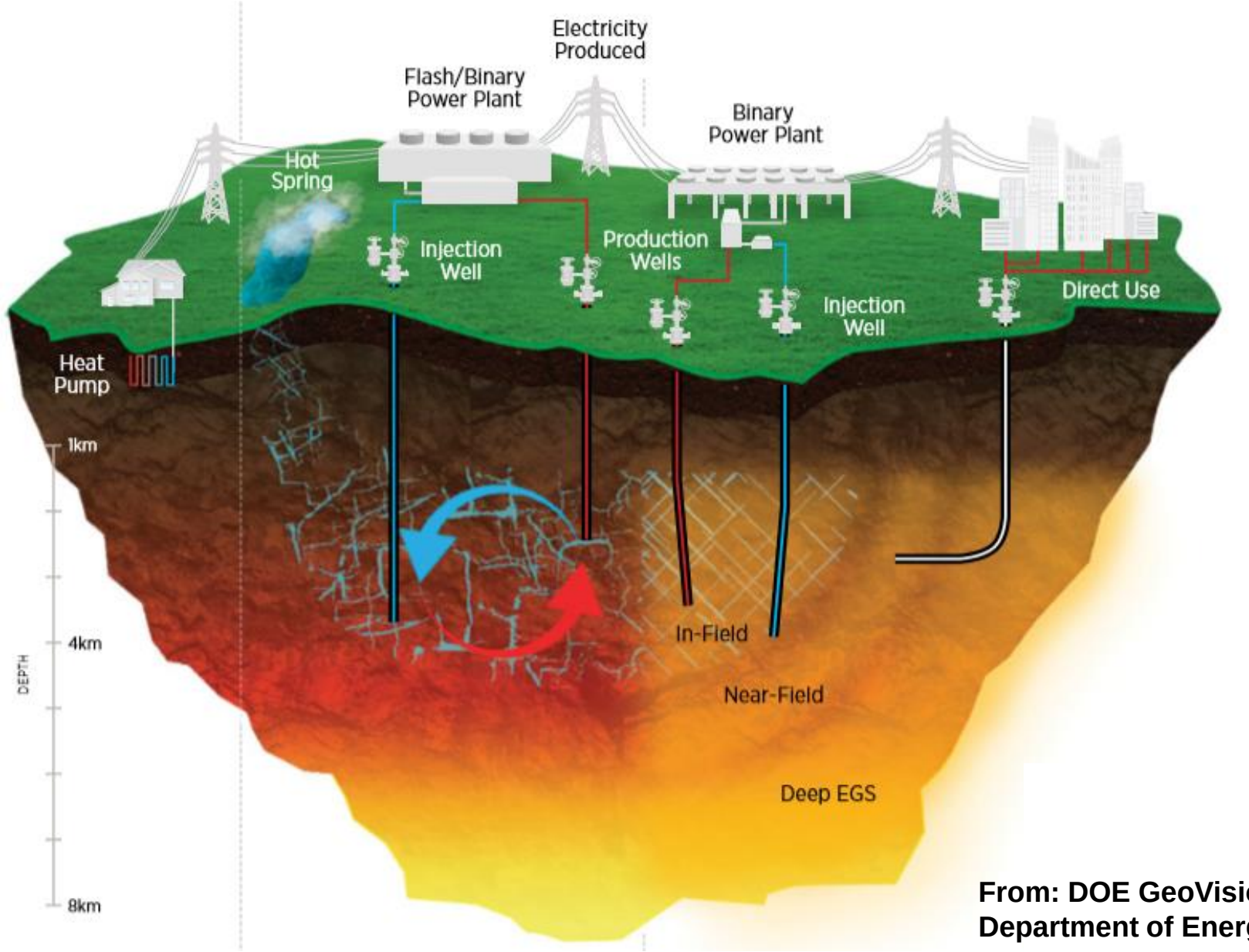
EESI Briefing, The Growing Role of Renewable Energy in the U.S. Energy Mix, Washington DC, 15th November 2019



Heat Beneath our Feet

Geothermal Industries

1. Power Generation
2. Direct Use
3. Heat Pumps
4. EGS



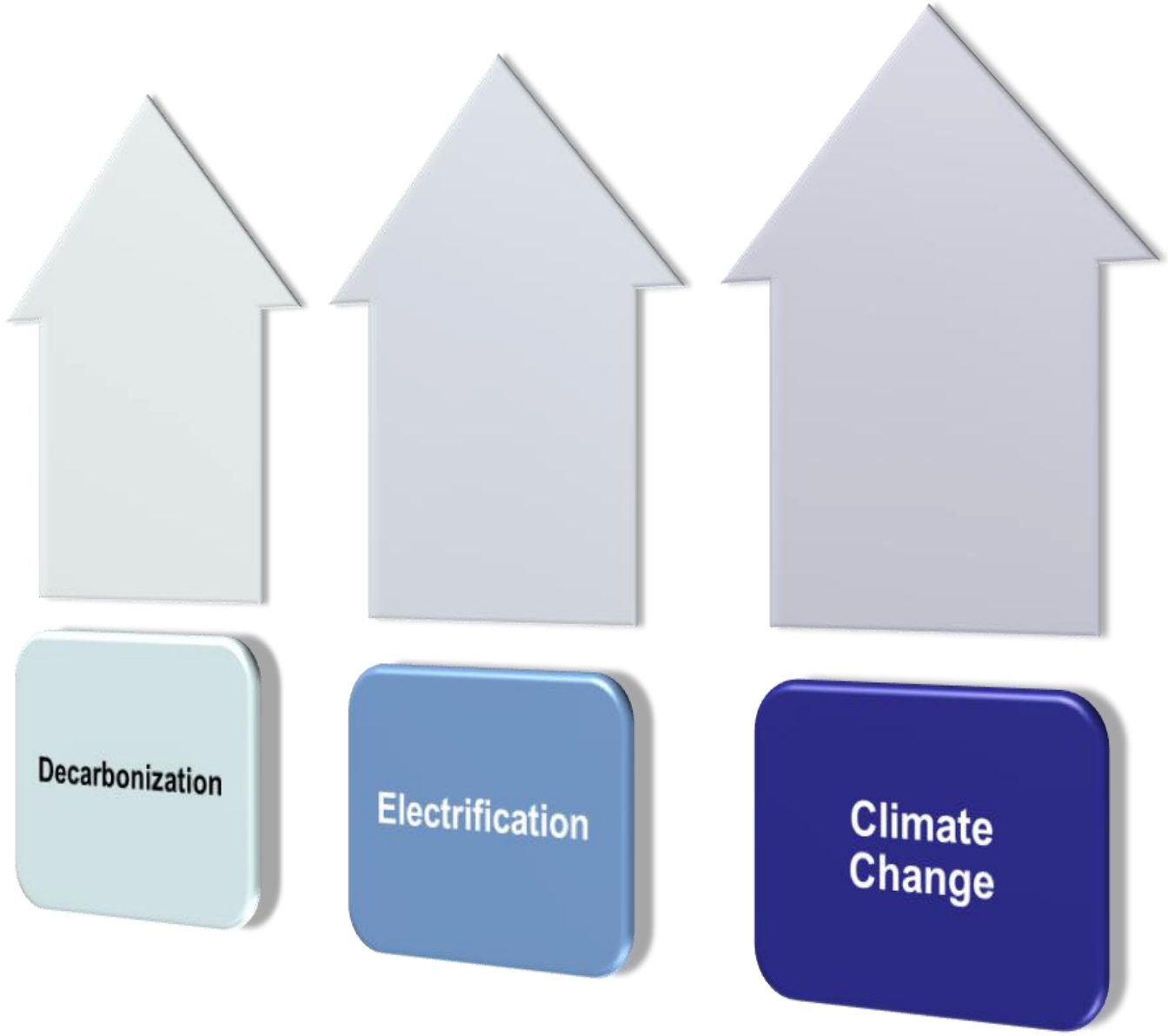
From: DOE GeoVision Report, Department of Energy, 2019

Lets ask ourselves this…

Where is my clean energy coming from on a still, dark, winter night in 2030?

What about 2050?

What will be happening in 2030?



2017 Climate Change Scoping Plan Policy Portfolio

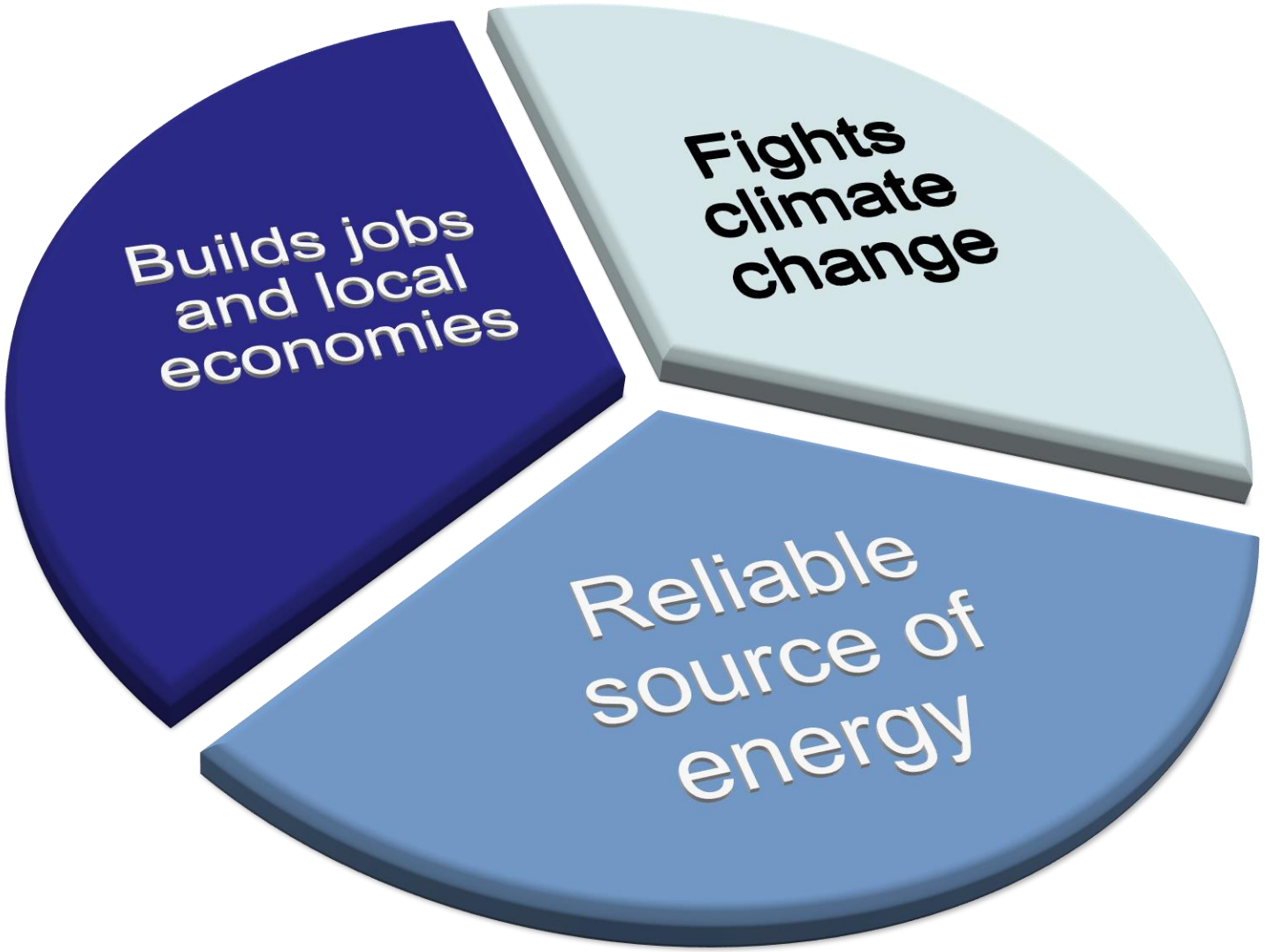
- Double building efficiency
- 50% renewable power**
- More clean, renewable fuels
- Cleaner zero or near-zero emission cars, trucks, and buses
- Walkable/bikeable communities with transit
- Cleaner freight and goods movement
- Slash potent "super-pollutants" from dairies, landfills and refrigerants
- Cap emissions from transportation, industry, natural gas, and electricity
- Invest in communities to reduce emissions
- Protect and manage natural and working lands

**In 2018, SB 100 increased the Renewables Portfolio Standard to 60% by 2030

From: SB 100 Scoping Report – Scoping Workshop, California Energy Commission, October 2019

6

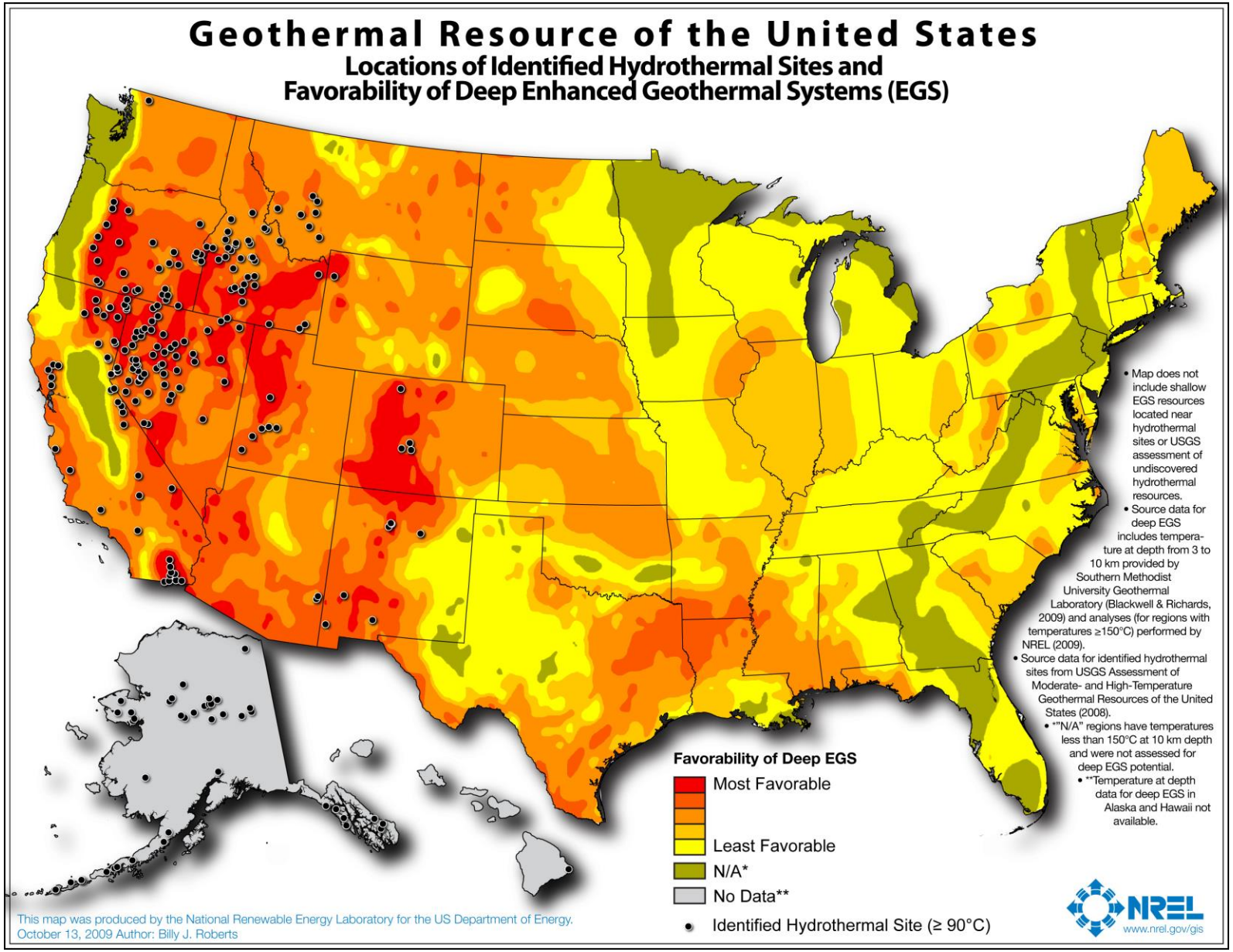
What does Geothermal Bring?



Geothermal is 24/7 always on

Renewable Energy that Works Around the Clock

- Clean
- Reliable
- Flexible
- Balancing
- Resilient
- Stable
- Facilitator



Installed conventional geothermal

3.6 GWe*

Conventional geothermal under development

1.2 GWe*

Geothermal by 2050

60+ GWe**

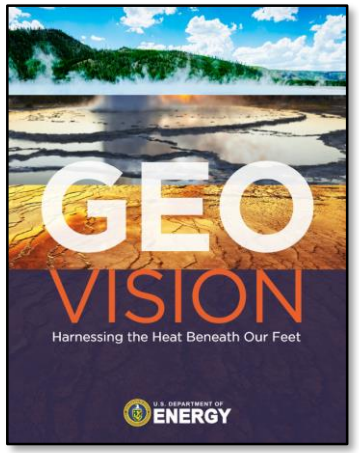
Viable EGS potential

>>100 GWe***

* After: GEA 2015, 2016
** From: DOE GeoVision, 2019
*** From: Ziagos et al., 2013

GeoVision

Harnessing the Heat Beneath Our Feet



www.energy.gov/geovision

Slide courtesy of NREL

enable

Geothermal
Anywhere

lower

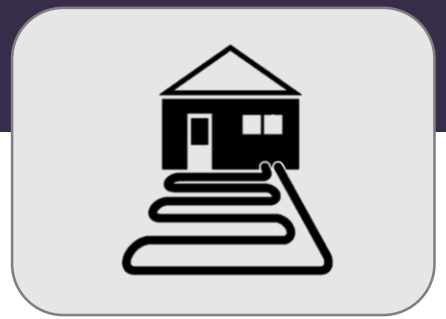
Well
Costs

reduce

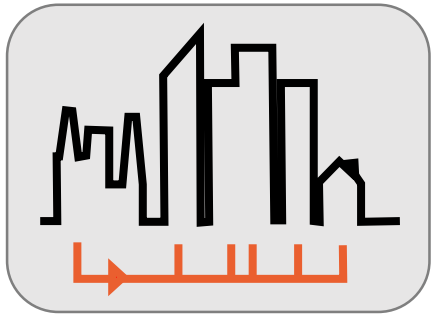
Regulatory
Timeframes

There is vast potential for economic geothermal expansion in the United States

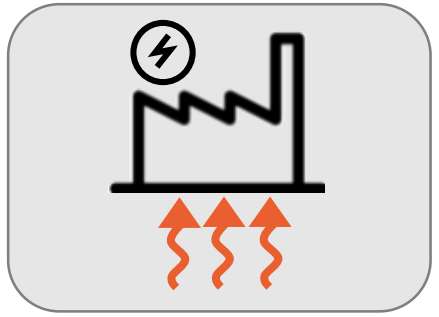
By 2050



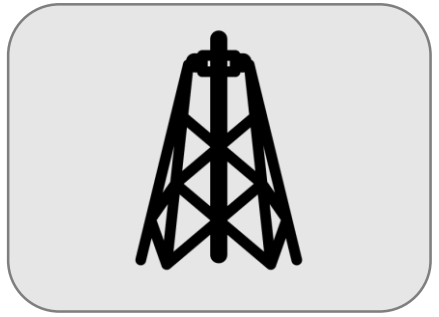
28 million
Geo Heat Pumps



17,500
District Heating Systems



60+ GW
Geothermal Power



10,000+
New Wells Per Year

On the Hill – 2019 has been a busy year!

Committee Hearings

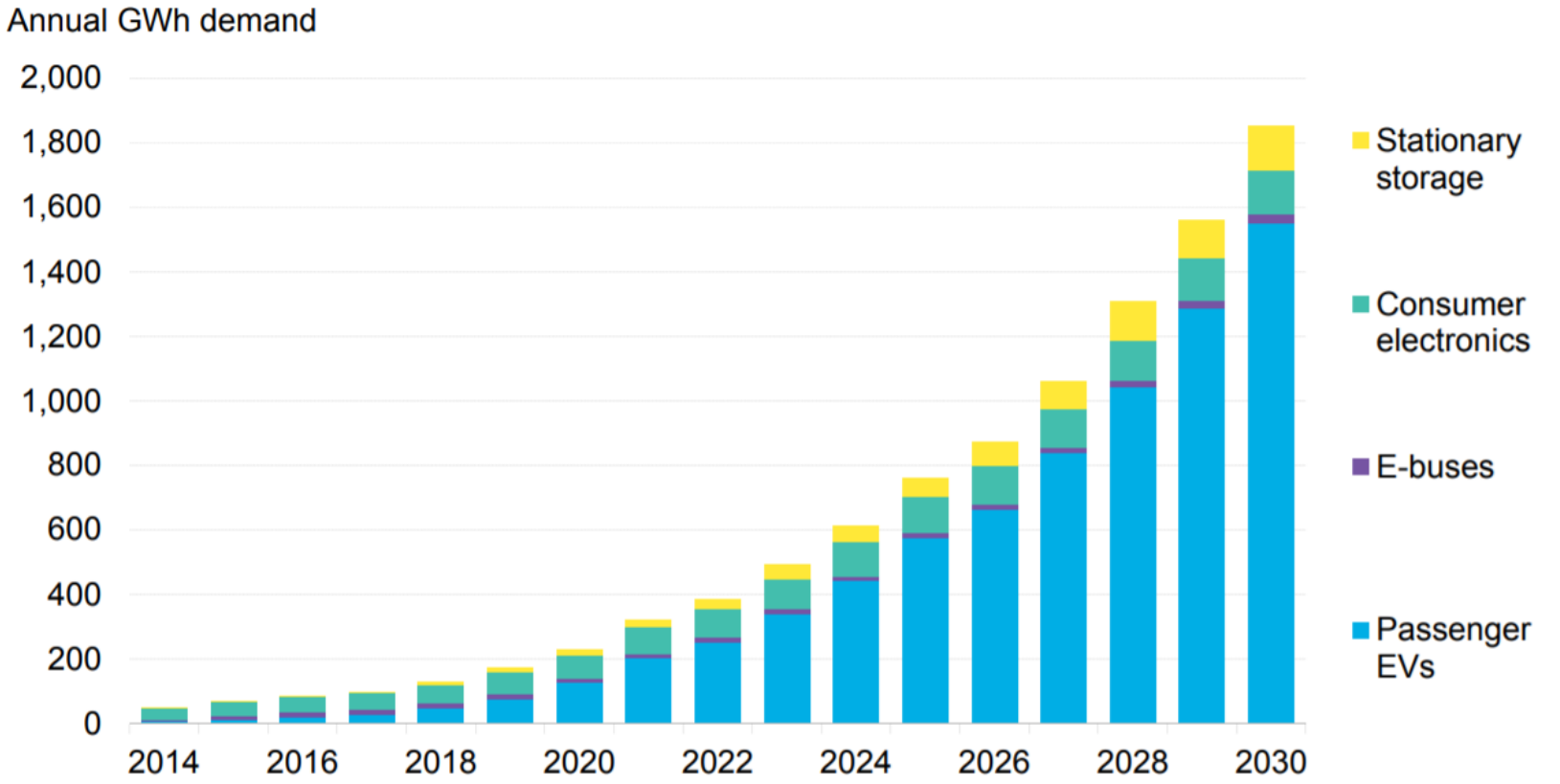
- June 20, 2019 – **Senate Committee on Energy and Natural Resources** – Hearing to Examine Geothermal Development
- September 19, 2019 – **House of Representatives Committee on Natural Resources, Subcommittee on Energy and Mineral Resources** – legislative hearing to review the "Enhancing Geothermal Production on Federal Lands Act"
- November 14, 2019 – **House of Representatives Committee on Science, Space and Technology, Subcommittee on Energy** – Water And Geothermal Power: Unearthing The Next Wave Of Energy Innovation

Draft Legislation

- Senator Catherine Cortez Masto (D-Nev.) and Senator Ron Wyden (D-Ore.), **"Geothermal Energy Opportunities (GEO) Act"**.
- Chairman Lisa Murkowski (R-Alaska) and Ranking Member Joe Manchin (D-W.Va.), Senate Energy and Natural Resources Committee, **"The Advanced Geothermal Innovation Leadership Act of 2019" (the "AGILE" Act)**.
- Senator Jim Risch (R-Idaho) and Congressman Russ Fulcher (R-Idaho), S.2270/H.R.4026, **"Enhancing Geothermal Production on Federal Lands Act"**
- Tax related draft legislation: "Renewable Electricity Tax Credit Equalization Act" (House); "Tax Extender and Disaster Relief Act" (Senate); Taxpayer Certainty and Disaster Relief Act" (House).

Annual Lithium-ion Battery Demand

Berkshire Hathaway Energy – Geothermal development in Southern California could also supply over two-thirds of the world's lithium demand in 2025! And at competitive cost…



Thank you!