

BENCHMARKING PERFORMANCE DATA: DRIVING EXCELLENCE IN THE GEOTHERMAL INDUSTRY

PRESENTER:



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You Can't Manage What You Can't Measure

Peter F. Drucker



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Setting the Scene

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02

Understanding
Performance
Benchmarking

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What's in it for us?
Benefits of Benchmarking

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How did they do it?
Lessons from Oil & Gas

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Breaking Through
Barriers in Geothermal

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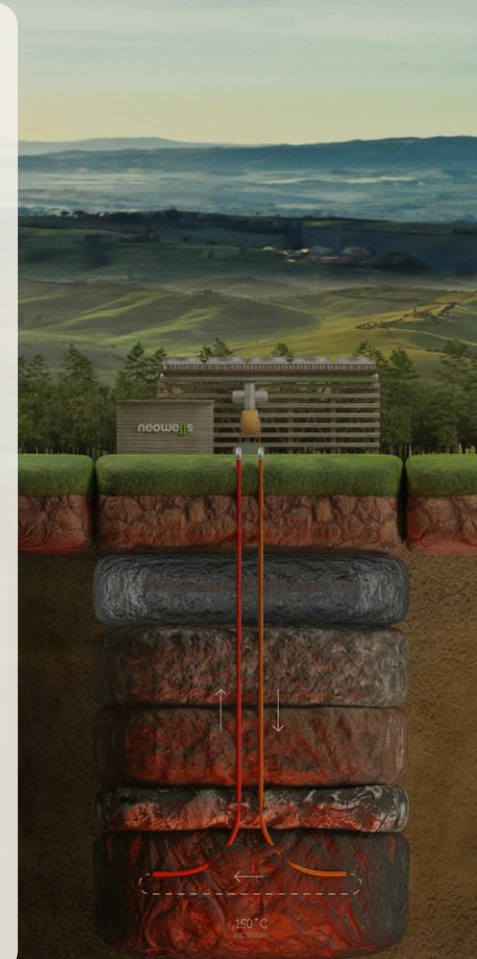


06

Our Proposition

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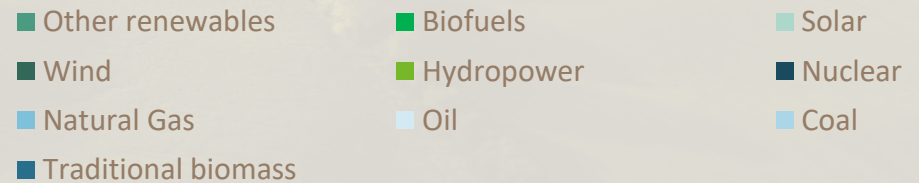
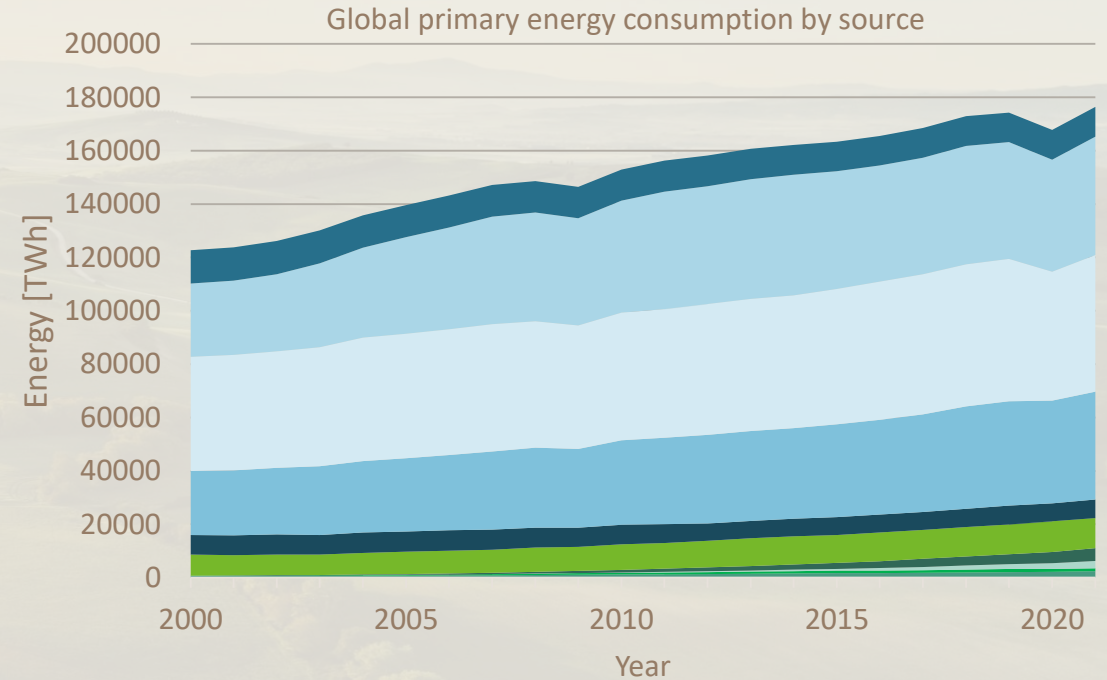


01

Setting the Scene

THE CHALLENGE

- **Worldwide Increasing Energy Demand**
 - Half of global energy demand is for heating & cooling
- **Energy Transition Overdue**
 - But: sustainable & environmentally friendly
- **Renewable Energies**
 - Critical role for energy transition
 - More & more political requirements
 - Paris Climate Agreement
- **Solution Lies (Also) In The Earth's Crust**
 - But: To achieve CO₂ neutrality by 2050, an annual expansion of geothermal energy of over 15% is necessary by 2030 alone



[Source: Our World in Data]

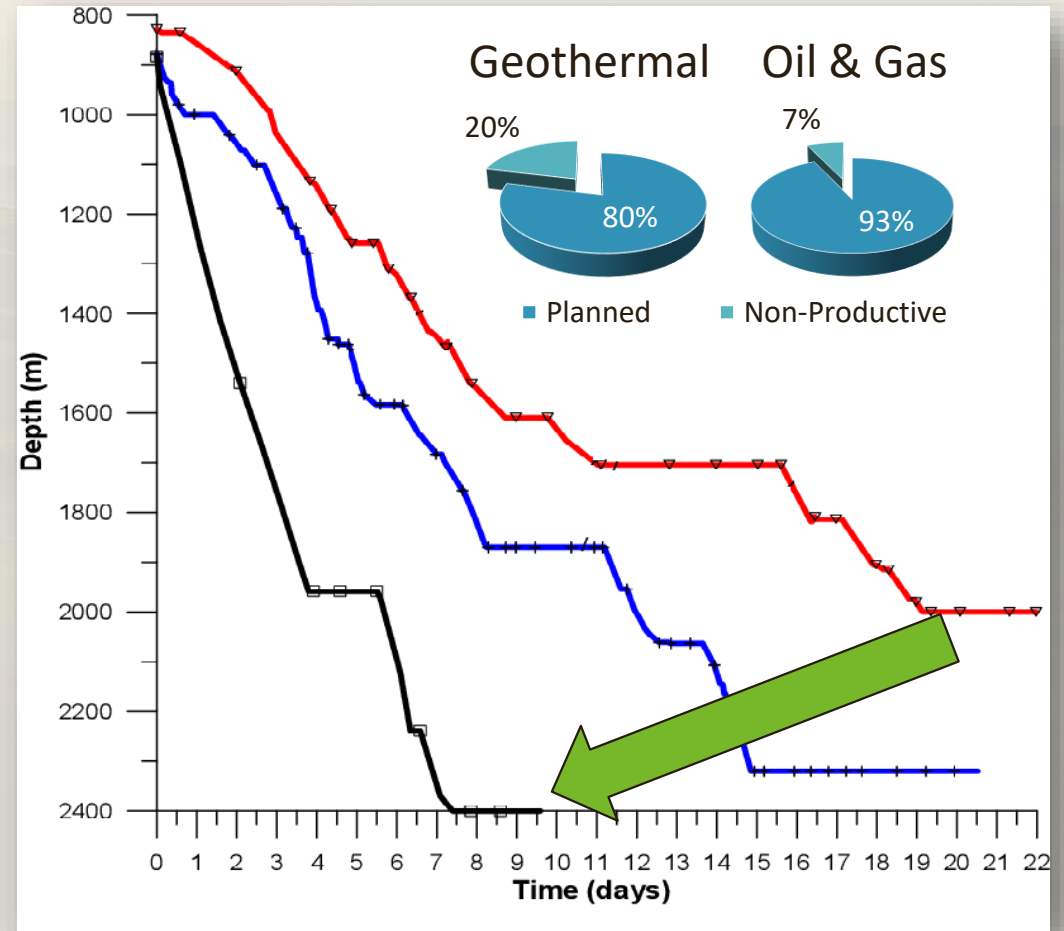
→ **What we need: Investable Geothermal Projects**

CHALLENGES IN GEOTHERMAL DRILLING

- **Budget Overruns**
 - The Costly Reality
- **Engineering & Execution Challenges**
 - Achieving Success Amidst Complexity
- **Meeting Ambitious Targets**
 - Striking the Balance Between Vision & Feasibility
- **Geothermal projects**
 - Less often reach their goal
 - Take longer
 - Have an ambivalent reputation among investors

→ **What we need: A Rise to the Challenge**

- Innovation for Sustainable Solutions
- Harnessing Measurement & Benchmarking for Continuous Improvement



02

Understanding Performance Benchmarking

DRIVING EXCELLENCE THROUGH COMPARISON & INNOVATION

■ What is Benchmarking?

- "Benchmarking is the process of comparing one's performance metrics, processes, or practices with those of industry leaders or competitors."

■ Key Elements of Benchmarking

- Identifying Best Practices: Learning from Industry Leaders
- Setting Performance Standards: Aspiring Towards Excellence
- Understanding Processes & Strategies: Beyond Numbers



03

What's in it for us?

Benefits of Benchmarking

BENCHMARKING BENEFITS IN GEOTHERMAL DRILLING

■ Establish Competitive Performance

- It is nice to know we are doing better than last year, but the real bottom-line measure is how we are performing in relation to our competitors.

■ Provide A Driver For Improvement

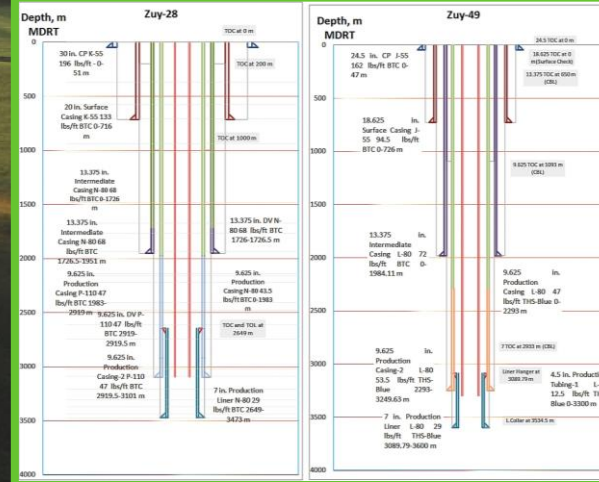
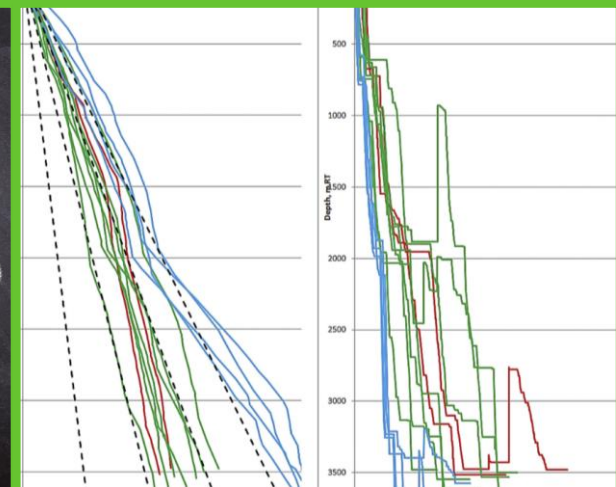
- If we can show that others are doing it faster or less expensively, we can use this fact to accelerate improvement.

■ Target The Big Gaps

- Most Operators are good at some types of wells, or in some areas, but not so good in others. Use this information to make sure we target the biggest potential gains.

■ Insights Into Best Practices

- Learning from top-performing companies & industry leaders by implementing successful strategies & techniques for optimal performance.



BENCHMARKING BENEFITS IN GEOTHERMAL DRILLING



■ Design & Plan Wells

- Engineers can study offset well data during the well design phase to consider how Operators of nearby wells react to the challenges in terms of wellbore size, trajectory, other design aspects, casing schemes, mud selection etc.

■ Compare ROP Rates

- Plot offset well time-depth charts using the tables of time-depth data provided by Rushmore participants, to see how planned ROP rates compare with others & ensure that the most appropriate targets are set.

■ Evaluate Progress

- Add an external viewpoint to your performance, report on your achievement of internal targets & integrate benchmark results into your standard measurement process.

04

How did they do it? Lessons from Oil & Gas

BENCHMARKING IN THE OIL AND GAS INDUSTRY

■ Rushmore’s Drilling Performance Review

- Long embraced fundamental tool for sharing well data & driving operational excellence

■ Led To Significant Improvements

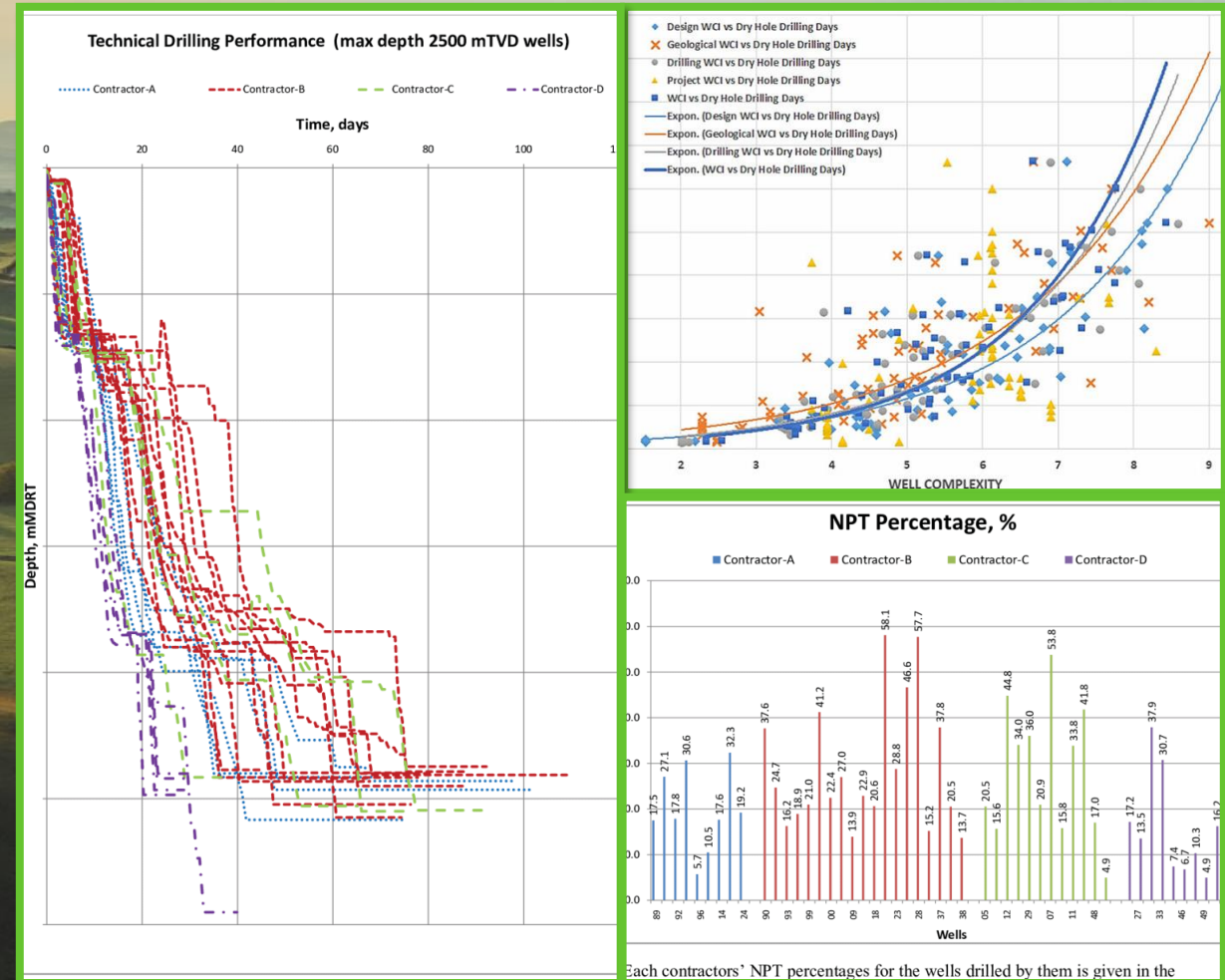
- Operational efficiency, cost reduction, & safety enhancement

■ Development of Performance Framework

- “Top Quartile”
- “Drilling the Limit”
- “Doing Things Right First Time”

→ What was needed as a Minimum?

- An independent neutral, transparent mechanism to establish “Best in Class” Well Performance

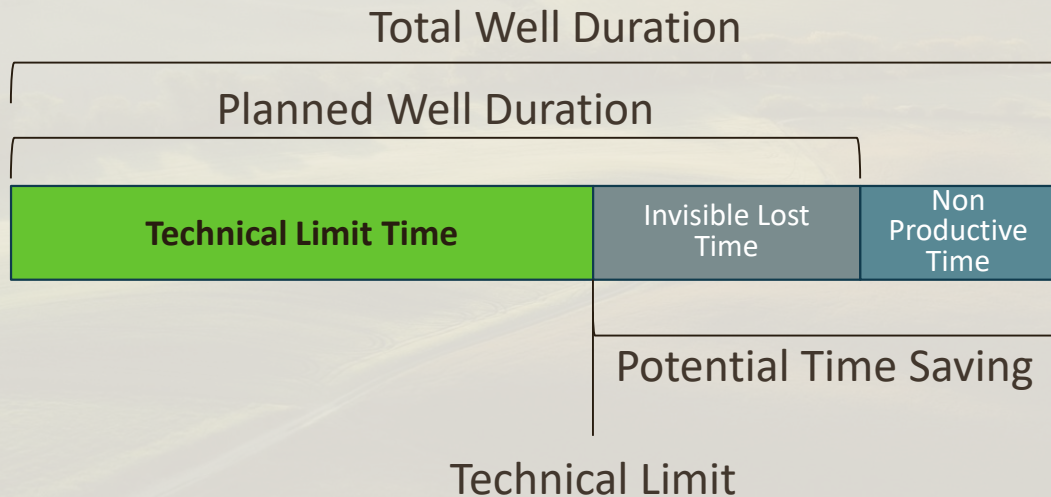


WHAT WE LEARNED FROM OIL & GAS

→ Wells vary

It is not possible to simply say that because Well #5 was drilled faster than Well #1 it represents better performance or efficiency.

It may simply be a much easier well or the operator used superior technology, standards & processes.



■ Delivering Top Quartile Performance:

- Not solely a numbers game

■ Technical Limit:

- What could be achieved in a flawless operation using the best people, planning & technology

■ Improved well delivery performance requires

- Integrated strategy & decision making, followed by detailed preparation and execution
- Integrated multi-disciplinary team (G&G, well engineers / drilling, reservoir engineering, testing, completion) including production people from client, contractor, vendors.

→ What we need

- We need to measure, if we want to understand, control, optimise, automate & manage!

05

Breaking Through Barriers in Geothermal

CHALLENGES & LIMITATIONS

■ Lack of Openness:

- The Veil of Secrecy
- Companies hesitate to share experiences, hindering collective learning
- Fear of revealing weaknesses stifles innovation & progress

■ Limited Data Availability:

- Scarcity of benchmarking data limits industry-wide comparisons
- Incomplete datasets hinder accurate performance assessments

■ Standardization Challenges:

- Diverse drilling practices make benchmarking complex
- Difficulty in establishing common metrics & benchmarks



→ **What we need:**
Joint Movement Towards
Openness & Collaboration

UNVEILING THE HIDDEN POTENTIAL: STRATEGIES FOR OVERCOMING CHALLENGES

- **Foster Culture of Transparency:**
 - Encourage open dialogue & knowledge sharing.
 - Emphasize the importance of collective industry advancement.
- **Establish Data Sharing Initiatives:**
 - Collaborate on industry-wide data collection & sharing platforms.
 - Ensure confidentiality while promoting transparency.
- **Develop Standardized Metrics:**
 - Collaborate to define common performance metrics & benchmarks.
 - Establish guidelines for data collection & analysis.
- **Encourage Collaboration:**
 - Facilitate forums, workshops, & conferences for industry collaboration.
 - Foster partnerships between drilling companies & research institutions.



- **What we need:**
- Embracing benchmarking unlocks untapped potential for industry growth
- By overcoming challenges & fostering collaboration, we pave the way for innovation & excellence in geothermal drilling.

06

Our Proposition

THE POWER OF COLLABORATION

■ Collaborative Benchmarking Initiative

- neowells proposes to lead a collaborative initiative to benchmarking in the geothermal drilling industry

■ Our vision:

- Create a culture of transparency & collaboration among industry stakeholders
- By acting as a connecting company, neowells aims to foster knowledge sharing & drive innovation.



UNLOCKING INNOVATION

- **Driving Innovation Through Benchmarking**
 - neowells offers to develop & introduce a data sharing platform for willing operators & companies to access benchmarking data & insights.
 - Standardized metrics & AI-supported tools will enhance data analysis & interpretation.
 - Together, we can identify areas of improvement & capitalize on competitive advantages to drive innovation in geothermal drilling.



Let's join forces on this journey together towards a more transparent, efficient, and innovative geothermal drilling industry!

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QUESTIONS?

