Think & Act Differently
Powered by BHP

GreenSpace Tech
by Deloitte

Unearthed

UNLOCKING INNOVATION IN DEEP MINING

EXPANDING OUR GLOBAL REACH AT MINEXPO

At the recent MinExpo conference in Las Vegas, Think & Act Differently (TAD), Powered by BHP, GreenSpace Tech by Deloitte, and Unearthed hosted an event to bring together startups, OEM's, miners and investors from different industries to unpack the challenges associated with mining at depth.

The event aimed to foster collaboration and spark creative ideas by giving innovators and subject matter experts a platform to present and discuss novel solutions to deep mining challenges. Each of the innovators presenting were provided with the deep mining problem statement a month ahead of time, so their presentations were tailored to think specifically about how their capability and technology could be adopted for a deep mining context.

The event generated lots of insightful conversation about how different stakeholders can come together to address different aspects of the deep mining challenge. Many of the innovators that presented were new to mining professionals in the audience, so the mining industry was able to learn about emerging technologies in other industries that could be applied to mining problems.

We are excited about how these in-person events spark conversations, and drive novel ideas, and continue this momentum forward through TAD and Unearthed's Deep Mining Challenge.

The Deep Mining Challenge

Our industry faces the challenge of accessing resources located deeper than ever before, requiring us to consider challenges such as higher temperatures, increased pressure, and corrosive environments that current technologies and techniques often are not built to withstand.

THE CURATED LIST OF INNOVATORS THAT PRESENTED THEIR TECHNOLOGIES AND IDEAS TO ADDRESS DEEP MINING CHALLENGES INCLUDED:

Astroforge
Showcased the potential applications of their asteroid mining capability to overcome the limitations faced in accessing critical resources at extreme depths.

Blue Origin
Presented 'Blue Alchemist' technology, originally designed for lunar mining, and its potential applications for deep mining on earth.

Eden Geopower
Introduced their high-voltage electricity technology for rock fragmentation, highlighting its benefits in minimising vibrations, noise, and ventilation requirements while improving ore yield and productivity at depth.

Ecohoist
Presented their innovative electric hoisting solution designed for underground mines, allowing for the transportation of more material while minimising emissions, energy use, and hazardous interactions.

Godelius
Highlighted their expertise in automation and robotics, specifically in deep mining environments that have high-salinity and high-temperature conditions.

Grokit Data
Showed us how they're 'Thinking & Acting Differently' by bringing the industrial internet to mining, and how this could improve collaboration between machines and humans in harsh environments.

Ideon Technologies
Presented their 'subsurface intelligence' technology, which can detect both high-density and low-density mineral deposits and other anomalies at depth, offering more efficient ways to reduce drilling while gaining valuable insights into ore bodies.

Impossible Metals
Discussed the use of autonomous underwater vehicles for harvesting nodules containing critical minerals at extreme depths on the ocean floor. Their technology minimises environmental impact by preserving biodiversity and reducing sediment plumes.

Novium Designs
Introduced their system designed to provide comprehensive insights into the composition of minerals during the extraction process, with multiple sensors and advanced algorithms able to reduce human oversight and improve real-time analysis.

Special Teams
Drew on their experience developing landing systems for Mars missions to showcase the applicability of their technology to create cost-effective, reliable, and sustainable extraction systems in extreme underground environments.

TerraSpace
Discussed their 'mineral asset technology' that combines multiple sensors and machine learning to provide real-time ore body knowledge.

Teraglo
Introduced Teraglo's fluorescence sensors, which have the potential to dramatically improve mining efficiency by providing insights directly at the rock face.

The Robbins Company
Showcased their deep tunnelling and mining technologies, including high-lift conveyors and modular shaft machines for faster ore access at extreme depths.

TOP 3 INSIGHTS WE LEARNED

1. Mining at depth presents a myriad of challenges that require us to adopt a systems perspective to test what the right combination of solutions might be to unlock it. Optimal parts of the combination might already exist in adjacent industries, yet they might not, which means bringing together different technologies to converge on new options.

2. There are similarities between the problems shared by space technology developers and miners, particularly around operating in highly constrained and challenging environments. This presents exciting opportunities, which we are now exploring – particularly how these technologies might be transferred to mining.

3. The challenging conditions that exist deep underground require us to re-think how we design our mode of operations at depth. Several innovators challenged us to think about what a mining system might look like when the variables we typically consider to make decisions are not easy to operate in.

Our next steps:

The TAD and Unearthed Deep Mining Challenge remains open. From this innovation challenge, we will be selecting several innovators to take forward to test their technologies.

THINK & ACT DIFFERENTLY

For more information, please reach out to us at tad@bhp.com

Learn more about Think & Act Differently, Powered by BHP by visiting our website at https://www.thinkactdifferently.com