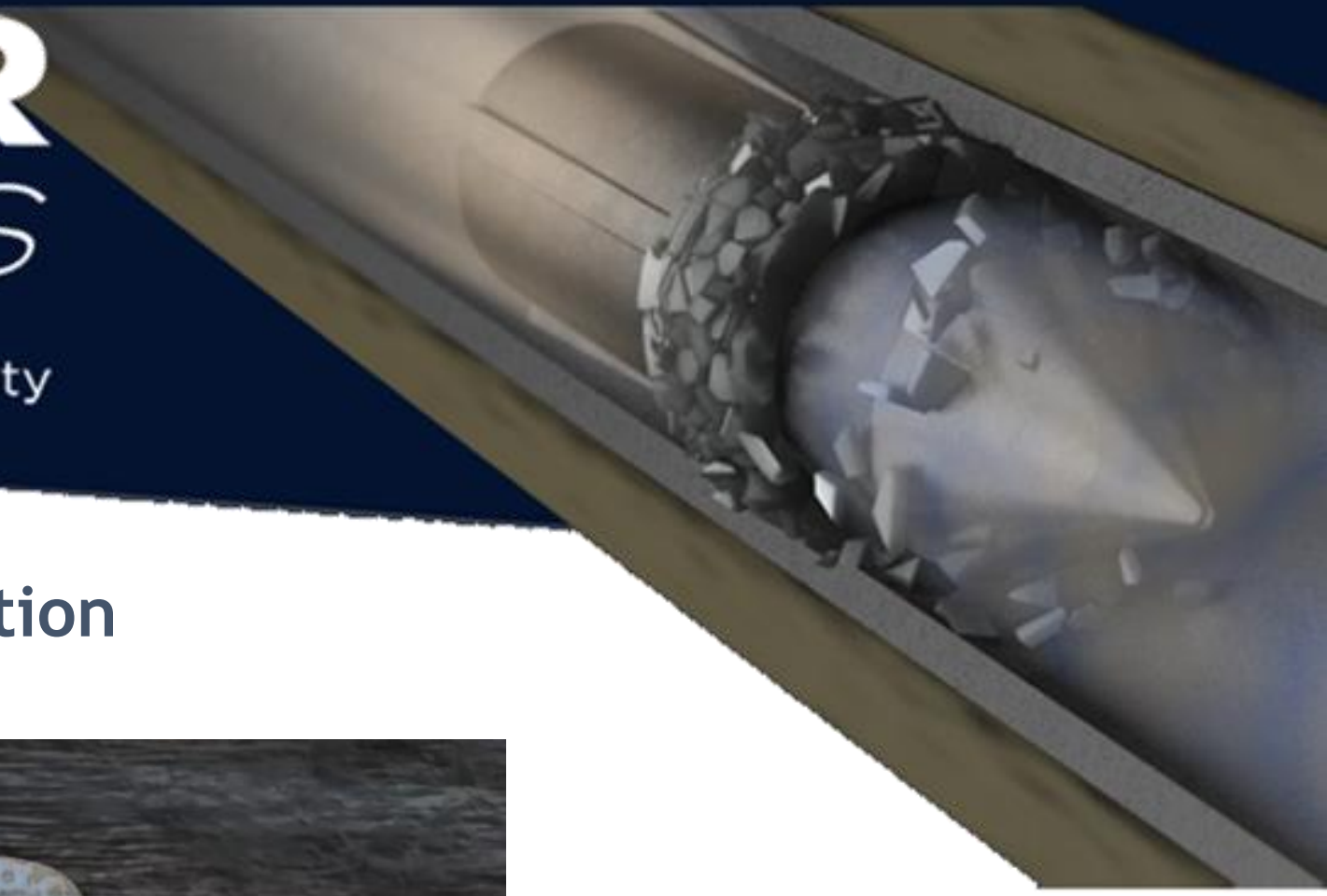
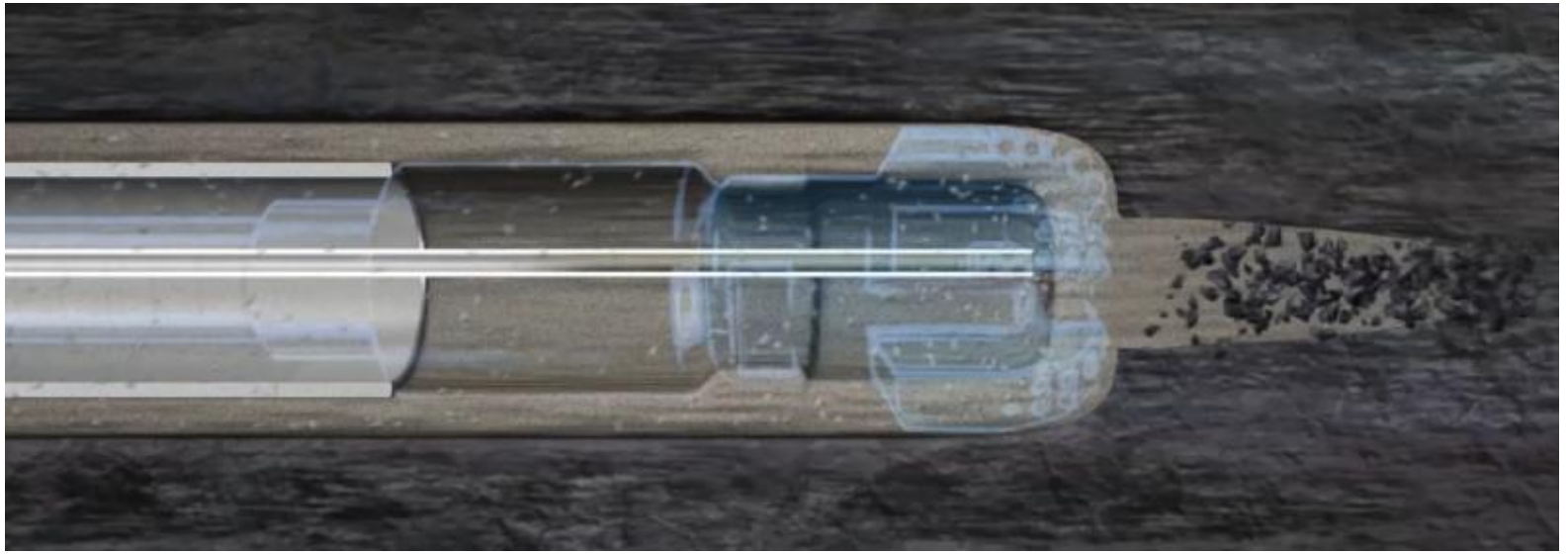
HYPER SCIENCES

Harnessing the Power of Extreme Velocity



Hyperdrill Summary Presentation



Nov 15, 2017

IADC

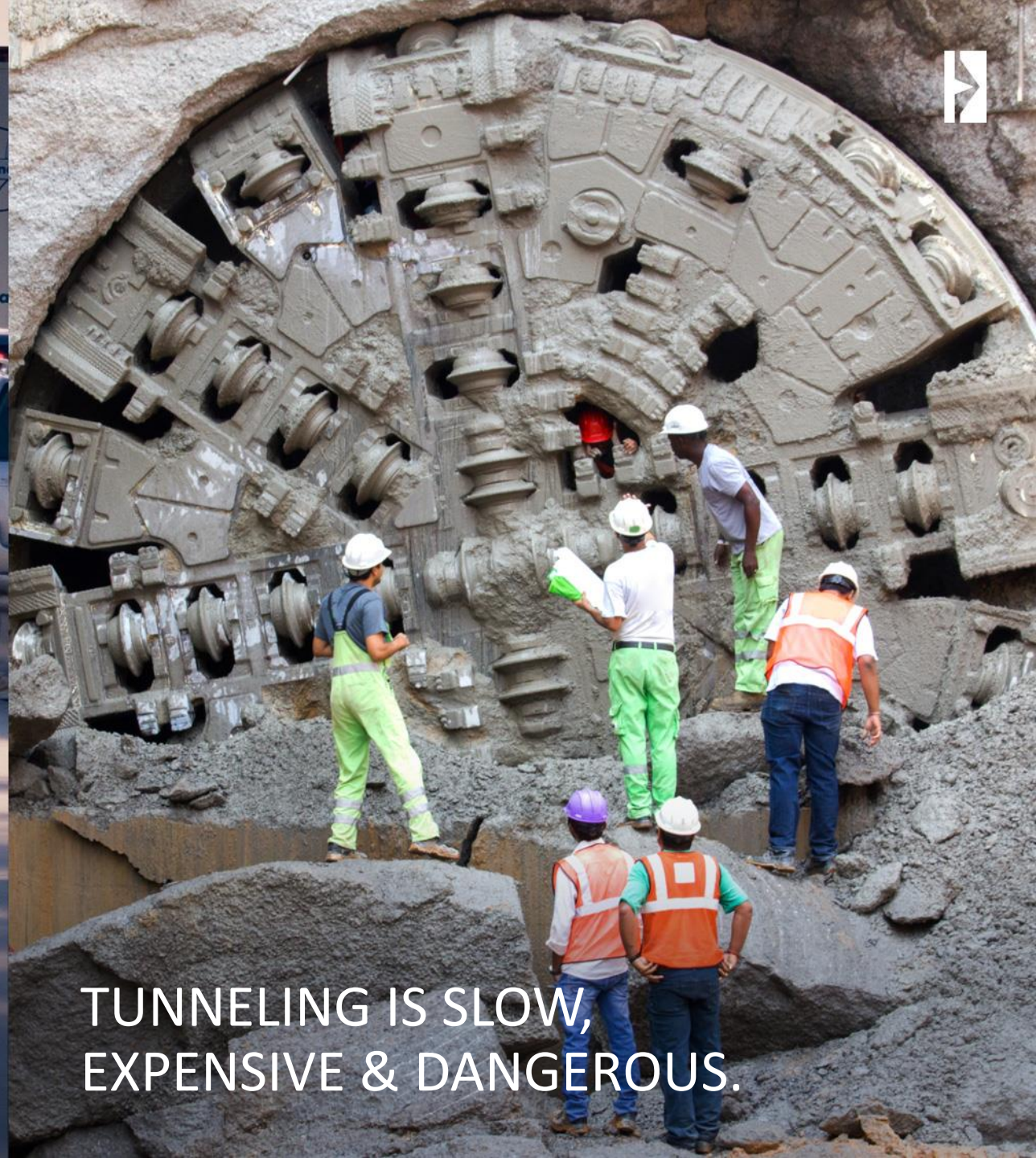
GE-Baker Hughes

Houston Texas

mark@hypersciences.com www.hypersciences.com


RENEWABLE ENERGY IS INTERMITTENT.
It is also expensive.

TRAFFIC IS BAD.



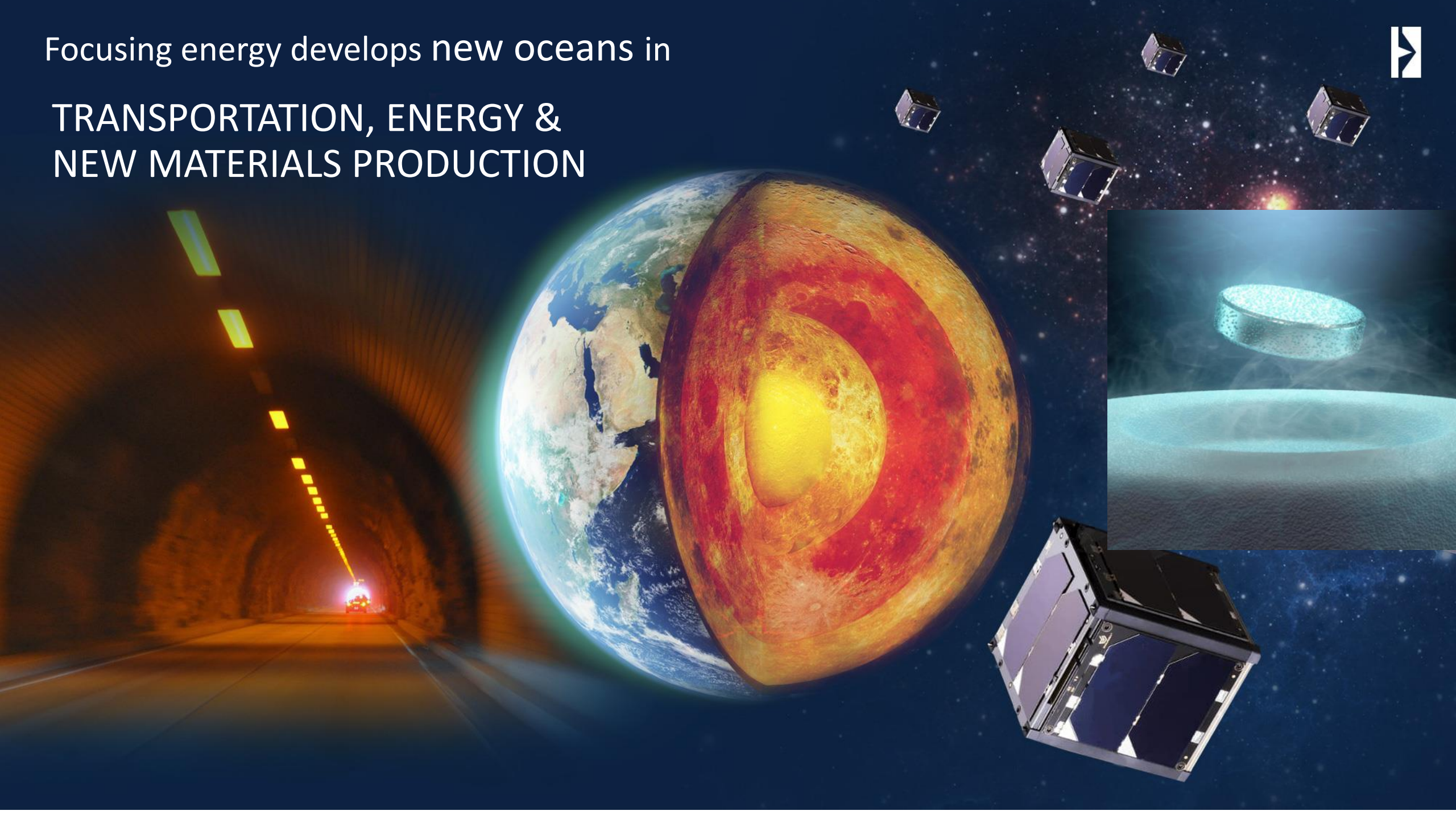
TUNNELING IS SLOW,
EXPENSIVE & DANGEROUS.

BOTTLENECKS

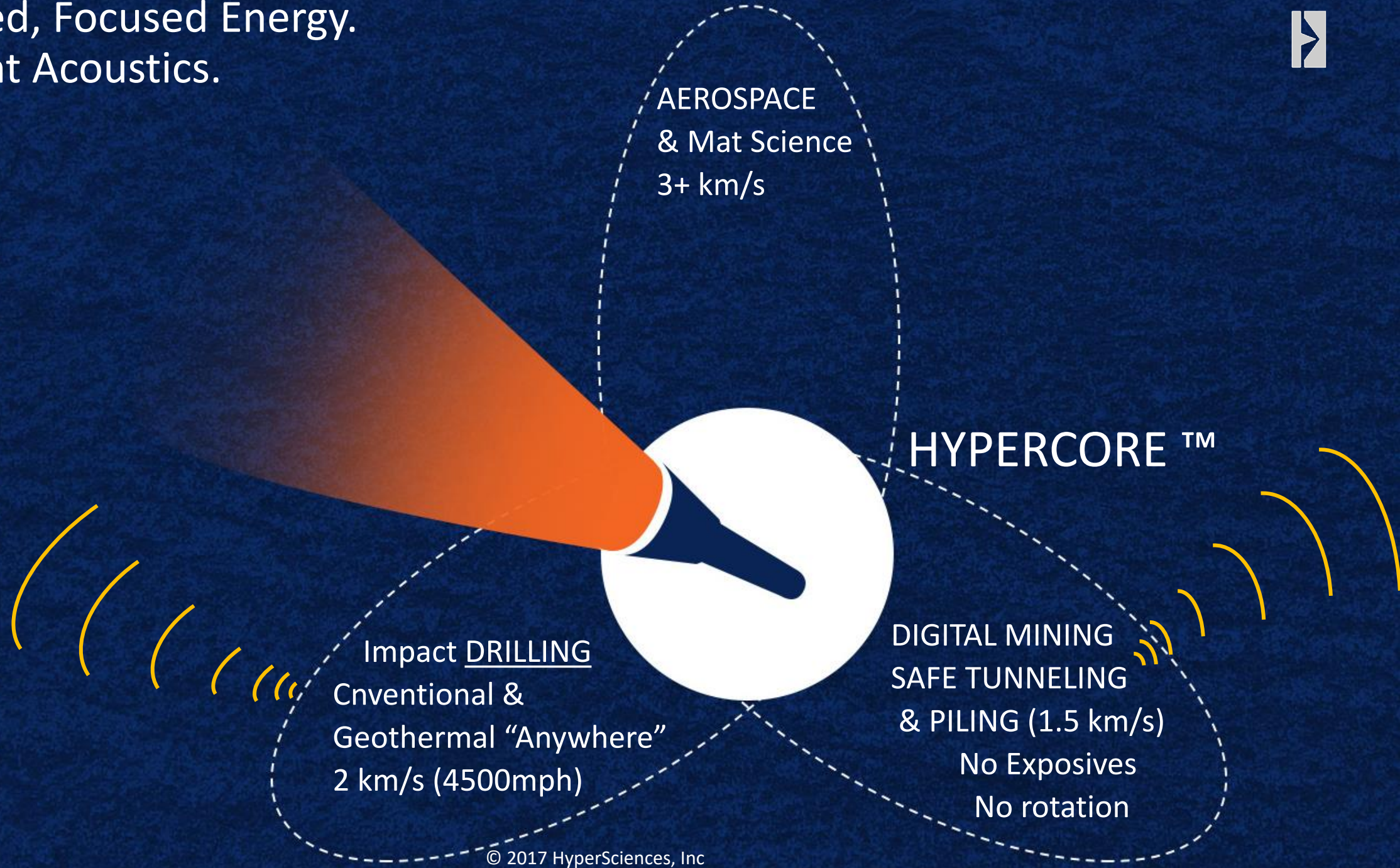
1.) DRILLING
2.) COMPLETIONS

Focusing energy develops new oceans in

TRANSPORTATION, ENERGY & NEW MATERIALS PRODUCTION



Packetized, Focused Energy.
Intelligent Acoustics.



WE PUT HYPERVELOCITY TO WORK.

HYPER SCIENCES

Simple Chemical Energy -> Kinetic Energy -> Work

Industrial. Scalable.
Hyper-projectile technologies.

Energy Drilling

Infrastructure

<u>Industry /Market Problems:</u>
Low commodity prices. Hard rock.

Deep & expensive resources.

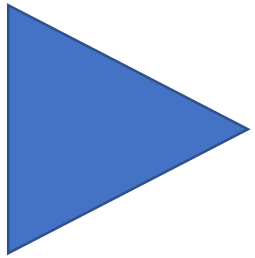
Market priority: Efficiency & Cost

Underground Mining

Tunneling

Short Movie

HYPER SCIENCES



See Video at : www.HyperSciences.com

Energy Drilling

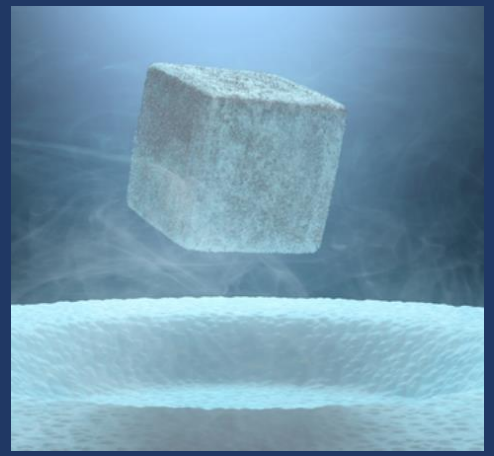
Infrastructure

Industry /Market Problems:
Low commodity prices. Hard rock.

Deep & expensive resources.

Market priority: Efficiency & Cost

Materials Production (Mining & MatSci)



Tunneling

A New Engine. High Impact Platform Technology

Breaking thru Rock with the Power of HyperVelocity

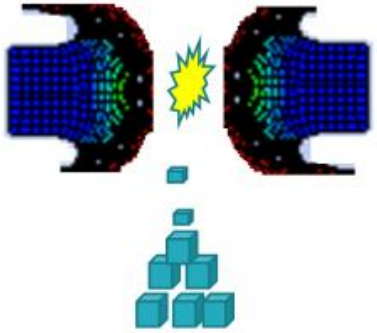
HyperCore™

Piling

Mining

Energy Drilling

Tunneling



New Materials (Abrasives & Super Conductors)

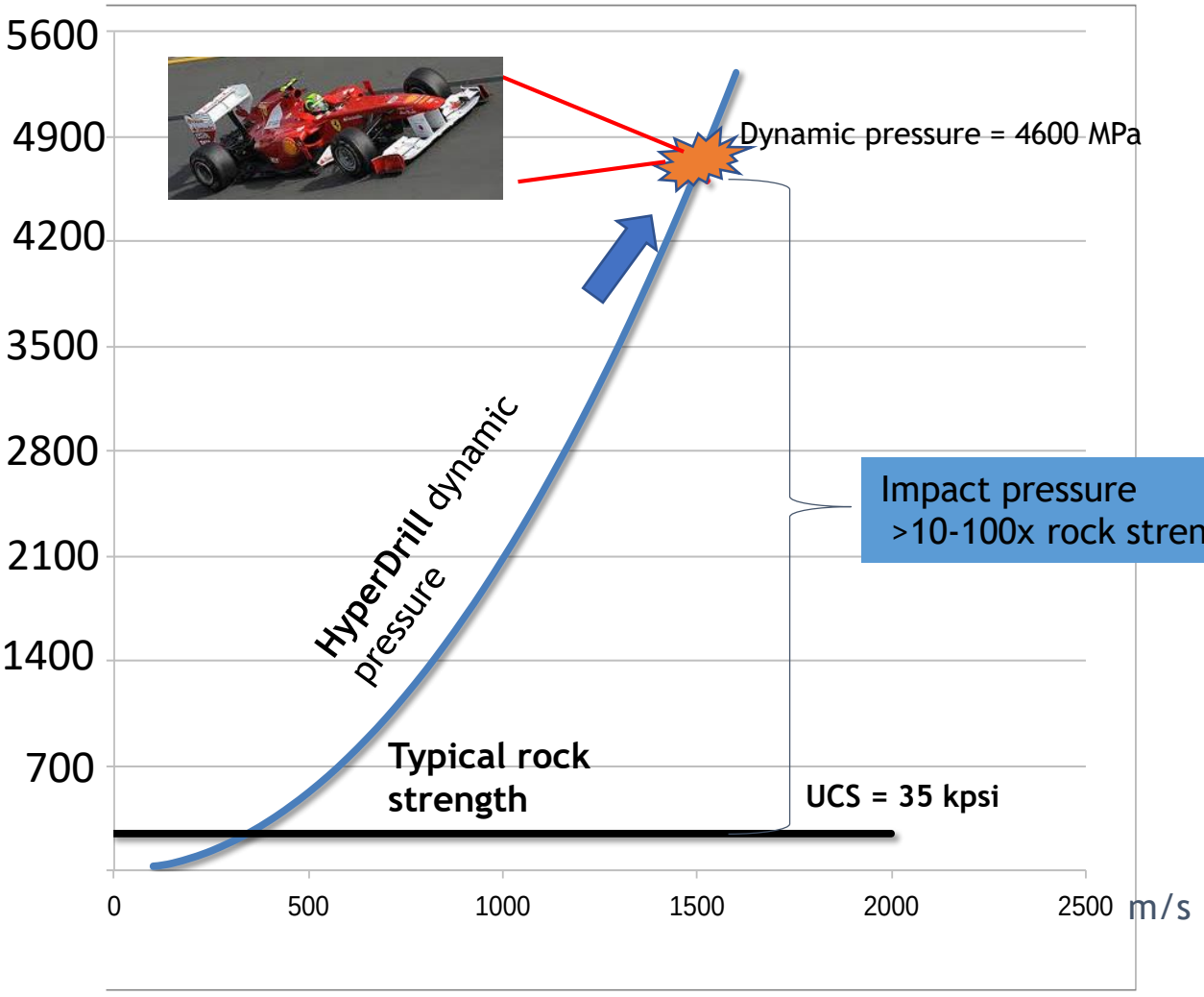
“GAS-POWERED RAILGUNS”
TUNNELING, PILING, DRILLING DEEP GEOTHERMAL, MATERIAL SCIENCE

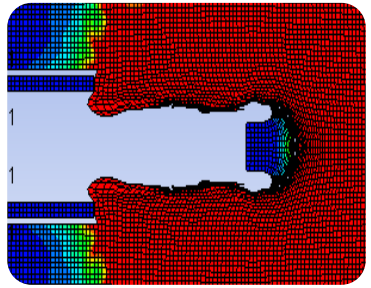
HSI-003

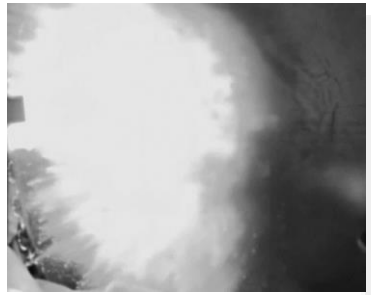
HOW: Focused Energy: Short, Extreme Pressure Impacts

10-100x rock strength = New way to break rock

Generate pressures that are order of magnitude greater than rock strength



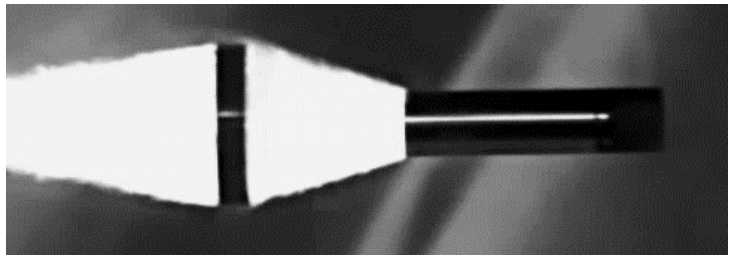


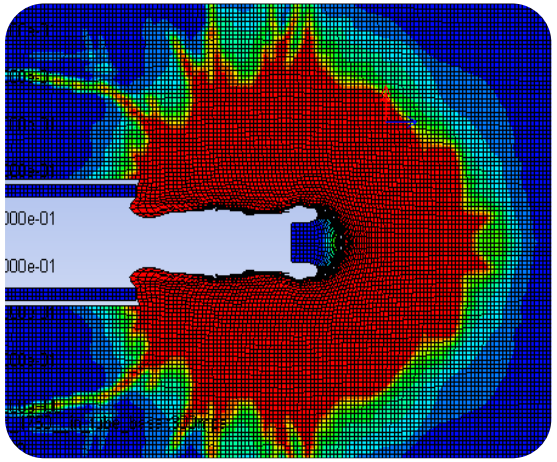


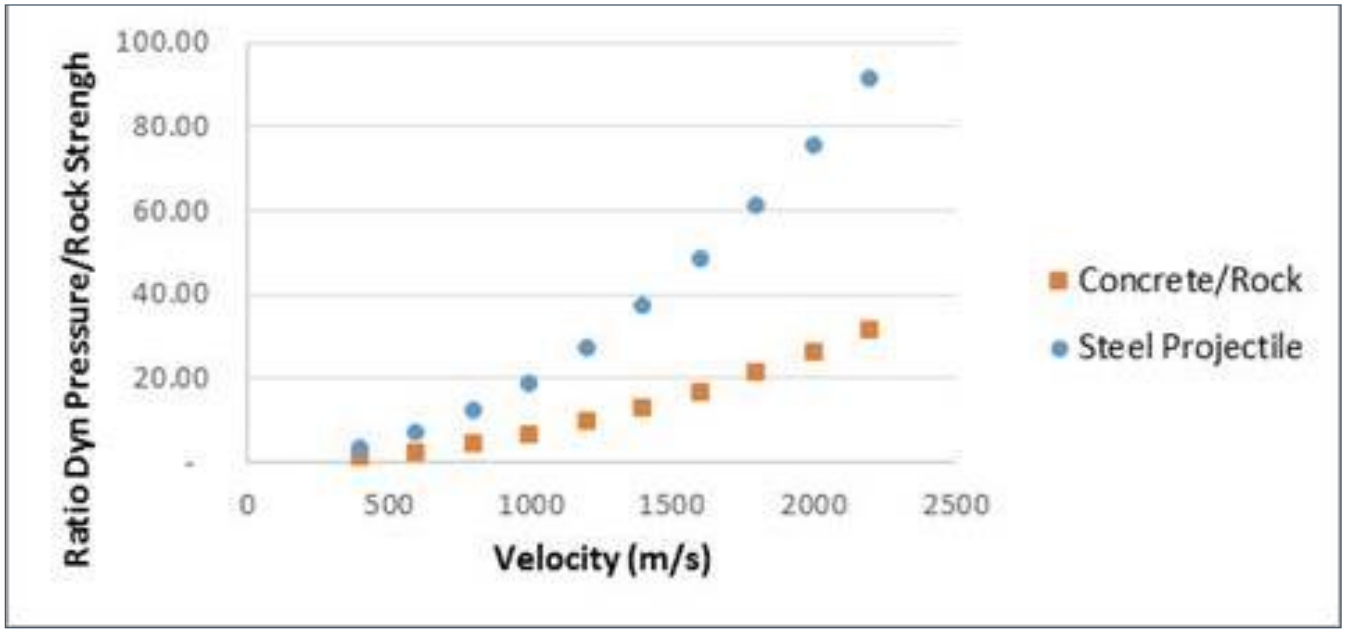
World's fastest commercial projectile technology: Mach 4.5+

Rock Breaking Efficiency: Hydro-Elastic Impact

Short-Impact Pressure 10 – 100 x material strength







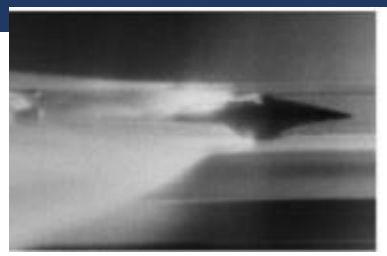
The Physics of Hyper Impact

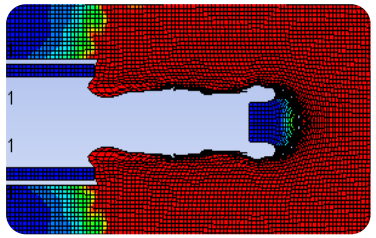
- **Energy:** E = ½MV^2 (Joules)
  ~1MJ: 700 grams @ 1650m/s

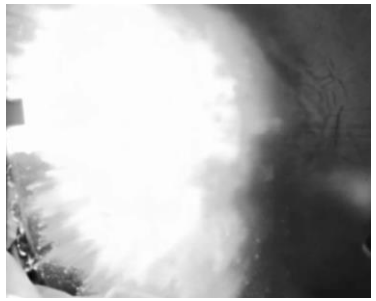
- **Power:** P=E/dt (Watt)
  ~350 MW (.003 sec)

- **Impact Pressure** = ½ρV^2 (Pa) [psi]
  ~4000 MPa
  ~ 500 Tonne-Force

- **Break Rock:**
  Variable: Mass, Velocity
  5X-10 X Faster, 30-80% lower cost





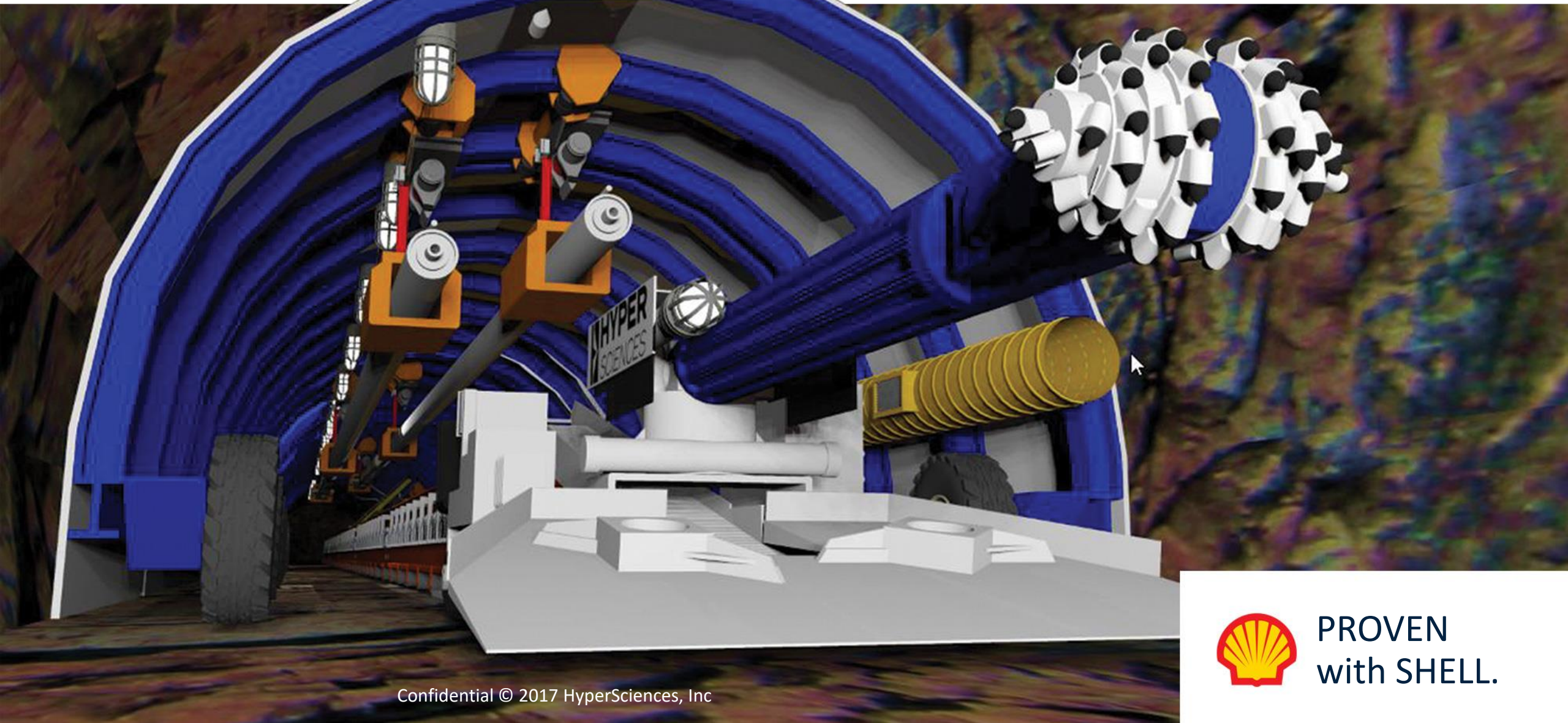


Pile Driving & Foundations

- 10 X Faster Pile Driving / Foundations

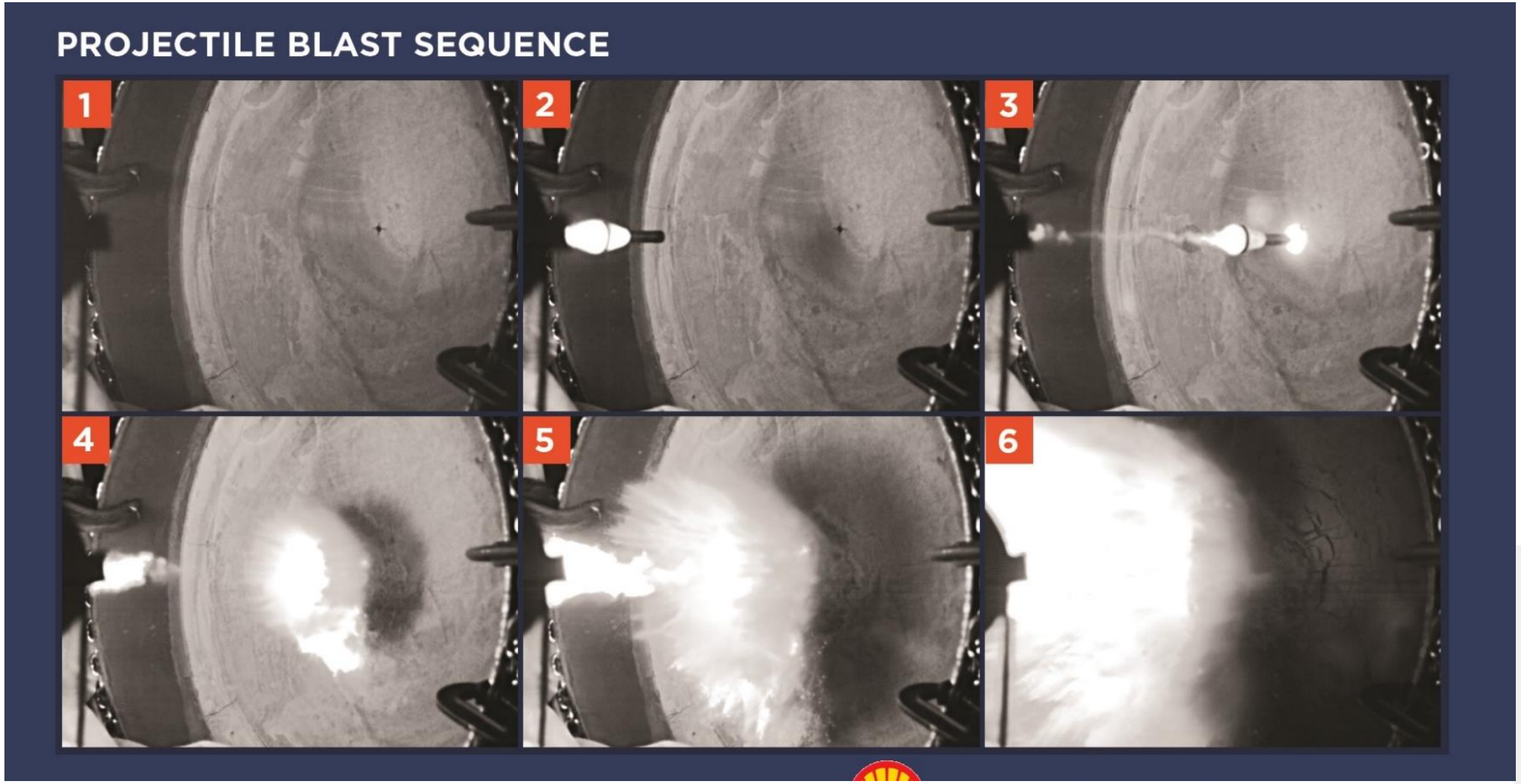
TUNNEL 5X FASTER.
30% LOWER COST.

DRILL 10X FASTER & DEEPER.
EXTREME LOW COST



PROVEN
with SHELL.

HOW: Hydro-Impact Projectile
Near-Surface impact Mach 6 (2 km/s)

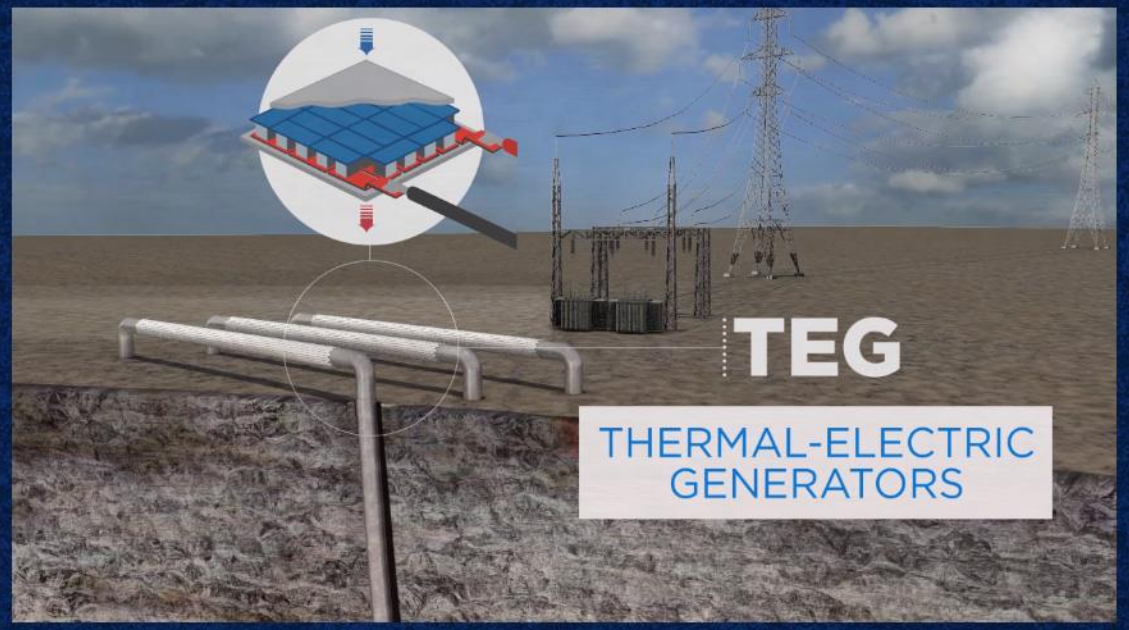


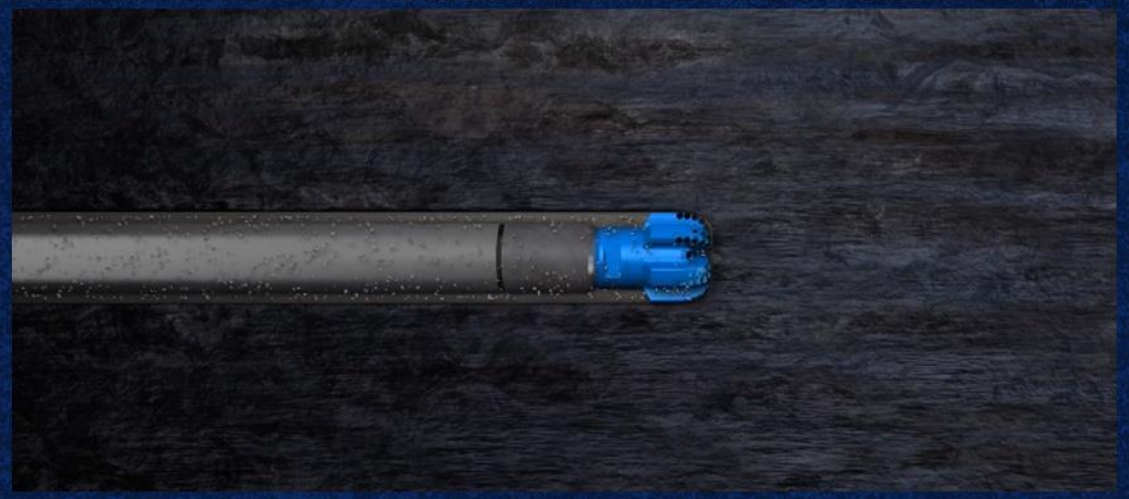
HYPERDRILL™ ENABLES ENERGY ANYWHERE™

Our Patent-Pending Silicon TEG Plant is Moore's Law for Geothermal.

- *NEW ENERGY*
- *$2.5M / MW INSTALLED*
- *$.05 / KW-HOUR*

PLANT SIMPLY SCALES





Graduate

Our Geothermal and HyperDrill™ technologies were sponsored & funded in-part with Shell Game Changers™ Program

COMMERCIALIZATION PATH:

Hyper-Drilling and Tunneling

2017

Tunneling & Piling-
Conductor Casing

2018

HyperDrill™ Field Trials

2020

Energy Anywhere™ Geothermal

Platform Technology: Aerospace and Natural Resources

Low Cost Projectiles at Hypersonic velocities break and pulverize rock

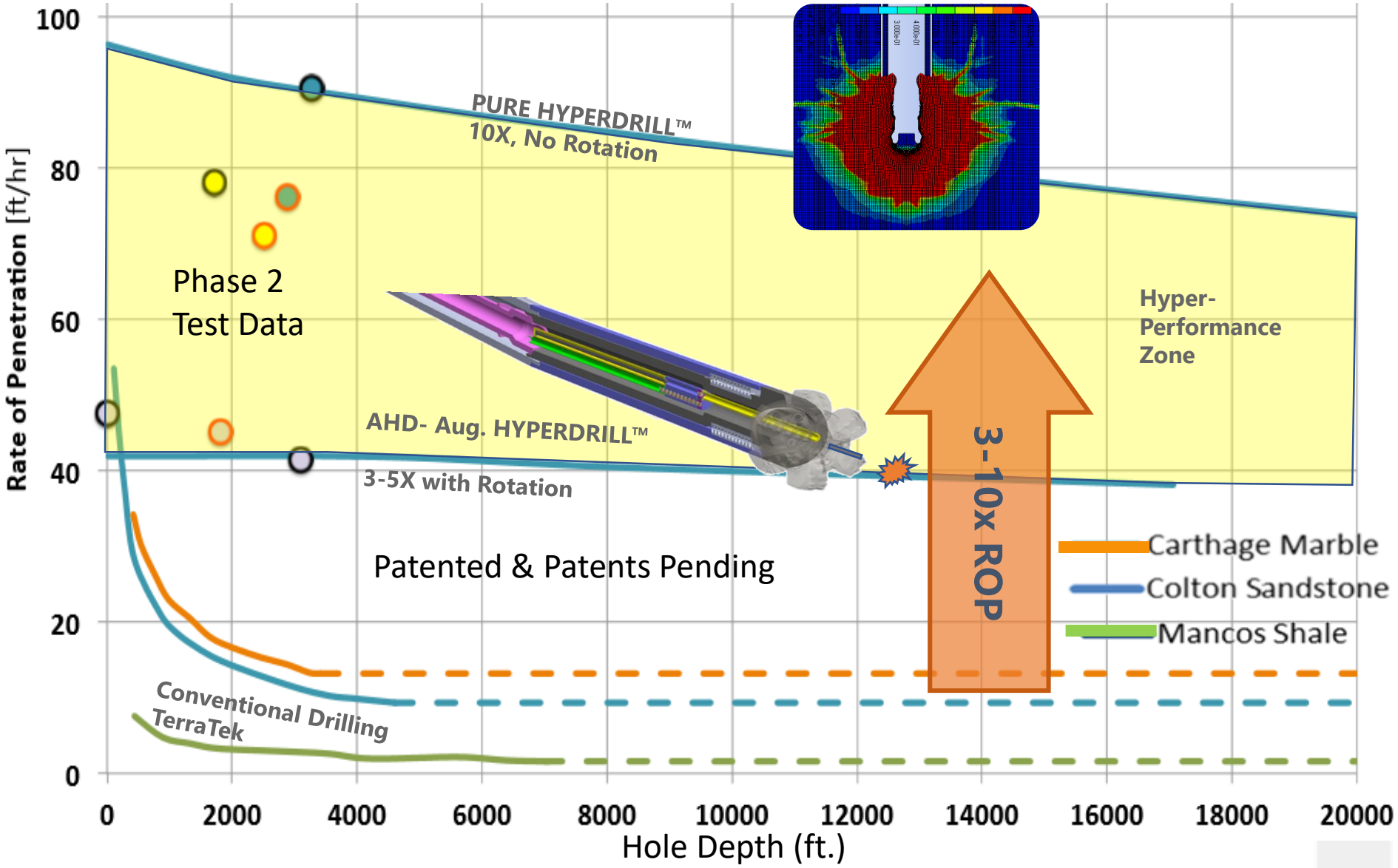
Market priority: Efficiency & Cost

- Low commodity prices. Hard rock.
- Deep & expensive resources.

HyperSciences Solution:

- Mature industrial-aerospace technology.
- V^2 Power of extreme velocity to break and pulverize rock
- Radically changes the economics of breaking & Pulverizing Rock.

HyperDrill™: Quantum Leap in Depth, Time & Cost.



Proven.

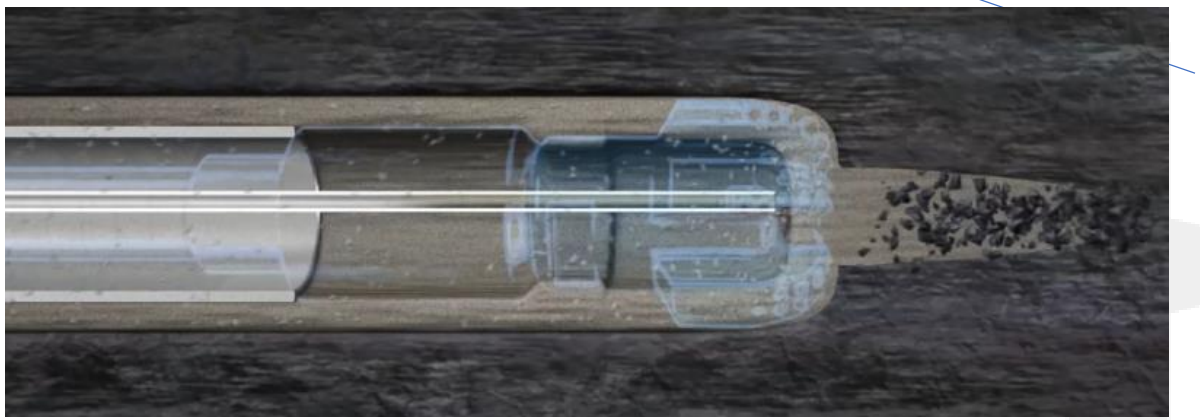
Augmented HyperDrill™: Guaranteed performance

Key Advantages:

- Lower Bit Count & Trips
- Save up to 50% Rig Days/Cost
- Complete compatibility
- Fast !

Key Use Cases:

- Chirt & Variable rock
- Deep
- Hard Rock



Patented & Patents Pending

PURE HyperDrill™ = No rotation required ! 10X+ ROP

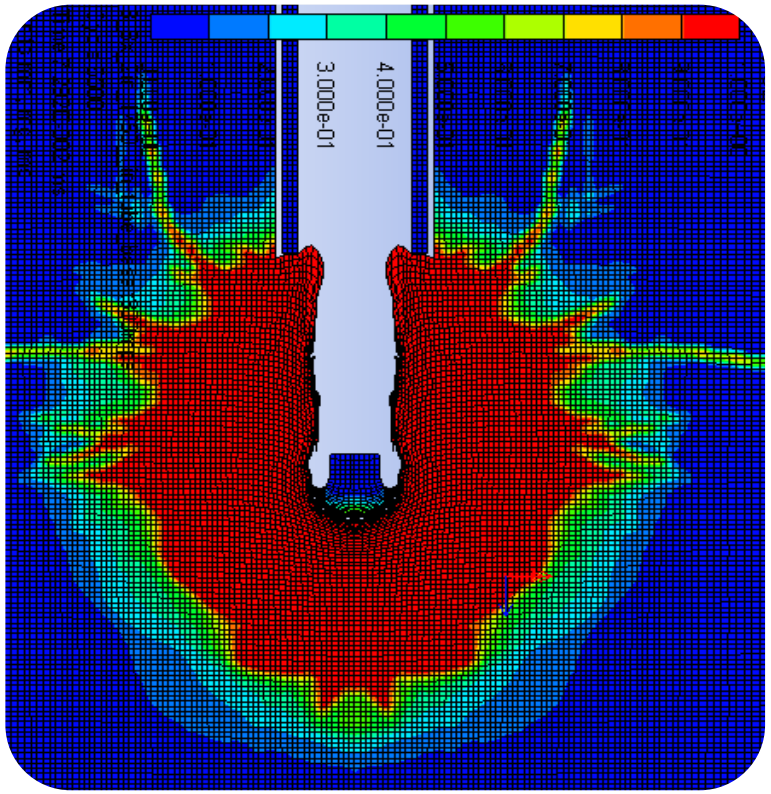
Key Advantages:

Hyper-projectile does all the work

- Eliminate Bit Count & Trips
- MonoBore to TD if desired
- Save 80% Rig Days/Cost
- Rig compatibility
- Steerable

Key Use Cases:

- Granite/Basalt
- Chirt & Variable rock
- Deep
- Hard Rock
- Geothermal



Patented & Patents Pending

Harnessing the Power of Extreme Velocity

HyperDrill™ Technology Unlocks Deep Energy

- Shell Game Changer

  2.5 yr Funded

- Proven Technology

  High Pressure Demo Tests

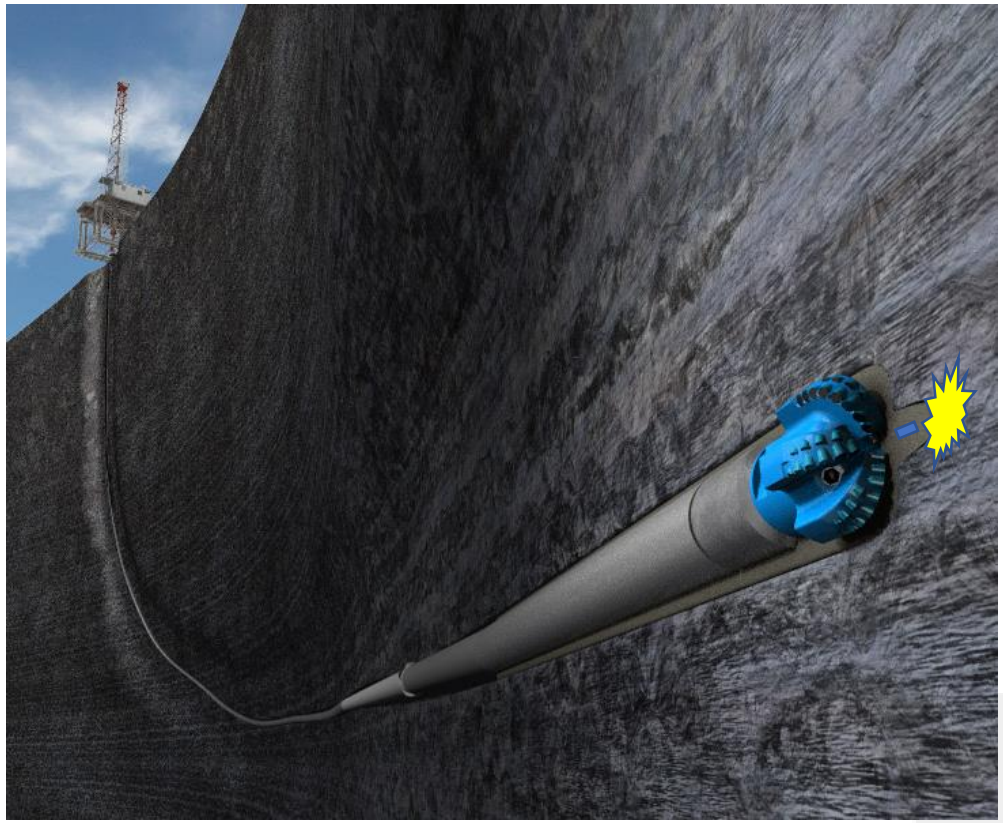
  100's tunneling field tests

- Independent econ analysis:

  $15.5 Billion dollar value in drilling

  $100's M + annual revenues

- Field trials now -> 12 months
  - Steerable. 3-10x ROP

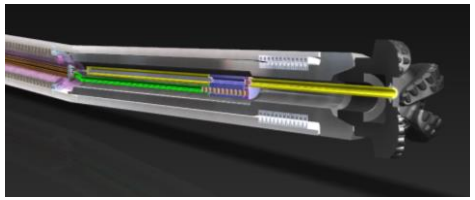


Patented & Patents Pending

Aug. HyperDrill Technology Overview

Driver Tech

Diesel/air HyperCore is integrated in the BHA, Similar propellants as diesel engine

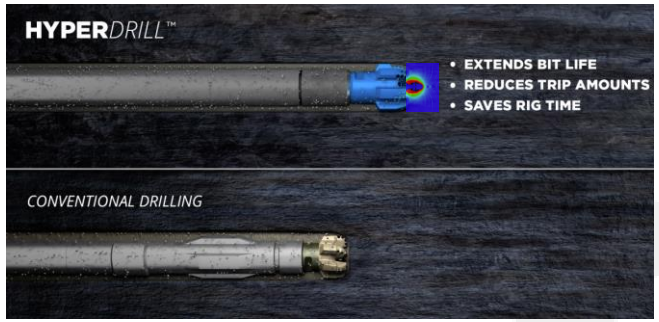


Driven Tech

Composite projectile is designed for high density to maximize dynamic pressure but will erode at impact.

Performance

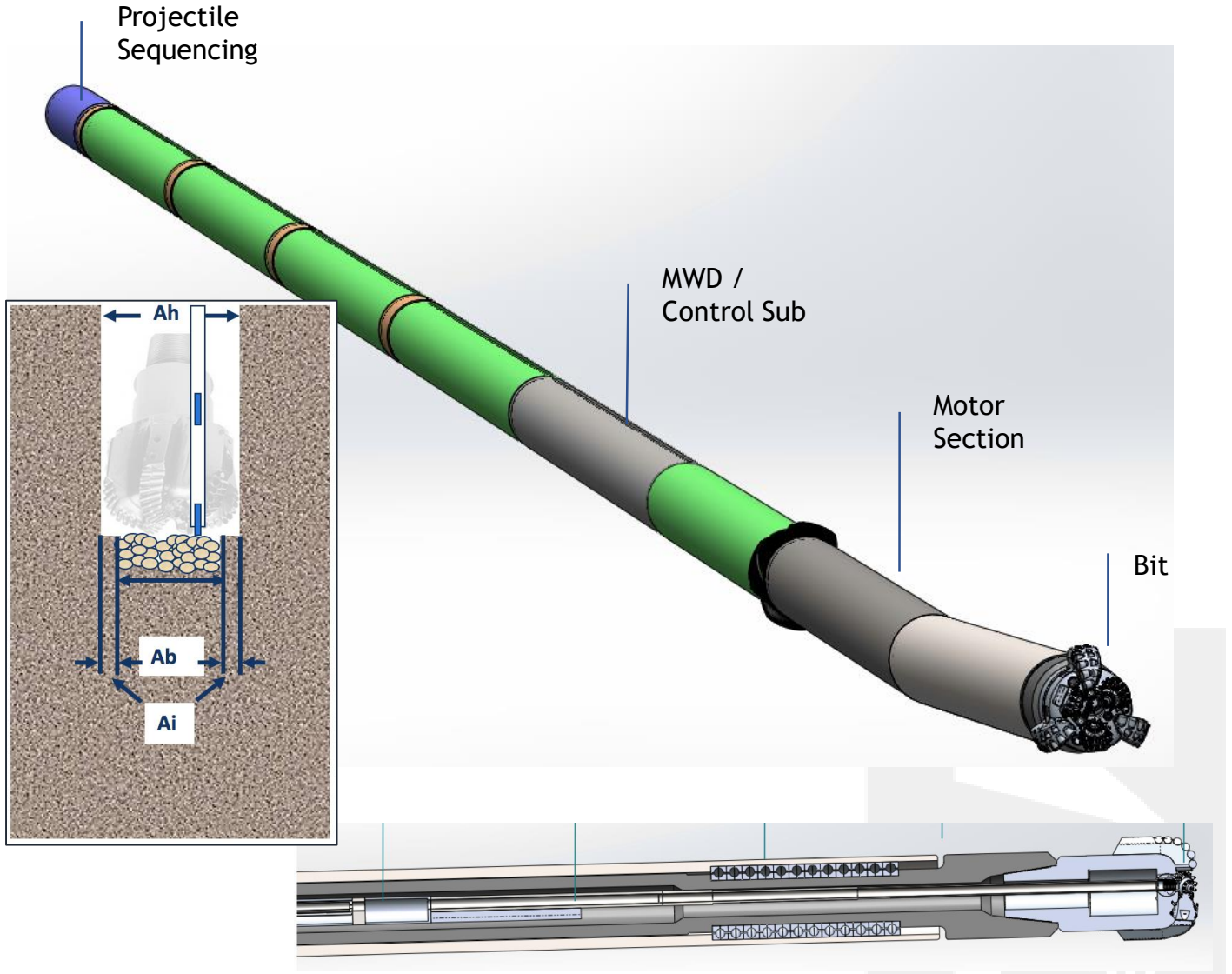
Projectile impact creates crater, weakens rock, and creates fractures, improving ROP by 5-10x especially in hard rock and high pressure conditions



Minimum Viable Product Downhole Tool Design

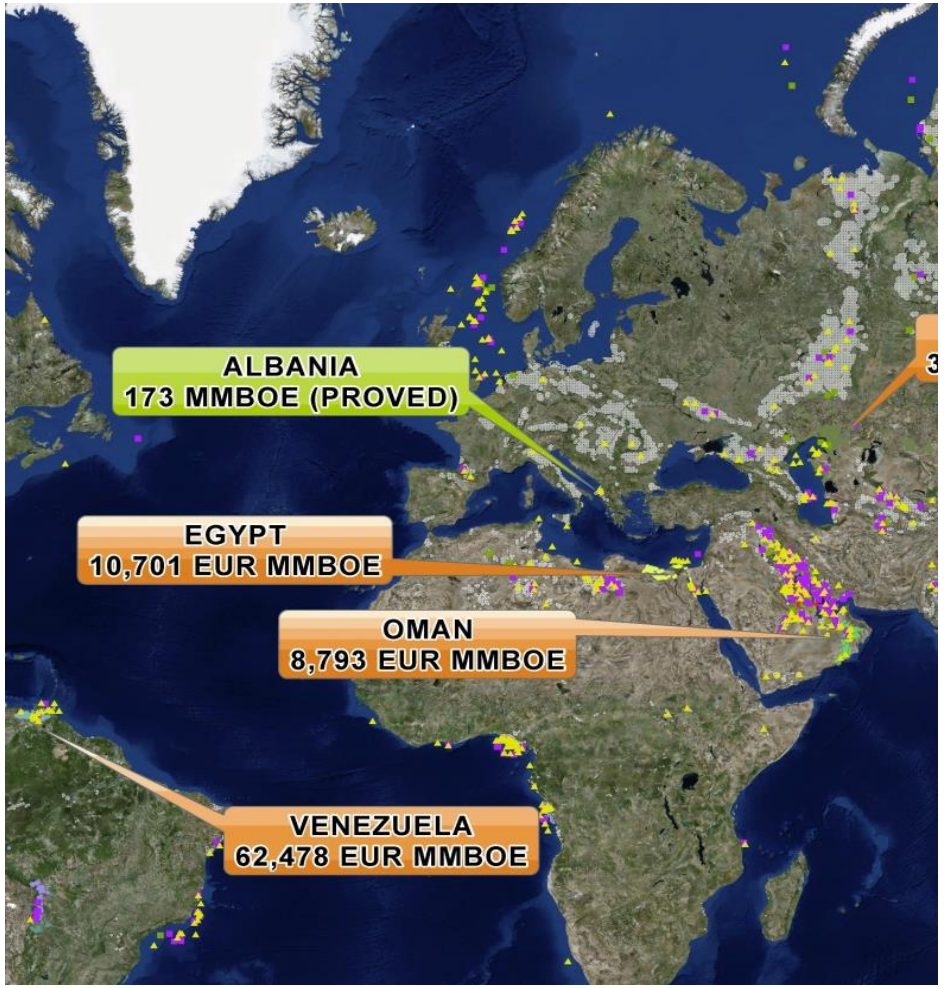
Tool Features:

- 3-5x ROP Improvement
- Drop-in compatible with existing drilling technology
- Augmented HyperDrill – HyperCore gun integrated into rotating drill bit
- BHA features
  - Bent sub steering to 15 deg/100 ft



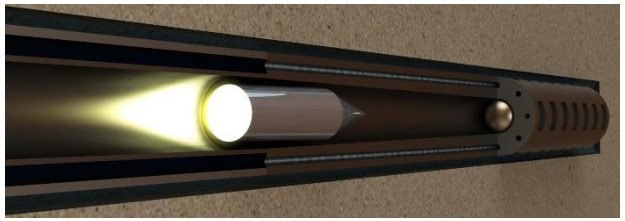
O&G Drill a Well on Paper Summary: $1- $4M per well net saved w/ Aug HyperDrill

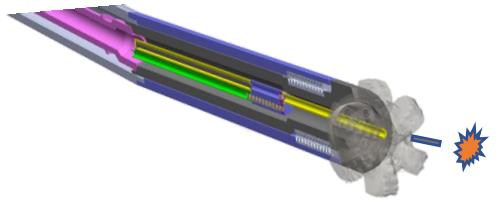
- Europe: **$4.6MM (38%** of Combined Sections Drilling Costs) per well **net** savings to operator
  - Expected 10-12 well program = $50MM savings
- Oman: **$1.35MM (47%** of Combined Section Drilling Costs) per well **net** savings to operator
  - Expected 60-100 well program = $105MM savings
- **Performed economic analysis for another Major IOC company** – confirms our results.



Shell Contract / Path

GameChanger





PHASE 1 Complete	PHASE 2 Complete	PHASE 3 Complete
"Feas. Study: Drill Hole On Paper" report (DWOP)	Drill actual hole based on Phase 1 findings	Down-hole MVP tool design. OG&Geo DWOP

- **Drill horizontal hole**
- Commission prototype at MineLab silver mine (N. Idaho)
- **Simulate drilling at depth**
- Conduct test shots using stressed rock targets (simulated pressure environment) SWRI
- **System integration**
- Evaluate solutions for HSSE, blowout prevention, cuttings removal, cementing, casing, etc.
- **Define MVP (Min. Viable Product)**
- Down-hole tool & Drill well on paper excercises to support Series A due diligence (September 2016)
  - **Oil & Gas Engineered Geothermal – New Energy Opportunities**

Proof Points

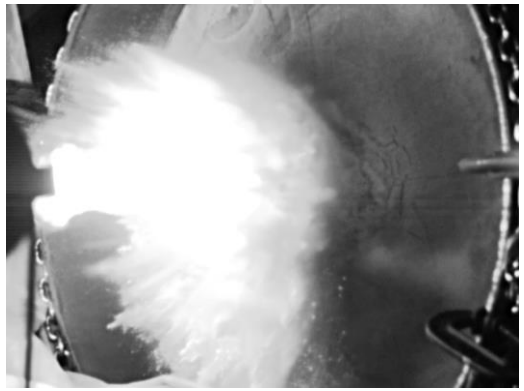
Hypervelocity Testing

Thousands of hypervelocity experiments completed by HSI team.

Bore sizes: 0.5”, 1.5”, 4”
Most experiments done in 1.5-2.7 km/s range

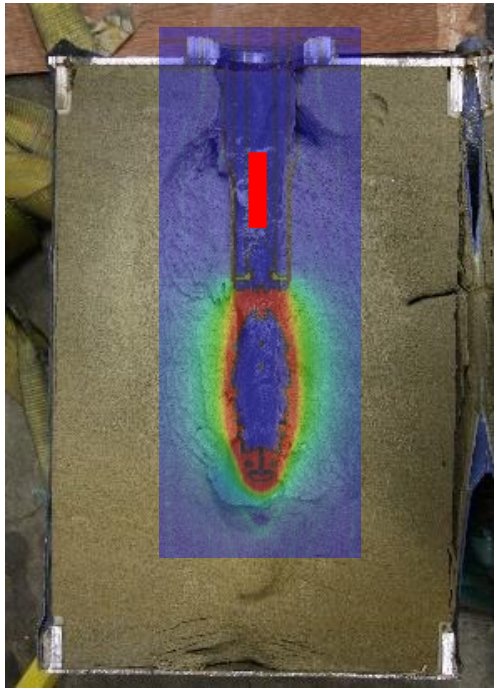
Rock Impact Testing

Hundreds of tests done in rock types of interest at downhole conditions (saturated samples under confining pressures > 3000 psi)

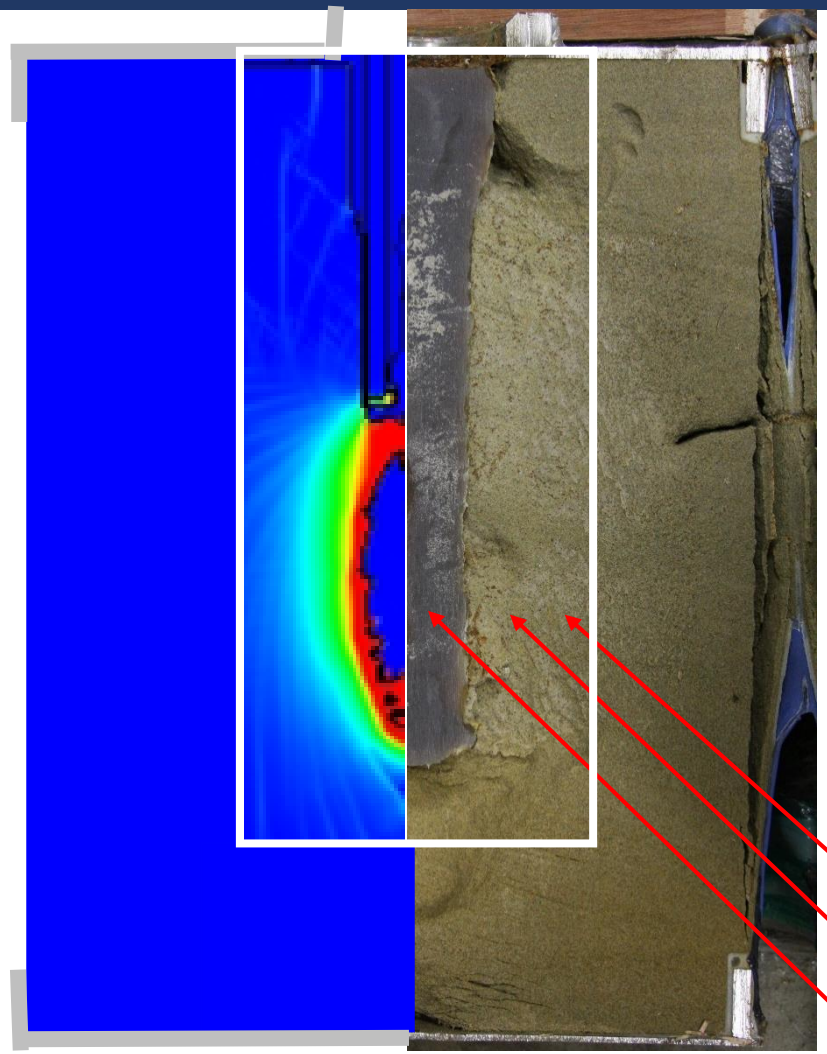


Model Correlation

Hydrocode models predict penetration characteristics and have been calibrated by Shell experiments. ROP proof.

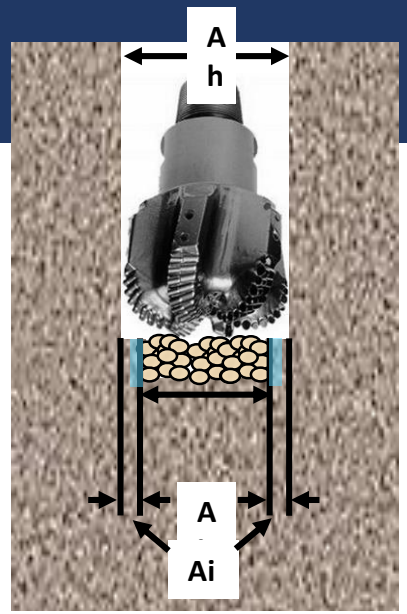


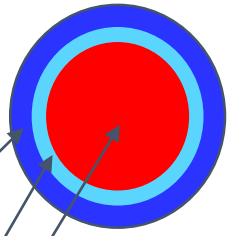
Damage Zones Details –Computational MSE ROP Models



CTH Model

HSI/SWRI Test





There are three zones in the hole bottom post-shot:

1. Intact rock
2. High porosity (weakened) rock
3. Crater

Seeking **JIP Partners & Series A investment**

Non-equity Joint Industry Project Partners
$250k minimum, applied as project specific

Hypervelocity.
A revolutionary technology platform

- HyperDrill Field Trials ($2.5-3 M, 3 phases)
  - **Phase 1: $450k** phase w/ Matched $450k 4.5" Hole
  - **Phase 2: $1.25 M** 8-12" Hole
  - **Phase 3: $ 500k** 8-12" at 2000 ft section field trials

Disruptive Innovation	Paradigm shift: Pulverize hard rock. New Materials
Multiple Industries	Drilling, Civil Tunneling, Mining, Material Science, Aerospace
$ Billion Markets	TAM estimated at over $5 billion/year

O&G Drill a Well on Paper Summary: $1- $4M per well net saved w/ HyperDrill

- Shell Project 1: > **$4 MM**
  - **(38%** of Combined Sections Drilling Costs) per well **net** savings to operator

- Shell Project 2: > **$1.5MM**
  - **(47%** of Combined Section Drilling Costs) per well **net** savings to operator

- **Performed economic analysis for another Major IOC company** – confirms our results.

HyperDrill™ Summary

- Technology basis mature and demonstrated

- MVP design complete & vetted by Shell and another Major
  - No Technical show stoppers
  - Risks identified and plan to test/mitigate identified
  - Series A ask focused on proof well demo

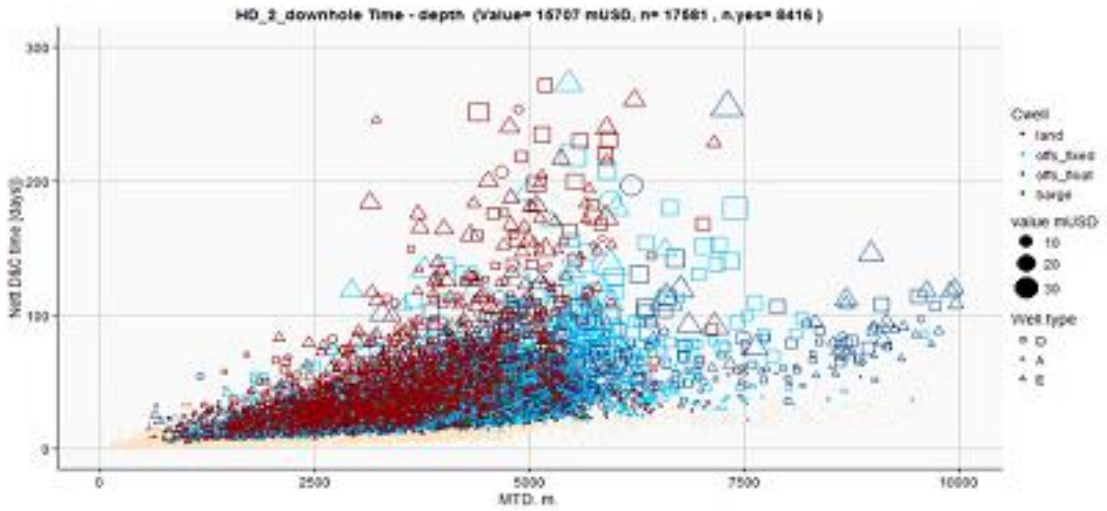
- DWOP Oil & Gas shows game Changing economics for operator
  - Europe: $4.6MM (38% of Combined Sections Drilling Costs) per well net savings to operator
  - Expected 10-12 well program = $50MM savings
  - Oman: $1.35MM (47% of Combined Section Drilling Costs) per well net savings to operator
  - Expected 60-100 well program = $105MM savings

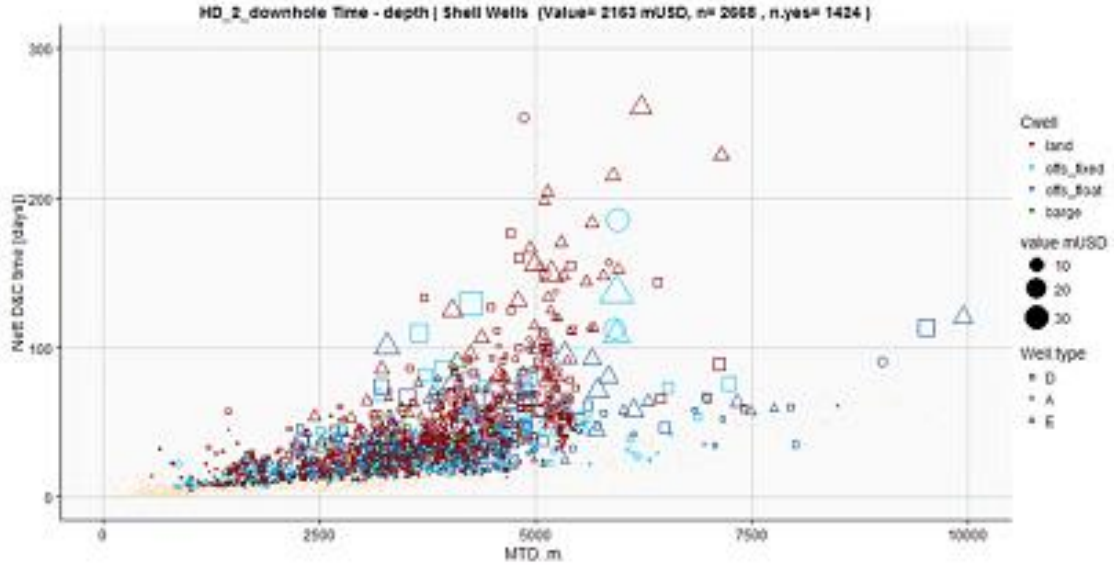
- Large opportunity Deep / Hard Rock
  - $15 bn (10 year)

10-YEAR VALUATION - HYPERDRILL 2.0 DOWNHOLE DESIGN

Note that this is a small but indicative fraction of the hundreds of thousands of newly drilled wells added every decade

Value:
$15+ Billion





- Total value of base-line HyperDrill 1.0 design over the 10 year dataset is 15.7 billion USD, averaging 10% saving on dry hole cost on 8416 wells where the Downhole HyperDrill was used
- Value now more 20/30/50 for land/fixed/floating pushing value towards the high-end offshore floating installations.

- Value of application to Shell and ex-BG portfolios approx 2.2 billion USD.
- Does not include non-operated wells-most

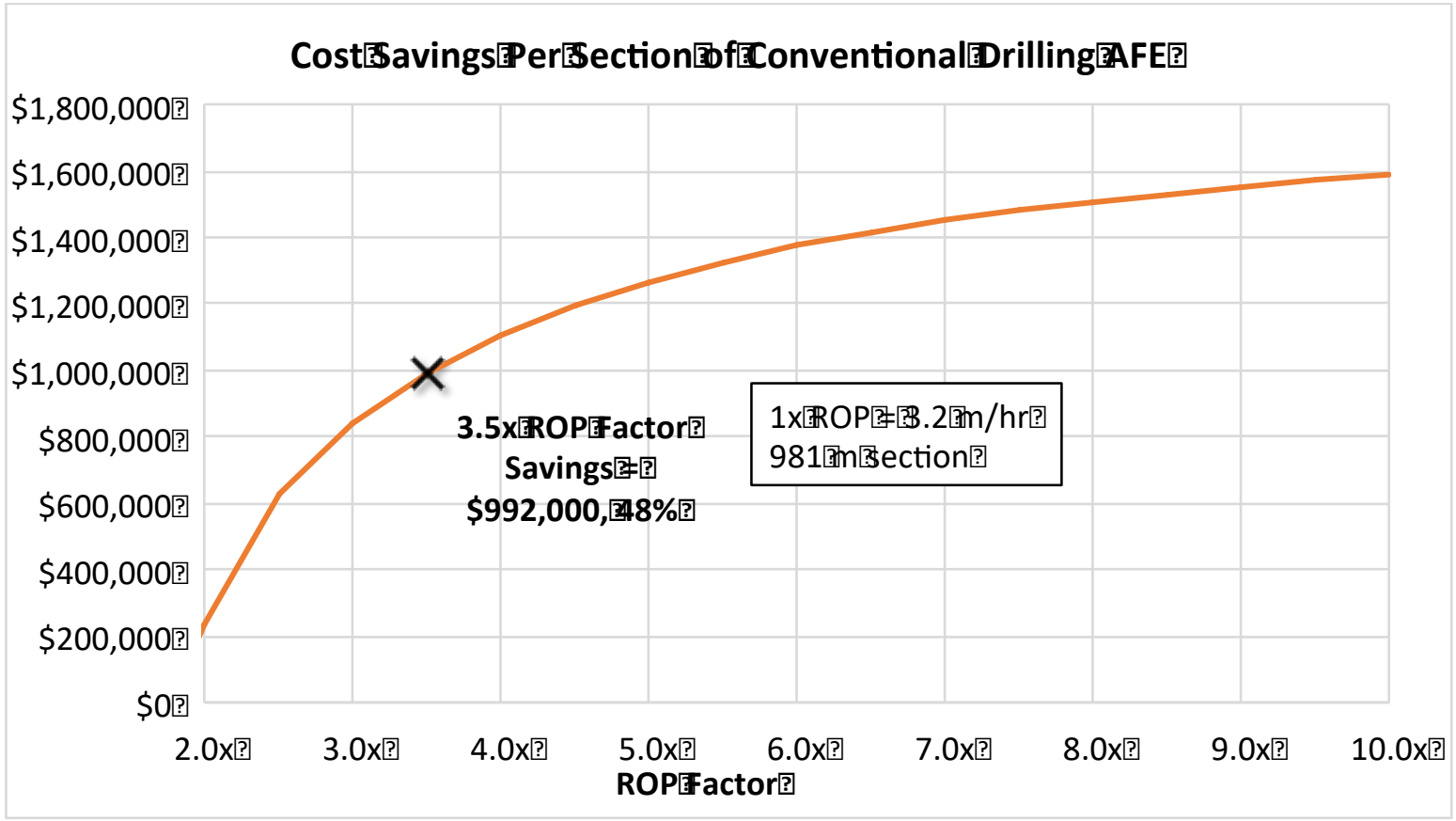
DWOP Oman HyperDrill™
8-3/8” Hole Section – Conventional Rotary Baseline Data

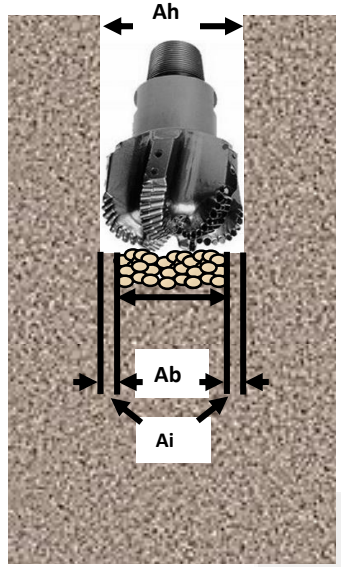
- 981m interval
- 6 bits
  - 4 PDC
  - 2 Impregs
- ROP = 3.2 m/hr
  - ~300 drilling hours
- ~18 days drilling + tripping

- UCS 35 – 65 ksi
- Temp 320 – 356°F
- MW = 14.1 – 14.4 ppg (OBM)

- Data provided by Shell via Email
  - K5 Bit Record

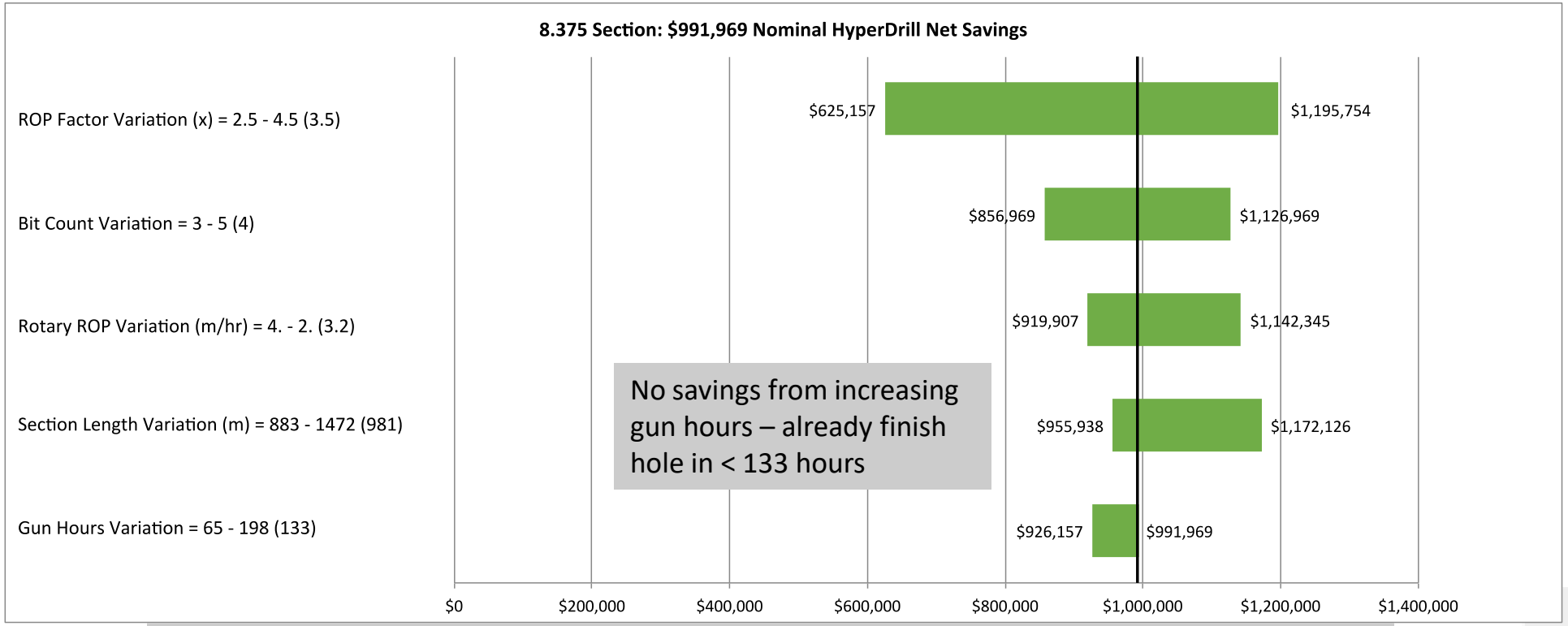
DWOP Oman 8-3/8” Hole Section HyperDrill 3-5x improvement





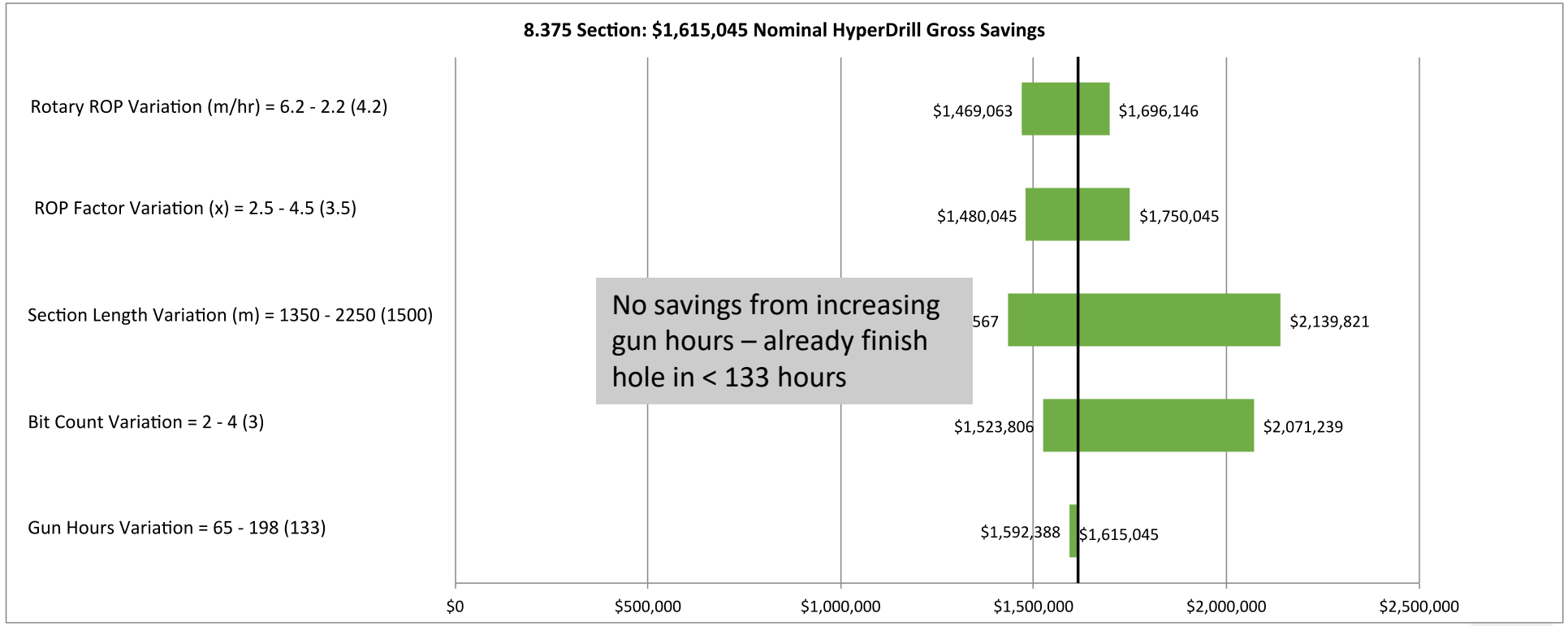
HyperDrill™ 8-1500-S
1500m/s
3”, 27 gram darts
0.7” ID Barrel
Steering

DWOP Oman
8.375” Net Savings - $625,000 - $1,200,000 per section



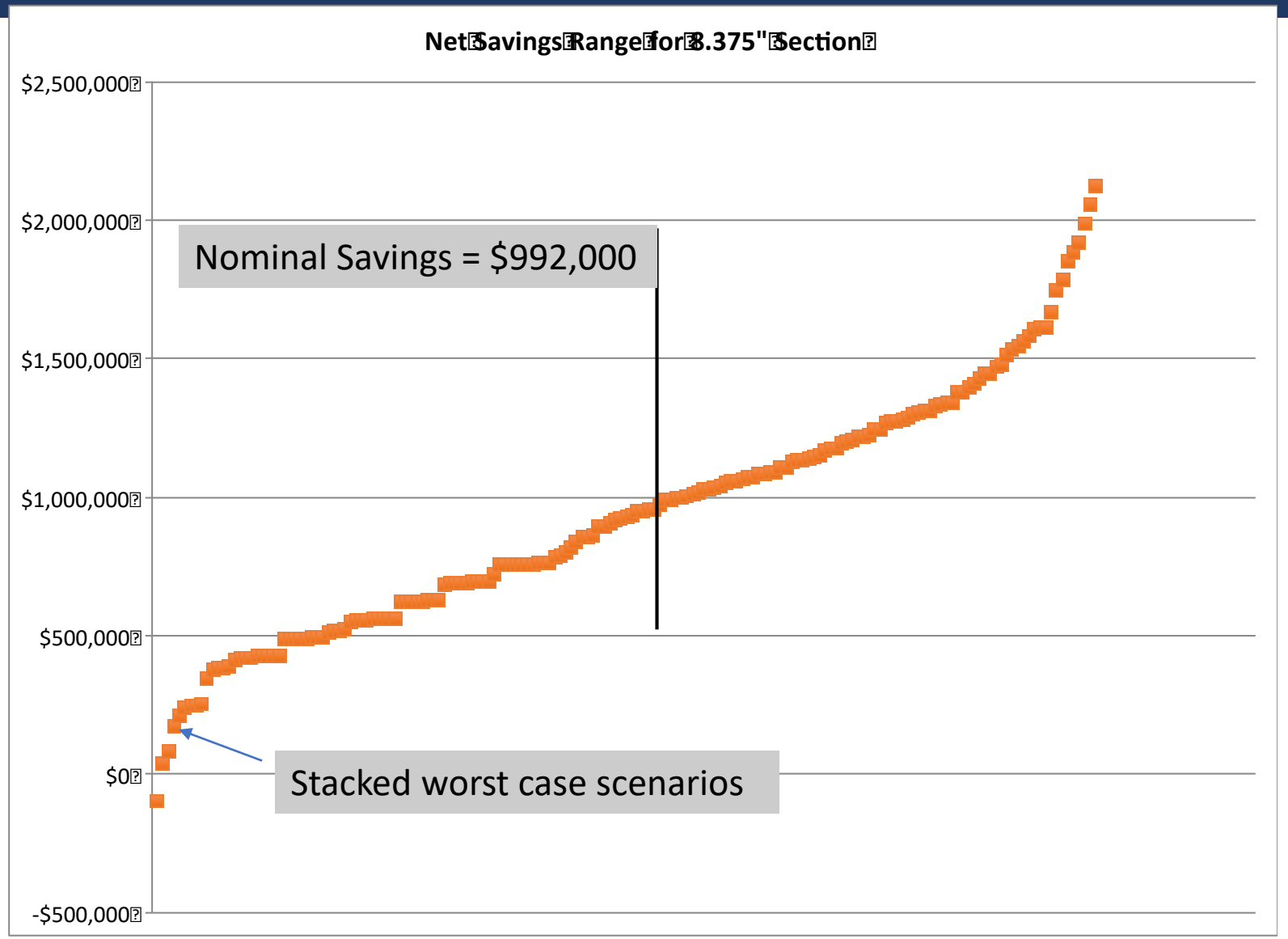
Nominal Net Savings: $992,000
Minimum Net Savings: $625,000 (ROP Factor Variation)
Maximum Net Savings: $1,200,000 (ROP Factor Variation)
Summary: Slower conventional drilling and higher HD Performance = higher potential HyperDrill savings

DWOP Oman HyperDrill™ improvment
8.375” Gross Savings - $1,40,000 - $2,140,000 /section

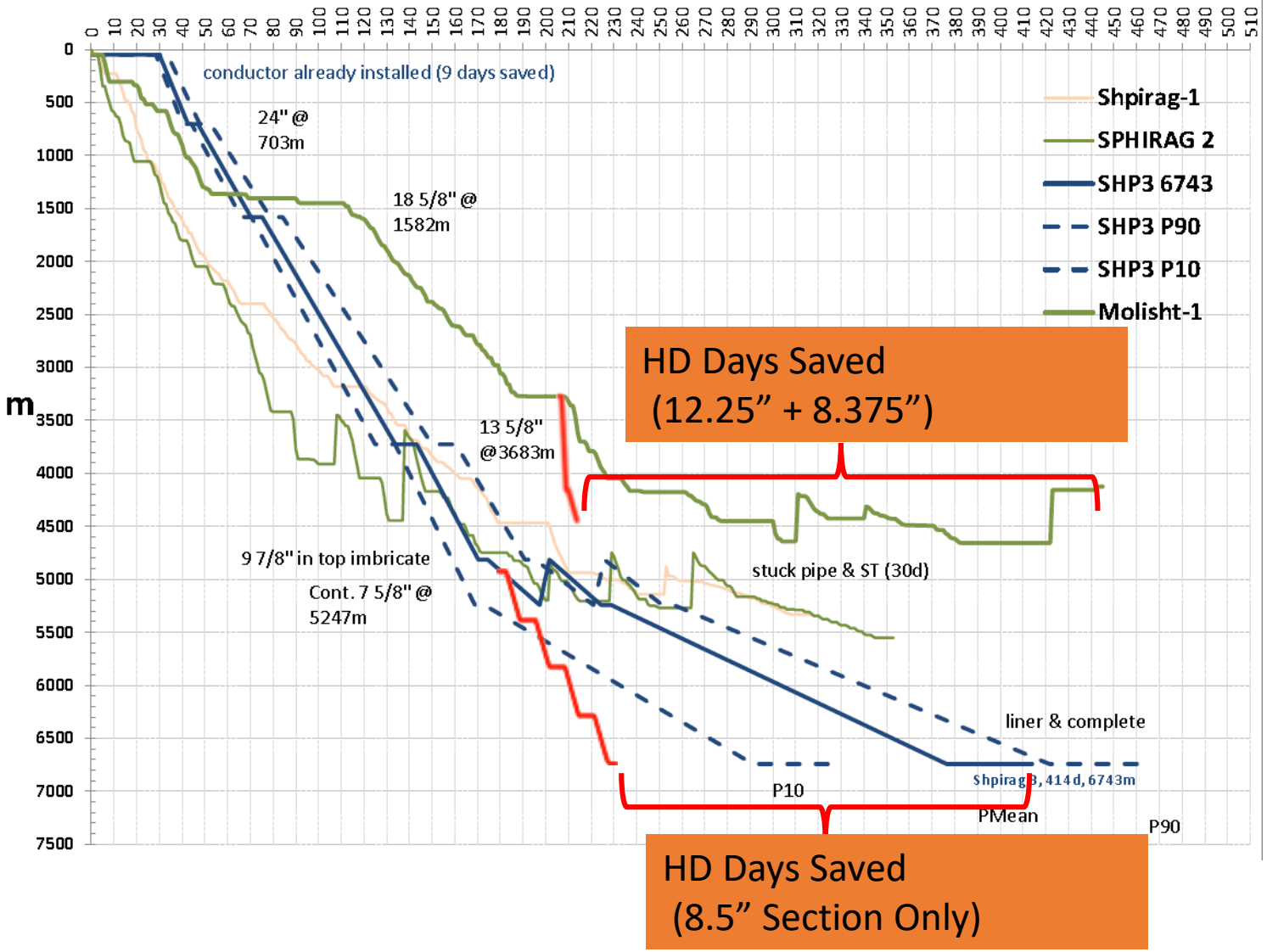


Nominal Gross Savings: $1,615,000
Minimum Gross Savings: $1,430,000 (Rotary ROP Variation)
Maximum Gross Savings: $2,140,000 (Rotary ROP Variation)
Summary: Slower conventional drilling = higher potential HyperDrill savings

DWOP Oman HyperDrill™ improvment
8.375” Section – Net Savings, Nearly Every Scenario



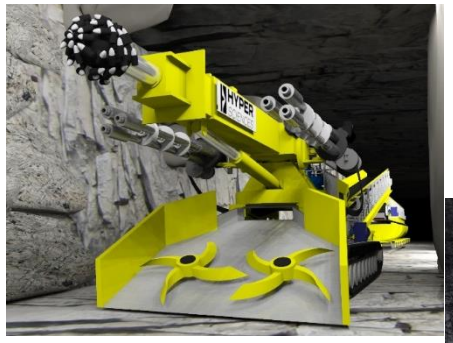
DWOP Oman HyperDrill™ improvment Days vs. Depth Europe – days saved

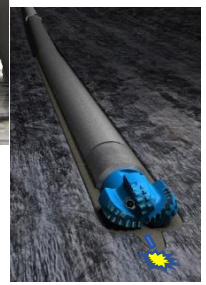


Commercialization Path – All Use HyperCore™ Engine inside

JIP's Joint Industry Projects / SERIES A Series B

2017-2018



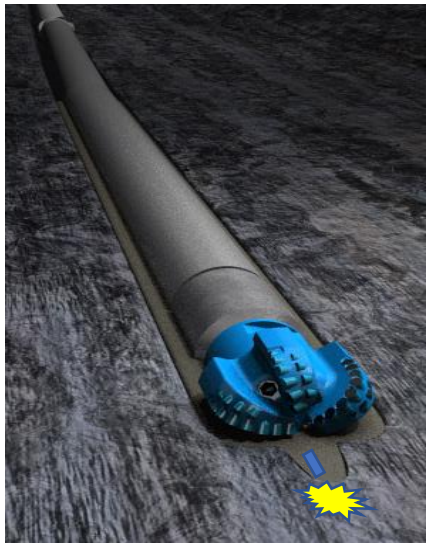


HyperDrill JIPs and Hyper Tunneling

Both with same HyperCore™

- Large scale facility
- Fully integrated
- Cost savings
- NPV/IRR increase
- Faster access

2018-2020

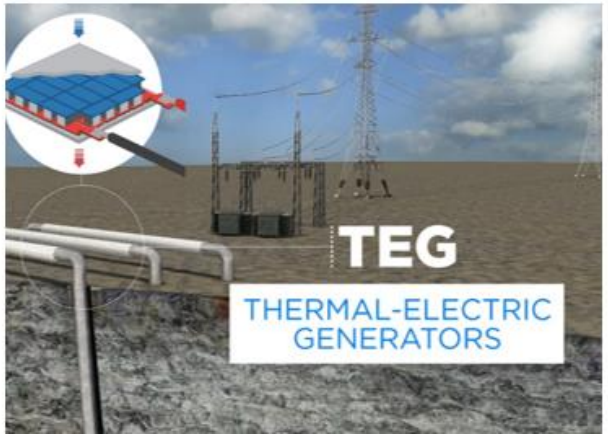


HyperDrill™ Field trials

- Hard rock drilling
- Oil & Gas
- Geothermal
- Access enabler
- Mature product
- Reliability will be key

Patented & Patents Pending

2020-2023

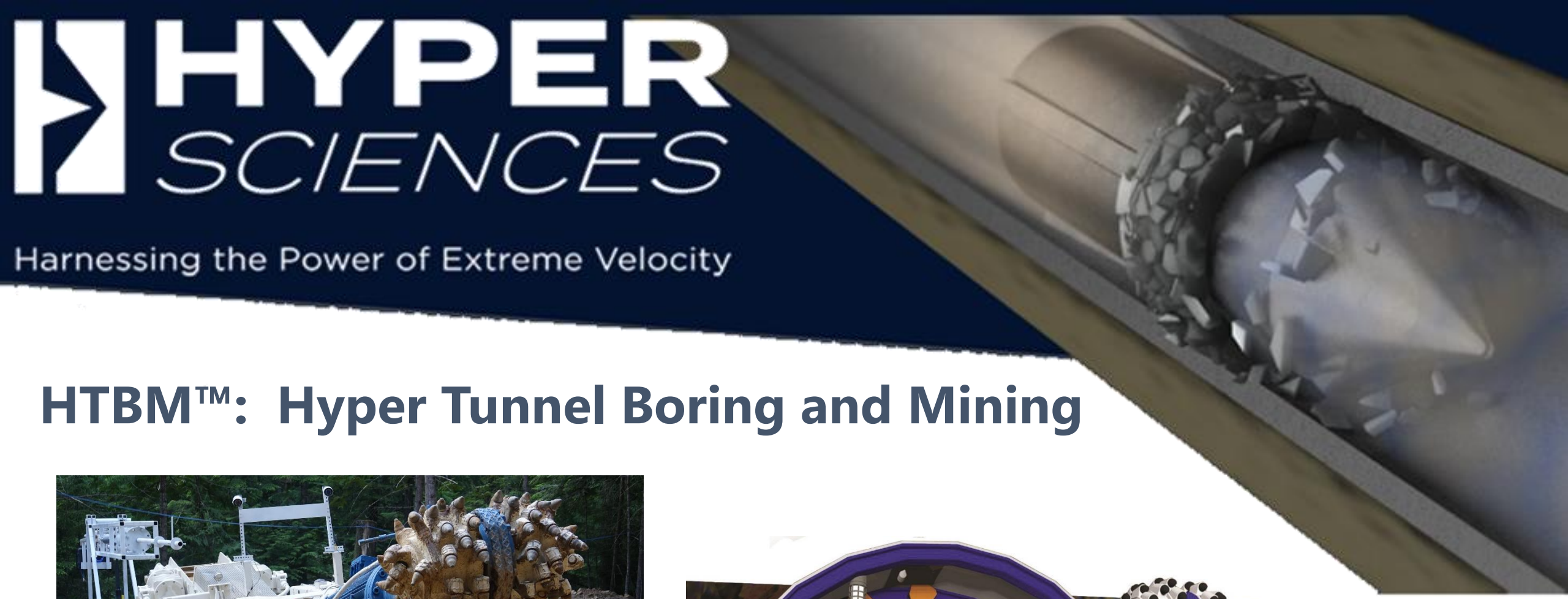


Energy Anywhere Geothermal

- Mature Technology
- Integrated Solution
- Revenue
- Baseload Power

HYPER SCIENCES

Harnessing the Power of Extreme Velocity

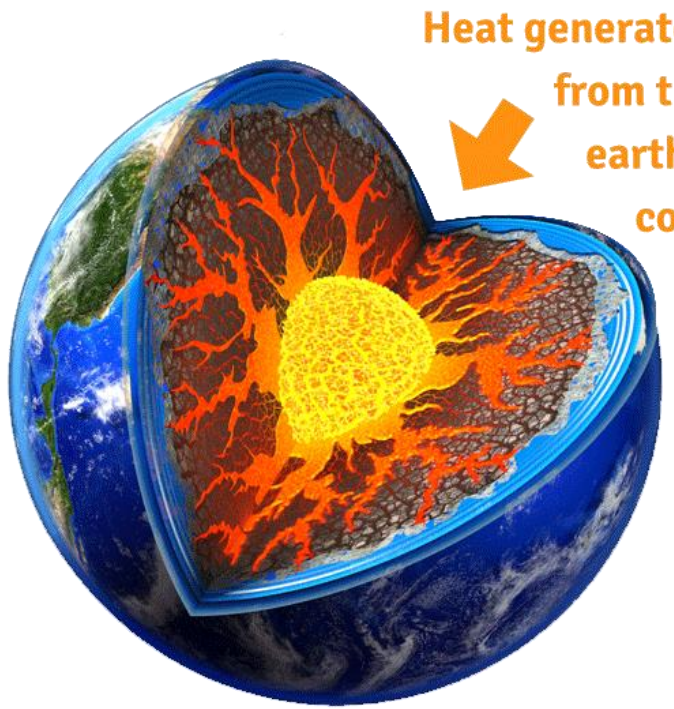


HTBM™: Hyper Tunnel Boring and Mining

HyperDrill and HTBM: 38mm HyperCore™

HYPER SCIENCES

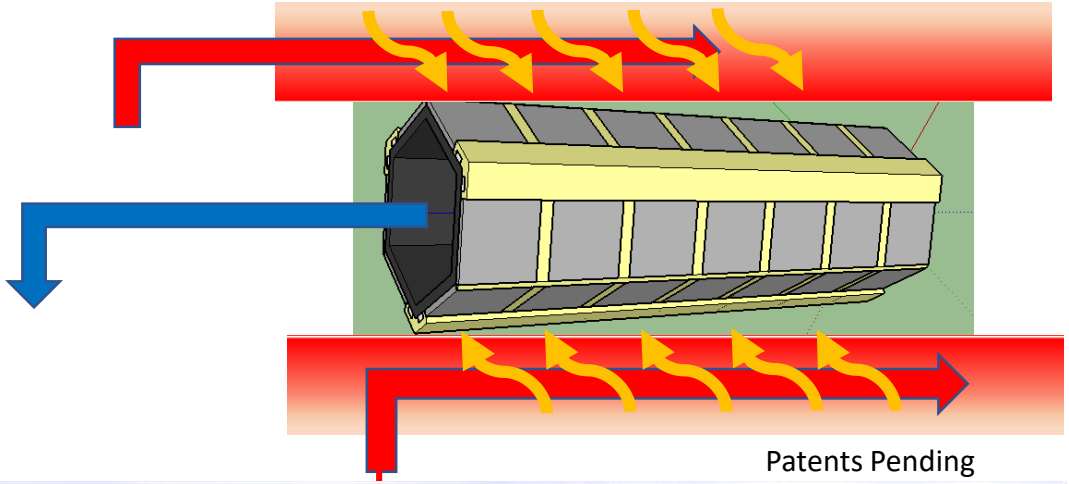
Harnessing the Power of Extreme Velocity



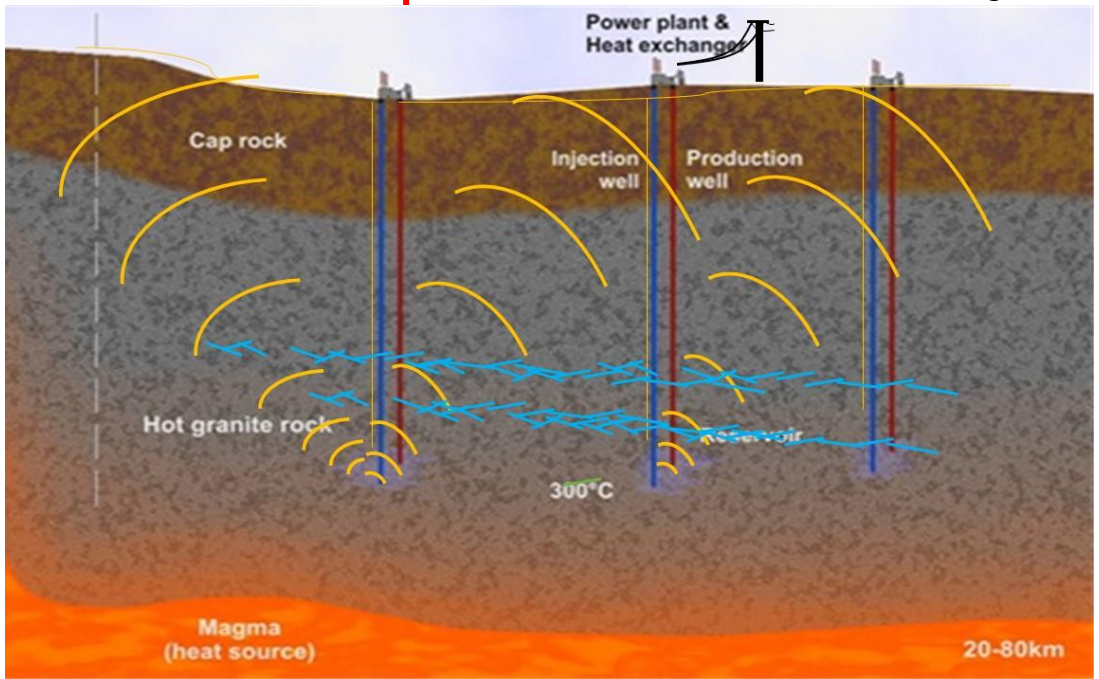
Deep. Energy Anywhere.

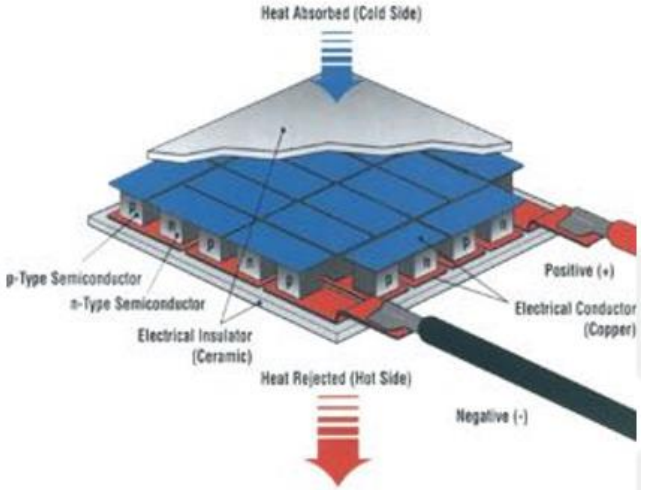
HyperDrill™ & Scalable Geothermal Power

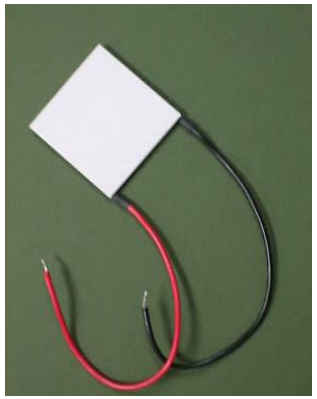
Geothermal Anywhere™. HyperDrill AI™ continuous microseismic Fast Drilling, Intelligent Completions & Silicon TEG plant



Patents Pending







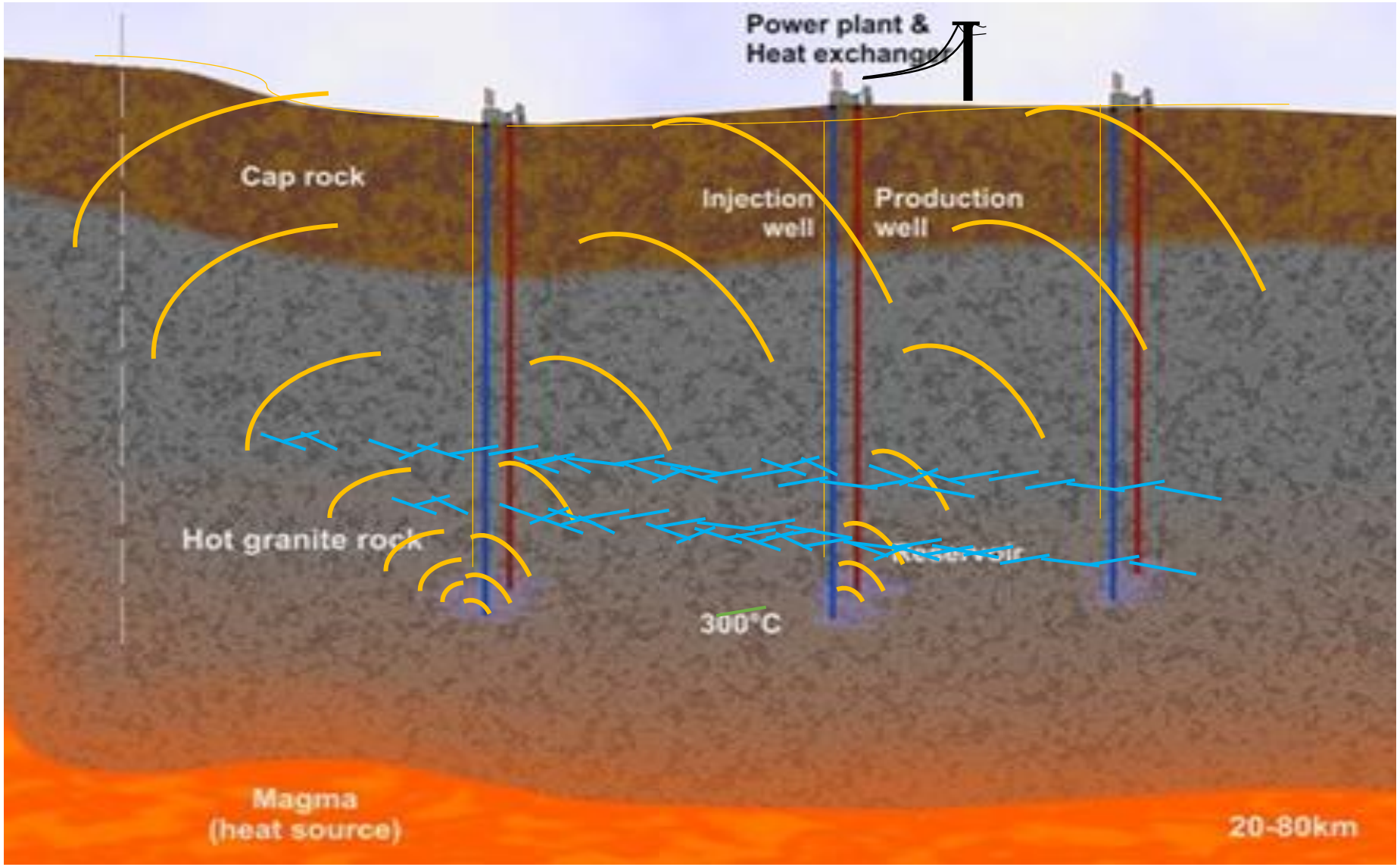
Moore's Law for Geothermal

COTS Thermal electric generators (TEG)

Temperature difference directly into electric power.

No complex turbines required

Geothermal Anywhere™. HyperDrill AI™ continuous microseismic Fast Drilling, Intelligent Completions & Silicon TEG plant



HyperDrill™ Technology Unlocks Deep Energy

- Shell Game Changer

  2.5 yr Funded

- Proven Technology

  High Pressure Demo Tests

  Fiber Optic Acoustic “Tomography”

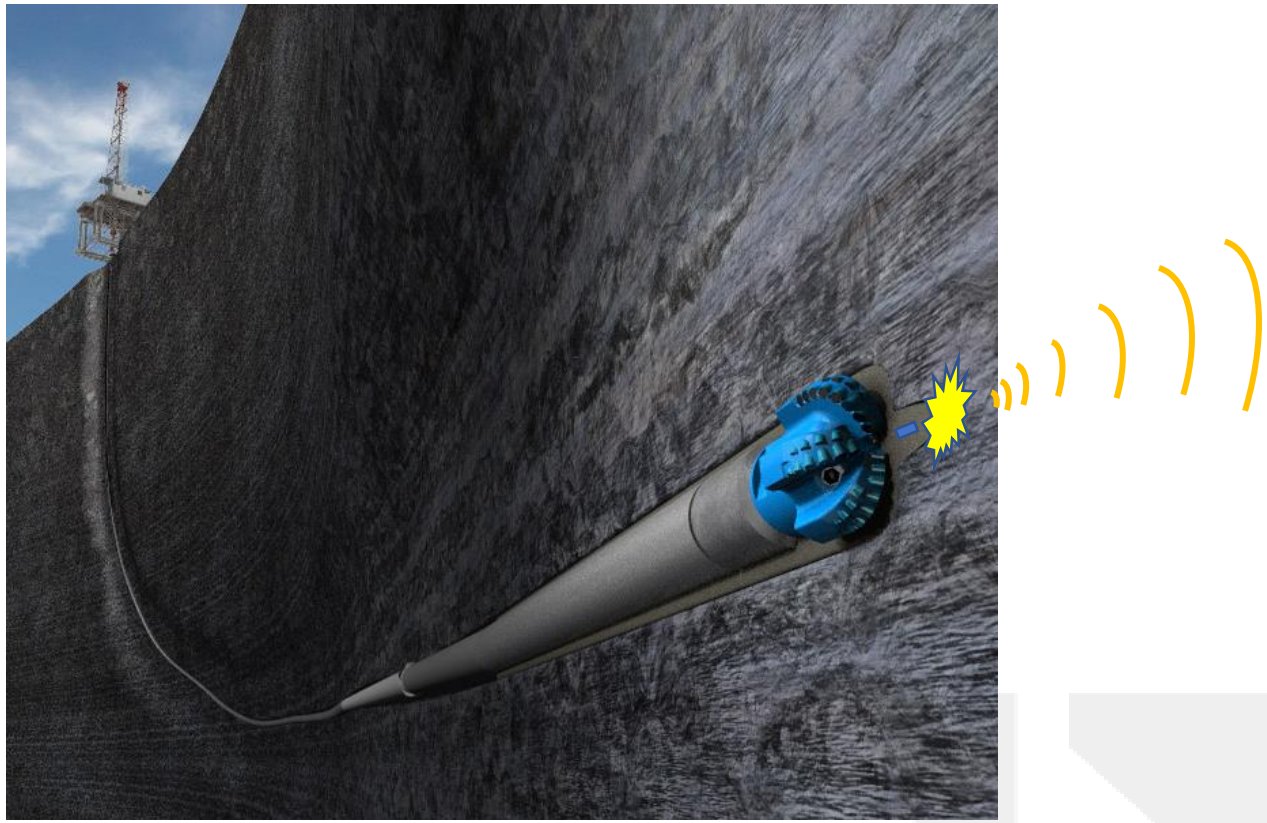
  100’s tunneling field tests

  Steerable

- Independent econ analysis:

  $15.5 Billion dollar value in drilling

  $100’s M + annual revenues



Patented & Patents Pending

HyperDrill™ Summary

- Technology basis mature and demonstrated
- MVP design complete & vetted by Shell and another Major
  - No Technical show stoppers
  - Risks identified and plan to test/mitigate identified
  - Series A ask focused on proof well demo
- DWOP Oil & Gas shows game Changing economics for operator
- Large opportunity Deep / Hard Rock
- JOIN OUR JOINT INDUSTRY PROJECT

HYPER SCIENCES

OUR TEAM:

Funded, Built several $16-$100M Oil, Gas, Mining & Tech Companies. With exits.

Mark Russell - CEO/ Founder

Stanford University - MS Aero/Astro Engineering
BS Rensselaer Polytechnic Inst. Aeronautical Eng.
Lead Engineer Blue Origin, Boeing, Intel, Kistler Aerospace, Russell Mining, St, Augustine Gold and Copper, Deepest DD coring

Chuck Russell - Director, Avionics / Controls

Carroll College, Engineering. avionics/controls,
Ram automation. Mining. RRPM Mining. Gen. Moly

Dr Carl Knowlen - Ram Accelerator Inventor/ Advisor

BS, MS, PhD Univ. of Washington
Professor, Univ. of Washington. Director of RAMAC/BTRA laboratory at UW.

Hossam Elbadawy - Houston Lead:
Advisor ,Bus. Dev. /Tech

Northwestern University - Kellogg School mgt. MBA & Men
BS Mech. Ain Shams Univ.
CEO Tercel, Limerock Partners, VP Mfg Schlumberger.

Mike McSherry - Director

B.A., Economics/Int'l Business, William & Mary
CEO SWYPE, Entrepreneur in Residence m
Providence Health. Amp'd Mobile, Boost Mobile

Hani Elshahawi - Shell Game Changer Sponsor

Formation Testing and Sampling Principal
Technical Expert. Shell, Schlumberger

HYPER SCIENCES

Seeking Series A Investment & JIP Partnership

DISRUPTIVE INNOVATION

MULTIPLE INDUSTRIES

BILLION $ MARKETS

TECHNOLOGY DEMONSTRATION PLAN:

- *MICRO-PILING*
- *HYPER TUNNELING*
- *HYPERDRILL TRIALS*
- *CUSTOMER ACQUISITION / PARTNERSHIPS*

CONTACT INFORMATION:

FOR FURTHER INFORMATION,:

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+1 (509) 994.8577
mark@hypersciences.com

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Thank You !

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mark@hypersciences.com