



Let's Get Energy Directly Where it is  
For Equal Independency and Prosperity



*Igor Kocis  
Founder and CEO of GA Drilling*

*„Our story with geothermal energy started when we projected a technology incubator building.*

*We are clean-tech enthusiasts with a roots in a country always dependent on fossils import from unstable region. So we decided to build an independent source of energy. Geothermal energy. As we found out after in-depth investigation, it was not viable! Deep drilling costs so much... and no alternative.*

*So, 10 years ago we revealed an extraordinary challenge ready for true rebels and visionaries! Since then geothermal energy became our life story and now we are here with PLASMABIT technology that can do efficiently what was so far not imaginable at all.*

*What we want to hit is an energy source available for everyone anywhere. Geothermal Energy. The real answer to several of global grand challenges - ENERGY, ENVIRONMENT, WATER OR POVERTY.“*

# Can you imagine?

## INSTEAD OF HOT HUMANITY PROBLEMS

### NO CONTINUOUS ENERGY

No continuous clean renewable energy

### UNSTABLE WORLD

Unstable world of fossils owning countries and their vassals

### NO EQUITABLE ACCESS TO ENERGY

Low resources regions with no electricity, no drinking water, no outlook to prosperity

WHY NOT?

## SOLUTIONS FOR EVERYONE

### 24/7 ENERGY

On demand renewable energy 24/7 anywhere and anytime

### NO DEPENDENCY

No dependency to fossils neither to countries with fossils production

### EQUAL OPPORTUNITY

Equal opportunity to economic growth and quality of life for every region and community

# Limitless Reservoir of Energy under Our Feet Anywhere

## Why We don't Use it?



99%

99% of the Earth volume has more than 1000 °C

6 billion

Reservoir of geothermal energy for 6 billion years +

1,2 billion

1,2 billion people with no access to electricity

3%

Only 3% of the Earth land can use geothermal energy

*BUT AT PRESENT*

# Why is Geothermal Energy so Largely Underestimated?

At Present is Available Only at Limited Number of Locations

## Location of world geothermal power plants

At anomalies near tectonic faults with hot spots near the surface (2-4 km)



# Depth as a Key Differentiator of Geothermal Energy

## Present – up to 5km and Ultra Deep – 10 km Depth

Up to 5 km

3%

Only 3% of the Earth land can use geothermal energy

180°C

Temperature too low for efficient production of electricity

Heat potential for power generation in 5 km depth:  
Barely 3 % (Island, Tuscany)



8 -10 km

70%

70% of the Earth land has heat potential for power generation in 10 km depth

250°C

Temperature enables efficient production of electricity + production of heat

Heat potential for power generation in 10 km depth:  
More than 70 % of the area



# Benefits of Ultra Deep Geothermal Energy

## But Technologically and Economically not Accessible yet!

### WEATHER AND NIGHT PROOF

Base-load, available 24/7

### ZERO RISK INSTALLATION ANYWHERE

Installation possible on 70+ % of Earth surface, distribution grid friendly, high predictability

### EFFICIENT

Zero fuel price, water as a recycled energy carrier, low OPEX

### CLEAN&GREEN

No pollution – zero carbon emission, no noise, minimal footprint (underground)

### AFFORDABLE

Modular scalable technology- smart gradual investment for developing countries

### INDEPENDENT & SECURE

Local source for any region including poor ones – no dependency on import



# Benefits of Heat Cascade around Geothermal Power Plant

## Production of Direct Heat in Cold Regions

### ELECTRICITY & HEAT IN ONE

One power plant for electricity, direct heating and cooling

### DRINKING WATER & DESALINATION

Geothermal heat for desalination of sea water and purification of sewage and river water

### INDUSTRY & FOOD PRODUCTION

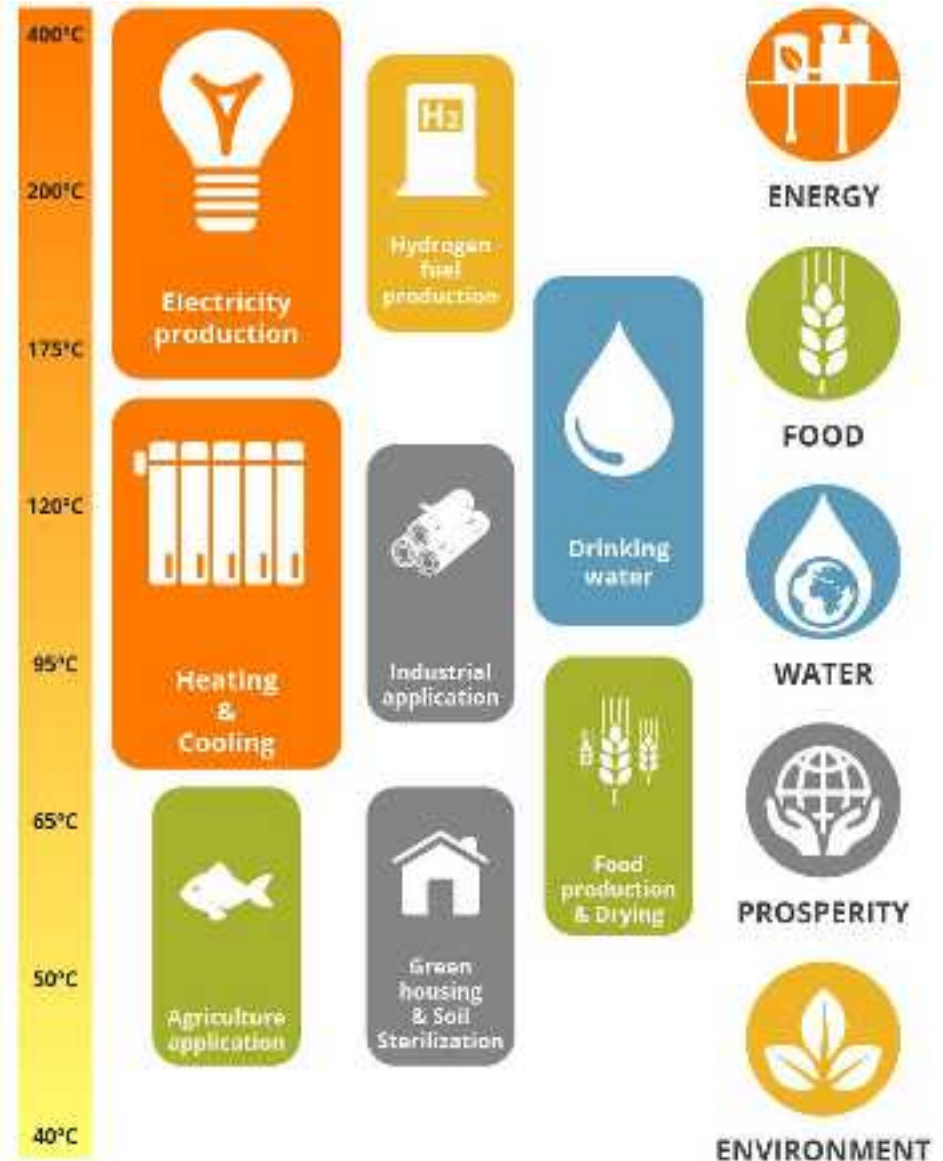
Utilisation customized to the geographical features and needs of the location

### EDUCATION & EMPLOYMENT

Diversified employment opportunities within economic growth centres

### PROSPERITY

Seed for further widespread prosperity and better quality of life on a larger scale

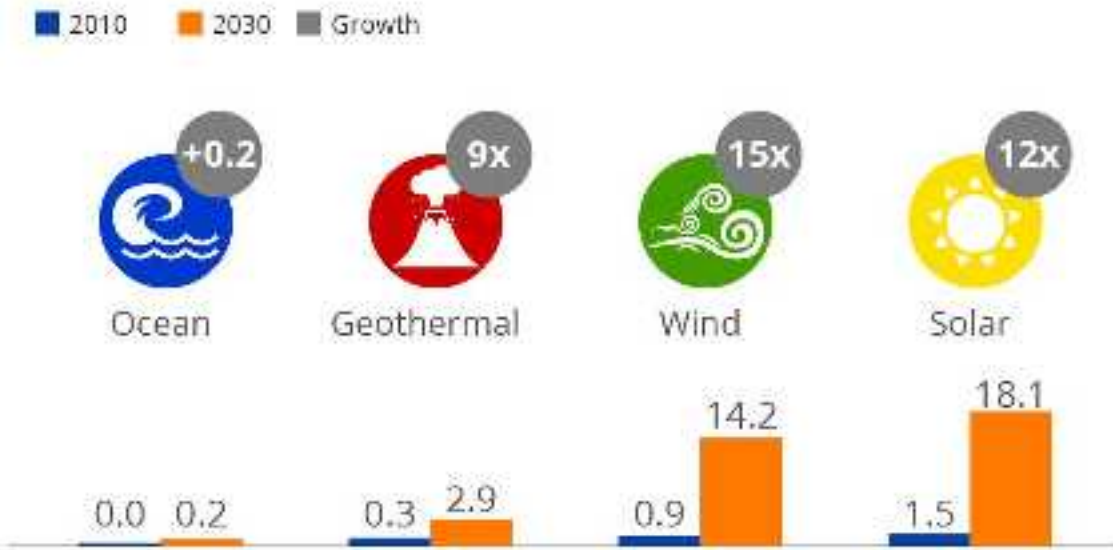




# Renewables Today and Predictions for Future

## Geothermal Energy is Untapped Low-Hanging Fruit

Global renewable energy use - EJ/year



Technological issues as limits for real usage of all renewable energies

Exponential leap is a must for each of them

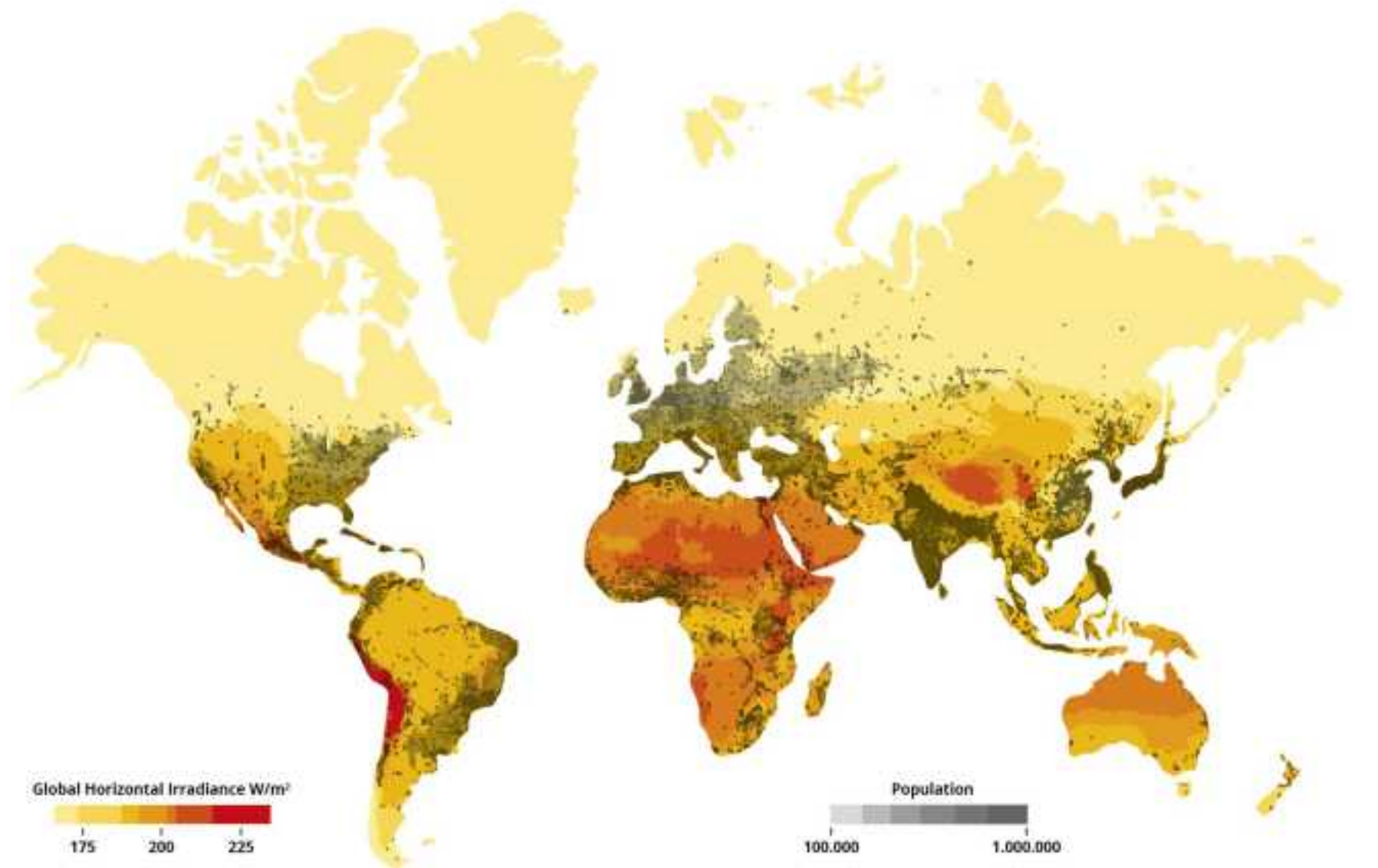
The geothermal energy use is currently left behind

Present assessments of geothermal energy potential don't take the exponential leap in technology into consideration

Game changer for geothermal energy is radically new drilling technology enabling economical access to 10 km depth

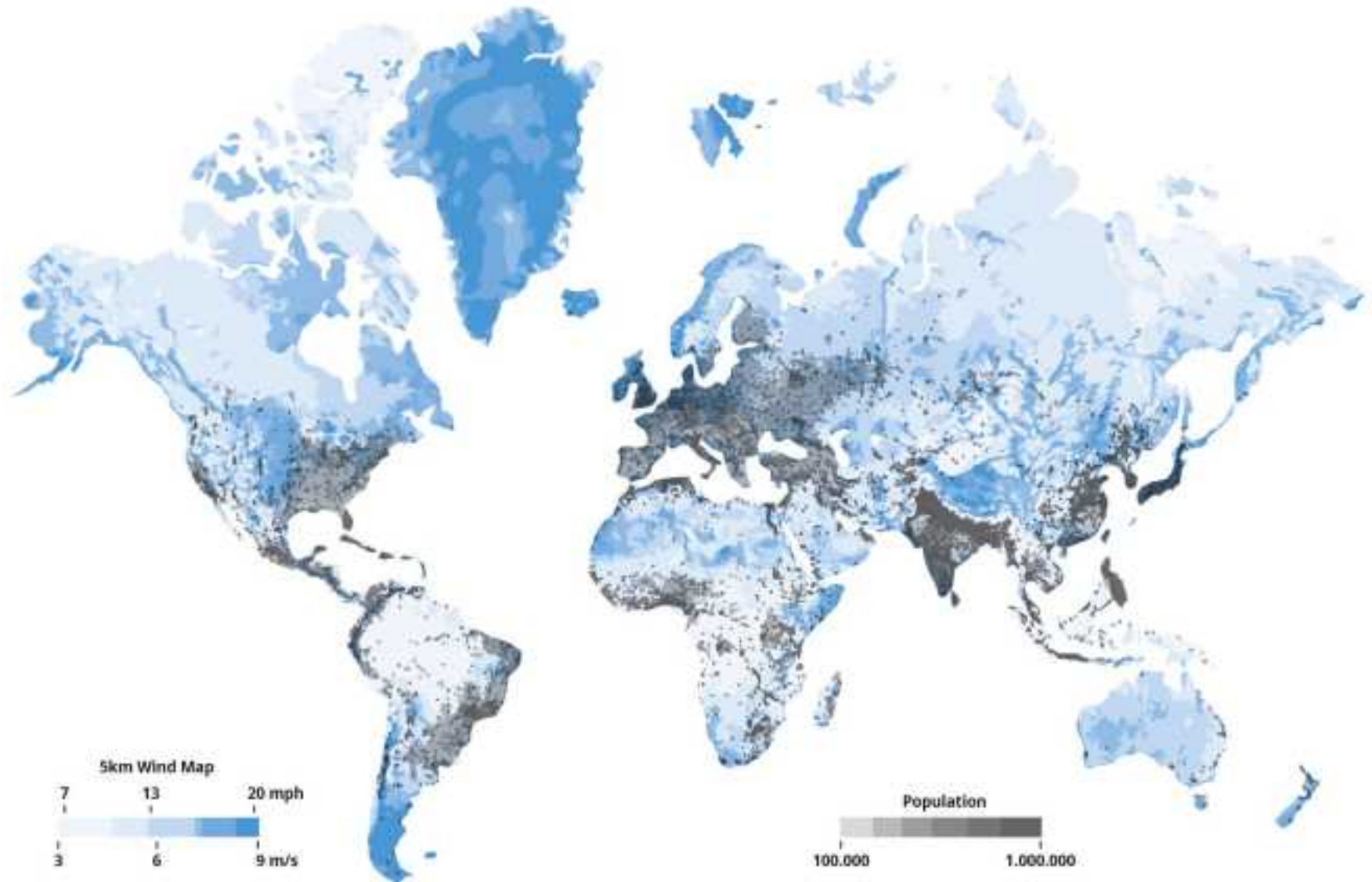
# Solar Energy does not Match with Population Distribution

## Comparison of Maps - Visible only in Slide Show Mode



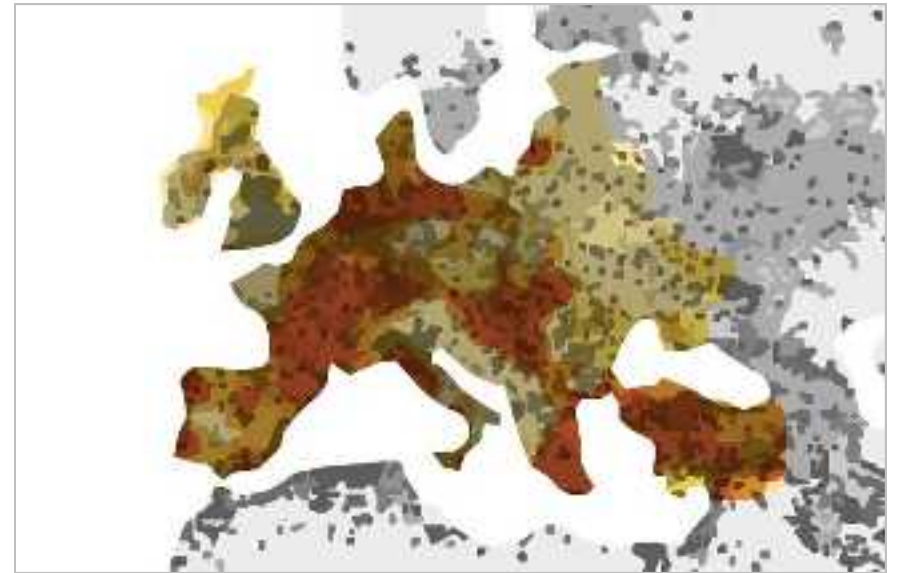
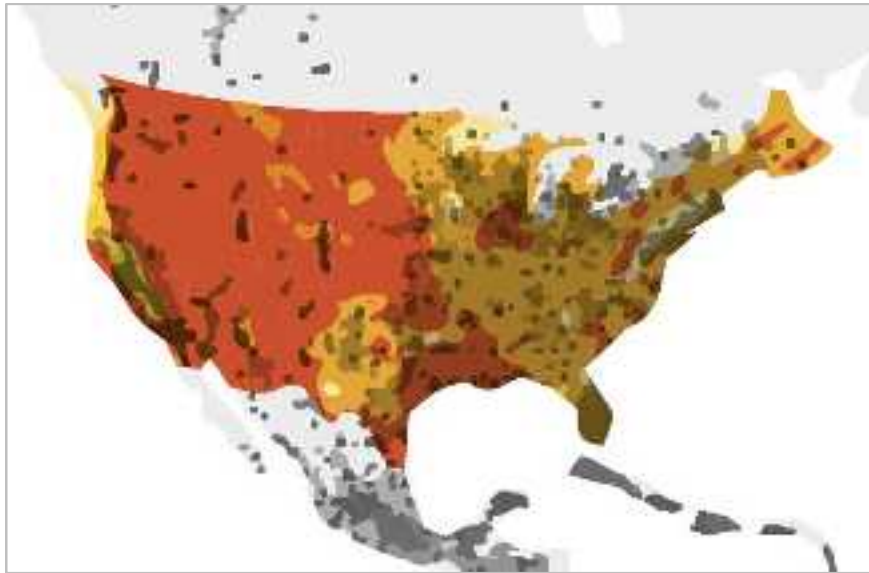
# Wind Energy does not Match with Population Distribution

## Comparison of Maps - Visible only in Slide Show Mode

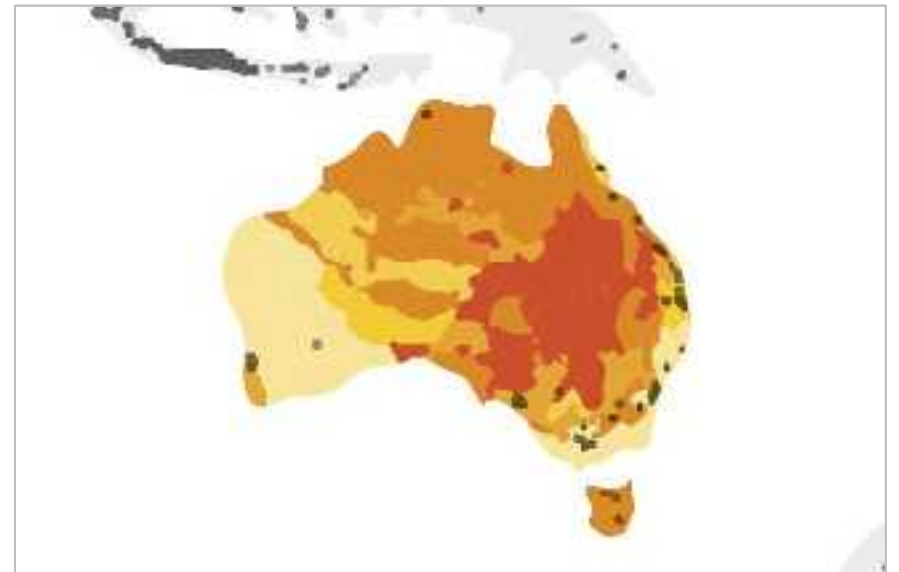
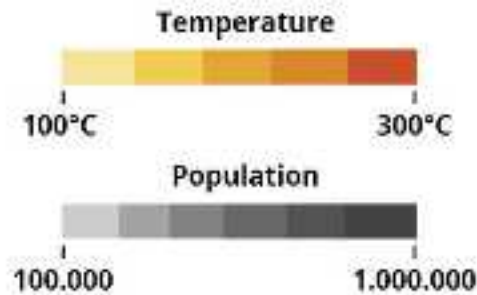


# Ultra Deep Geothermal Energy vs. Population Distribution









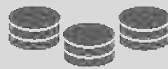











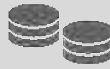



Comparison of maps - Visible only in Slide Show Mode



North America, Europe and Australia



# Solar, Wind, Deep and Ultra Deep Geothermal Sources Comparison

	Weather Proof	Low Area Footprint	Electricity Cost \$/kWh	Direct Heat	Independent of Lithium Battery for Storage	Transport Energy
Solar						
Wind						
Deep geothermal (>5km)						
Ultra deep geothermal (10 km)						

# Solar, Wind and Geothermal Sources

## Comparison of Land Use



Solar photovoltaic panels



Wind farms



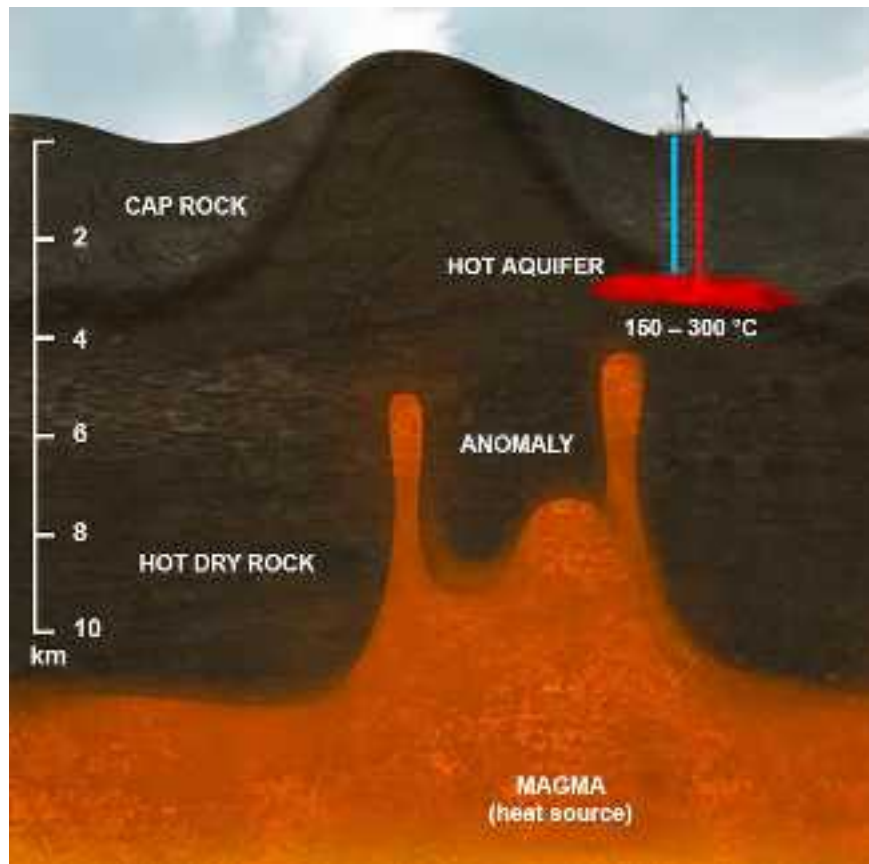
Geothermal underground power plant

Which countryside would you prefer for your family life?

# Ground Breaking Drilling Technology PLASMABIT Enables Opening Ultra Deep Geothermal Reservoirs

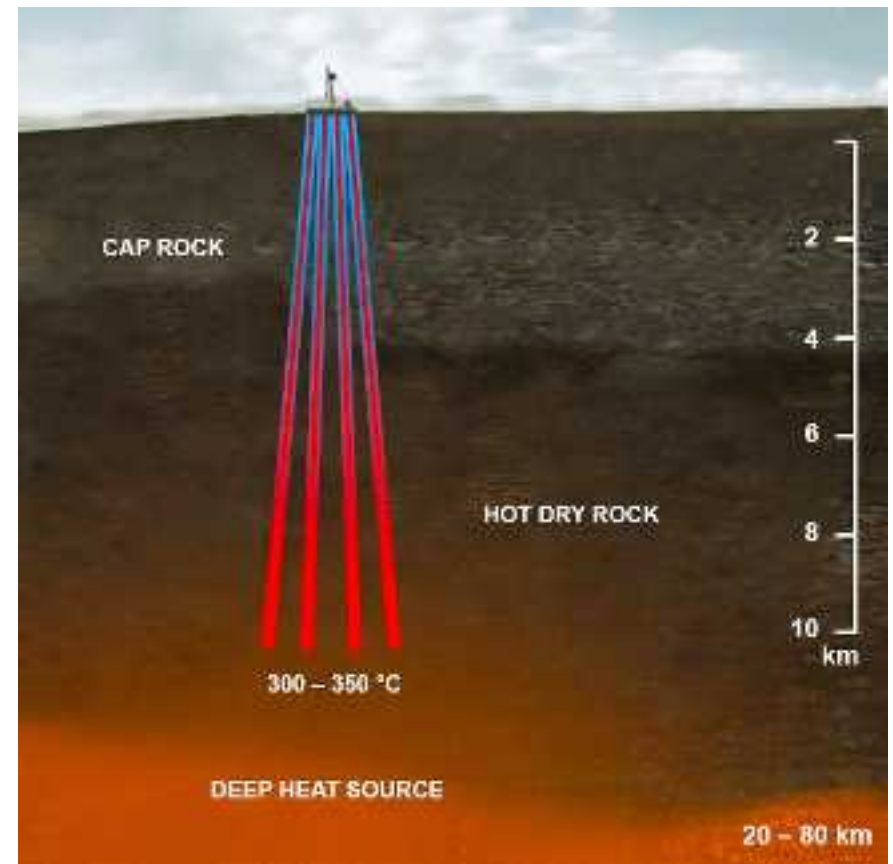
DEEP GEOTHERMAL SYSTEMS 5 km

Economically accessible by  
conventional drilling



ULTRA DEEP GEOTHERMAL SYSTEMS 10 km

Economically accessible  
**ONLY BY PLASMABIT**



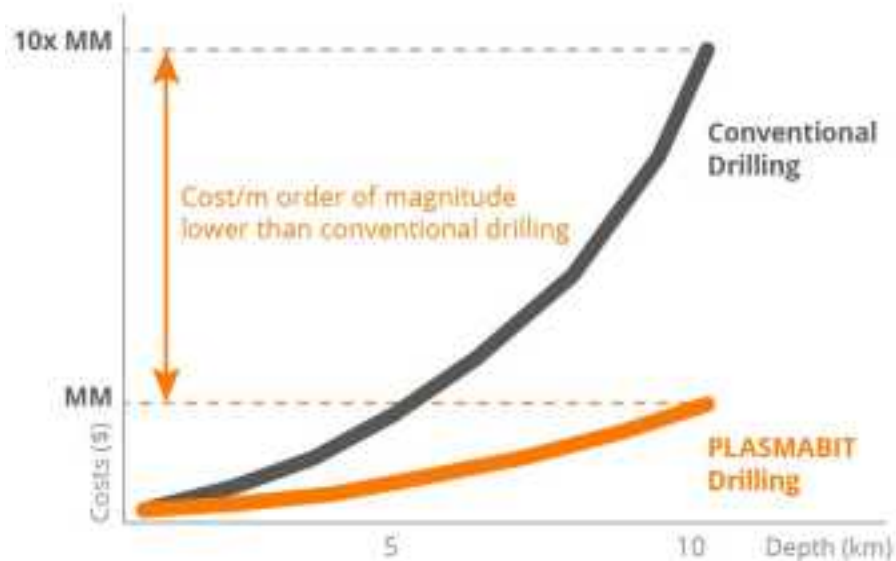
# Cost per Meter One Order of Magnitude Lower PLASMABIT Can Unlock Ultra Deep Reservoirs

Method of drilling	Cost per meter with increasing depth
Conventional	<b>EXPONENTIAL</b> increase
PLASMABIT	<b>LINEAR</b> increase



Pulsed non-contact drilling based on plasma with more than 5000°C

Protected by 12 patents





# PLASMABIT with the Temperature more than Surface of Sun

## How Does it Work?

Plasma is an ionized 3 000 – 6 000 °C hot gas

Electric arc rotating 800 times per second produces a continuous plasma discharge

Disintegration of any material – rock / steel / cement using plasma

Contactless drilling and milling in high pressure, high temperature downhole conditions

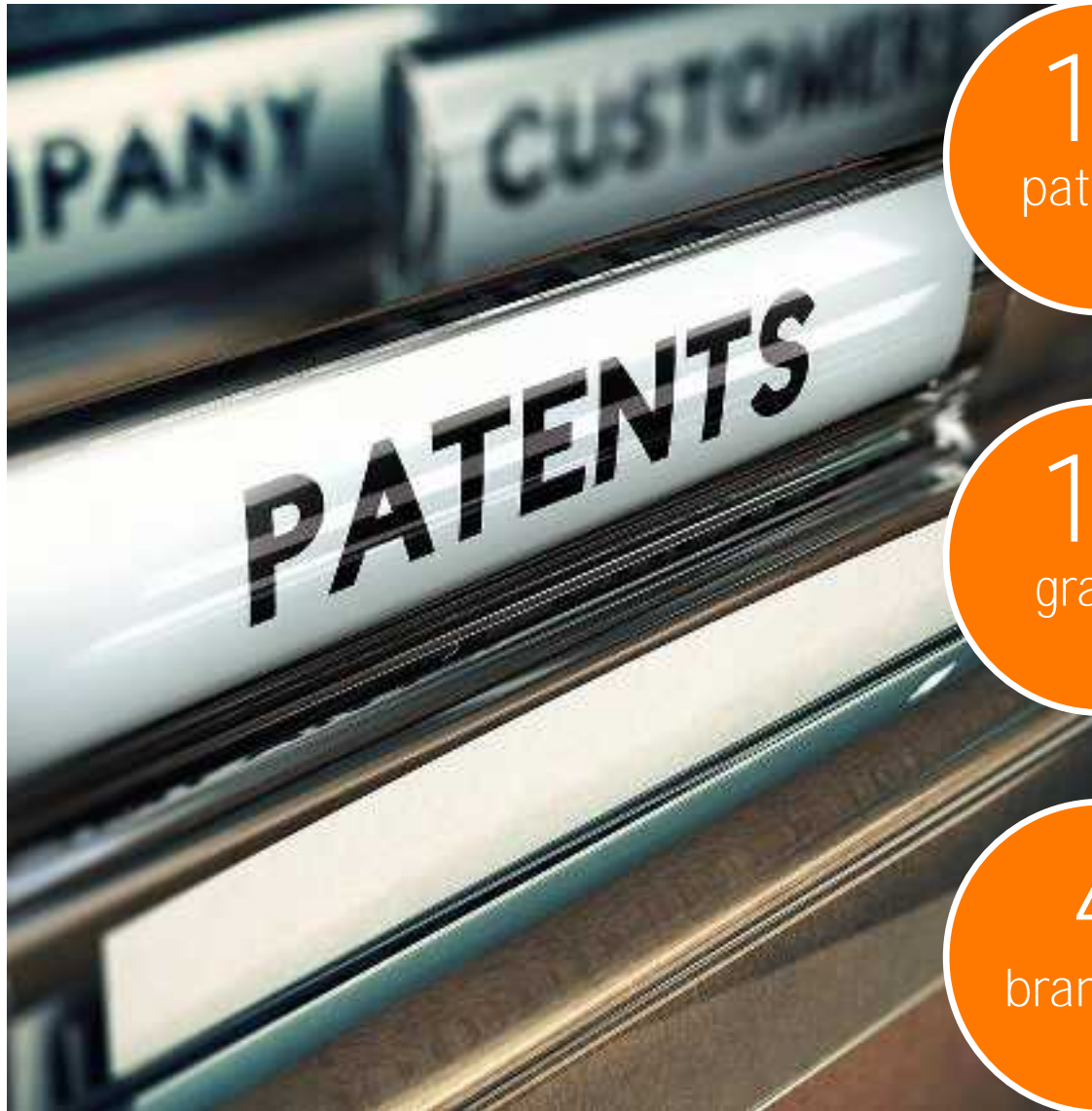
Pulsed plasma drilling to be efficient in hard rocks where conventional drilling methods suffer the most

Fast and controllable impact + compatibility with existing technologies



# GA Drilling Recognized and Supported by EU

## Well Patented Proposition, International Set-up



12  
patents

2 Granted Patents  
3 US + EU Patent Applications  
7 PCT Patent Applications  
2 Industry Designs

15  
grants

Continuously supported  
by the European Union  
Framework Programs:  
15 + grants

4  
branches

HQ in Bratislava, Slovakia  
representative offices  
in Aberdeen,  
London, Houston  
and Masdar City

# PLASMABIT Technology is Developed by GA Drilling Proven Team of Entrepreneurs, Experts and Visionairs



GA Drilling is hi-tech company with 80+ employees  
10+ DOCTORAL LEVEL AND 40+ MASTER LEVEL ENGINEERS



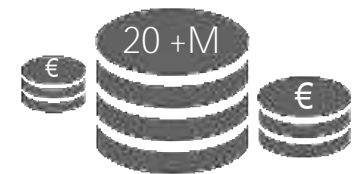
Technology Center



Testing Facility



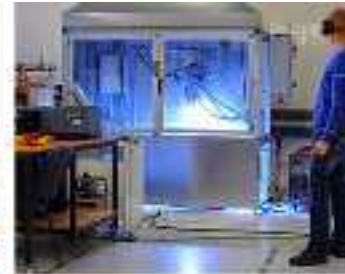
Infrastructure and equipment



Already invested in the company

# GA Drilling at Present

Hightech Labs, Robust Infrastructure and Own Testing Site



# Leadership of Visionaires and Experienced Entrepreneurs Backed-up by Board of Drilling Industry Veterans

Team highly skilled in

Building companies from the scratch

Scaling companies and diversified funding

R&D management in different areas

8 years directly in R&D for drilling, well construction and intervention



*Founders: Ivan, Igor and Dušan Kočiš; Tomáš Krištofič*

Nigel Jenkins



**BOARD MEMBER  
BUSINESS GROWTH**

Previously CEO of Decom North Sea, uniquely experienced engineer with O&G, nuclear, environmental market

Iain Pittman



**BOARD MEMBER  
PRODUCT DEVELOPMENT**

Specialization in engineering design, well engineering, abandonment operations.

Mikhail Gelfgat



**BOARD MEMBER  
TECHNOLOGY DEVELOPMENT**

50-years work experience in the petroleum industry. Scientific ultra-deep wells drilling projects.

Gerald Grohmann



**BOARD MEMBER  
BUSINESS STRATEGY**

President and Chairman of Executive Board of Schoeller-Bleckmann Oilfield Equipment AG

Martin Bruncko



**MEMBER OF THE BOARD  
FINANCIAL STRATEGY**

Board and advisory positions in globally innovative technology companies. Previously Head of Europe at the World Economic Forum.

# Platform Technology in Advanced Stage of Development On Track to be Commercially Deployable for First Application



Core **PLATFORM** technology PLASMABIT **FULLY DEVELOPED**

**PROTOTYPE** successfully demonstrated ability to disintegrate any material - rock/steel/ cement

First application for environmentally sound well plug&abandonment **READY FOR TESTS IN 4Q 2017**

First application as a **MARKET PROOF** of the first PLASMABIT application **IN 2018**



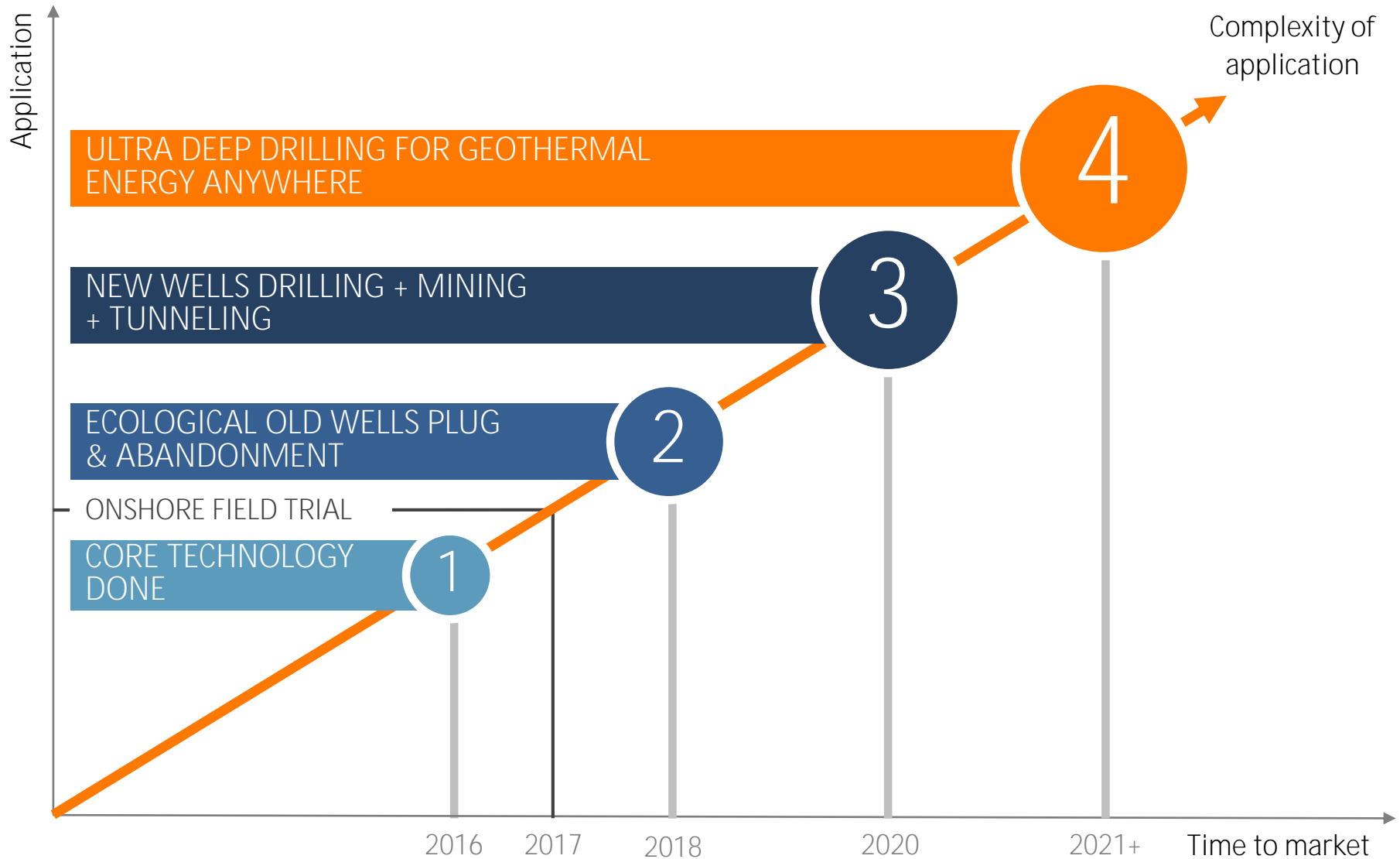
Since 2013 **JOINT INDUSTRY PARTNERSHIP WITH MAJOR COMPANIES UTILISING DRILLING**, financial support and an expertise for the first application deployment



Source: <http://www.forbes.com/global2000/list/#industry:Oil%20%26%20Gas%20Operations>

# Time to Market for PLASMABIT Platform Applications

## Cascade from Simple to More Complex Technology



# Platform PLASMABIT Technology and Prospective Spin-offs For Energy, Water, Resources and Space



**WATER**



Geothermal heat for desalination of sea water and purification of sewage and river water



**ENERGY**



The cleanest form of fuel for all mobile use – flights, motoring, shipping



**RESOURCES**



Exploration and increase of productivity



**SPACE**



Asteroid exploration and mining of rare elements and geothermal energy for Mars





Community Impact



Access to Clean & Sustainable energy



ENERGY  
FOREVER



ENERGY  
ANYWHERE



ENERGY  
FOR EVERYONE



POWERED BY  
PLASMABIT



**GA Drilling**