BRINGING FUSION POWER TO THE UNITED STATES

June 2025

About me

- Bachelors in Chemistry from University of Florida
- PhD in Chemistry from Florida State University
- Masters in STEM Leadership from Brown University
- Former Adjunct Professor at University of South Carolina
- Principal Scientist at DOE Lab (SRNL)
- Business Owner for Tutor Doctor of Evans
- Technical Project Manager at Tokamak Energy
- Married (Just celebrated 4.5 years)
- 5 kids (16-3)

Tokamak Energy

SRNL
SAVANNAH RIVER NATIONAL LABORATORY

Aiken
UNIVERSITY OF SOUTH CAROLINA

tutor doctor
How learning hits home.

1. Introduce Tokamak Energy.
2. What is fusion and why we need it.
3. Challenges in Developing Fusion.
4. Our Fusion Technology and Facilities.

AGENDA

Introduce Tokamak Energy.

1

WE ARE TOKAMAK ENERGY.

THE LEADING GLOBAL FUSION COMPANY.

OXFORD, UK

GLOBAL HEADQUARTERS

Partnering with:

- UK Atomic Energy Authority
- eni
- Westinghouse
- amentum
- AtkinsRéalis

PRINCETON, NJ

U.S. SUBSIDIARY

Partnering with:

- PPPL
- Oak Ridge National Laboratory
- University of Illinois
- ATI
- General Atomics

TOKYO, JP

JAPANESE SUBSIDIARY

Partnering with:

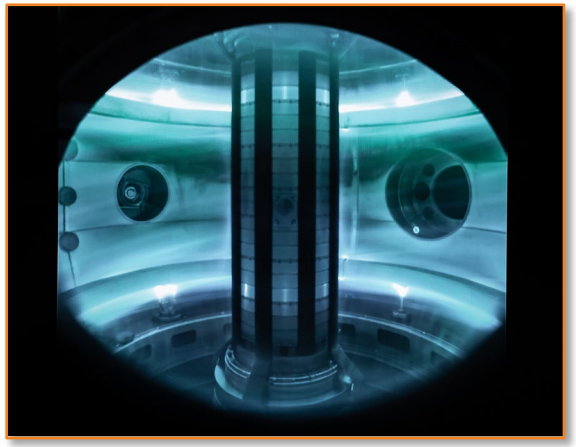
- Furukawa Electric Group
- Sumitomo Corporation
- Kyoto Fusioneering
- 東京大学 The University of Tokyo

260 people worldwide

$335 million raised

Tokamak Energy

OUR HQ NEAR OXFORD IS HOME TO WORLD-LEADING OUR FUSION R&D FACILITIES



Tokamak Energy

WITH STRONG COMMERCIAL LEADERSHIP, WE ARE PIONEERING TWO BREAKTHROUGH TECHNOLOGIES

Warrick Matthews
Chief Executive

Previously
Chief Procurement Officer

Rolls-Royce

Sir Warren East
Board Director

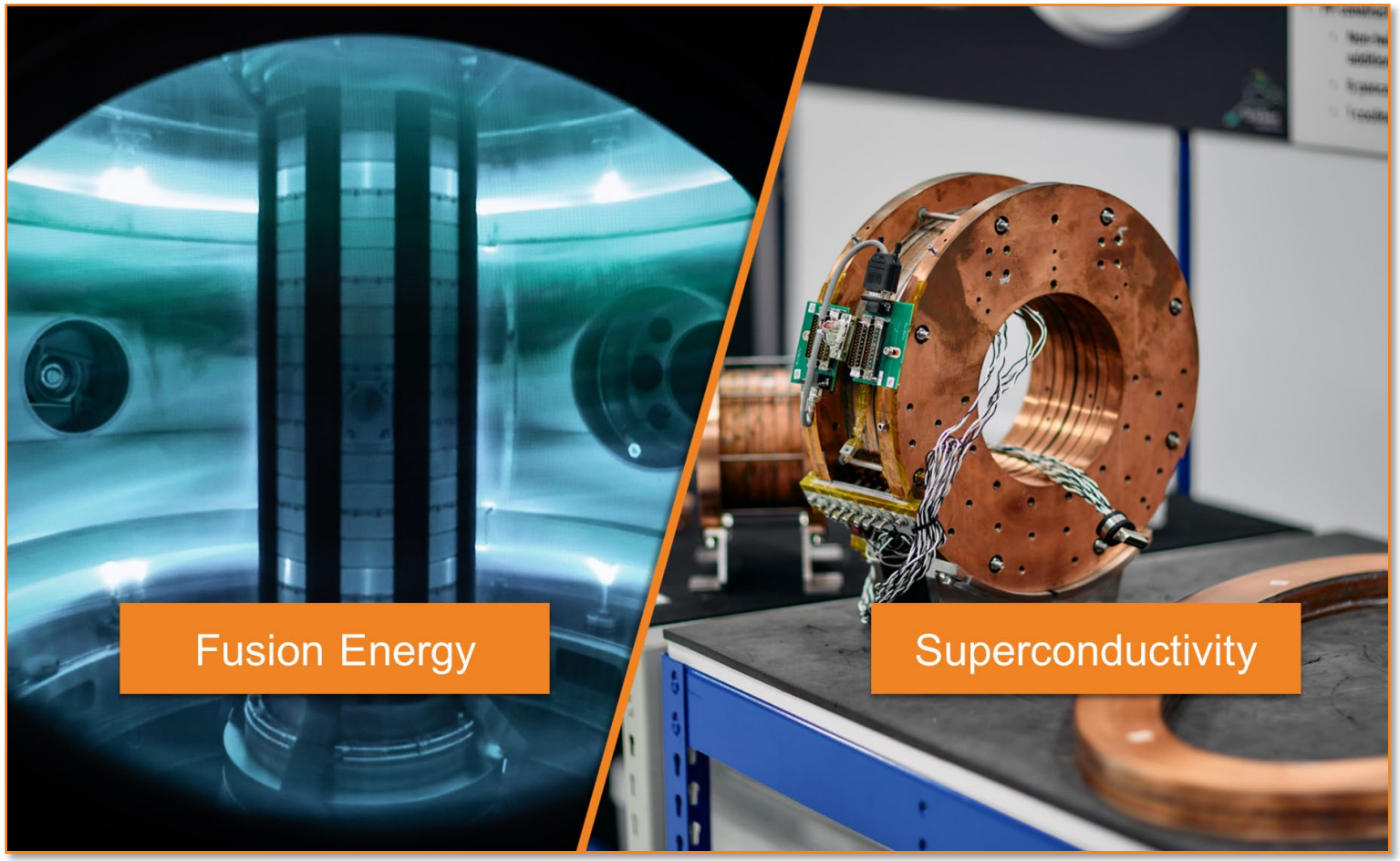
Previously
Chief Executive Officer

Rolls-Royce arm

Erik Bonino
Board Director

Previously
UK Chairman

Shell

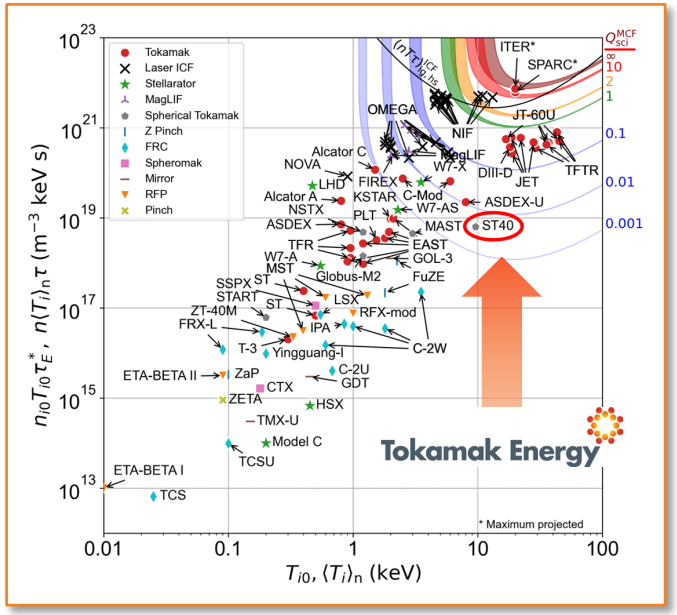


Tokamak Energy

OUR UNRIVALLED PEDIGREE IN FUSION ENERGY

Only company with 10+ years' experience designing and building tokamaks

Unrivalled experience commissioning, operating and upgrading tokamaks

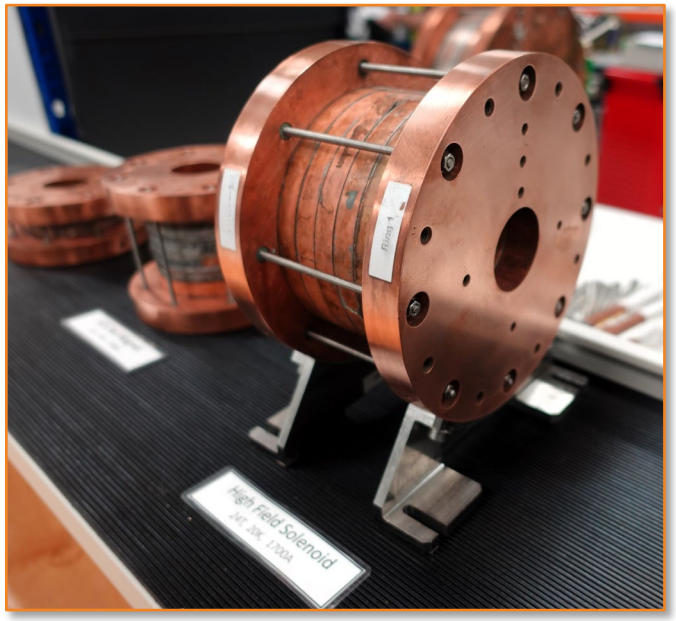


Peer reviewed highest 'triple product' in a privately funded tokamak

6 x 10^18 keV.s/m^3

Tokamak Energy

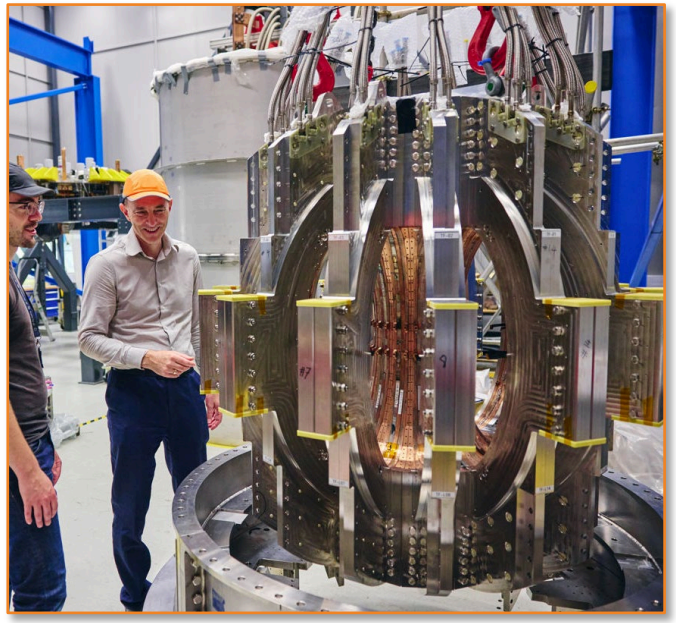
OUR UNRIVALLED PEDIGREE IN SUPERCONDUCTIVITY



World-record ultra-high field magnet with patented HTS technology

24 Tesla field at 20 K

10+ years expertise in design, modelling & manufacture of robust, quench-safe HTS magnets



Built world first high-field HTS fusion magnet system in tokamak configuration – ‘Demo4’

OUR HTS TECHNOLOGY IS BEING COMMERCIALISED TODAY THROUGH OUR TE Magnetics BUSINESS UNIT

Fusion and renewable energy

- Next-generation magnetically confined fusion energy devices
- Enhanced efficiency and power density of renewable energy devices e.g. wind turbines
- Grid stabilisation and load levelling through energy storage

Science and healthcare

- High performance, reliable and cost-effective ultra-high field (UHF) devices
- Advanced medical analysis, diagnostic and treatment technologies e.g. compact magnetic resonance, particle therapy
- Materials analysis and characterisation

Mobility

- High performance, high efficiency, light weight and low emissions mobility on land, in water, air and space
- Lightweight, powerful electric motors
- High speed magnetic levitation transport
- High performance magneto hydrodynamic drive (MHD) propulsion

Security

- Enhanced performance of existing technologies & entirely new applications
- High-performance, efficient and low-noise MHD propulsion
- Energy storage
- Electro-magnetic (EM) pulse and shielding technologies

What is fusion and why we need it.

2

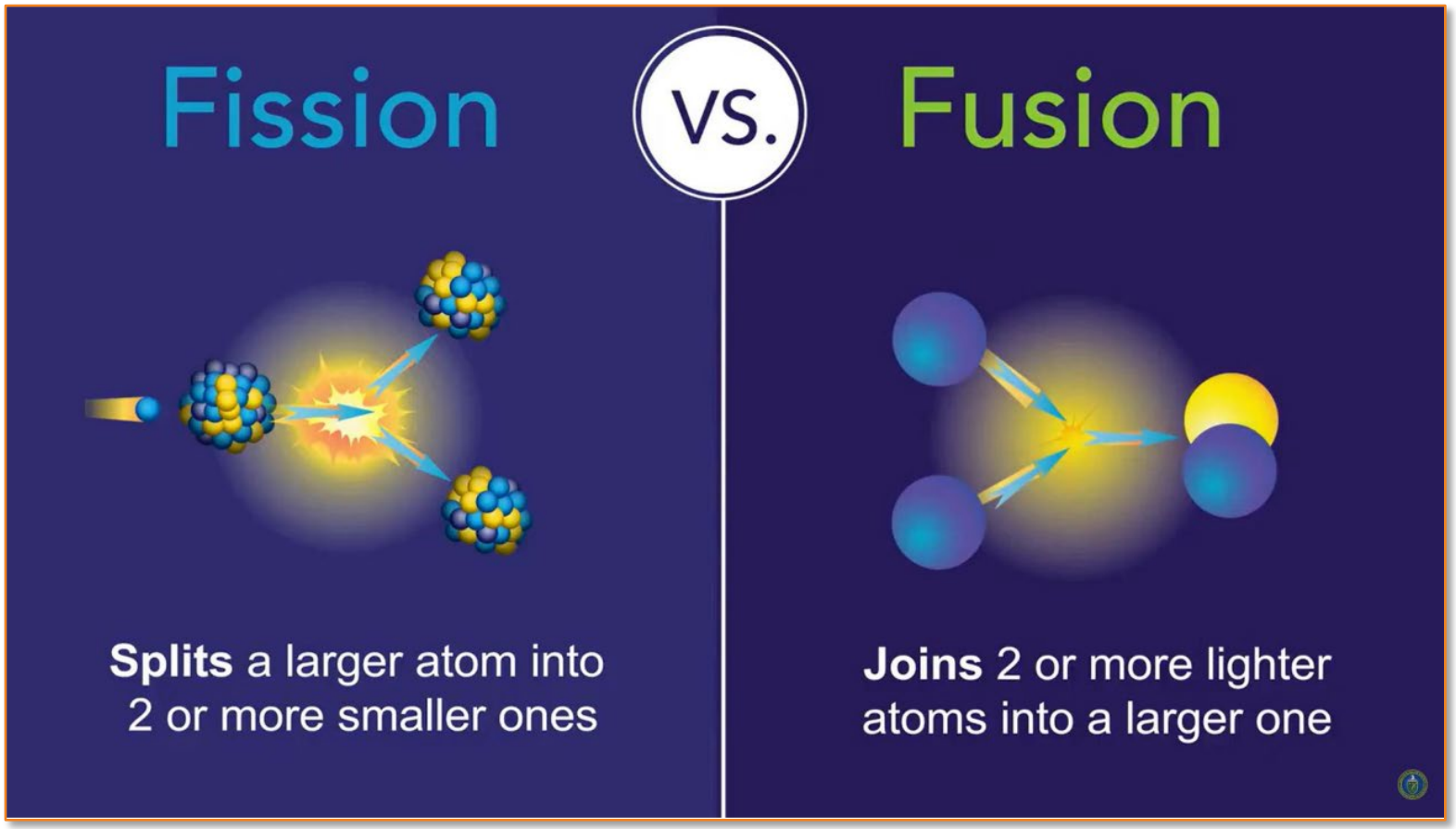
FUSION IS THE REACTION THAT POWERS THE SUN AND ALL STARS.

It offers the potential for clean, safe and abundant baseload energy here on Earth.

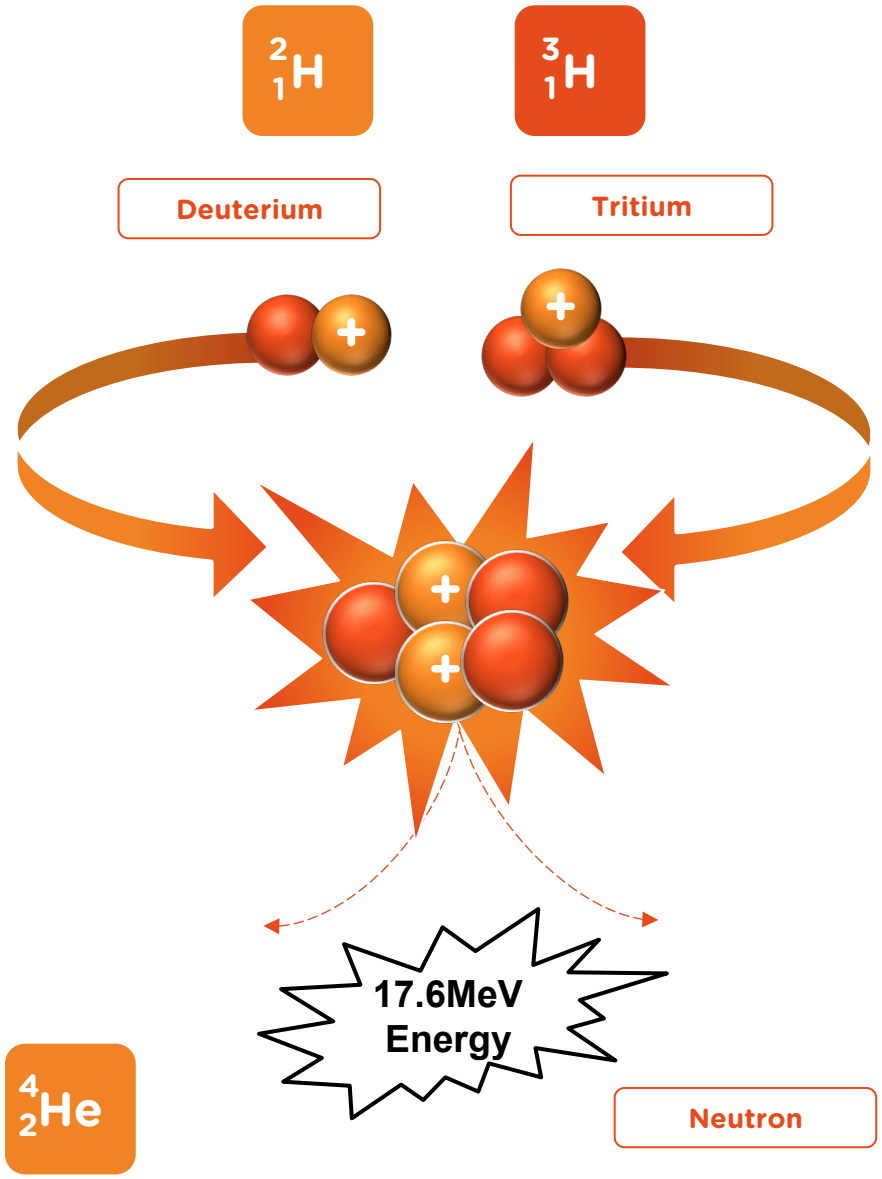
Zero CO_2 | Firm Power | Limitless Fuel

Tokamak Energy

A HIGH ENERGY NUCLEAR REACTION, 4-TIMES MORE ENERGETIC THAN FISSION



SOURCE: US Department of Energy



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TO RECREATE THE POWER OF STARS ON EARTH, WE NEED…

- Density (n)
- Heat (T) [>100 million ºC]
- Confinement (τ) [magnets cooled to 20K]

- **Tokamak**

Tokamak Energy

ST40: FOUR FACTS

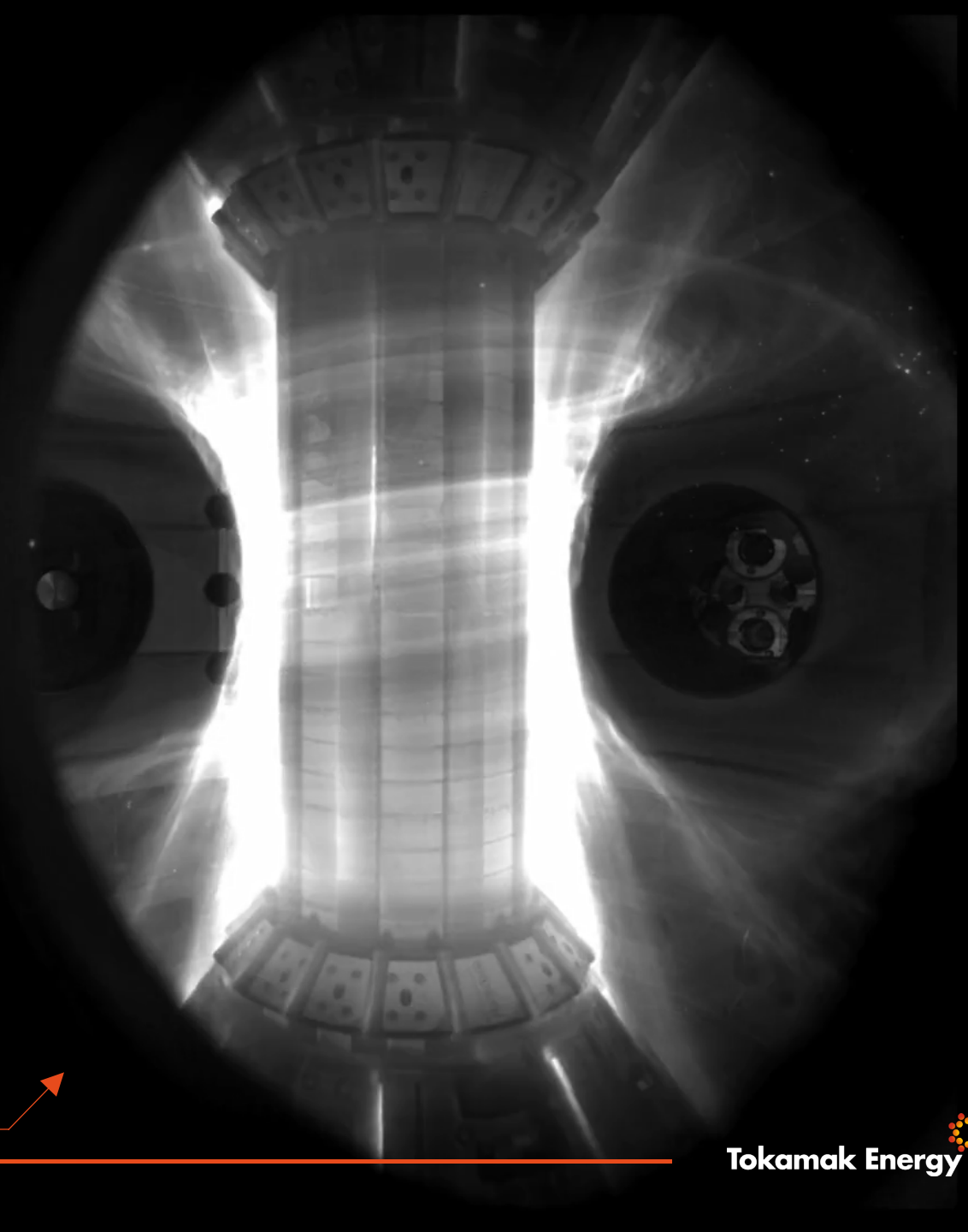
1. The world's highest-field spherical tokamak
2. Generating the highest nTτ of any privately-operated tokamak - **6 x 10^{18} keV.s/m^3**
3. Embarking on a bold $52million upgrade programme, sponsored by US and UK government

U.S. Department of ENERGY

Department for Energy Security & Net Zero

4. Making ST40 the most power plant-relevant spherical tokamak in the world

This is what a 100 million ˚C fusion plasma looks like on our ST40 tokamak



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WHY? BECAUSE PROF. HAWKINGS COULD IMAGINE WHAT THE WORLD WOULD LOOK LIKE WITH…

Abundant energy.

Inexhaustible energy.

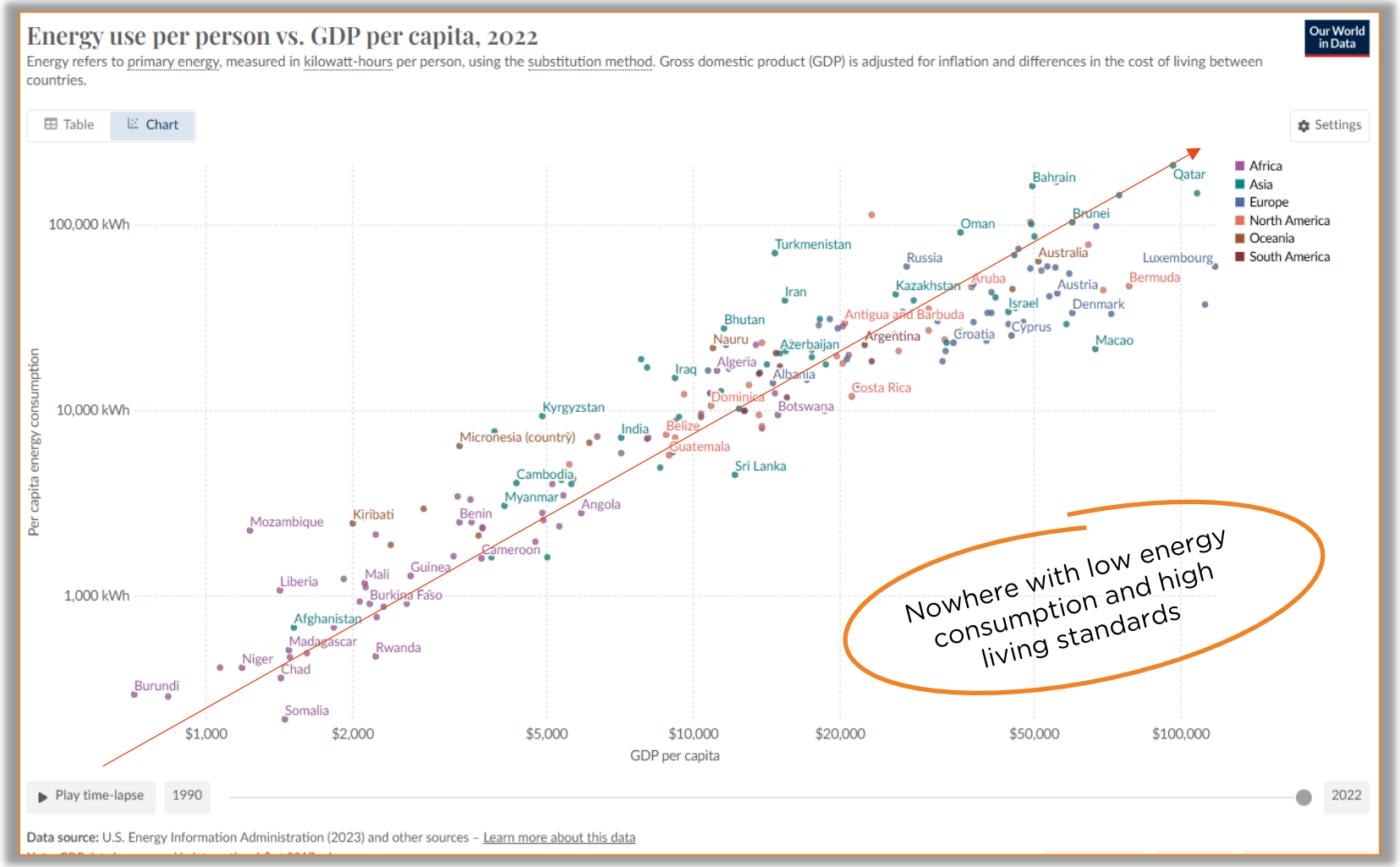
Safe energy.

Clean energy.

WHY? BECAUSE PROF. HAWKINGS COULD IMAGINE WHAT A WORLD WITH FUSION ENERGY WOULD LOOK LIKE...

He could imagine how many people's lives throughout the world could be transformed through access to abundant, clean, safe energy:

1.2B people
live without access to electricity globally



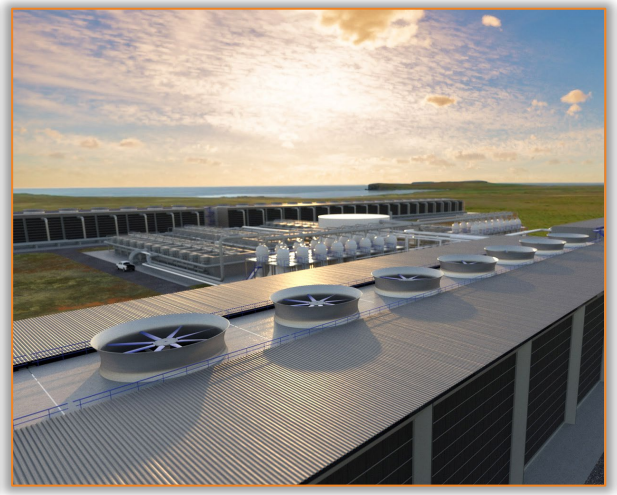
Tokamak Energy

WHY? BECAUSE PROF. HAWKINGS COULD IMAGINE WHAT A WORLD WITH FUSION ENERGY WOULD LOOK LIKE…

He could imagine the advances in economic and human development that could be unleashed with access to abundant, clean, safe energy:

Firm power for AI and data economies

Heat and power for desalination plants



Power for climate remediation and CO_2 capture

High-grade process heat for heavy industry and manufacturing

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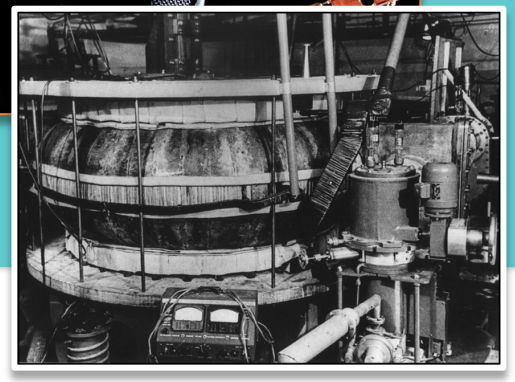
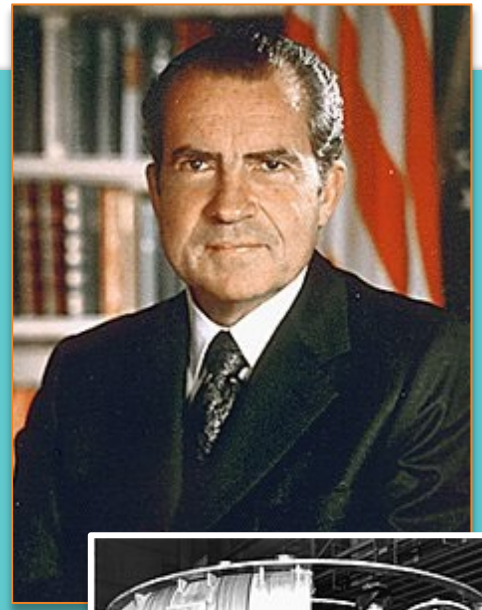
WE SHARE THIS CONVICTION IN THE POTENTIAL FOR FUSION POWER TO CHANGE THE WORLD!

Challenges in Developing Fusion

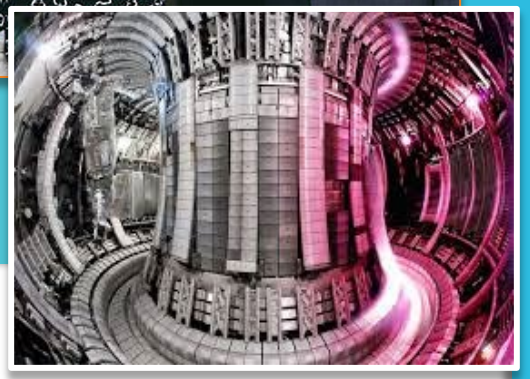
FUSION R&D HAS A LONG HISTORY



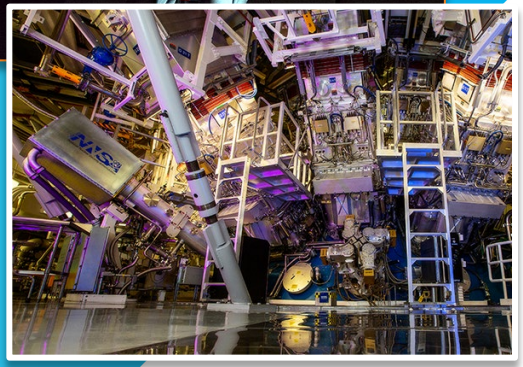
1958
T-1 Tokamak



1972
Princeton Large Torus



1983
Joint European Torus



1997
National Ignition Facility

WHAT ARE THE BUSINESS CHALLENGES OF FUSION

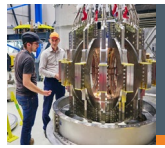
1. Raising Capital
2. Developing and Retaining IP
3. Maintaining Culture through Growth
4. Developing Public Private Partnerships
5. Commercialization metrics

RAISING CAPITAL

Capital Raising Life Cycle

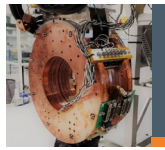
Developing and Retaining IP

Our transformative HTS and fusion technologies are protected by around 400 live patents and 77 families of patent applications, 37 of them related to our HTS magnet technology.

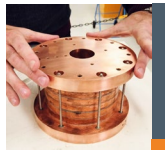


2024
Designed and built world-first high field HTS magnet system in tokamak configuration

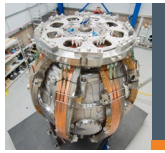
2022
World record 100M°C plasma ion temperature and highest triple product in a spherical tokamak



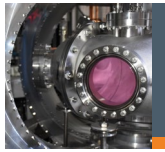
2021
Robust, scalable, quench-safe HTS magnet technology precisely validating simulations



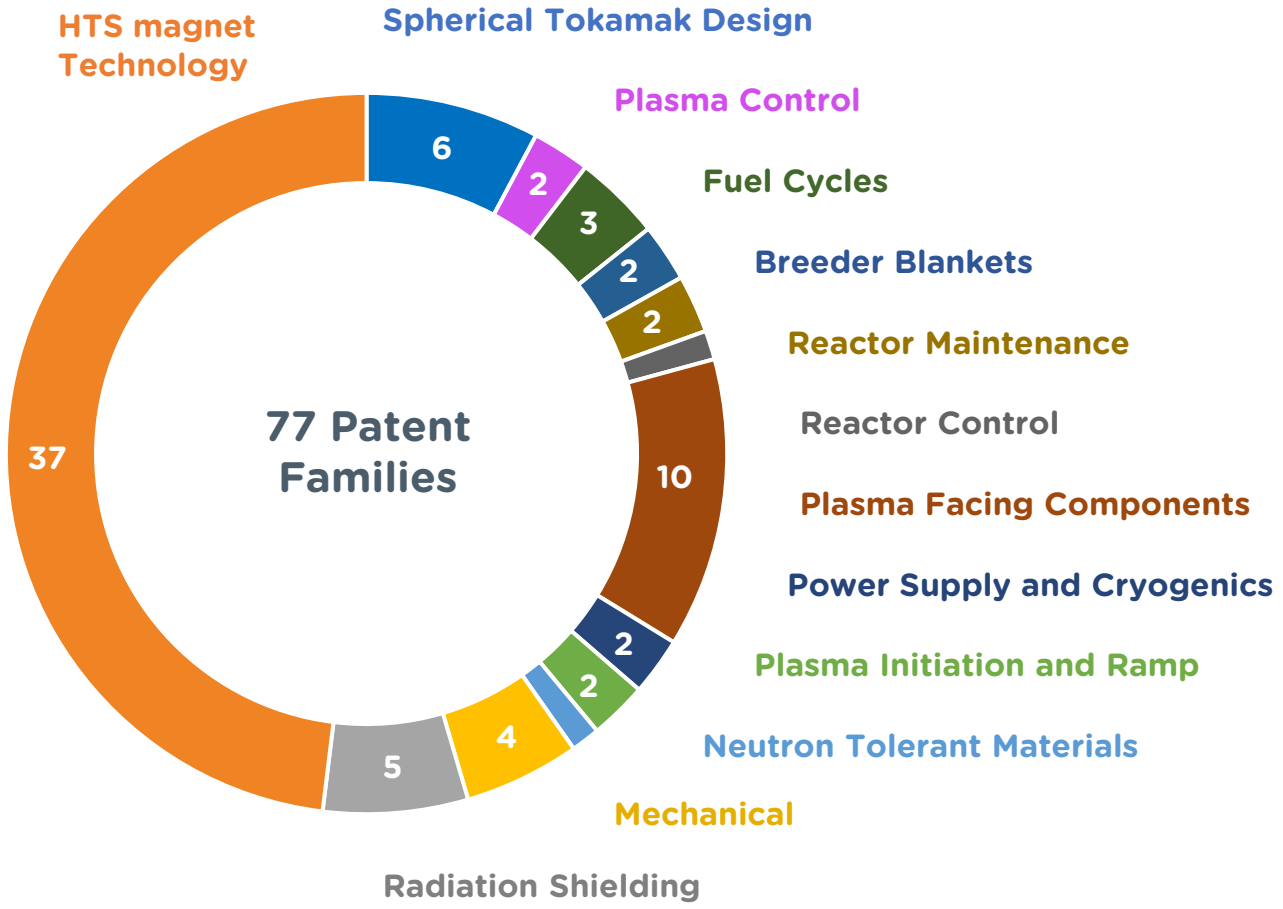
2019
World-record 24 Tesla field at 20 K with patented HTS magnet technology.



2017
Designed, built and operating world's highest magnetic field spherical tokamak (ST40)



2015
First HTS tokamak sustained pulse for >24 hours with ST25 HTS



Tokamak Energy

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Safety:
We're putting it first

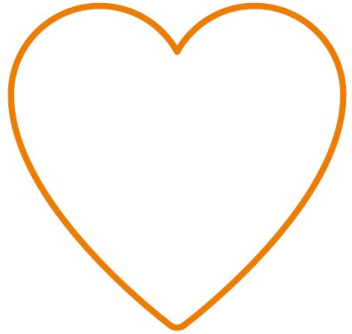
We put the safety, health and wellbeing of our people and our shared environment first. We will achieve this by respecting and supporting our colleagues, empowering them to take ownership of safety.

Tokamak Energy

Collaboration:
We're team players

We welcome diverse mindsets and alternative points of view to create our best work. Sharing knowledge, inviting constructive challenge and staying curious help us to move forward together.

Tokamak Energy



Respect:
We're open with each other

We respect and listen to other opinions, even if they differ from our own. This enables us to work together with integrity, clarity and team commitment.

Tokamak Energy

Agility:
We're fast on our feet

Our field of innovation is constantly evolving. We are ready to respond to new challenges and make changes whilst remaining focussed on our priorities. We empower our people to bring ideas that will add value, promote collaboration and improve the way we work.

Tokamak Energy

Creativity:
We're curious and courageous

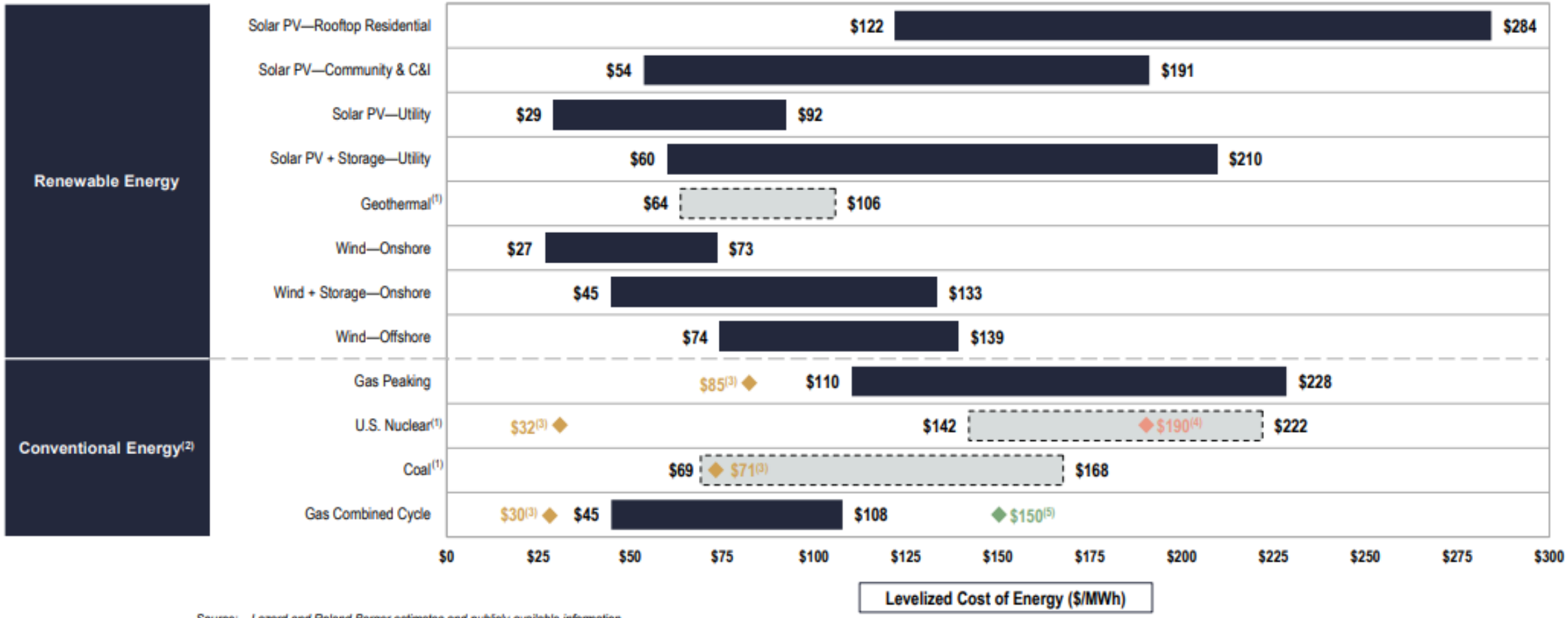
We need to think differently and innovate to make fusion energy commercially viable. We are pioneers. We make time to imagine and explore new ideas.

PUBLIC PRIVATE PARTNERSHIPS

1. 9 INFUSE awards
2. First CRADA in Fusion between multiple labs (ORNL and PPPL)
3. Participating with 5 of 6 FIRE consortia
4. Participating in 2 ARPA Chadwick awards (PFC)
5. DOE/DESNZ/TE joint award on LEAPS

Levelized Cost of Energy Comparison—Version 17.0

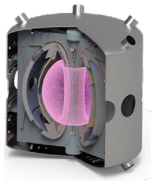
Selected renewable energy generation technologies remain cost-competitive with conventional generation technologies under certain circumstances



Source: *Lazard and Roland Berger estimates and publicly available information.*
Note: Here and throughout this analysis, unless otherwise indicated, the analysis assumes 60% debt at an 8% interest rate and 40% equity at a 12% cost. See page titled "Levelized Cost of Energy Comparison—Sensitivity to Cost of Capital" for cost of capital sensitivities.

Our fusion technology & facilities.

4



Tokamak Magnetic Confinement

Tech. Readiness	Complexity	Progress to Steady-state
Most mature fusion design	Requires planar Sup. Con. magnets & Integrated Fuel Cycle	Intermediate devices making progress, limited by current-drive TRL

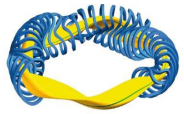
Tokamak Energy · GENERAL ATOMICS · Commonwealth Fusion Systems

Linear FRC Magnetic Confinement

Tech. Readiness	Complexity	Progress to Steady-state
Very low TRL, limited demonstration	Theoretically less complex due to linear layout	Very limited progress

tae TECHNOLOGIES · HELION

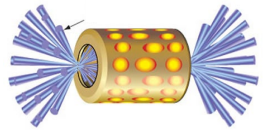
Fusion Technologies



Stellarator Magnetic Confinement

Tech. Readiness	Complexity	Progress to Steady-state
Less studied than Tokamaks	Requires complex non-planar Sup. Con. magnets & Integrated Fuel Cycle	Limited demonstrated progress but intrinsically stable

Proxima Fusion · TYPE ONE ENERGY · RENAISSANCE FUSION

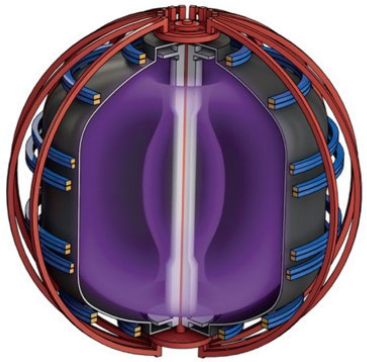


Inertial Confinement

Tech. Readiness	Complexity	Progress to Steady-state
Well studied but no progress to power plant design	Highly complex, requires multiple challenges to be overcome	Negligeable. Single shot demonstration is still state-of-the-art

FOCUSED ENERGY · MarvelFusion · XCIMER

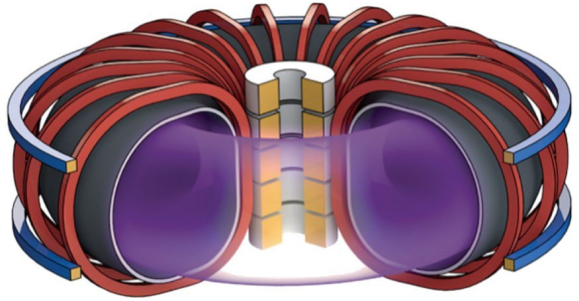
SPHERICAL TOKAMAKS



Low aspect ratio

- More Efficient
- Higher plasma stability
- More compact
- Less space for shielding of central solenoid

CONVENTIONAL TOKAMAKS



High aspect ratio

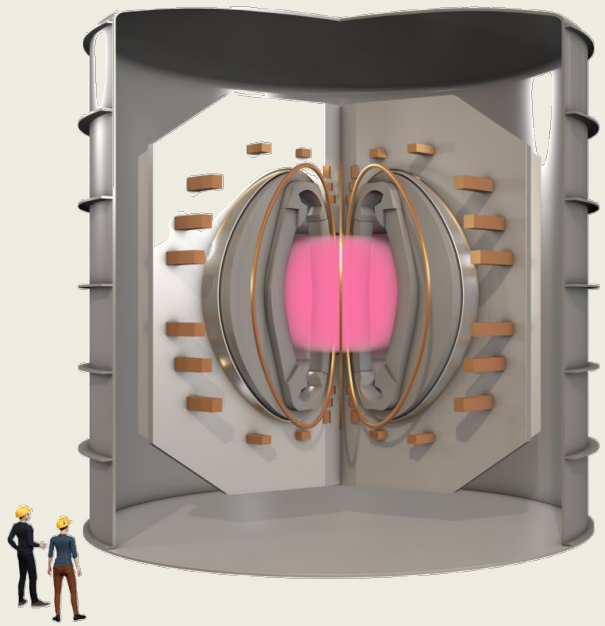
- Less Efficient
- Lower plasma stability
- Less compact
- More space for shielding

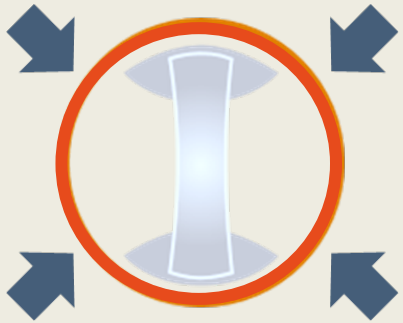
Tokamak Energy STEP FAST PPPL

OUR FUSION TECHNOLOGY

Compact Spherical Tokamak with High Temperature Superconducting (HTS) magnets

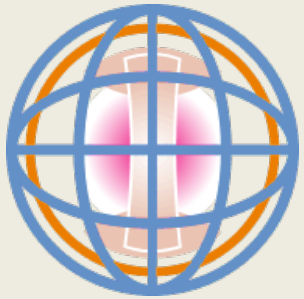
Cost-efficient and abundant baseload power and industrial heat, delivered in a compact form-factor.





Compact spherical tokamak

- High efficiency (high bootstrap current)
- Stable plasma
- Steady state running
- Requires 50% less magnet material*



HTS magnets

- Quench-safe, robust magnets
- Ultra-high magnetic field (20 Tesla +)
- Operate at 20K (no liquid cryogens)

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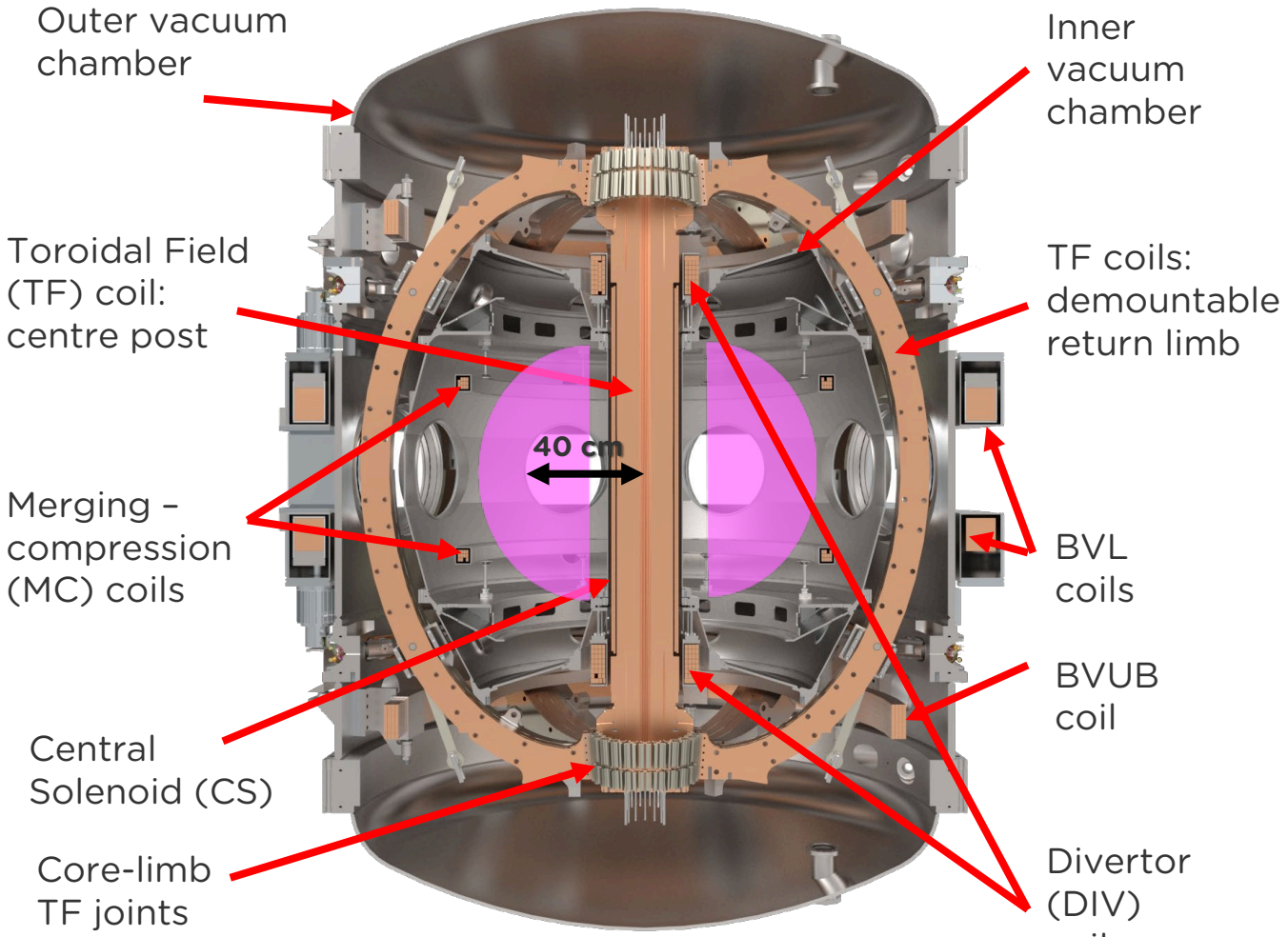
* Compared to a conventional tokamak (CT)

COMPACT SPHERICAL TOKAMAK

ST40

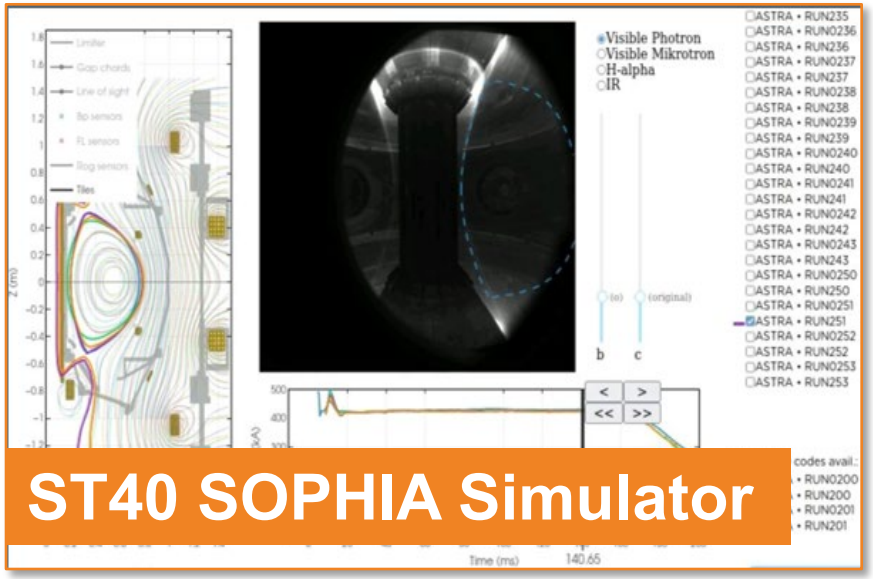
Compact Spherical Tokamak

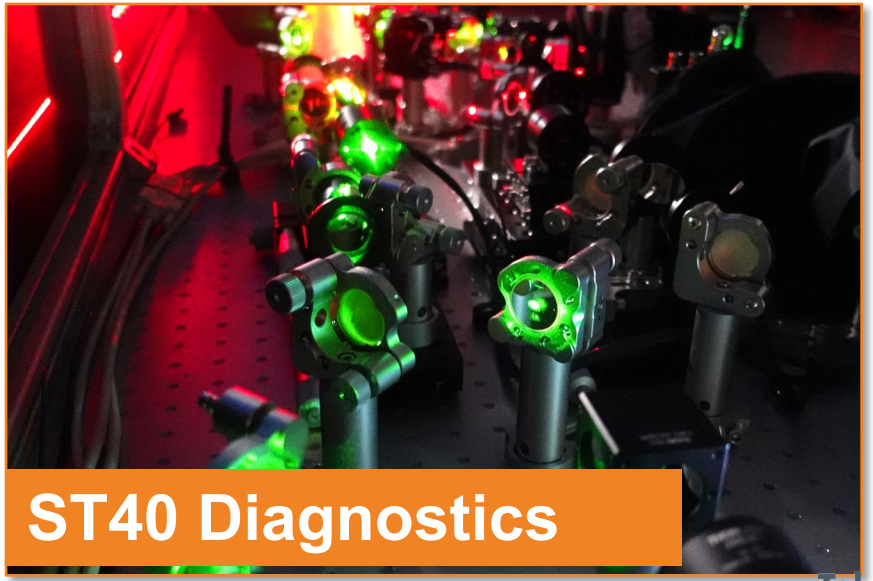
World's highest field Spherical Tokamak



S.A.M. McNamara *et al.* 2024 Nucl. Fusion **64** 112020

ST40 TOKAMAK FACILITY





Tokamak Energy

THE FUTURE FOR ST40

An operational testbed for power plant-relevant tokamak systems.

High Toroidal Field

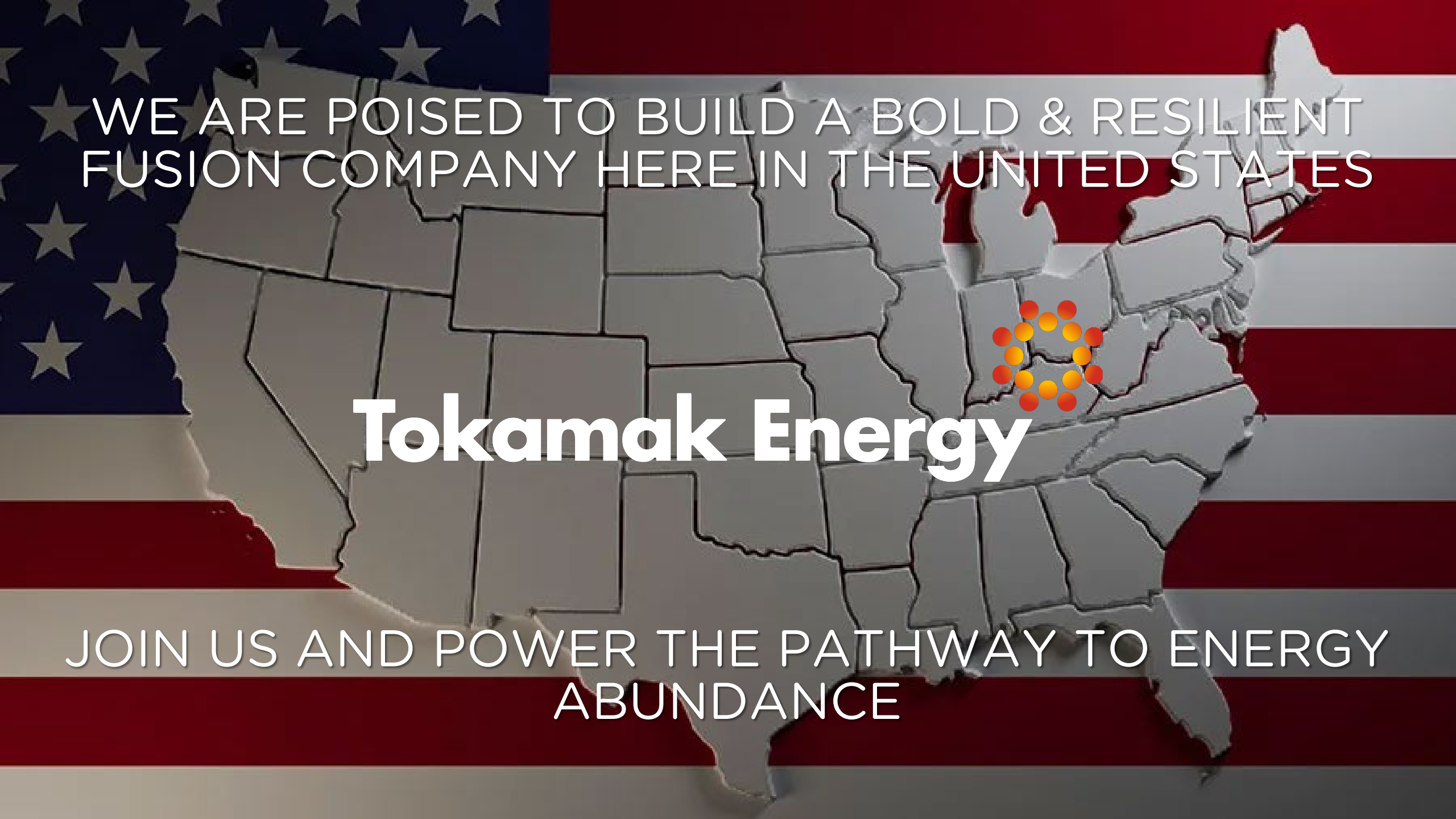
Dominant RF Heating

Lithium PFCs

Liquid Metal Divertor

Core Fuelling w/ Pellets

A unique research and training facility to build operational capability and know-how for first generation of fusion power plants.


WE ARE POISED TO BUILD A BOLD & RESILIENT FUSION COMPANY HERE IN THE UNITED STATES
Tokamak Energy
JOIN US AND POWER THE PATHWAY TO ENERGY ABUNDANCE

Tokamak Energy

Thank you

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Aaron.Washington@tokamakenergy.com

www.tokamakenergy.com