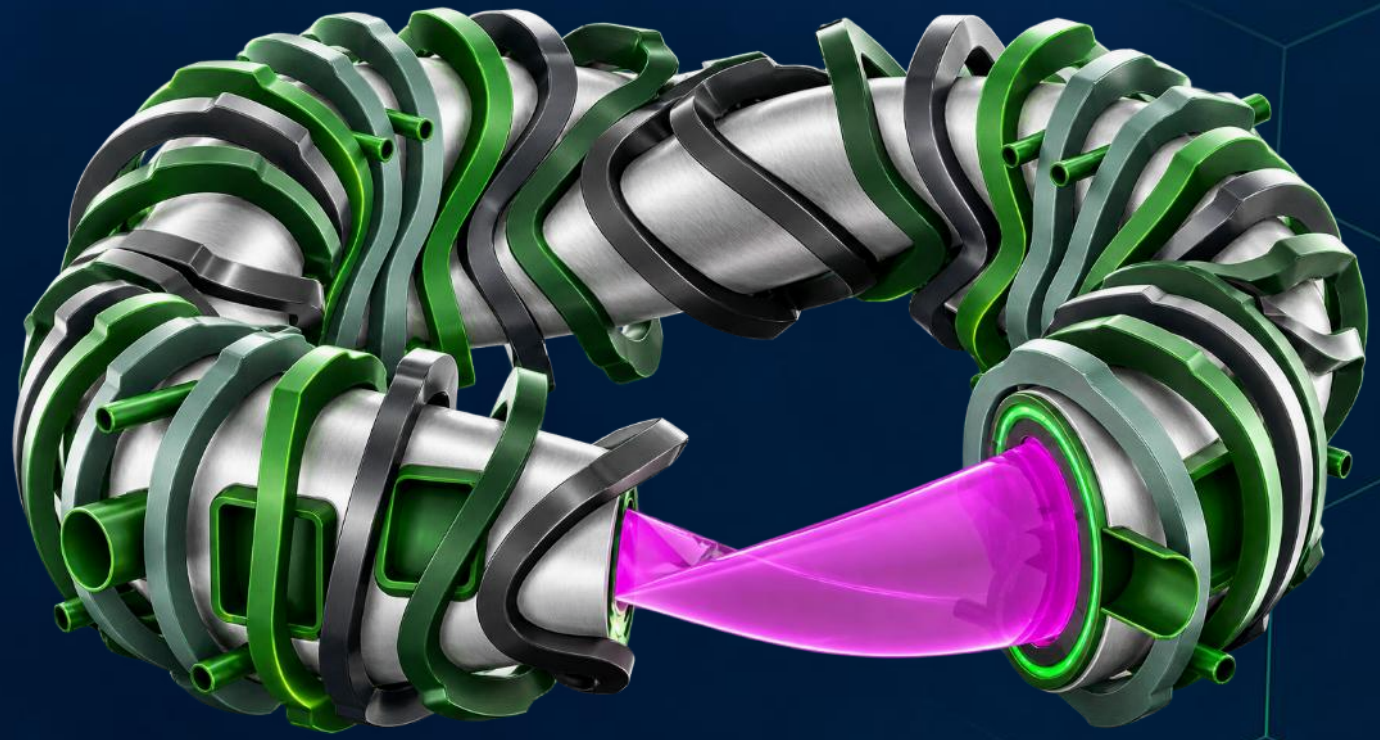


Frédérick Bordry
Gauss Fusion Senior Advisor
CERN Emeritus

Gauss Fusion: Introduction

Industrializing scalable Fusion Power Plants and their key technologies by combining breakthrough proprietary Stellarator design with world-class industrial know-how

4th Swiss ITER Suppliers meeting / PSI / 5th November 2026

Who are Gauss‘ industrial core partners? Companies delivering fusion components for decades on projects like JET, ITER, STEP…

Gauss‘ industrial network with >1500 experts, >500M€ rev/a, >30y experience and ~1B€ worth production capacity



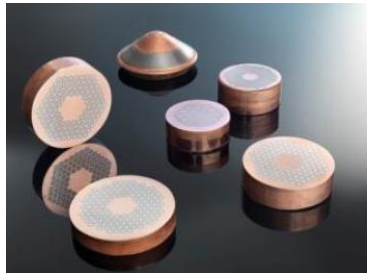
ASG SUPERCONDUCTORS

- ~200 experts
- ~60M€ rev/a
- 30y+ experience in fusion
- e.g. supplier of super-conducting magnets for ITER reactor (photo)



ALSYMEX ALCEN

- >500 experts
- >100M€ rev/a
- 20y+ experience in fusion
- e.g. supplier of Mitica grids for ITER Tokamak reactor (photo)

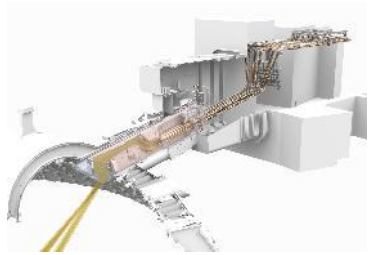


BRUKER

- >400 experts
- ~200M€ rev/a
- ~150.000km superconducting cables per year
- e.g. superconductor supplier for W7X, ITER, BEST

IDOM

- ~150 experts in fusion (5.000 in total)
- ~35M€ rev/a for IDOM ADA
- 20y+ experience in fusion
- design, qualification and delivery of reactor systems, e.g. diagnostics, RF heating, port systems, breeding blankets, divertors, … as well as power plant engineering



research instruments

- ~400 experts
- ~90M€ rev/a
- 30y+ experience in big science
- Strategic supplier of Fusion for Energy
- e.g. supplier of components for ITER/JT60/JET such as „Inner Vertical Target“ (Divertor), „Cryopumps“, „Upper launcher“, „Valve boxes“ (photo)





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How to operate? Gauss applies an ASML-like industrial collaboration-focused operating model to fusion

Partner-led, capital-efficient and focused on architecture, critical systems, IP generation and systems integration

Founders and Strategic Partners

ASG SUPERCONDUCTORS

ALSYMEX ALCEN

BRUKER

IDOM

research instruments

GAUSS FUSION

The Gauss Fusion model combines focused internal capability with the scale, infrastructure and manufacturing depth of industrial partners

Focus on orchestrating architecture, critical systems, IP generation and integration know-how where Gauss can create value

Partner with key industrial players to mature selected technologies and manufacturing pathways in existing factories

Avoid unnecessary vertical integration while retaining system-level control of critical interfaces for a resilient and efficient cost-structure

Build a capital-efficient route from design to demonstrator and first-of-a-kind systems to achieve a high RoIC

Scientific Partnerships

CERN

ENEA

IPP Max-Planck-Institut für Plasmaphysik

KIT Karlsruher Institut für Technologie

DIFFER

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

DTU Technical University of Denmark

TUM Technische Universität München

JÜLICH FORSCHUNGSZENTRUM

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Why Stellarators? Steady-state by design for stable, high-uptime operation; high-field 12T design for FPP lifetimes of ~50 years

To achieve affordable baseload electricity, choosing the right FPP topology and field design choice is essential

Understood Gauss high-field Stellarator physics

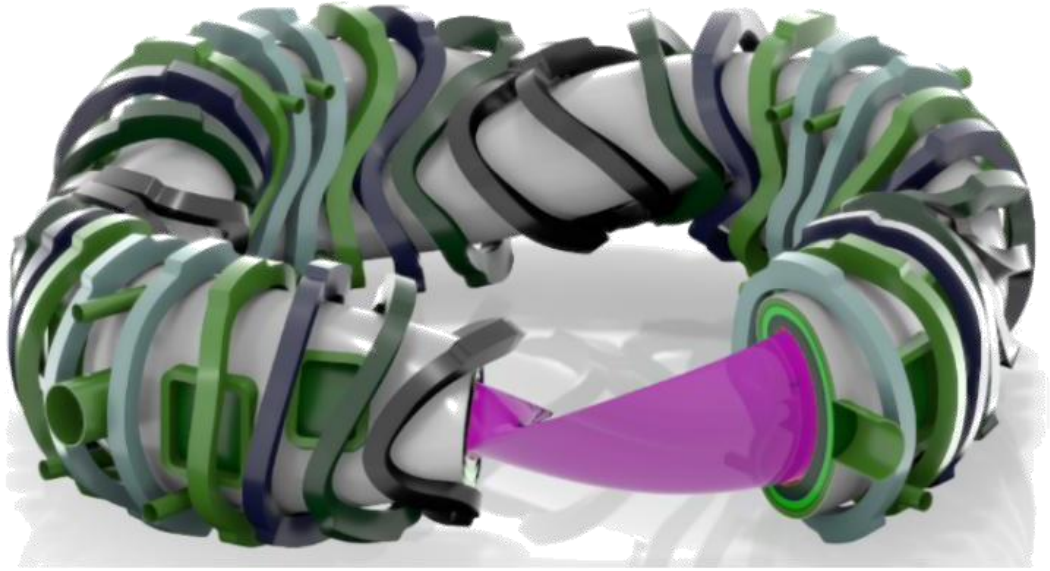
Magnetic-fusion technologies build on comparatively mature magnets, heating systems and industrial supply chains. High-field 12 Tesla / 170 GHz plasma heating Stellarators can deliver stable, cost-effective 500–1,000 MWe baseload power for half a century.

Inherently stable operation for minimal LCoE

Stellarators run continuously by design, compared with the pulsed operation of a tokamak, that limits component and systems lifetimes.

Clear staged industrial technology route

Gauss provides a staged route to validate high-field stellarator performance and to prove Gauss Fusion's proprietary critical bottleneck technologies before scaling to a first-of-a-kind fusion power plant.



The GAUSS GIGA™ FPP architecture is compelling. The opportunity lies in making it deployable and scalable to unlock the fusion energy industry.

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What is GIGA™? A scalable architecture for stellarator fusion power plants

The GIGA™ platform is modular, manufacturable, maintainable and scalable

1 Smart Design

Modular, high-field (12–14 T) Gauss stellarator with established 170 GHz plasma heating – at the sweet spot of compactness and neutron loading

2 Manufacturable Design

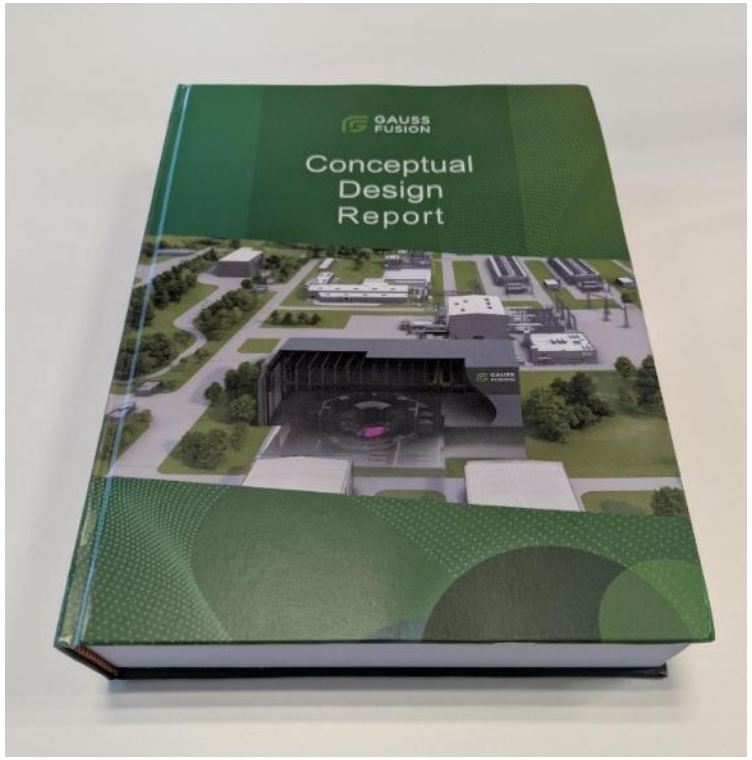
Proprietary demountable, standardized “Mitchell” magnets, modular HEXA™ tritium breeding blanket and PinkCap™ divertor

3 Maintainable Design

Demountable “Mitchell” magnets combined with remote handling and neutron flux as a design criterion enable uptimes of more than 85%

4 Robust Supply Chain Design

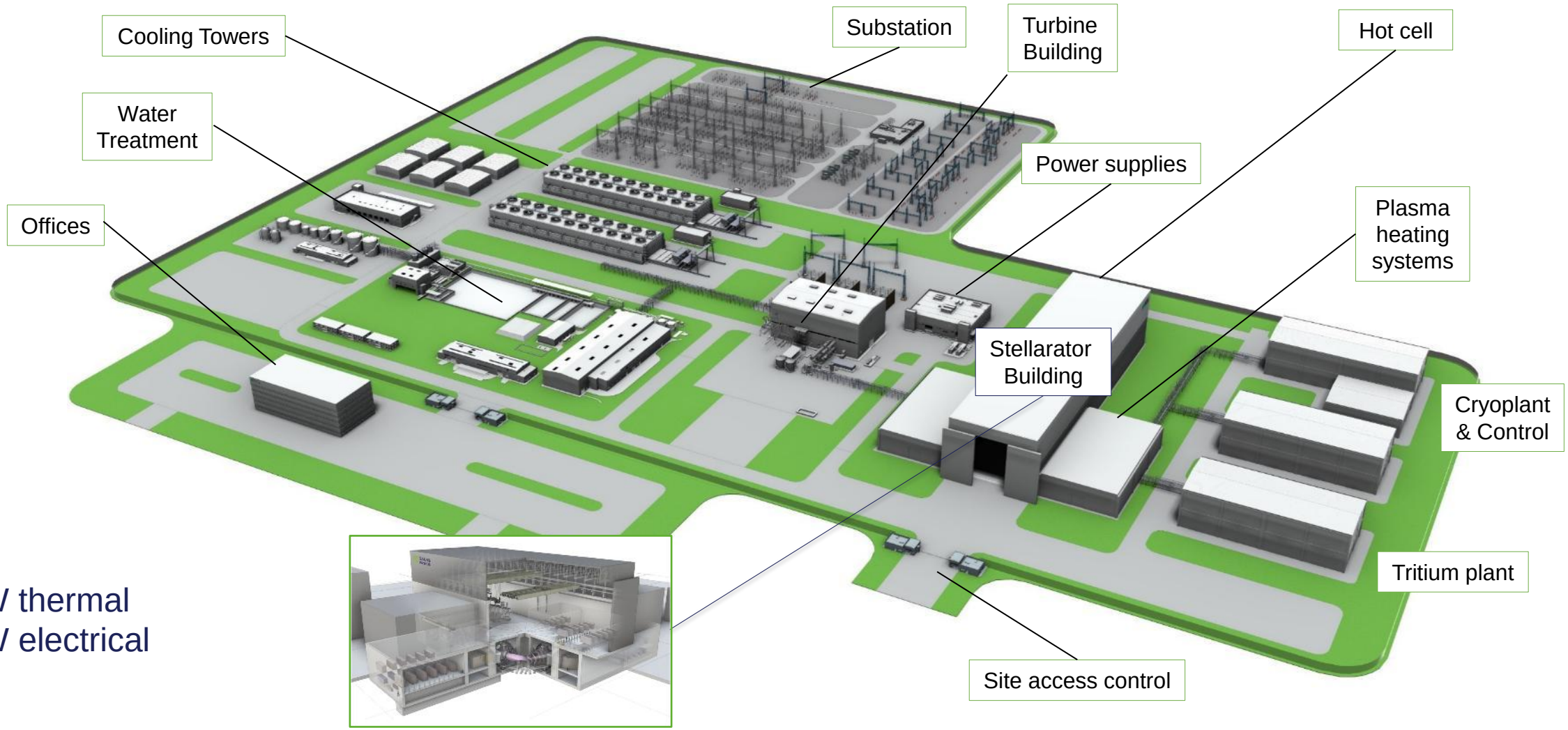
RRP and HTS superconductors, with deliberate de-risking of hard-to-source materials – e.g. lead instead of beryllium, Grade 91 instead of EUROFER



The independently reviewed CDR confirms GIGA™ as a modular, manufacturable, maintainable and scalable stellarator platform – designed with “Cost as a Spec”

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GIGA fusion power plant layout

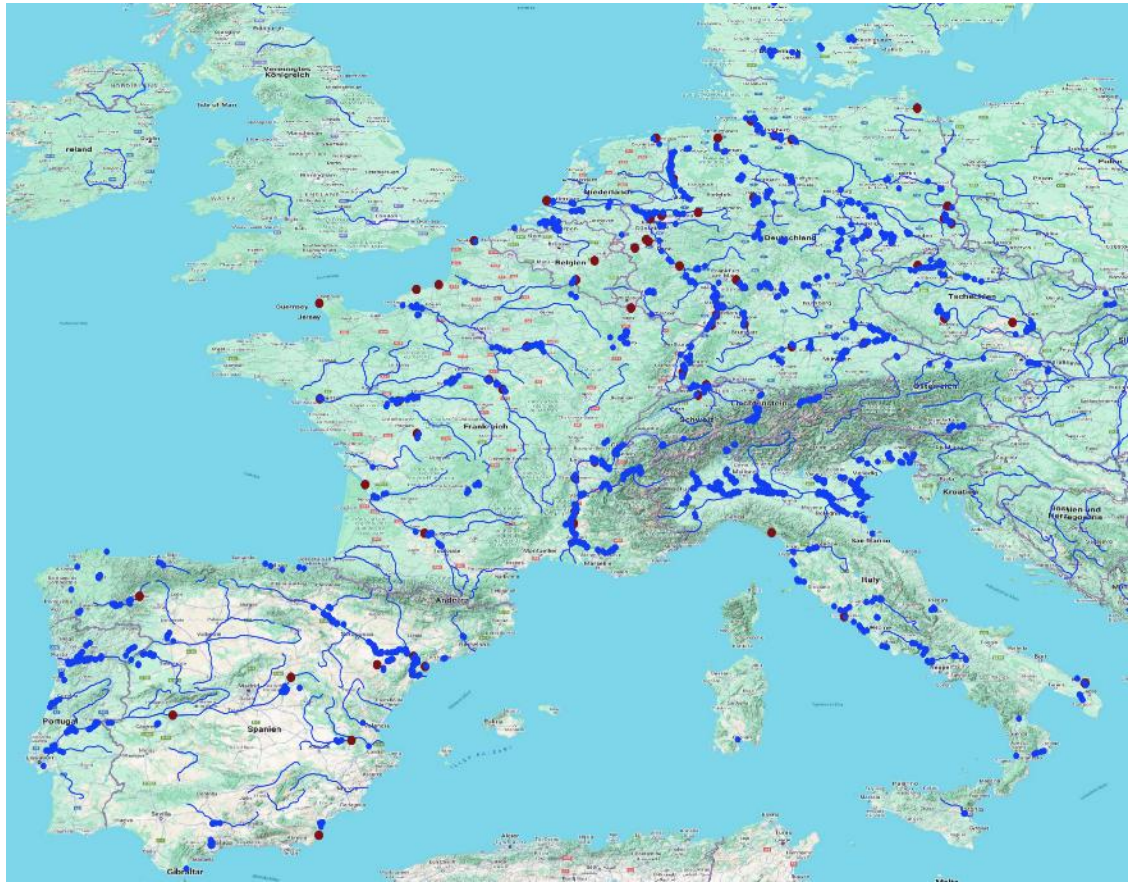


3 GW thermal
1 GW electrical

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Mapping Europe for the first generation of FPP

Potential sites in Europe



Filter criteria

1. 100 ha area
2. Electrical grid
3. Cooling
4. Urban areas “nearby”

Potential sites

- Nuclear and fossil power stations (≥ 1 Gw_e)
- Possible sites

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Mapping Europe for the first generation of FPP

Europe’s first comprehensive fusion siting study revealing potential locations across the continent

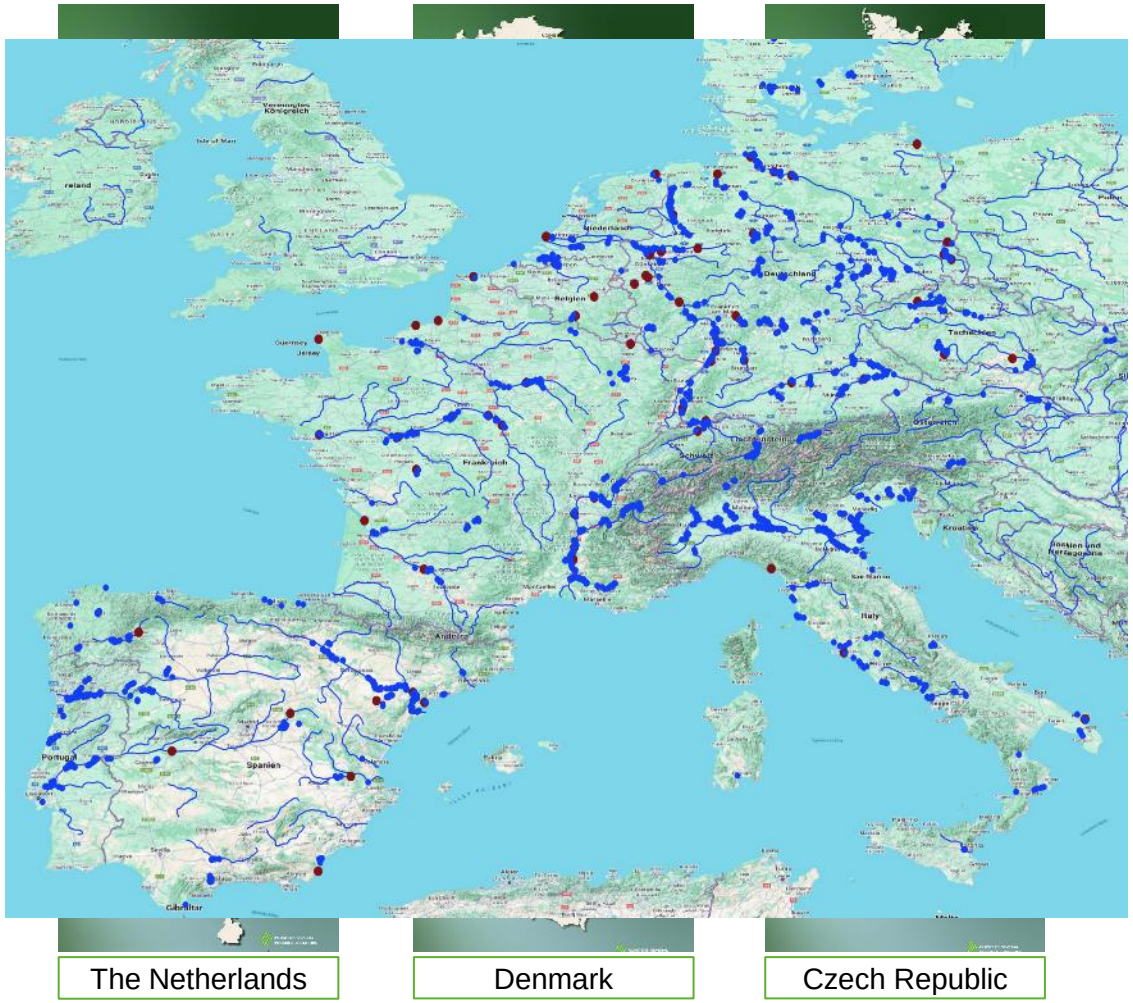
- A Europe-wide study identifies hundreds of potential fusion power plant sites across nine countries.
- Conducted with the Technical University of Munich (TUM), maps industrial clusters and existing energy sites suitable for Europe’s first generation of fusion power plants.

Filter criteria

1. 100 ha area
2. Electrical grid
3. Cooling
4. Urban areas “nearby”

Potential sites

- Nuclear and fossil power stations (≥ 1 Gw_e)
- Possible sites



The Netherlands | Denmark | Czech Republic

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Sites and hubs

1. Potential sites and hubs in European countries identified
2. Deeper analysis performed on a case-by-case scenario
3. As representative examples, a few areas have been further analyzed in France, Germany, Italy, Spain and Switzerland

Country	Ident. Sites	Hubs[1] (approx.)
France	218	15
Germany	353	27
Italy	244	24
Spain	153	9
Switzerland	33	12

Number of sites and hubs for France, Germany, Italy, Spain and Switzerland

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[1] Neighboring sites are bundled into hubs

How to scale? Staged value creation based on clear milestones

Based on the modular GIGA™ platform and proprietary key technologies, Gauss industrially scales stellarator science to fusion power plants

MILESTONES

2023

Team and differentiated expertise assembled

Entrepreneurial leadership, fusion expertise and industrial delivery capability brought together around a focused execution model

Partnership highlights

Industrial

Scientific

2025

GIGA™ CDR completed and independently reviewed

A system-level foundation defining a modular, manufacturable and maintainable architecture, the GIGA™. platform

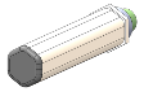
Critical design choices



2026 – 2029

Critical fusioneering technologies demonstrated

Demountable "Mitchell" magnets, HEXA™ tritium breeding and PinkCap™ divertor advanced to demonstrator-relevant capability



Modular HEXA™ breeding blankets

Demountable "Mitchell" Magnets (DMM™)



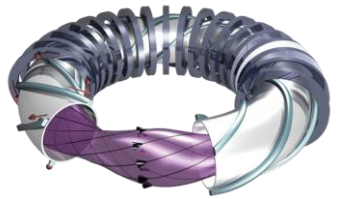


Unique PinkCap™ divertor

Mid 2030s

Gauss Industrial Demonstrator

GID-170: An industrial demonstrator to validate high-field design choices (TRL 7) and to build the supply chains for scalable power plants



2040s

Scalable fusion power plants

Long-term 500 MW – 1 GWe NOAK-scalable fusion power plant architecture for secure and affordable baseload electricity



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Technology missions

Not just a physics experiment

For a Fusion Demonstrator to be industrially useful, it must have **technology missions** as well as physics missions. The aim is to raise relevant technologies to **TRL 7** or above by providing a representative fusion environment. That means *neutrons* and *plasma-materials interactions*.

We define a set of missions for the Demonstrator which can be turned into requirements.

These missions follow from industrial power plant requirements.

TM-1: Validate high-field demountable coil technology at scale
TM-2: Demonstrate the plasma physics baseline for the FPP
TM-3: Validate reactor-relevant control scenarios
TM-4: Validate steady-state fuelling and exhaust scenario
TM-5: Validate machine safety concepts
TM-6: Validate machine assembly and maintenance concepts
TM-7: Validate blanket technology in fusion-relevant environment
TM-8: Establish supply chain for FPP manufacturing
TM-9: Training of FPP staff

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For a ~ 3GW (i.e. ~ 1GWe: 7 TWh/year, capacity factor 80%) Fusion Power Plant (FPP)

Deuterium mass flow

~ 0.3 kg/day

110 kg/year

Deuterium can easily be extracted from seawater, where 1 in 6700 hydrogen atoms is deuterium. It is a widely available, harmless, and virtually inexhaustible resource.
In every cubic metre of seawater, for example, there are 33 grams of deuterium.
Deuterium is routinely produced for scientific and industrial applications.
Enough deuterium for billions of years of energy supply.

Tritium mass flow

~ 0.5 kg/day

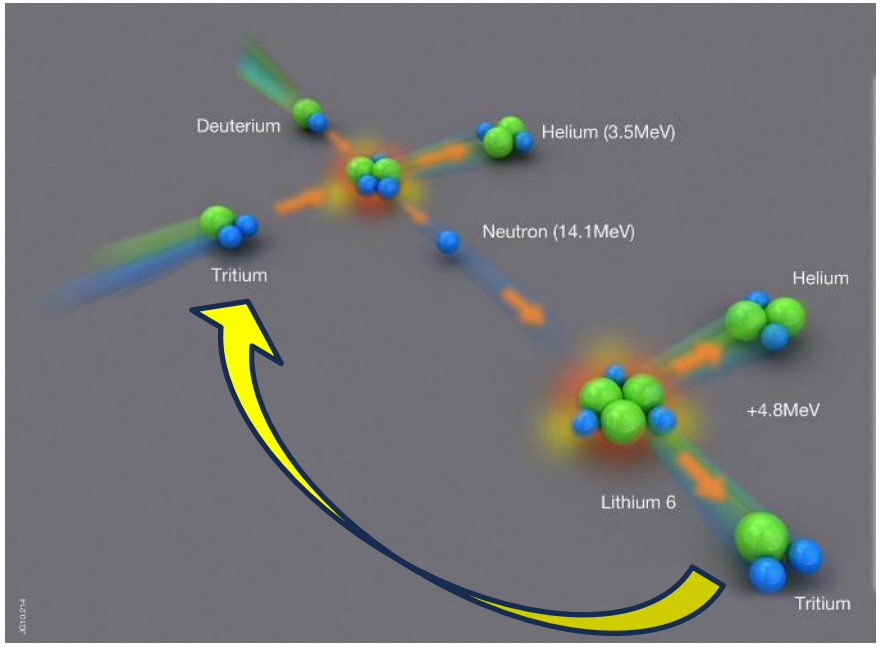
150 kg/year

Tritium is radioactive and has a half-life of 12.3 years
The atmosphere has only trace amounts, formed by the interaction of its gases with cosmic rays.
The largest source of tritium for civilian use comes from heavy water reactors (CANDU) as a by-product of operation: about 1.5 kg/year
Current inventory ~ 25 kg

External supply of Tritium for FPP is not possible

Tritium must be “bred" inside the fusion device in a closed loop from lithium, which is abundant in the Earth's mantle and in seawater.

Deuterium –Tritium <= **Lithium**



Fusion reaction:

$D + T \rightarrow He + n + 17.6\ MeV$

Primary fuels: D and Li

$n + {}^{6}Li \rightarrow He + T + 4.8\ MeV$

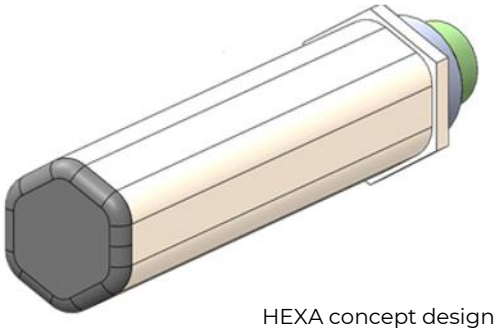
- Enough deuterium in the ocean to supply 60 billion years
- Enough lithium in land to supply 16,000 years
- Enough lithium in ocean to supply 30 million years

Note:

- Natural lithium contains about 92.5% of lithium 7 (^{7}Li) and only 7.5% lithium-6 (^{6}Li).
- TBM: ~40–90% of ^{6}Li, depending on the concept and TBR

=> enrichment process

HEXA: Innovative Helium Cooled Pebble Bed (HCPB) architecture



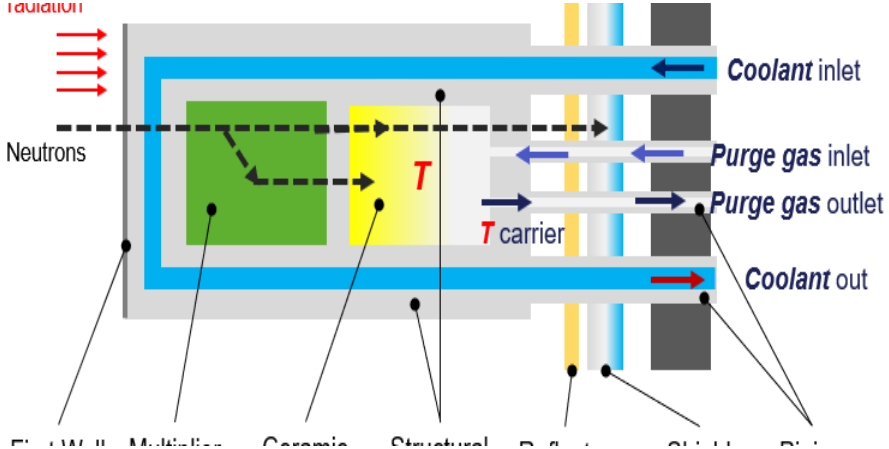
HEXA concept design

KEY BENEFITS

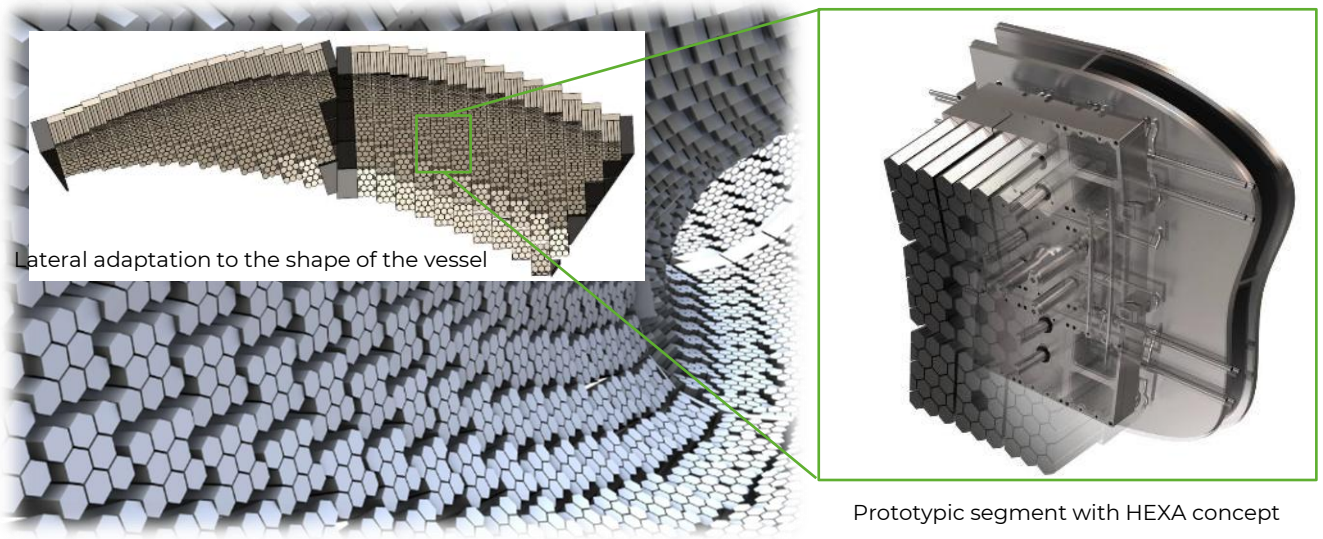
- Novel and highly adaptable pin structure –highly scalable
- Suitable for magnetic and intertial fusion devices
- Designed for integrated remote handling and manufacturability
- Materials selected for the full component life-cycle
- Phased qualification strategy to reduce risks through prototyping and testing

POWERED BY BMFTR PROJECT SYRVBRETT WP2

Bundesministerium für Forschung, Technologie und Raumfahrt



HEXA main subcomponents



Prototypic segment with HEXA concept

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HEXA© in-vessel distribution. Gauss Conceptual Design Report. Supported by IDOM.

Timescale and roles

When do we need the data?

The largest technology gaps in fusion remain those related to tritium breeding and extraction. **Without fuel, we do not have fusion**. These technologies need to be demonstrated as soon as possible to give confidence in the viability of a reactor.

To minimise overall risk and tritium consumption, and maximise speed of delivery, **staged operation** of a Demonstrator, allowing a single device to fill multiple roles over its lifetime, makes a lot of sense.

Minimal device (TM1, 2, 6, 8)

↓

Upgrade with tritium cycle, test blanket, initial remote maintenance

↓

Burning plasma device, breeding tests (TM2, 3, 4, 5, 7, 9)

↓

Upgrade with full blanket

↓

Full pilot plant (TM6, 7, 9)

↓

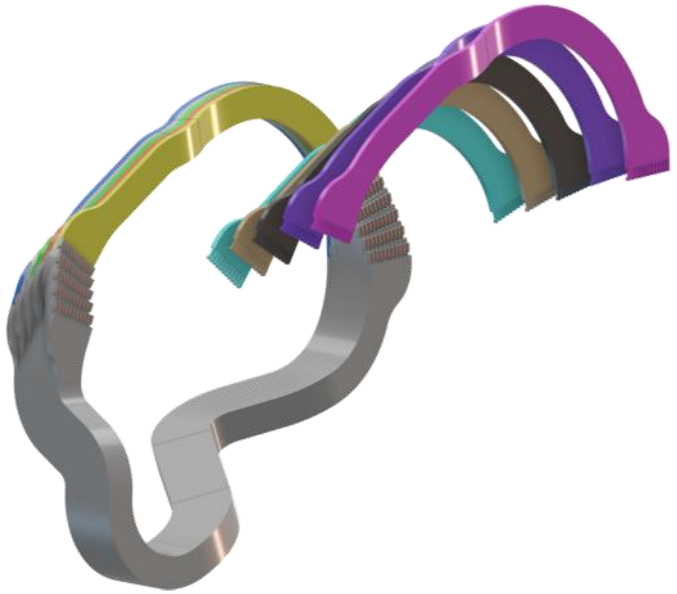
Long-term role as VNS?

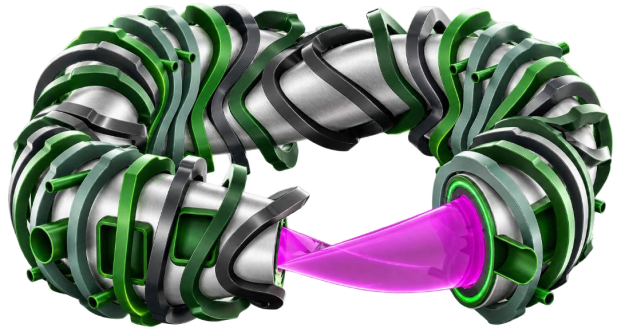


Small numbers are partial fulfillment of mission.

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Demountable Mitchell Magnets

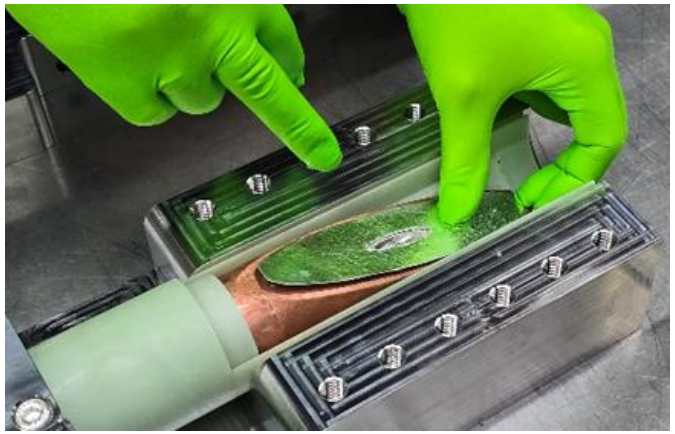




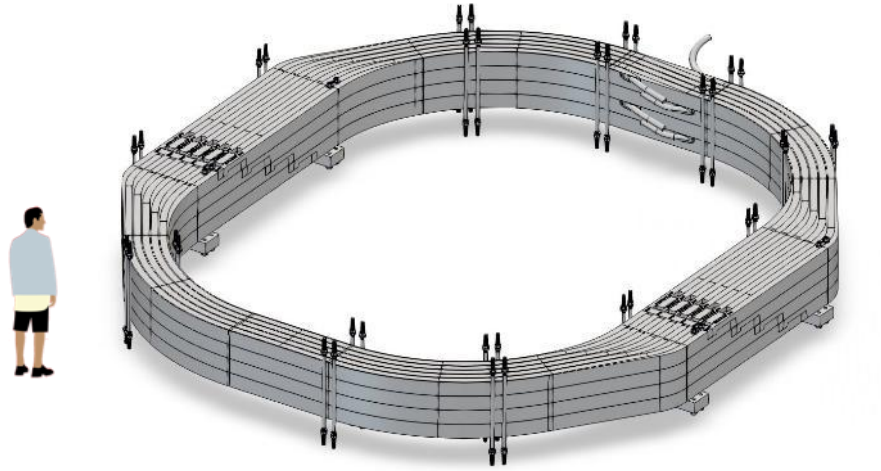
KEY BENEFITS

- Enables novel maintenance schemes and simplified device assembly
- Enables SC magnet repairability
- LTS (RRP) and multiple HTS concepts under development
- LTS single joint resistance < 1 nΩ achieved
- HTS single joint resistance < 3 nΩ achieved
- Multi-joint demonstrator in development

POWERED BY MULTIPLE BMFTR PROJECTS: DC-U, FPP-MC-U, RH-MC, BLUEPRINT, MAGPIE







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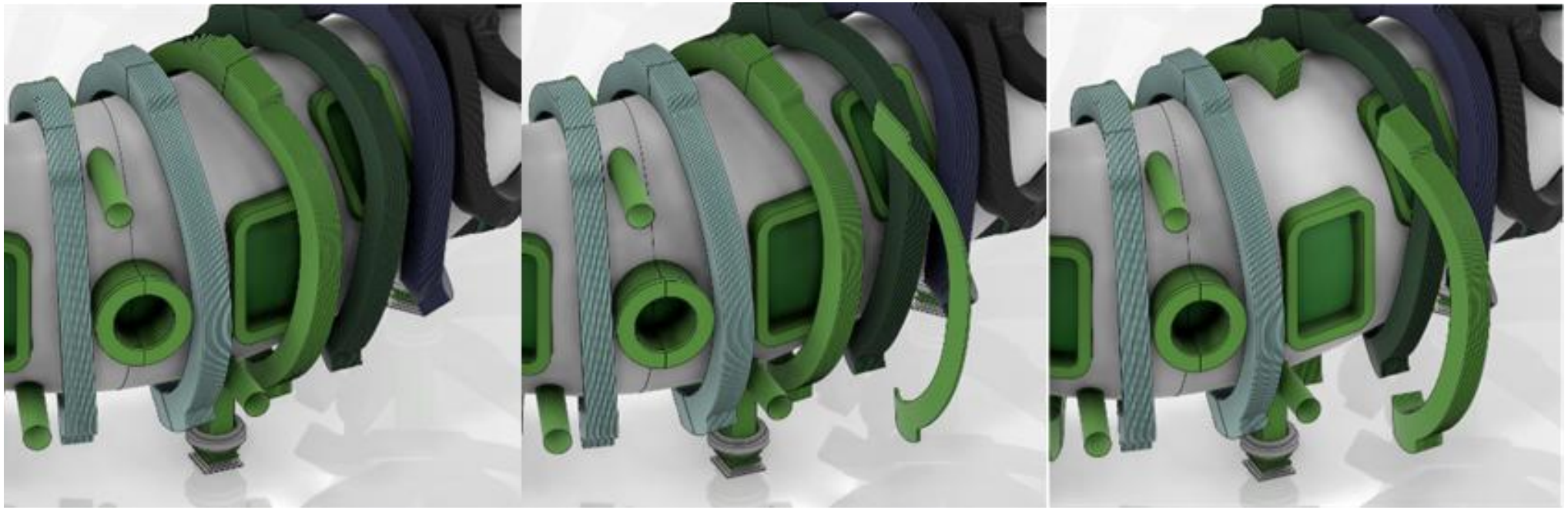
GIGA leverages DMM technology for assembly and maintenance

Traditional modular coils (TF) are entombed by the vacuum vessel

- Requires lifting of entire magnet+vessel structures (as done for W7-X)
- Also requires complex threading of magnets onto vacuum vessel

DMM magnets

- Magnets can be assembled in-place after vacuum vessel installation
- Allows for novel maintenance schemes
- Allows for novel coil designs

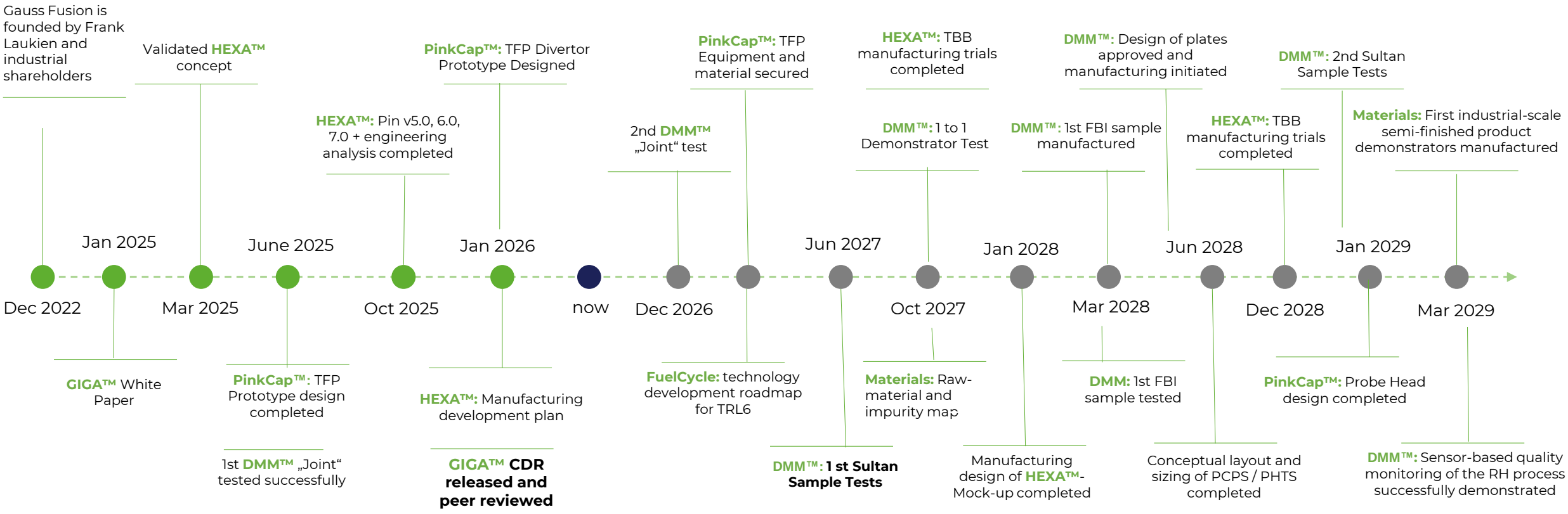


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What's next? Based on past achievements, Gauss has clear near-term milestones for each key technology and GIGA™

At Gauss, delivery is key – by a clear set of clearly defined milestones, Gauss rigorously progresses to the first Fusion Power plant

MILESTONES



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Private Fusion companies by year



7. Approach

56 responses

Magnetic confinement — 26

- Stellarator: 8
- Tokamak: 5
- Spherical tokamak: 3
- Field Reversed Configuration: 3
- Gas Dynamic Magnetic Trap: 1
- Centrifugal Magnetic Mirror: 1
- Open Magnetic confinement: 1
- Pulsed Stellarator: 1
- Tandem magnetic mirror: 1
- Levitated Dipole: 1
- Levitron: 1

Inertial confinement — 12

- Laser-driven inertial confinement: 9
- Quantum enhanced laser-driven inertial confinement: 1
- Hybrid Fast Ignition: 1
- Pulser-driven inertial confinement: 1

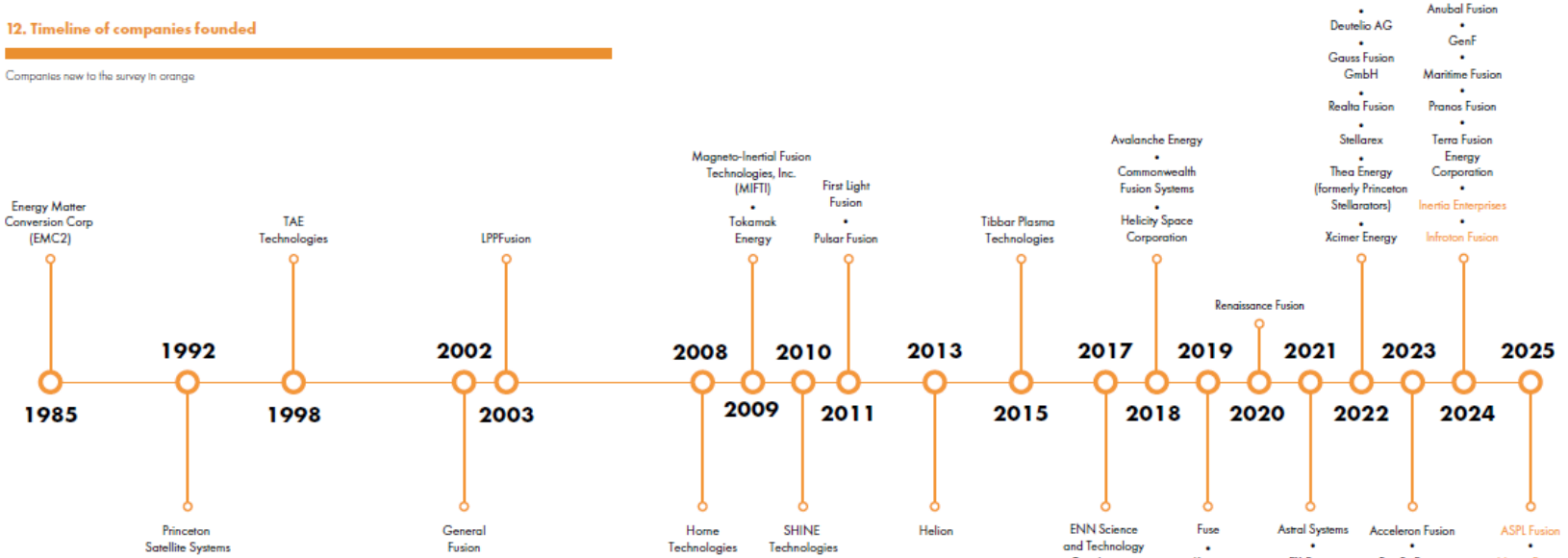
Magneto-inertial — 9

- MagLif: 1
- Magnetized target fusion: 1
- Magnetized target impact fusion: 1
- Plasma jet driven magneto-inertial fusion: 1
- Laser-driven magneto-inertial fusion: 1
- Plectoneme: 1
- Dense Plasma Focus: 1
- Z-pinch: 1
- Sheared-flow-stabilized Z-pinch: 1

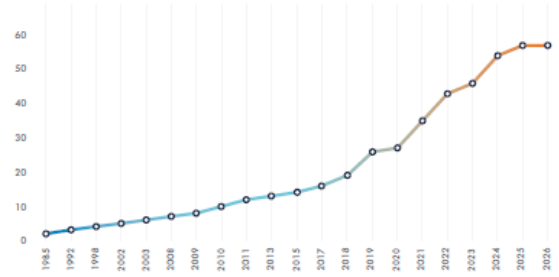
Hybrid electrostatic 7 and Muon catalyzed fusion 1

12. Timeline of companies founded

Companies new to the survey in orange



Total number of private fusion companies by year



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A new wave of startups and capital is accelerating the fusion

56

private fusion companies worldwide (FIA, 2026)

$14.2B

cumulative funding raised since the industry began

$4.48B

raised in the 12 months to July 2026 alone

16,000+

people directly employed by the fusion industry

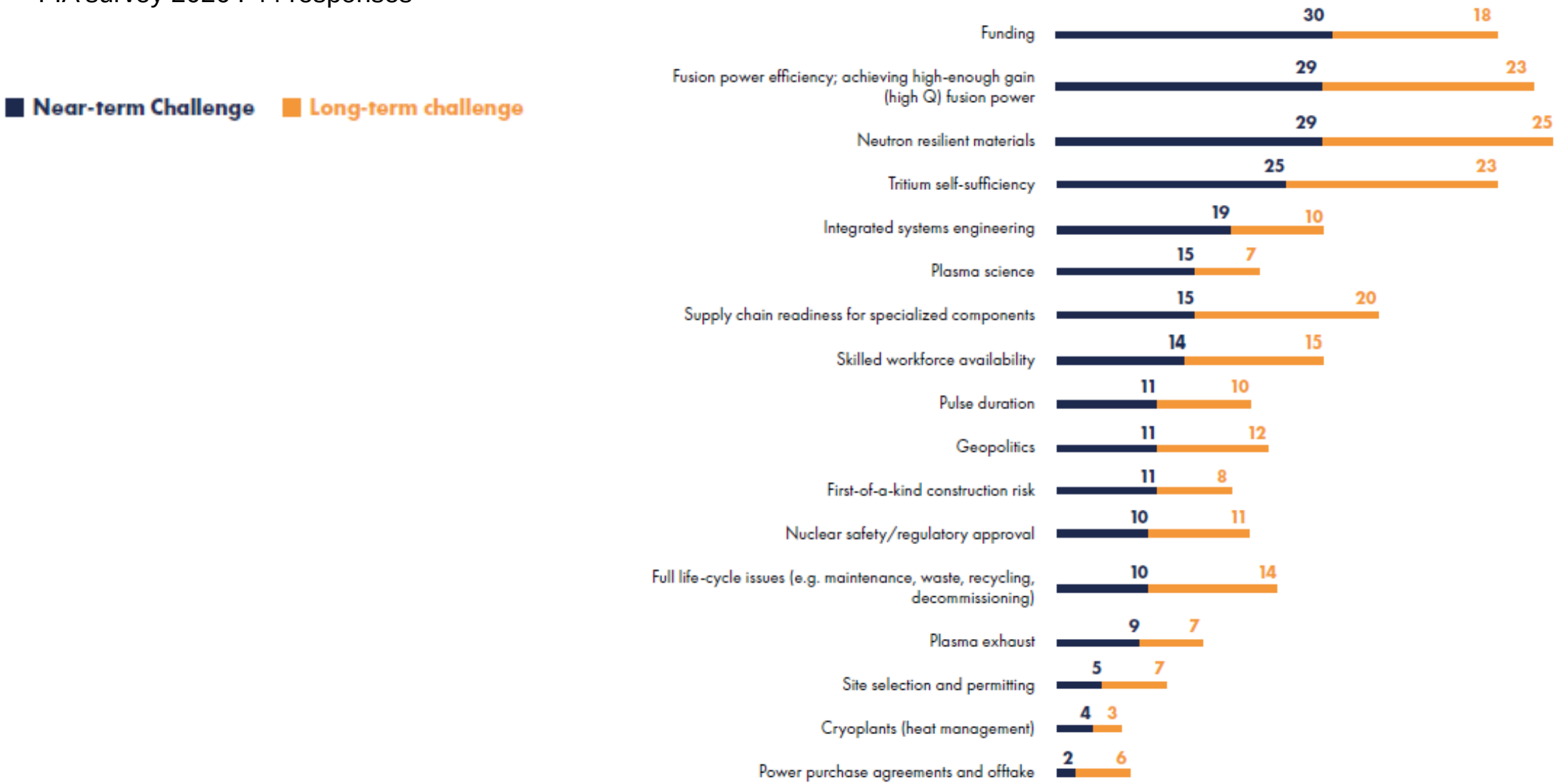
Source: Fusion Industry Association, Global Fusion Industry Report 2025

Funding has grown roughly seven-fold since 2021, and the sector's technology base now spans magnetic and inertial confinement, novel fuel cycles, and dedicated supply chains

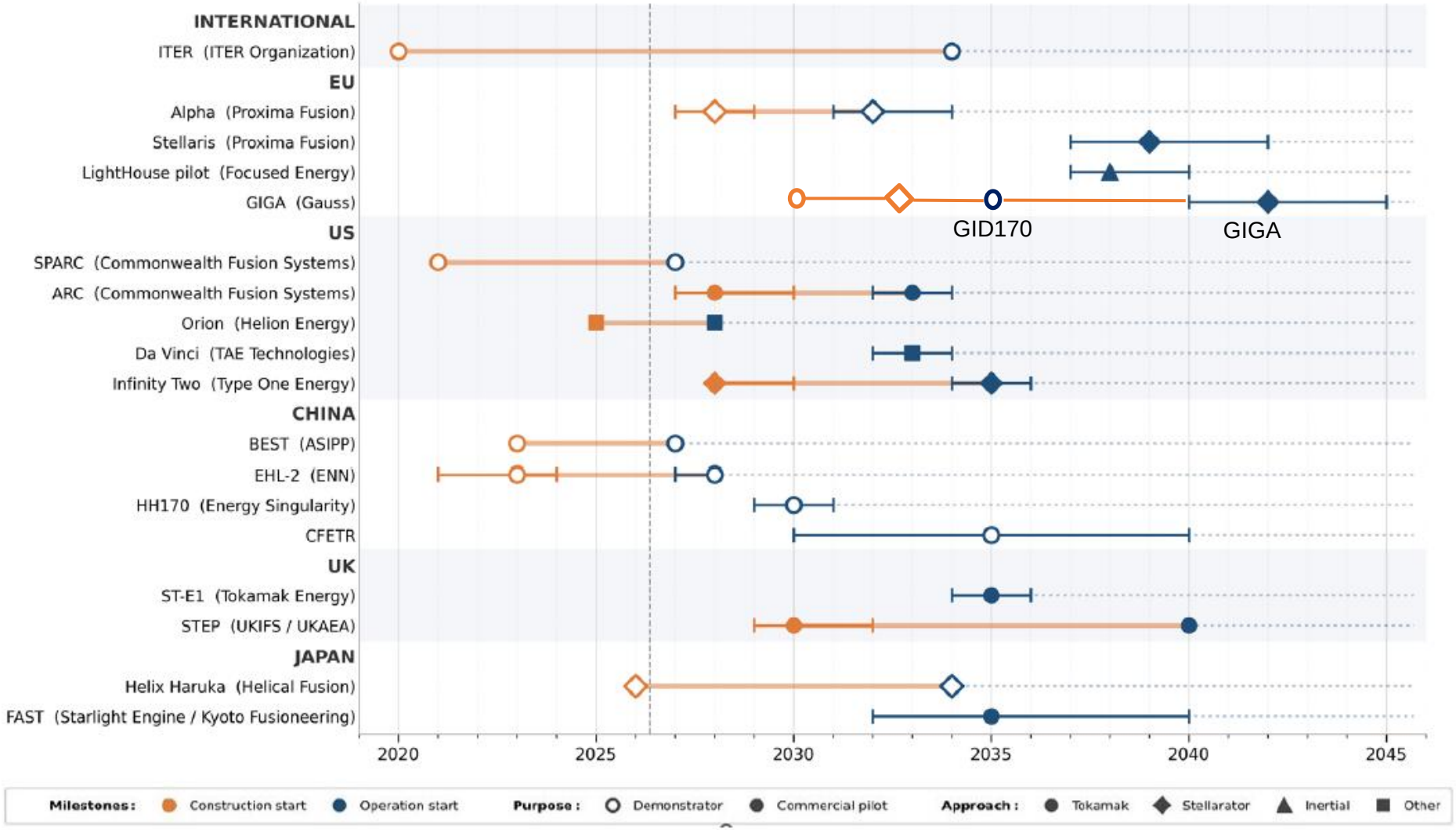
A shift from physics-driven research toward industry-led delivery.

What do you see are the main challenges for fusion energy ?

FIA survey 2026 : 44 responses



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Construction-start and operation-start milestones for next-generation fusion-performance and power-demonstration devices under construction or planned (data cut-off May 2026)

A word of caution

Beware promises of commercial fusion "within five or ten years"

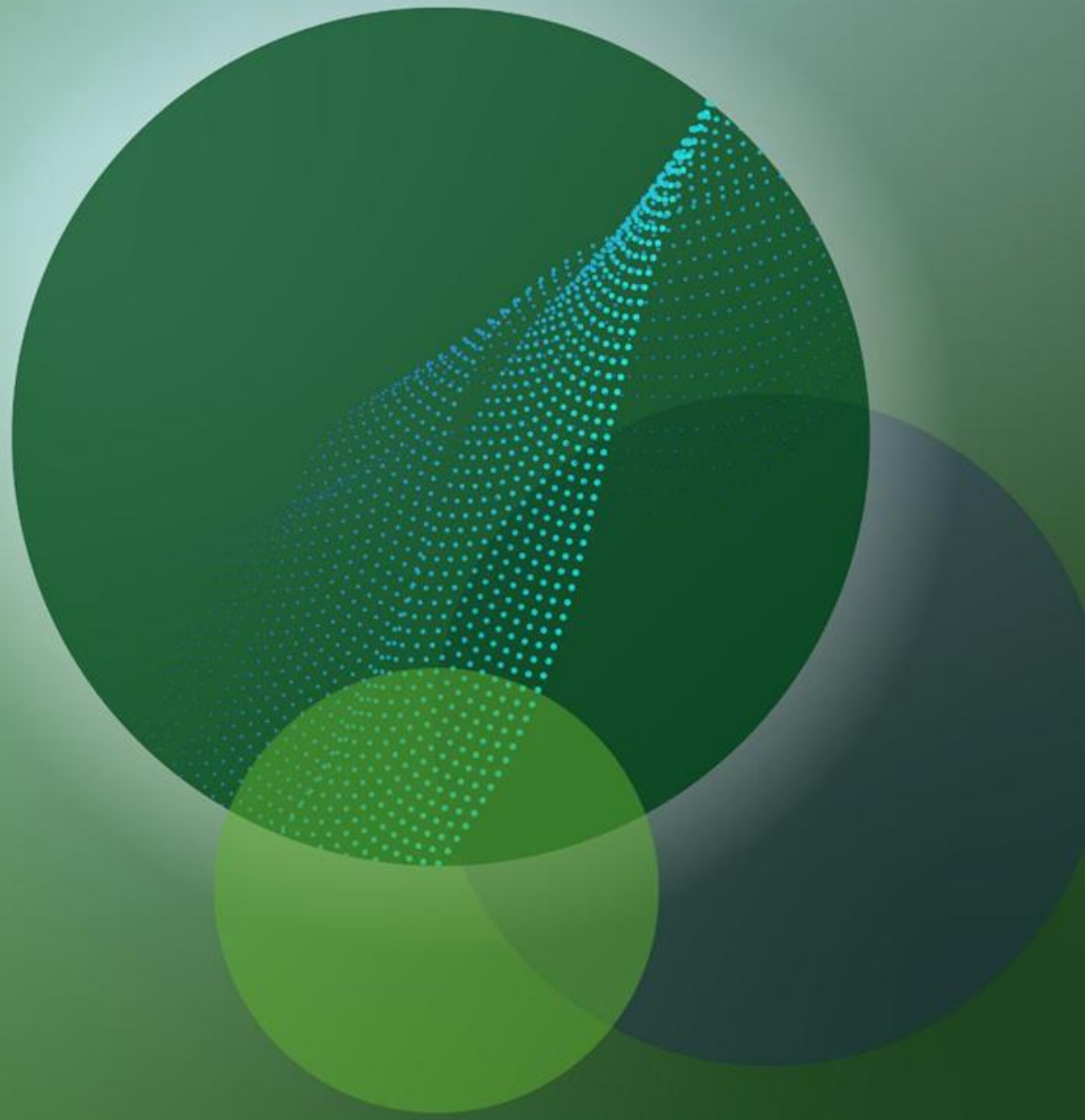
Hardware & materials : Tritium-breeding blankets, neutron-resistant materials, high-field magnets … are still maturing at the component level, not just in the lab.

Project management at scale : Delivering a first-of-a-kind (FOAK) nuclear facility on time and on budget is a discipline in itself: distinct from delivering a physics result.

Nuclear licensing : Regulatory pathways for fusion are still being defined in most countries; licensing timelines routinely exceed optimistic construction schedules.

GAUSS FUSION

The time for demonstrating industrial fusion energy is now…



Thanks for your attention

The physicist Lev Artsimovich said,
“Fusion will be ready when society needs it.”

What is crucial for a fusion power plant? Gauss' proprietary key technologies build the core of every magnetic fusion device

With DMM™, HEXA™, PinkCap™, Gauss develops crucial cornerstones for GIGA™ and offers solutions for fusion power plants in general

Demountable "Mitchell" Magnets (DMM™)

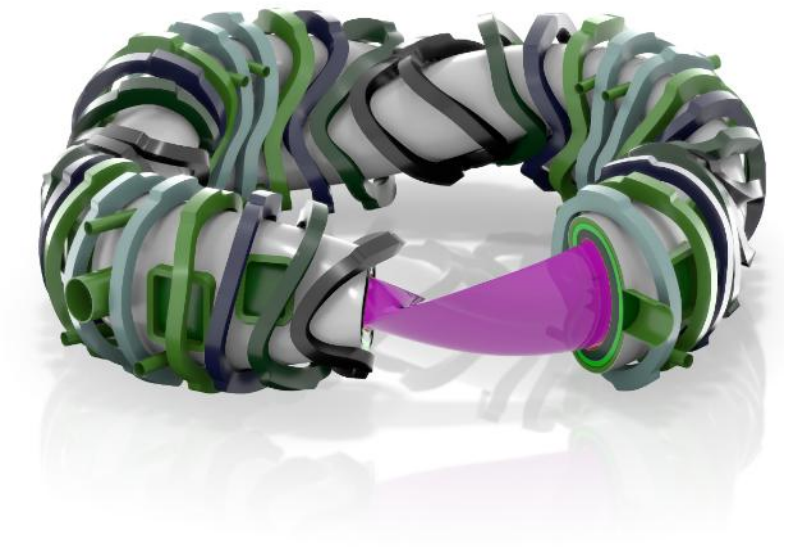
- Demountable magnets
- RRP and HTS compatible
- Low voltage with active controlled internal quench protection

Tritium Fuel Cycle (HELIOS™)

- FOAK architecture dedicated to stellarator operation
- Adaptable to any breeding concept
- Modular design for scalability, redundancy and maintainability
- Supporting systems dedicated to HEXA™

Materials

- Licensable FOAK material baseline
- Industrial supply-chain focus
- Pragmatism towards available materials



Tritium Breeding (HEXA™)

- Novel and highly adaptable pin structure
- Modular design for easy scalability
- Suitable for magnetic and inertial fusion devices

Divertor (PinkCap™)

- Unique exhaust flow capture technology
- Stellarator and tokamak compatible
- Critical enabling technology for fusion

ECRH (170Ghz) & Diagnostics

- Available and proven 170Ghz ECRH technology
- Modular Gauss launcher concept
- Robust and modular diagnostic concept

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Gauss proprietary technologies: Stellarator and Device

Stellarator and Device Enabling Technologies

Three enabling technologies underpin the stellarator and device technology concept.

Demountable superconducting high-field magnets enable simplifications in construction, enable in-vessel maintenance, and allow for repairs.

The capture of **toroidal flow in divertors posses** the possibility for significant improvements in pumping, a critical shortfall in existing stellarators.

Meanwhile the development of **modular port concept** with cassette base diagnostics and heating interfaces, not only simplifies the build but make mass production possible.

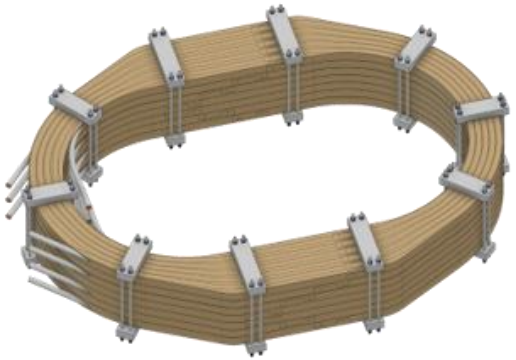
Critical fusioneering technologies



Dr. Neil Mitchell
Magnets

DMM™

Demountable “Mitchell” Magnets improve manufacturability and enable remote maintenance concepts and magnet maintainability.

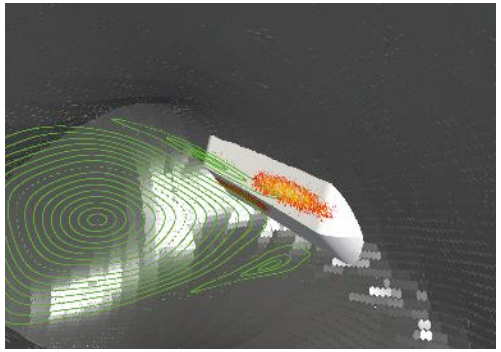




Matteo Moscheni
Divertor

PINK-CAP™

Concept to take advantage of toroidal flow for improved pumping in stellarator and tokamak divertors.

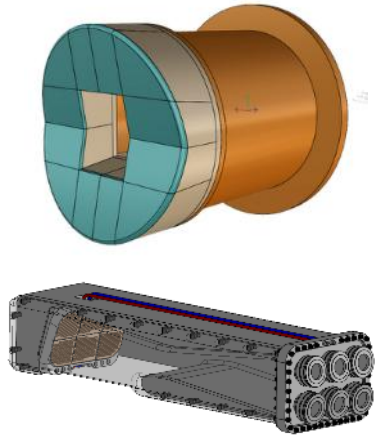




Dr. Samuel Lazerson
Stellarator

MACH-D

Modular port plug design with cartridge-based modules for diagnostic and heating system integration. USB/HDMI for diagnostics and heating systems.



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Gauss proprietary technologies: TRIMAT Fusion Technologies

TRIMAT Enabling Technologies

A **tritium ecosystem and technology program** for providing fusion power plants with manufacturable, and maintainable fuel-cycle systems and in-vessel breeding blankets.

The value comes not from a single material or subsystem, but the **integration of the complex interplay** between materials, breeding, heat extraction, shielding, tritium fuel cycle, tritium accountancy and lifecycle management.

The development and qualification strategy is **aligned with GIGA platform** and **adaptable to other Fusion concepts**.

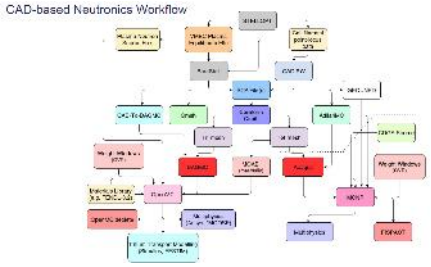
Critical fusioneering technologies

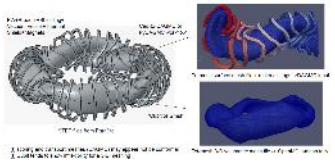
Dr. Jan Coenen
Materials



IMAT

Industrialised material choices – RRP, Grade 91 / HCPB – Lead multiplier / Li breeding – qualification and lifecycle basis



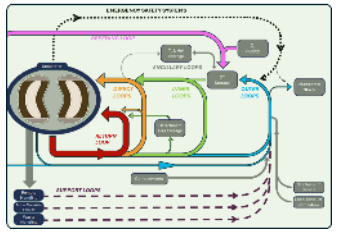


Dr. Paul Staniec
Tritium Fuel Cycle



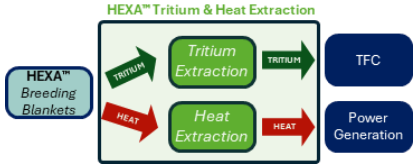
TFC *HELIOS*

Fuel cycle architecture integrating all FPP needs, adaptable to any FPP-scale stellarator and interfacing with any breeding blanket technology



THES *HEXA*

Systems to extract the tritium from HEXA and feed into any TFC, while extracting heat and transferring it onwards



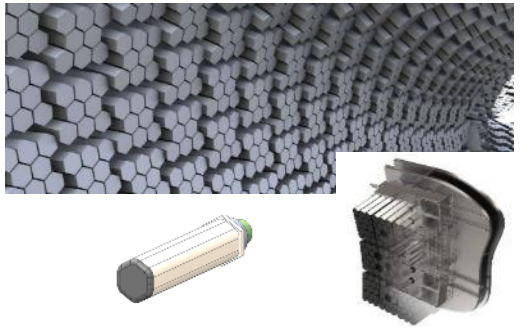
Jacobo Zegri
Tritium Breeding Blanket



TBB *HEXA™*

Modular solid breeder blanket technology compatible with any FPP device:

- Highly adaptable and scalable
- Suitable for magnetic and inertial fusion devices
- Designed for integrated remote handling and manufacturability



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Why Gauss Fusion? Gauss was founded to bring industrial discipline and engineering integration to Stellarator fusion

Combining credibility, integrated systems engineering and industrial delivery around complex systems needed for GIGA fusion power plants



Dr. Uwe Bau
CEO, Engineer

"We are industrializing fusion. Every design choice at Gauss is measured against one specification: affordable electricity from a power plant that can be manufactured, maintained and operated for fifty years. That discipline, not the shortest path to a headline, is what turns fusion into an industry."



Dr. Frank Laukien
Founder, Physicist

"Fusion energy on Earth will not be realized via physics alone. Affordable fusion energy requires systems engineering, specialised manufacturing and industrial integration to scale innovation into fusion power plants, energy sovereignty, value generation, and dramatic economic and employment growth."

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