FOCUSED ENERGY

Executing the Vision:
Creating the Power of the Stars on Earth

FOCUSED ENERGY

2023
Execution is the key to Fusion

- Experienced pros and young talents for efficient execution.
- Scientifically proven methods for swift commercialization.
- Masterplan for strategic execution.
- Organizational structure for methodical execution.
- Milestones to monitor and assess progress.
- Engineering for seamless connectivity and comprehensive solution-building.
- Strategic secondary market commercialization on our path to fusion.

2023 – notable achievements in Industry, Government, Science, Funding, and DOE PPP

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GOVERNMENT AWARDS

- **DOE Award** - US PPP Fusion Program
- **ARPA-E** – winner of three infuse proposals
- SPRIN-D Award by the **Federal Ministry of Research**
- Selected by the **Federal Ministry of Research and VDI** for prototyping a Laser Driven Neutron Source
- The **EuroHPC** "Industry Track"

U.S. DEPARTMENT OF ENERGY

Federal Ministry of Education and Research

SCIENCE & TECHNOLOGY

Targetry alignment robot developed and demonstrated

Liquid cooled slab **amplifier** designed

Proprietary computational codes for synthetic modelling of ICF physics, fuel compression, laser tracking, and plasma behaviors developed

4 Patents submitted in the areas of Targetry, LDRS, Beam shaping

uspto

Deutsches Patent- und Markenamt

SCIENCE AWARDS

Fellow of American Physical Society (**x4**)

John Dawson Award for Excellence in Plasma Physics (**x3**)

Fusion Power Associates Leadership Award (DC)

E. Gail de Planque award from American Nuclear Society (DC)

Ronald Davidson award from American Institute of Physics, Physics of Plasmas journal (DC)

Edward Teller Award winner (SA)

David J Rose Excellence in Fusion Engineering Award from Fusion Power Associates (PP)

Landau-Spitzer Award from American Physical Society and European Physical Society (WT)

LaserNetUS Data & Diagnostics Committee membership (VO)

APS

AIP

ANS American Nuclear Society

ECOSYSTEM

Cooperations and partnerships established with key commercial, public and scientific leaders

First **commercial traction** with LDRS & RWE

Partnership with **LLNL**

Partnership with **Gauss & Proxima (FF)**

SIEMENS

TRUMPF

THALES

RWE

SCHOTT glass made of ideas

Fraunhofer

LEONARDO

Lawrence Livermore National Laboratory

FUNDING

Over **$82 million** in funding collected from public and private sources

CAPITAL FACTORY

Prime Movers Lab

NUCLEATION CAPITAL

VCP VENTURES

HESSEN HessenKapital

2023 – Our experienced experts and young talents for efficient execution

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2023 – Our extremely talented Team

FOCUSED ENERGY

BOARD

Thomas Forner
- 20+ years experience as CEO/CFO
- Expert in developing and leading of international High-Tech companies

Prof. Dr. Markus Roth
- Professor TU Darmstadt, GER
- APS – Fellow, Rosen Award
- Founder of the IC for Nuclear Photonics
- 25+ years in fusion research
- Invented the Proton Fast Ignition Concept

Dr. William Goldstein
- Director Emertius of the Lawrence Livermore National Laboratory (LLNL)
- President of Lawrence Livermore National Security

Dakin Sloss
- Founder & Partner at Prime Movers Lab
- Deep-Tech Lead Investor

ENGINEERS

Doug Hammond
- Has a diverse and extensive work experience in engineering

Adrian McFarland
- Design and Electrical Engineering for fusion energy

[illegible] Meriaux
- R&D engineer

STAC

Dr. Juan Carlos Fernandez
- >20 years of leading plasma and fusion as group leader at Los Alamos National Lab (LANL)
- Expert in Fast Ignition and ion acceleration

Dr. Kurt Schoenberg
- Director Emertius
- >35 years of experience leading large science infrastructures

IFE EXPERTS

Leading IFE experts have quit their positions in National Laboratories and Universities to join FE

Dr. Pravesh Patel
- NIF ICF Program Element Lead
- Lead of the LLNL Fast Ignition Program

Dr. Debbie Callahan
- 35 years at LLNL
- Group leader Target design
- Co-leader of ignition campaign 2012 Dawson Price

Prof. Dr. Stefano Atzeni
- Professor at the LaSapienza University, Rome, Italy
- The theory expert in IFE

Dr. Wolfgang Theobald
- Leading expert on direct drive experiments at Laboratory for Laser Energetics (LLE) / OMEGA laser
- Expert in Fast Ignition experiments

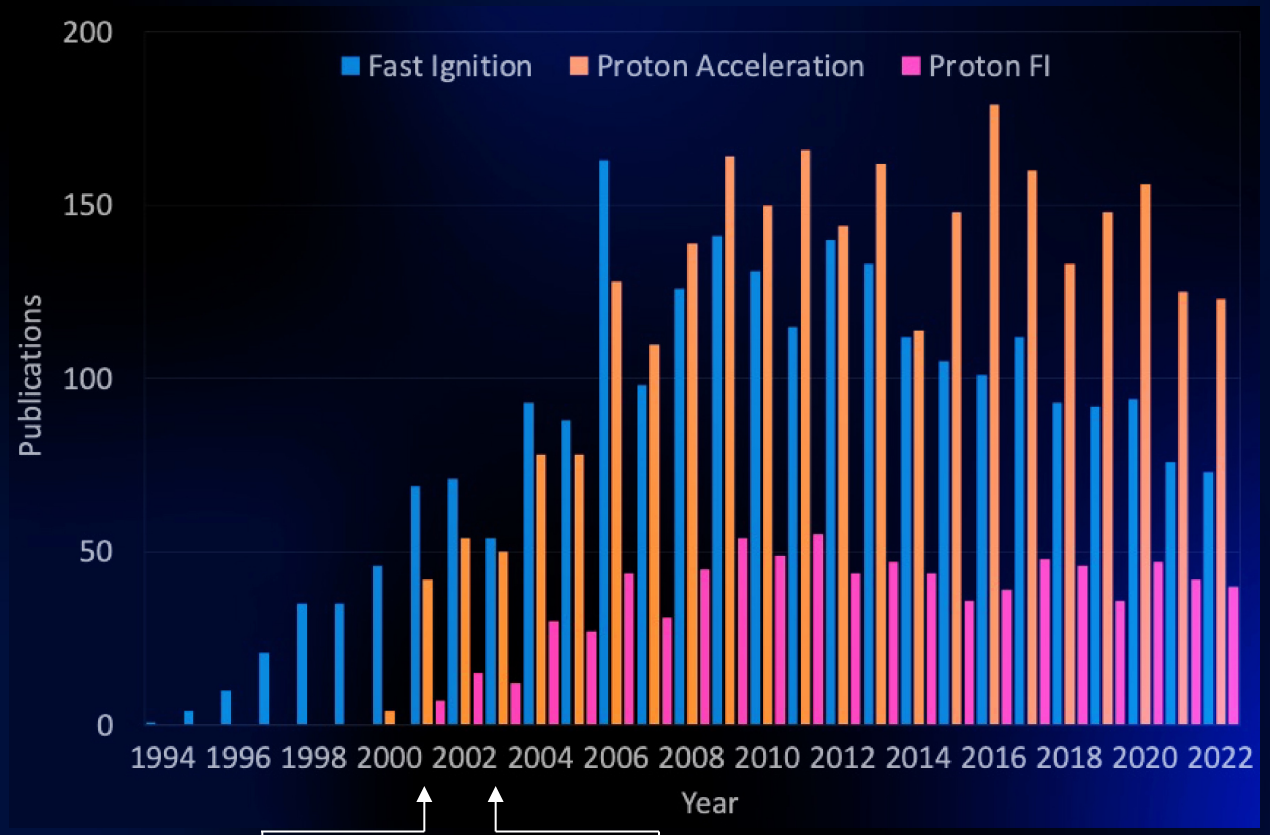
Prof. Dr. Paul Gibbon
- Professor and Director theory at Forschungszentrum Jülich
- Expert in laser-plasma Interaction

Prof. Dr. Javier Honrubia
- Professor at Politechnica Madrid Spain
- Leading expert in fast ignition simulations

Dr. Omar Hurricane
- Physicist at Lawrence Livermore National Laboratory, in the thermonuclear and inertial confinement fusion design division.

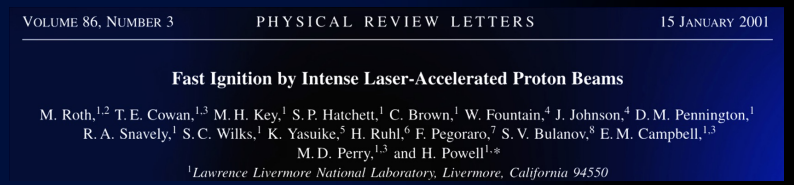
Prof. Dr. Jose Manuel Perlado
- Professor and Director Insituto Fusion Nucleaire at Politechnica Madrid, Spain
- Expert in reactor structural materials and activation

2023 – Our scientifically proven methods for swift commercialization



"The science basis of fast ignition and proton acceleration has been studied extensively over the past 20 years"

Fast Ignition	2400+ papers
Proton Acceleration	2700+ papers
Proton FI	800+ papers


VOLUME 86, NUMBER 3 PHYSICAL REVIEW LETTERS 15 JANUARY 2001

Fast Ignition by Intense Laser-Accelerated Proton Beams

M. Roth,[1,2] T. E. Cowan,[1,3] M. H. Key,[1] S. P. Hatchett,[1] C. Brown,[1] W. Fountain,[4] J. Johnson,[4] D. M. Pennington,[1] R. A. Snavely,[1] S. C. Wilks,[1] K. Yasuike,[5] H. Ruhl,[6] F. Pegoraro,[7] S. V. Bulanov,[8] E. M. Campbell,[1,3] M. D. Perry,[1,3] and H. Powell[1,*]

[1]*Lawrence Livermore National Laboratory, Livermore, California 94550*

1000 citations


VOLUME 91, NUMBER 12 PHYSICAL REVIEW LETTERS week ending 19 SEPTEMBER 2003

Isochoric Heating of Solid-Density Matter with an Ultrafast Proton Beam

P. K. Patel,[1] A. J. Mackinnon,[1] M. H. Key,[1] T. E. Cowan,[2] M. E. Foord,[1] M. Allen,[1] D. F. Price,[1] H. Ruhl,[2] P. T. Springer,[1] and R. Stephens[3]

[1]*Lawrence Livermore National Laboratory, Livermore, California 94550, USA*

500 citations

2023 – Our Masterplan for strategic execution

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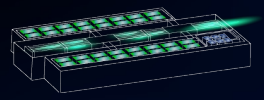
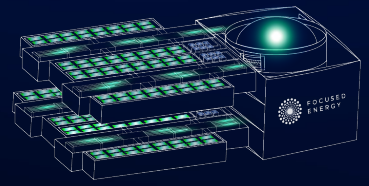
FUSION

SP/LP Prototype Beamline
2023-2025

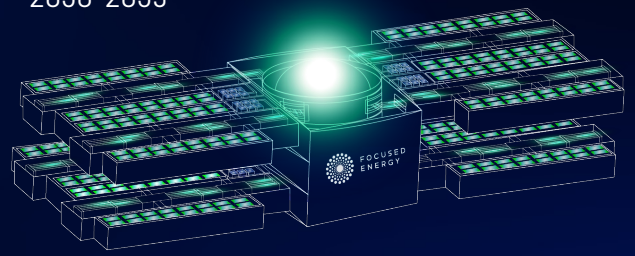


- Darmstadt
- Oxford
- Denver

Sub-Scale Implosion Facility
2024-2032

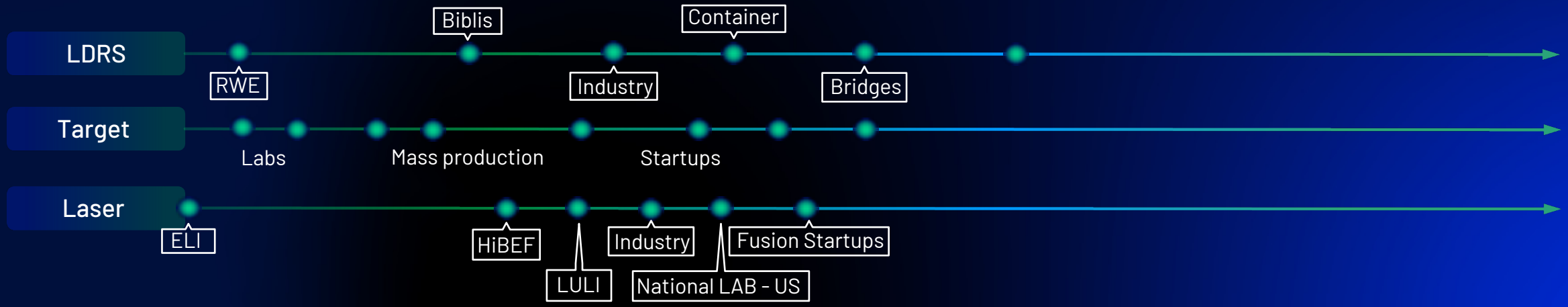


Fusion Pilot Plant
2030-2039



2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2039

$ COMMERCIALIZATION



2023 – Our organizational structure for methodical execution

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Systems Engineering

- Facility studies
- Project Management
- Implosion test facility design
- FPP facility design
- Reactor Material
- Breeding & Blanket
- Chamber Design
- Energy Extraction
- Software Integration

Laser

- Diode-pumped laser design
- Flashlamp-pumped laser design
- Prototype broadband front-end
- Prototype 2w frequency conversion

Targetry

- FPP targetry systems concept design
- Prototype shell
- Prototype foam
- Prototype cone
- Prototype calotte
- 1000+ hemispherical target production
- Prototype robotic target supply system

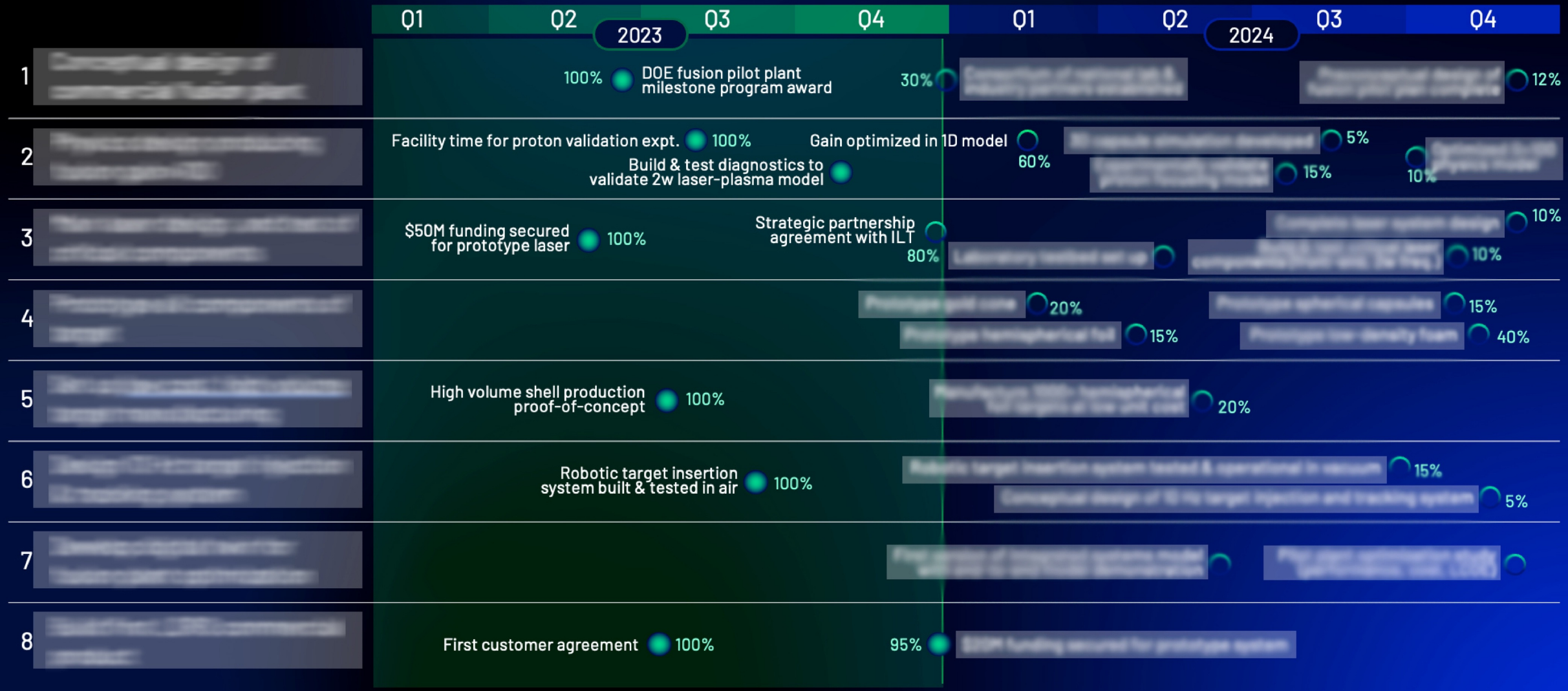
Science

- Develop **Q>100 point** design
- 2w LPI diagnostic development (ELI)
- LPI mitigation experiment (GSI)
- Proton focusing experiment (CSU)

Products

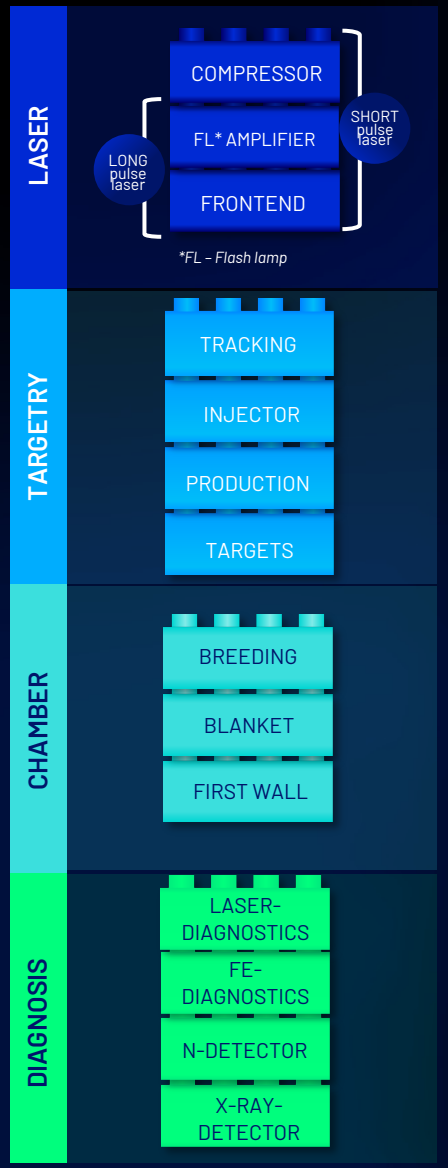
- Targets
- Lasers
- LDRS
- More to come

2023 – Our Milestones to monitor and assess progress



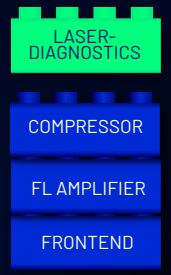
2023 – Our modular 'Lego principle' for building comprehensive solutions

FOCUSED ENERGY



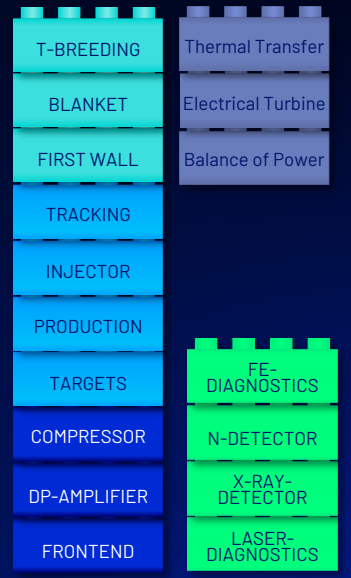
IFE: Progression to Building Fusion Power Plant

2023-2035
Short pulse/
Long pulse
Prototype Beamline



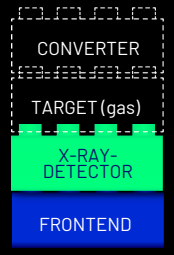
2024-2037
Sub-Scale Implosion
Facility

2030-2039
Fusion Power Plant

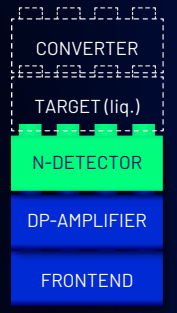


LDRS: Use the same bricks for a commercial product

2026
Laser Driven X-ray
Source



2028
Laser Driven Neutron
Source



2030
Laser-driven Muon
Source

2023 – Products **on our way to Fusion**

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LDRS

Using our modular laser fusion technology

3-Phase plan to **recycle fission infrastructure for fusion in Biblis** set up

A **collaboration with RWE** will involve the construction of a prototype device within the **existing plant facilities**

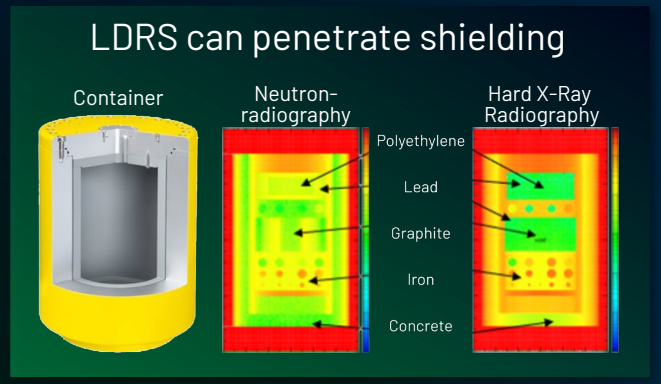
The plant is already **fully integrated into the grid** and local infrastructure

We have **direct support from the Hessen State Government**

Phase 1: LDRS facility for nuclear waste inspection on site (huge ARR source)

Phase 2: IFE prototype reactor

Phase 3: Full-scale, fully integrated **IFE plant** to provide clean energy for Hessen



Lasers

Using our modular laser fusion technology

$30M LOIs with strategic partners for our first lasers

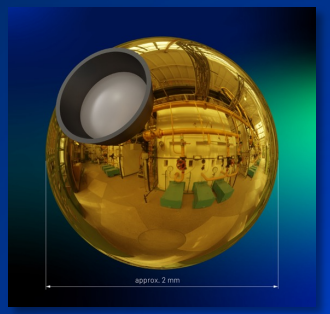
HiBEF

eli

Targets

First revenues with targets in 2023

Currently in talks with top scientific centers, we aim to **provide target (fuel) supplies** for high-energy physics and laser-driven fusion



2023 – Our commercial products by as early as 2025 **to support us on our way to Fusion**

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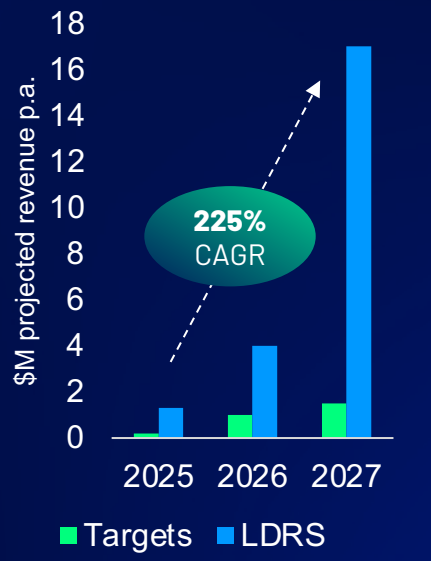
REV STREAMS	OVERVIEW	STATUS
Laser-Driven Radiation Source	• LDRS focuses on imaging technologies that allow for the **analysis** of materials or objects • Use cases: e.g. **pipeline monitoring**, **nuclear waste control,** and **container inspections**	• **LOIs as of now** • **Strategic cooperation with RWE is live** • **Market** faces **strong cost pressure** and **surging volumes**
Fusion Targets	• Fusion target**s** are at the **core of fusion experiments** and **reactors** worldwide • they **enable** achieving and sustaining fusion reactions	• **Operational** as of now • **Production** has started • **Market** is almost ripe for **accelerated growth phase**

ARR*



MARKET SIZE

TAM
$150B+

INITIAL STRATEGIC PARTNERSHIPS

- thyssenkrupp – Exploration Phase
- TRUMPF – Strategic Partner
- intel – Exploration Phase
- RWE – Strategic Partner
- AIRBUS – Exploration Phase
- Fraunhofer – Strategic Partner

Thanks

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guenter.kraft@focused-energy.world