GenF

Energy Generated by Fusion

Taranis overview
June 2024

- TARANIS PROJECT-

Carbon free / Safe / Affordable

The inertial fusion energy for a sustainable futur

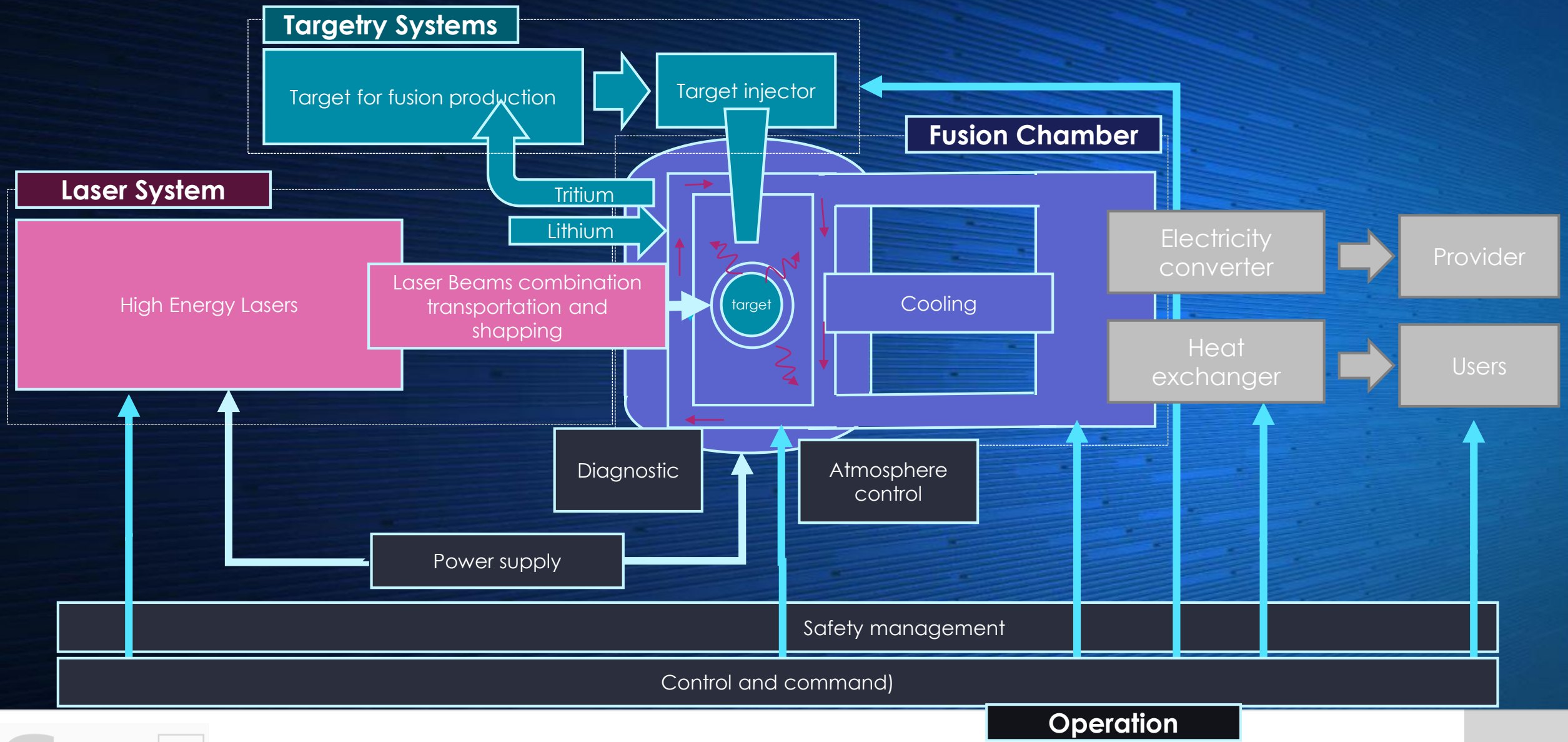
Inertial fusion energy principle

- **Reach the density and the temperature condition on Deuterium-Tritium target to start the nuclear fusion reaction**
  - Density : 10^3 x solide
  - Temperature : 100 million C
- **Make a uniform plasma around the target by ablation of the material using high energy lasers**
  - Hundreds synchronized laser beams in ps period of time
- **The expanding plasma presses the target thanks to the rocket effect**
  - Size reduced 35 times
  - Mater density multiply by 3000

DEMONSTRATED*

December 2022 - National Ignition Facility (U.S.)

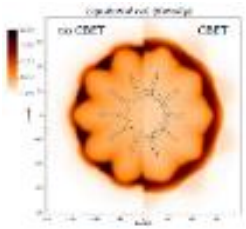
Taranis IFE reactor overview

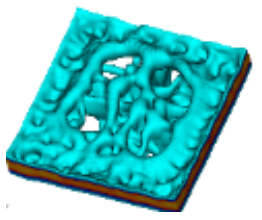


Taranis technological landscape

1 – Fusion reaction

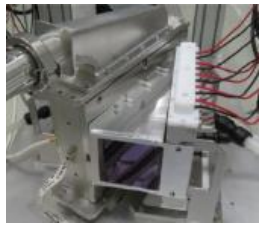
- Light-matter interaction
- Plasma management

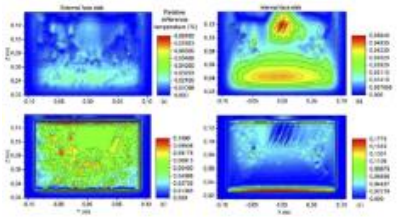




2 – High energy laser

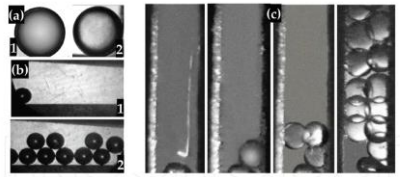
- Repetition rate
- Efficiency
- Beam shapping
- Cost

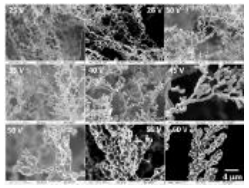


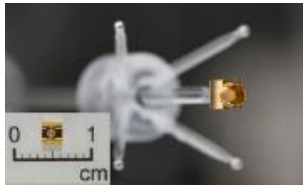


3 - Targets

- Structure
- Cryogenic
- Injector
- Cost

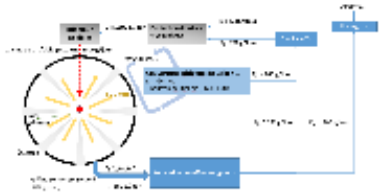


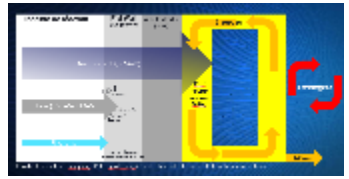




4 – Reaction product

- Neutrons, X
- Heat
- Tritium cycle





Taranis Project major steps

2027

2035

1 Fusion scheme

In house fusion reaction model

Calibration by experimentation on existing laser facilities

Operating point definition

Cost model for the output energy

Design of the functional mock up

TRL3

2 Proof of concept

Ignition : energy production demonstration (Gain>1)

Single shot

Efficiency demonstration

Subassembly mock ups of key technologies

FOAK Design

TRL5

3 First Of A Kind (FOAK)

Increased power (Gain >100)

increase in repetition frequency (up to 10Hz)

First Mwh deliveries

TRL6

WHO ARE WE ?

For Taranis project **Thales** created **GenF** to lead the IFE French team made of the best skills in fusion and laser : CEA, CNRS & Thales

IFE French team faces

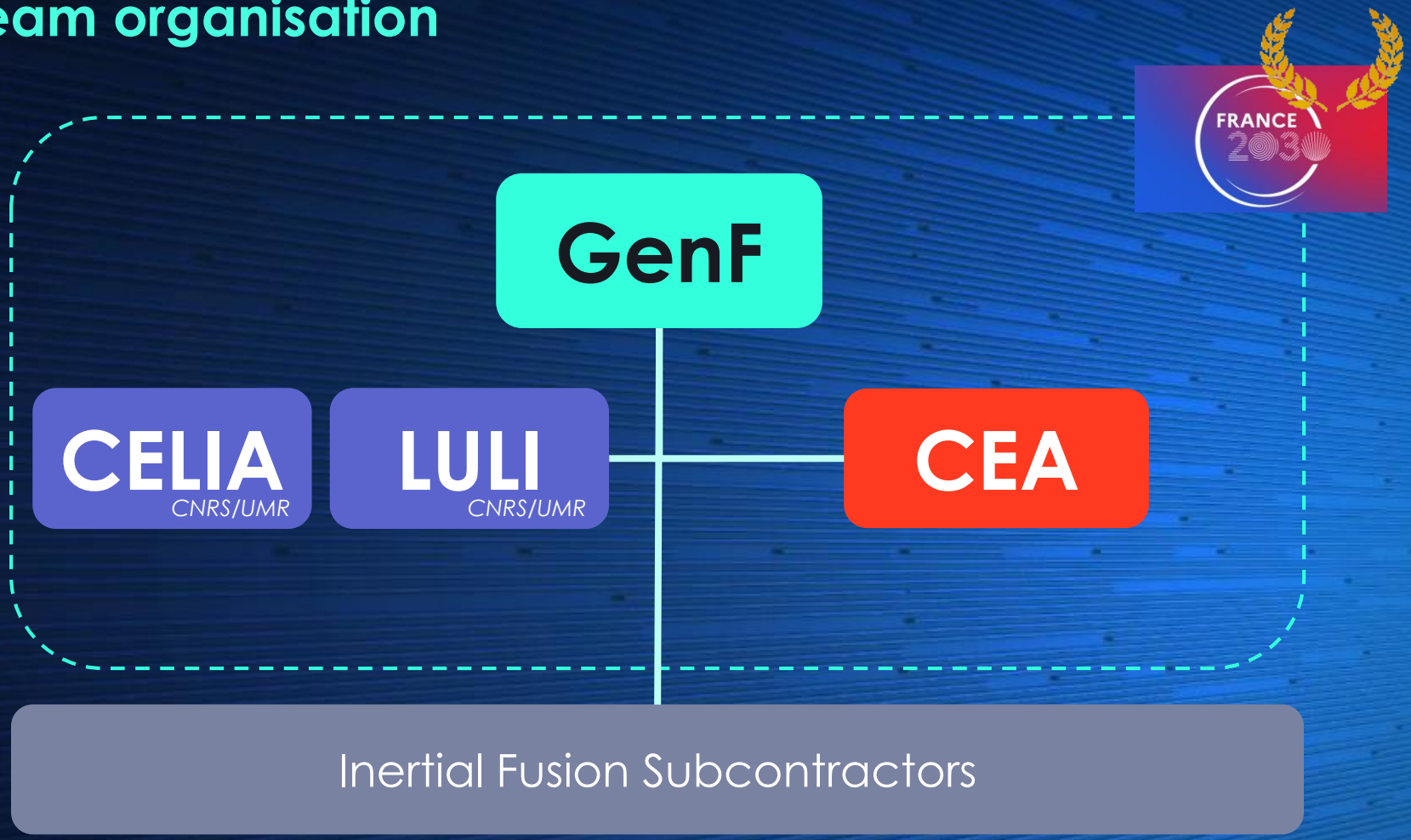
Yann GERARD
GenF CEO
10 years as executive manager
Engineer in laser and optronics

Hervé BESAUCELE
GenF CTO
20 years in technical directorate
Expert in complex systems and laser

Sébastien LE PAPE (PhD)
Director of the LULI Laboratory(CNRS/X)
14 years at NIF (US) in charge of IFE experimentation

Alexis CASNER (PhD)
Inertial Confinement Fusion, High Energy Density Physics Project manager
CEA DAM
HDR
Ecole Normale Supérieure Paris-Saclay

IFE French team organisation



Our values

- **Sustainable energy**
  - Carbon free
  - Low environmental impact

- **Energy for humankind**
  - Affordable
  - Safe

- **Sovereignty asset**
  - Federative approach
  - Consistent with Euratom agreement

GenF Contact

> GenF Head Quarter

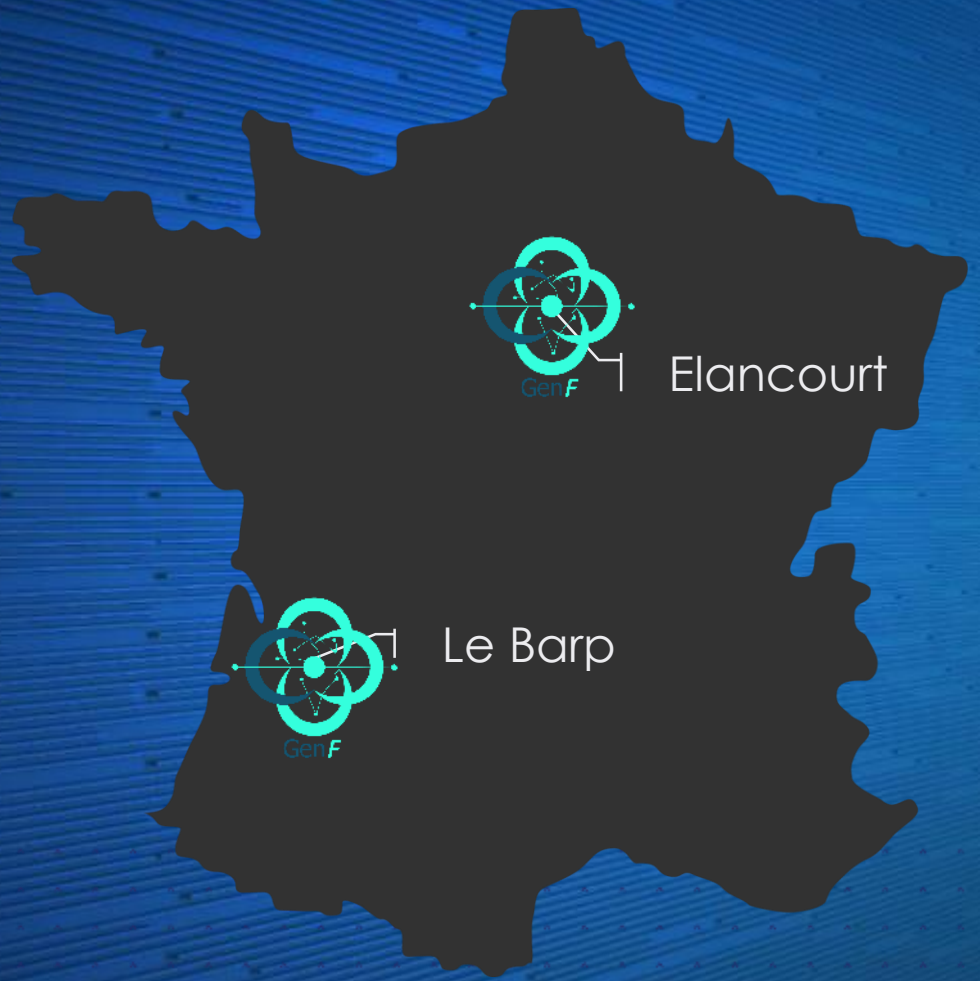
- 2 avenue Gay Lussac
  78990 Elancourt

> Mail

- yann.gerard@fr.thalesgroup.com

> Phone

- +33 1 30 96 88 43



THANK YOU !