
STELLARIA
ENERGY FOR CENTURIES
cea
orano
Schneider Electric
T.EN

The problem

1

Electro intensive sites need dispatchable 24/7 power

- Data center & industry demand will keep growing faster than the grid
- Classic nuclear power remains expensive to build and deploy due to safety systems
- Nuclear fuel reserves (not resources) are at risk after 2030 due to mine shortage & big nuclear programs
- Fuel waste radioactivity storage remains a sustainability issue

2

Electro intensive sites need **affordable**, **on demand**, **renewable power**

Affordable	On-demand	Sustainable
Low LCOE **Predictable pricing** over N years	**24/7 availability** **Dispatchable & Flexible**	**Renewable** **CO2 free** **Low levels of pollution & waste** **Recyclable**

The first breed & burn Molten Salt Reactor

- Renew 100% of its fuel in situ >20 years of fuel autonomy
- 10 x safer than today's norms by design : underground, ambient pressure, ATEX

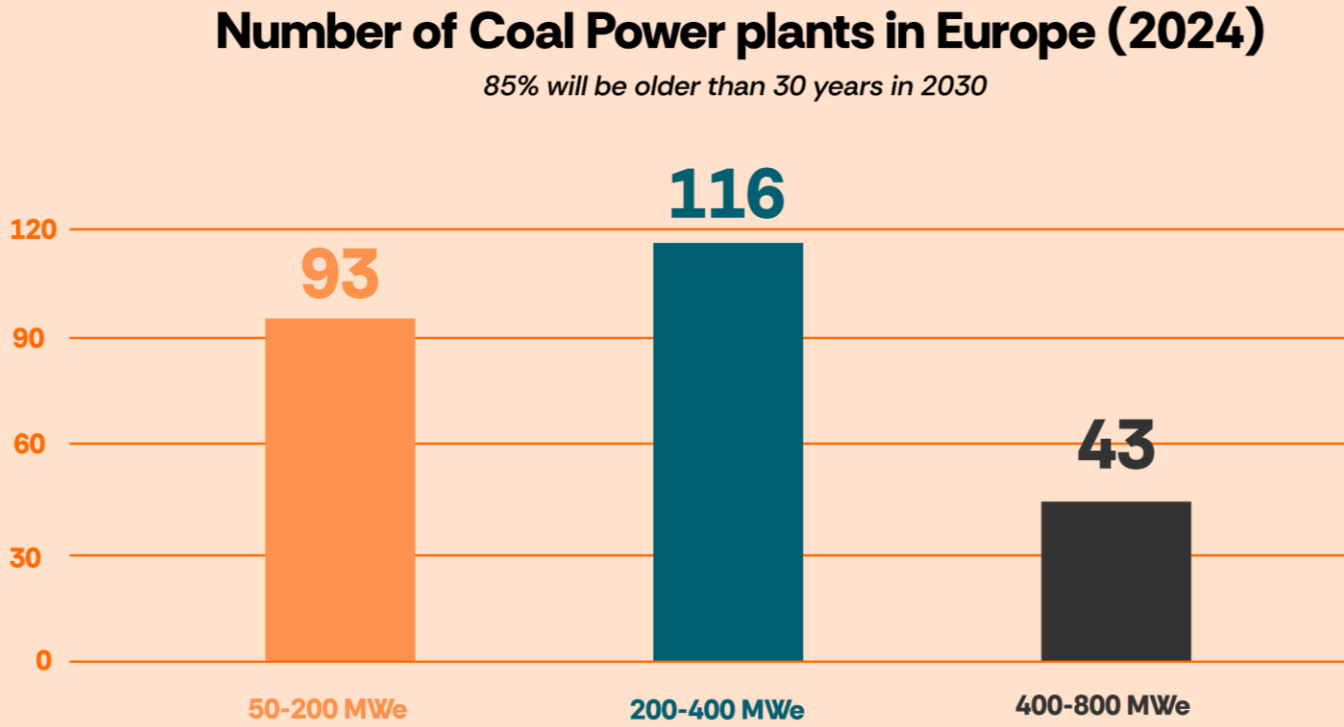
The Stellarium reactor

1

Applications & business

We can retrofit coal & gas powerplants

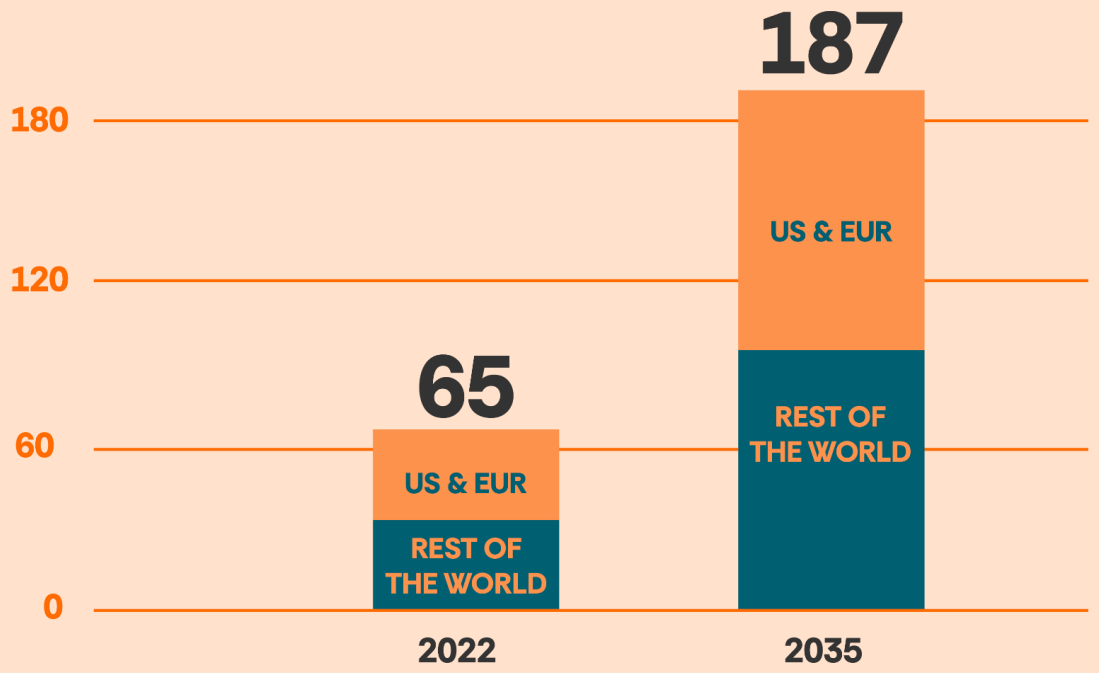
- Replace burners by Stellariums reactor
- As flexible 24/7 power as gas/coal
- Keep steam turbines & personnel case by case



We can run hyperscale Data centers

- Data centers are getting larger (from 100 MWe up to 1 GWe)

Data center power growth in the world (GW)



Sources: Accenture Analysis, S&P database (2022)

We can electrify machinery & provide HT steam

1. **Reduce by 5 to 10% the amount of O&G burnt** in the downstream refining processes
2. **Produce e-fuels at a lower cost, reuse CO2** thanks to abundant power, H2, and heat available on site
3. **Auto-produce** heat and power
4. **Convince** local government.

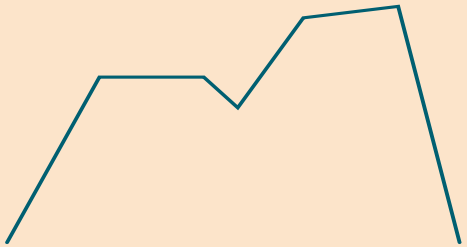
>48%

Yield of a Stellarium to convert Heat to Power at **600°C**

We can balance the grid quickly & locally

+ - 50% per minute

Power demand (t)

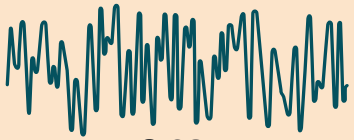


x2 by 2040

24/7

Power generation (t)

Intermittent power (t)



WIND & SOLAR

Network follow up (t)

GAS, BIOMASS & HYDRO, STELLARIA

Base load (t)

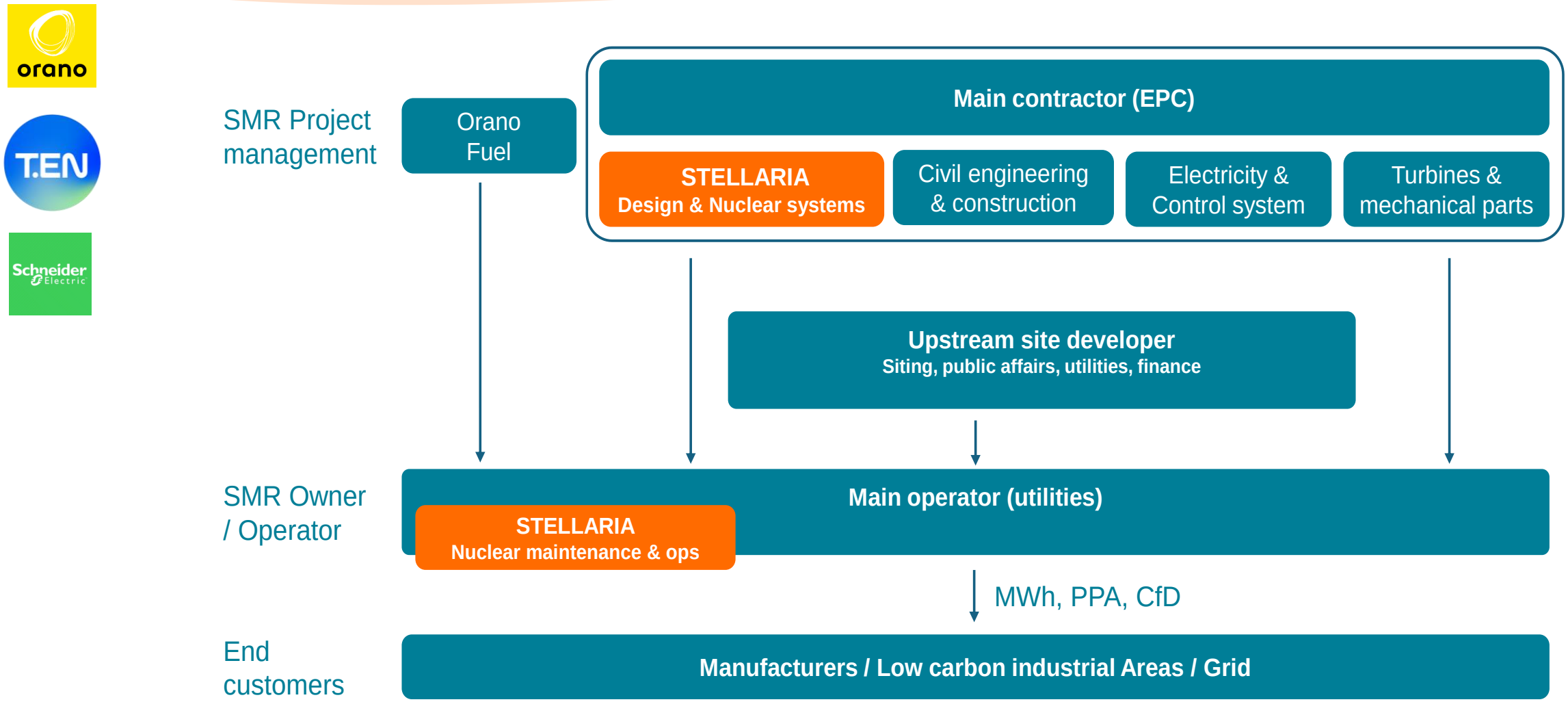
WPR & LARGE GAS, COAL NPP

x2 by 2040

STELLARIA

- Reinforce weak grid nodes
- Can store as much energy as 10 dams in form of fertile atoms in only a 5 m*2 m vessel
- Manage peaks

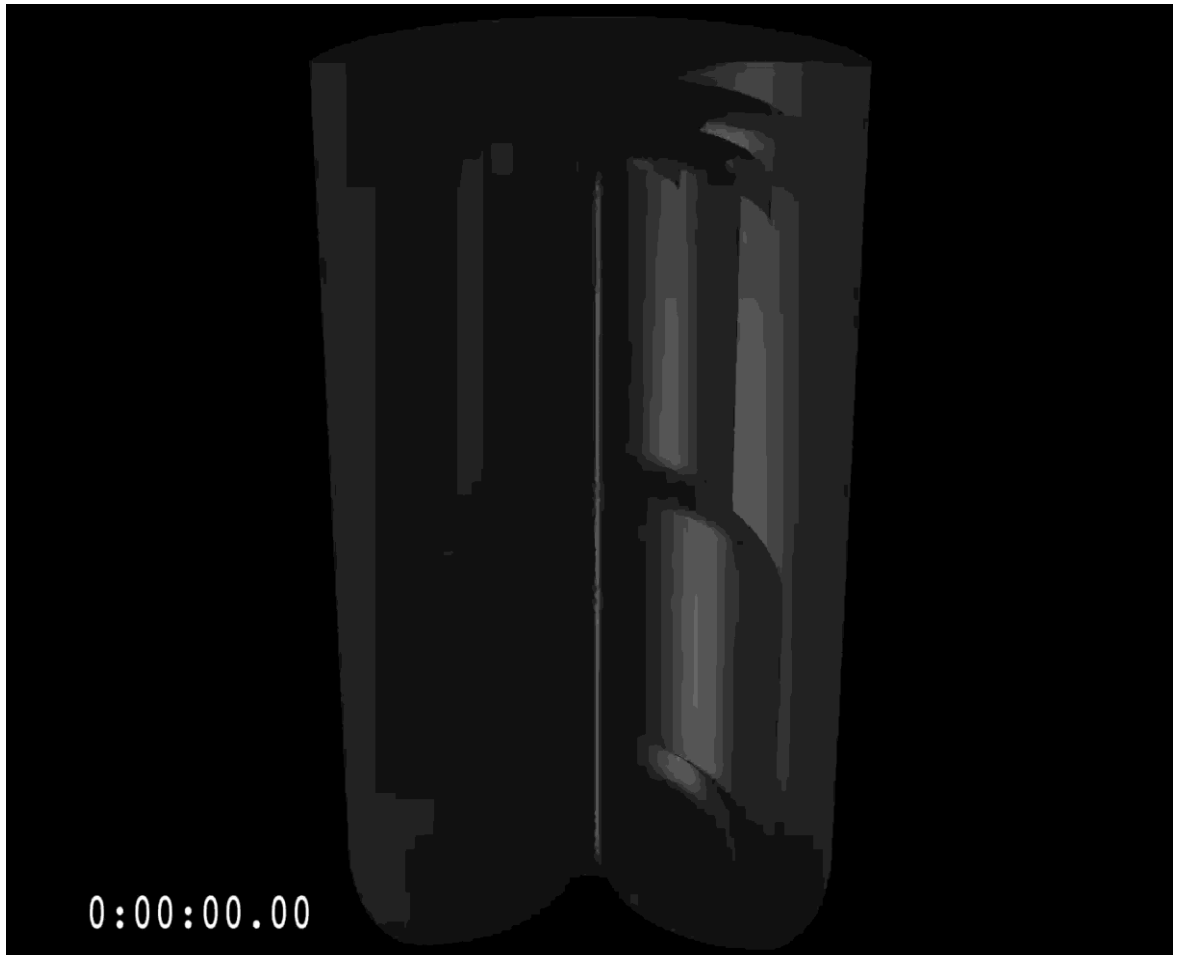
Business model



2

Our technical breakthrough

A breakthrough core innovation



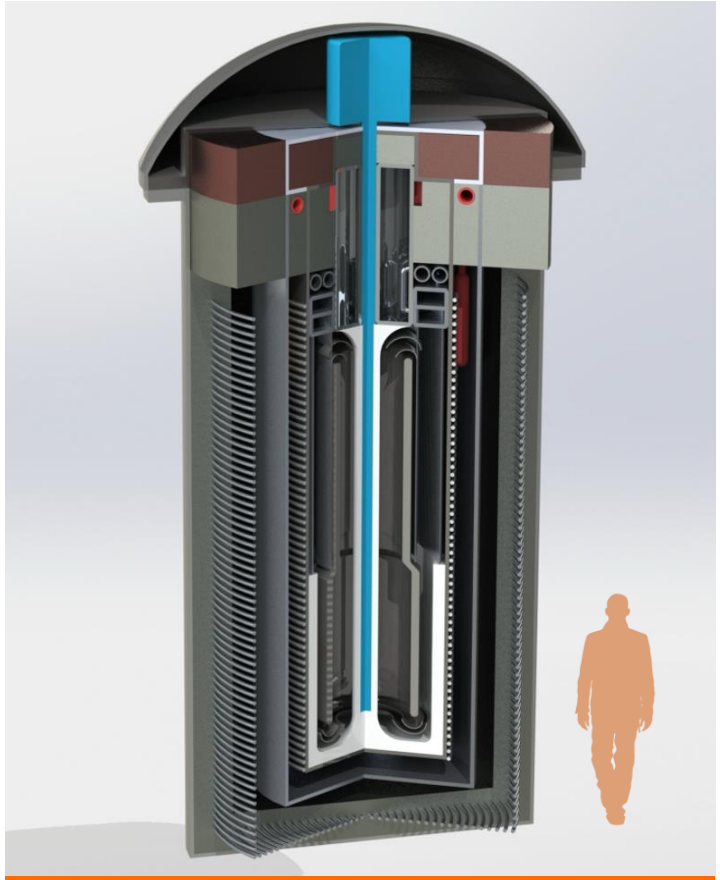
Natural convection + Iso-reactivity

- ➔ No pump, less safety system
- ➔ 100% regeneration in reactor for free
- ➔ 250 MWe iso-Power reloaded for decades
- ➔ Unleash 5000 years of U238 reserves

Iso-reactivity makes power stable over 20 years

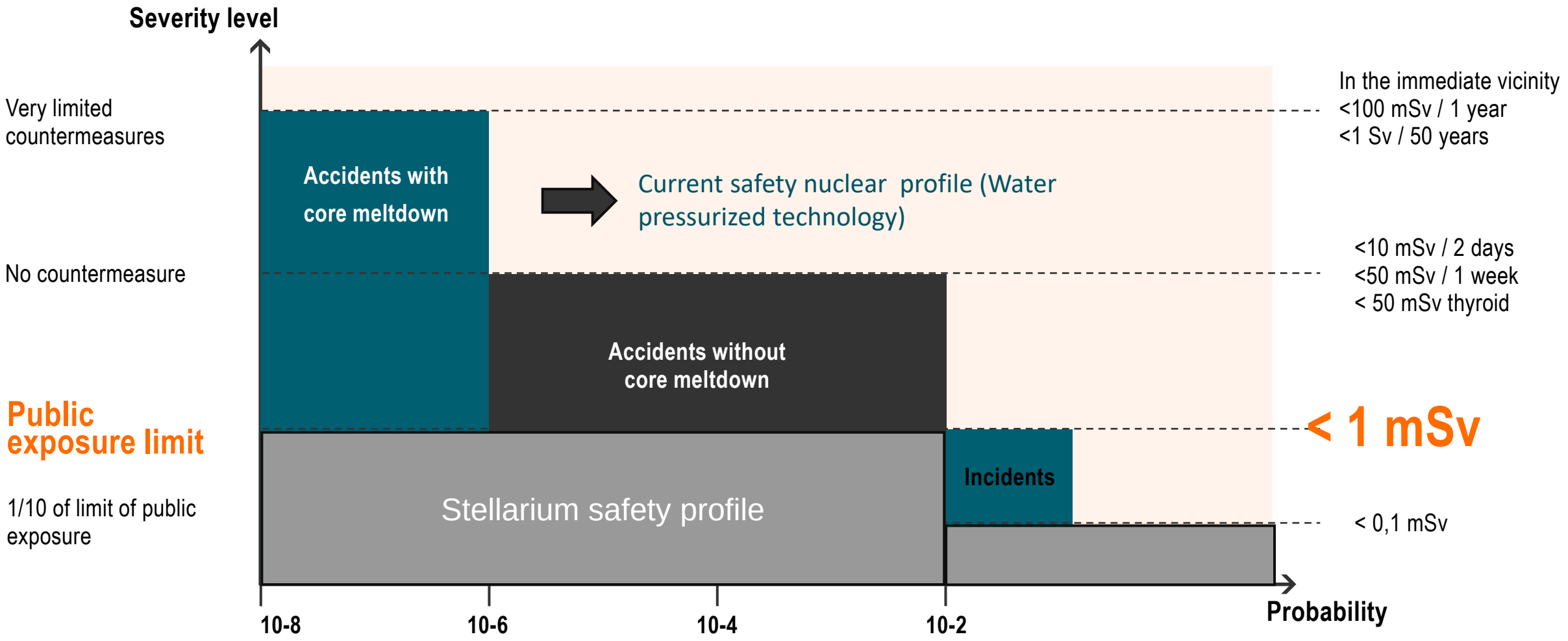
without refueling to due internal auto-recycling in liquid salt

Powerful	• **250 MWe** or 530 MWth (T° output 600° C)
Cost-effective	• **LCOE €50-55 / MWh** • CAPEX €3.5 m / MWe • Stable energy bills (>20 years without refueling)
On-demand power	• **As flexible as a gas power plant: ΔPe / mn > 50%**
100% Sustainable **= Reserves for centuries**	• **20-to-60-year fuel-cycle autonomy onsite** • **Infinite recycling of fissile fuel** • **Multifuel** capability: HALEU, exUOX, ex, MOX • **Incineration** of long-life High-Level Radioactive Waste • **Capacity to reuse & recycle third parties' nuclear waste** • **Up to 70 million tonnes of CO2** saved / Stellarium
Safe by design	• Atmospheric-pressure, liquid core, ultra fast counter-reaction by thermal dilation ➔ **rules out any major accident** • 4 safety barriers ➔ **deployable in suburban and industrial areas**



Stellarium - Molten Salt Fast Reactor

Safety : no exclusion zone



Make energy out of spent fuels

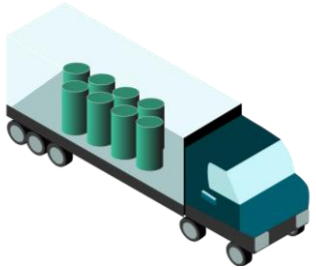
Know more?
Watch the video www.stellaria.fr/en

Recycling instead of paying storage

01. La Hague

- **Spent fuels from PWR pools or from Stellariums**
- Mixed into NaCl salts (U238, Pu, Minor actinides, Thorium) (Purex)

➔ **Make La Hague profitable**



Purified salt is transported back to the reactor

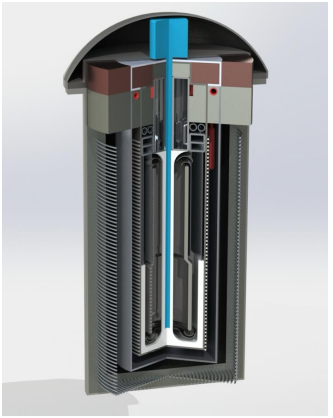
Inexpensive Multi-recycling

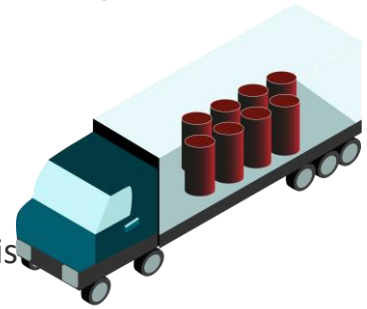
02. Breed & Burn reactor > 20 years

600°C

Isogeneration & iso reactivity in situ

Stellarium





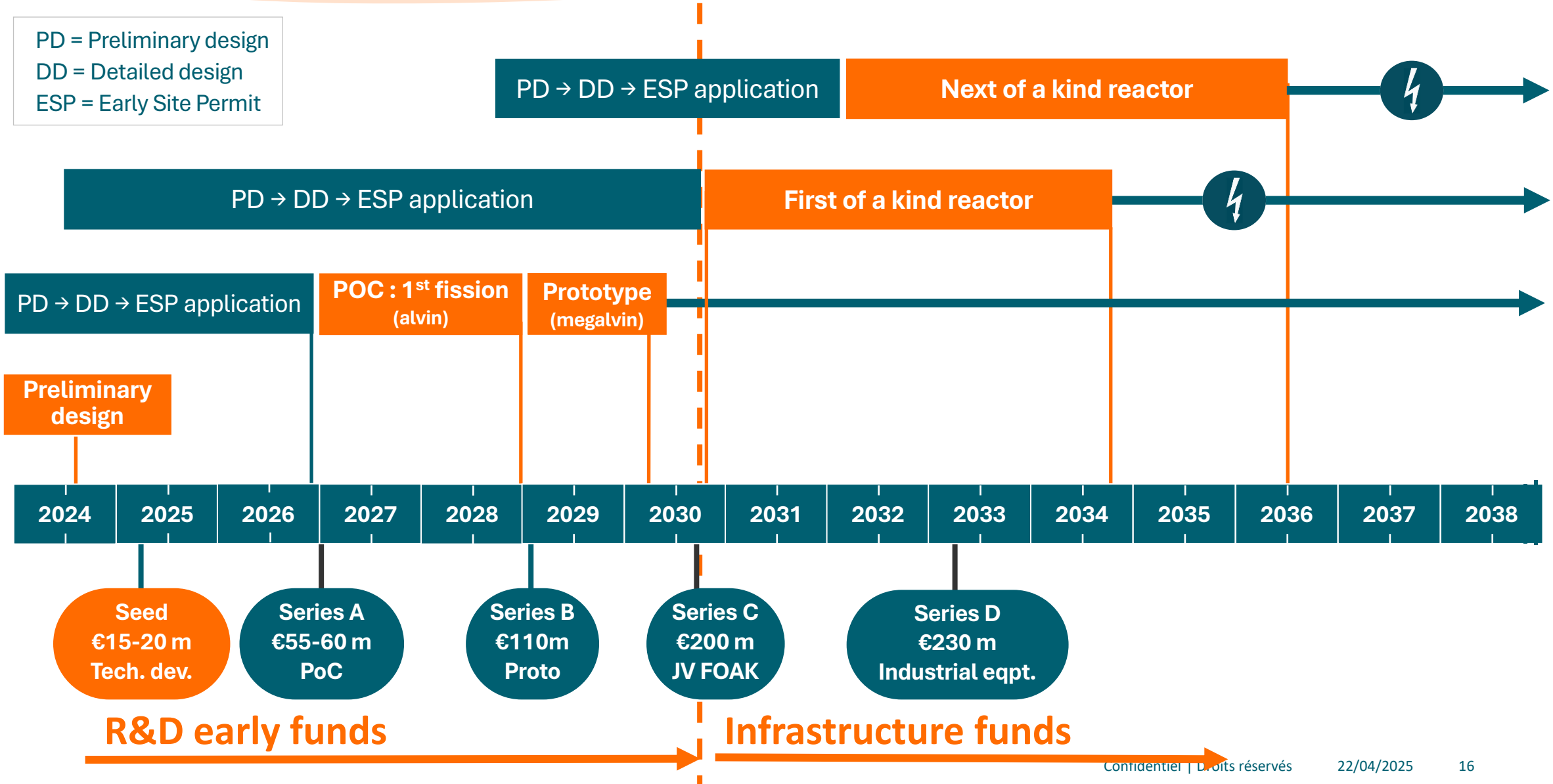
After 20 to 60 years of use, salt is sent back to orano for cleansing

(removal of 50% of fission products is enough to restart again)

3

Roadmap & SEED deliveries

Development roadmap & equity capital needs



4

Founders & team

The best Gen4 SMR & power experts in Europe

A technical team of 20 experts

A team of Stellaria founders (founded in May 23)

Ex Schneider Electric

Nicolas BREYTON
CEO & Business owner
INSA Lyon
25-years international experience in the power business

Ex CEA

Guillaume CAMPIONI
Chief Technology Officer
PhD, Nuclear Science
20-year experience in the Fast-breeding

Ex CEA

Lucas TARDIEU
Fuel cycle expert
5-year experience in reactor design and innovative fuels

Ex ILL NEUTRONS FOR SCIENCE

Bruno DESBRIERE
Nuclear safety expert
40-year experience in SMR safety and post Fukushima at the ILL SMR of Grenoble

Ex CEA

Antoine GERSCHENFELD
ENS Ulm, Thermo-hydraulics expert
Nuclear Professor at X Paris
15-year experience in Astrid, Nuward, World-renowned Gen-4 expert

Key partners

orano

CEA

Shareholders

SUPER NOVA INVEST

Schneider Electric

T.EN

Labels

NUCLEAR Valley FEDERER LES ENERGIES

FRANCE 2030

Thank you

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