



Boosting technological innovation and its impact on society—the vital role of RTOs

Sébastien Dauvé, CEO of CEA-Leti



Driving innovation, impacting industry : CEA-Leti world-class facilities

2,000 talent people



 300 industrial partners

11,000 sq. m. cleanroom space

75+ startups created



3,200 patents in portfolio



Telecommunications

Cybersecurity

Nano-characterization

Clean rooms (200 & 300 mm)

Design

Micro-nanotechnologies
for health

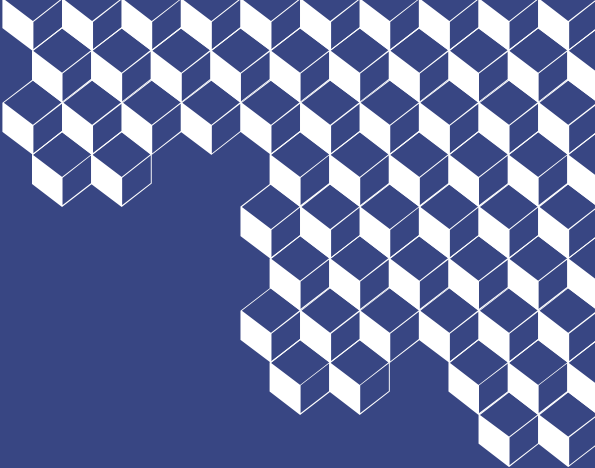
Cyber-physical systems

Photonics

Power electronics

Microsystems

Clinattec



“

Chips are at the center of the global technological race. They are, of course, also the bedrock of our modern economies.

Ursula Von Der Leyen, European Commission



“ We will not solve
the problems of the planet
by opposing science, but rather
by harnessing its power.

Alain Aspect, Nobel Prize winner



Research partnerships enhancing innovation

Rest of the World

EUROPE

FRANCE

GRENOBLE



FAMES

FD-SOI pilot line for future Applications strengthening European Markets and Ensuring Sovereignty

To develop FD-SOI 10 to 7 nm
with embedded non-volatile memories
and compatibility with 3D options

to open to all EU stakeholders the pilot line and more
generally the CEA-Leti's 300mm and 200mm infrastructure
(PDK, Multi Project Wafer, technology process steps or
technological modules)



6G



Automotive



Cybersecurity



Quantum computing



Health



Industry

Unveiling the Future

CEA-Leti to build a cutting-edge semiconductor research facility



anr®



24 months project

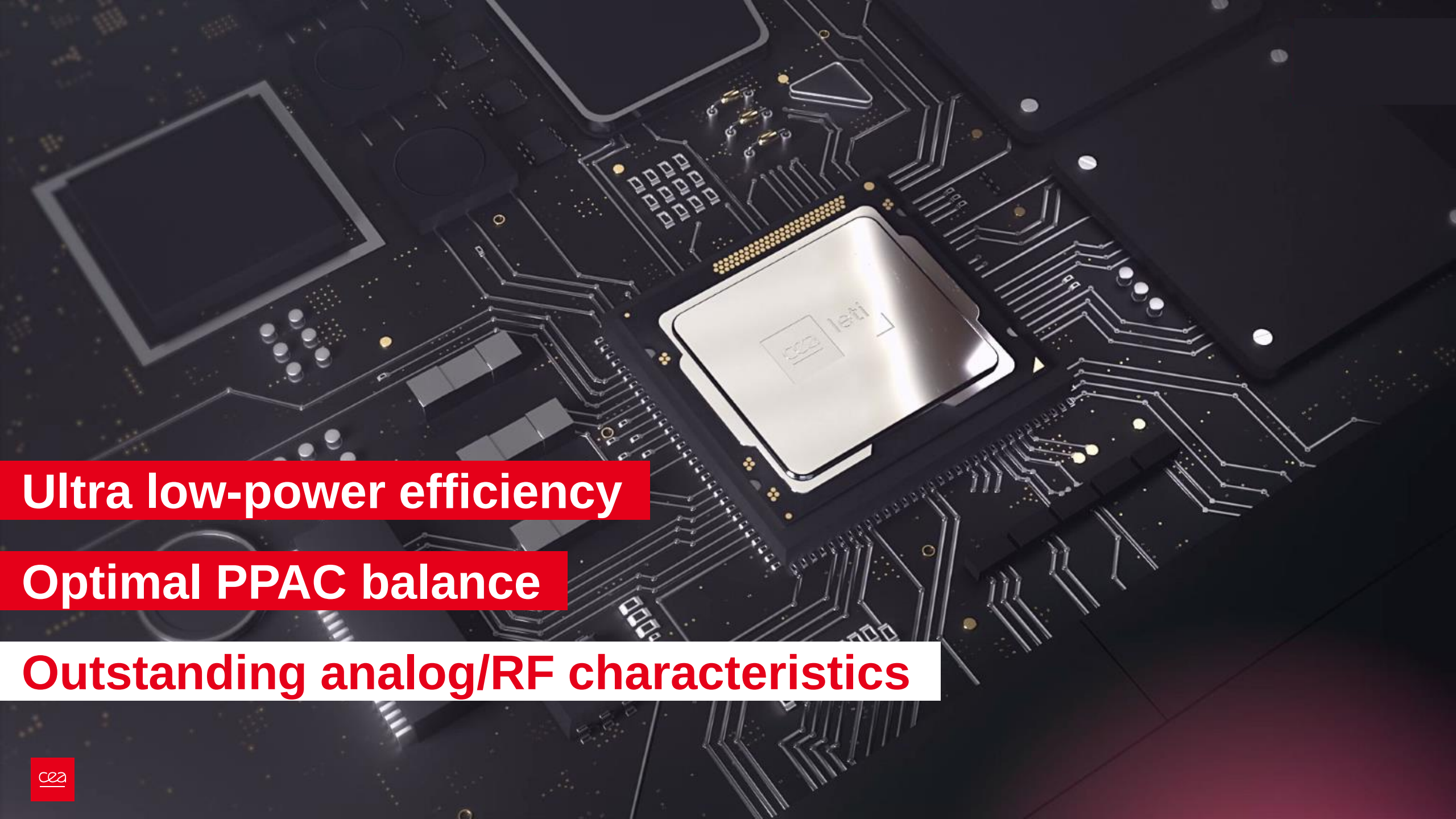
2,000 square meters
of cleanroom space

EUV compatible

Meeting the most stringent
environmental regulations



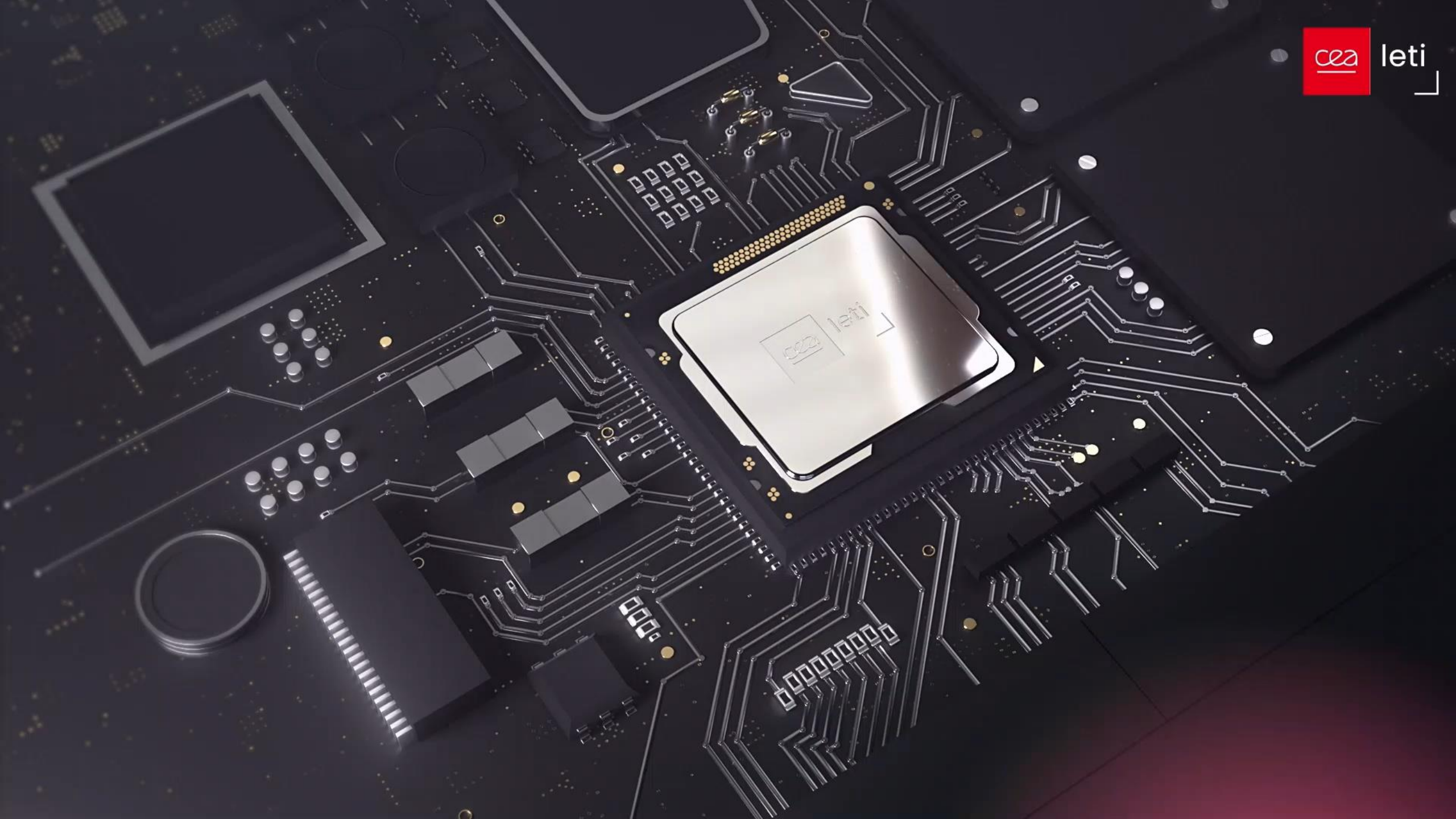
How technological research will shape the world of 2030



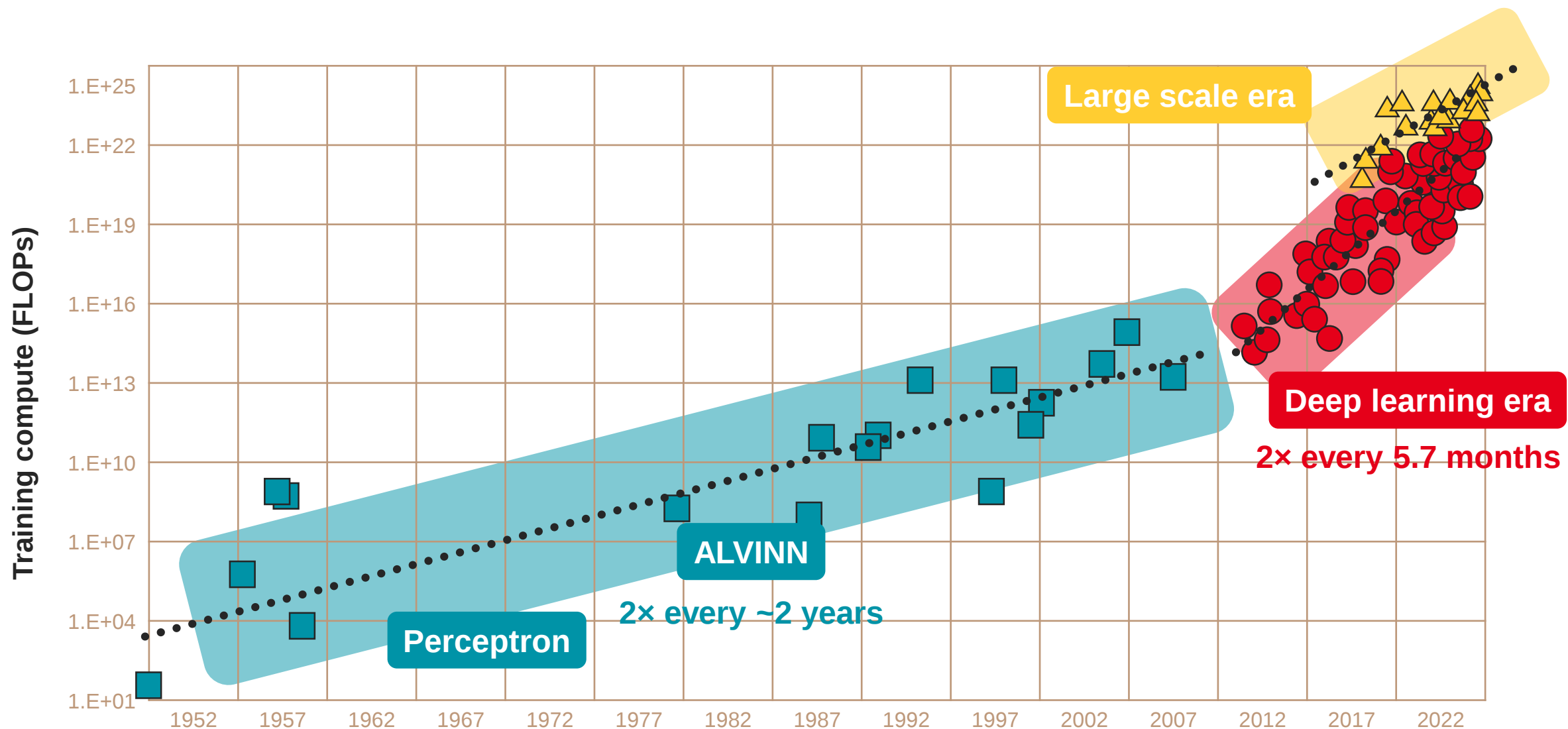
Ultra low-power efficiency

Optimal PPAC balance

Outstanding analog/RF characteristics



CO2 Emissions



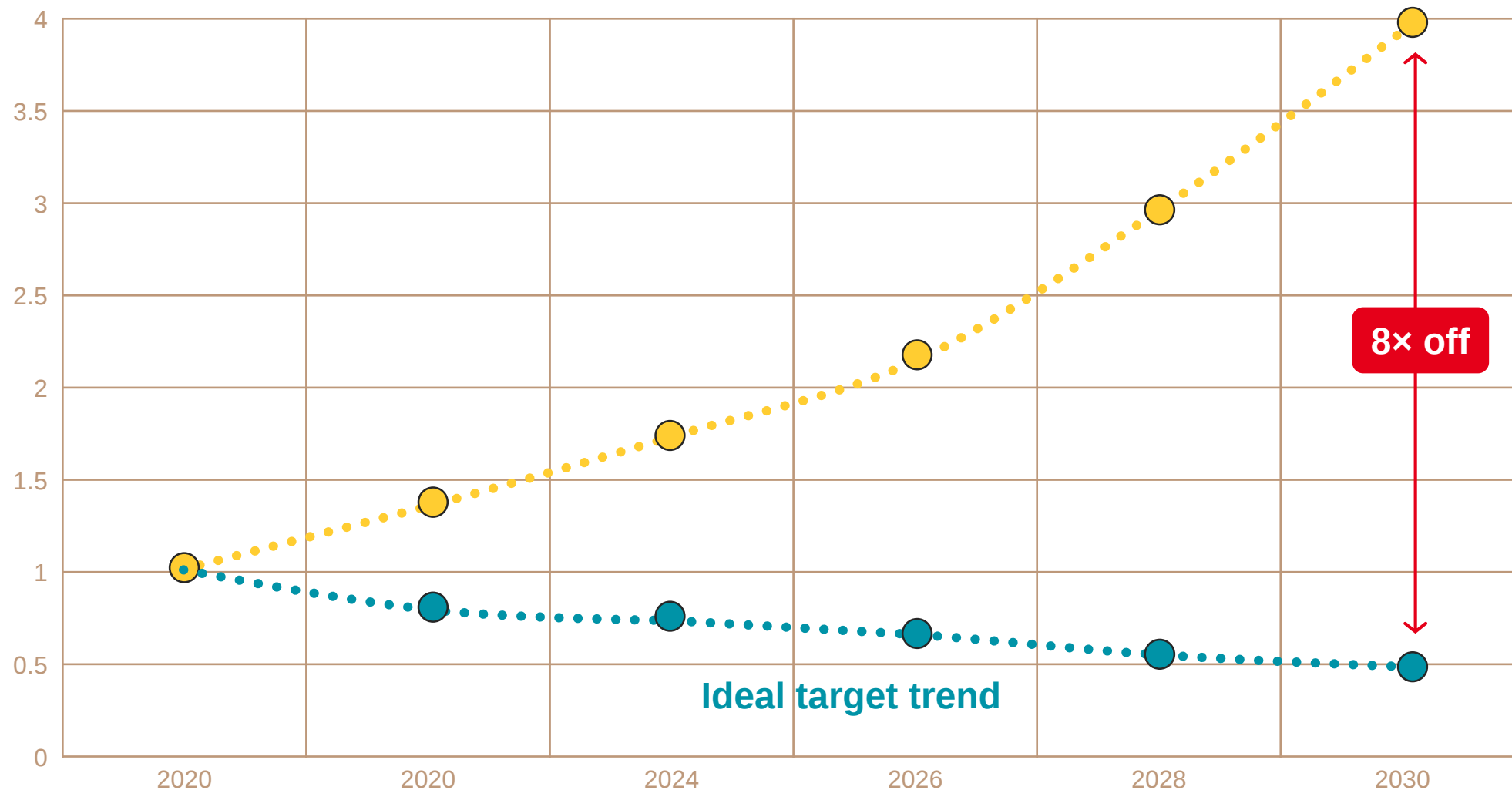
CO2 Emissions

LISBON
11-14 SEPTEMBER 2023
ESSDERC
ESSCIRC



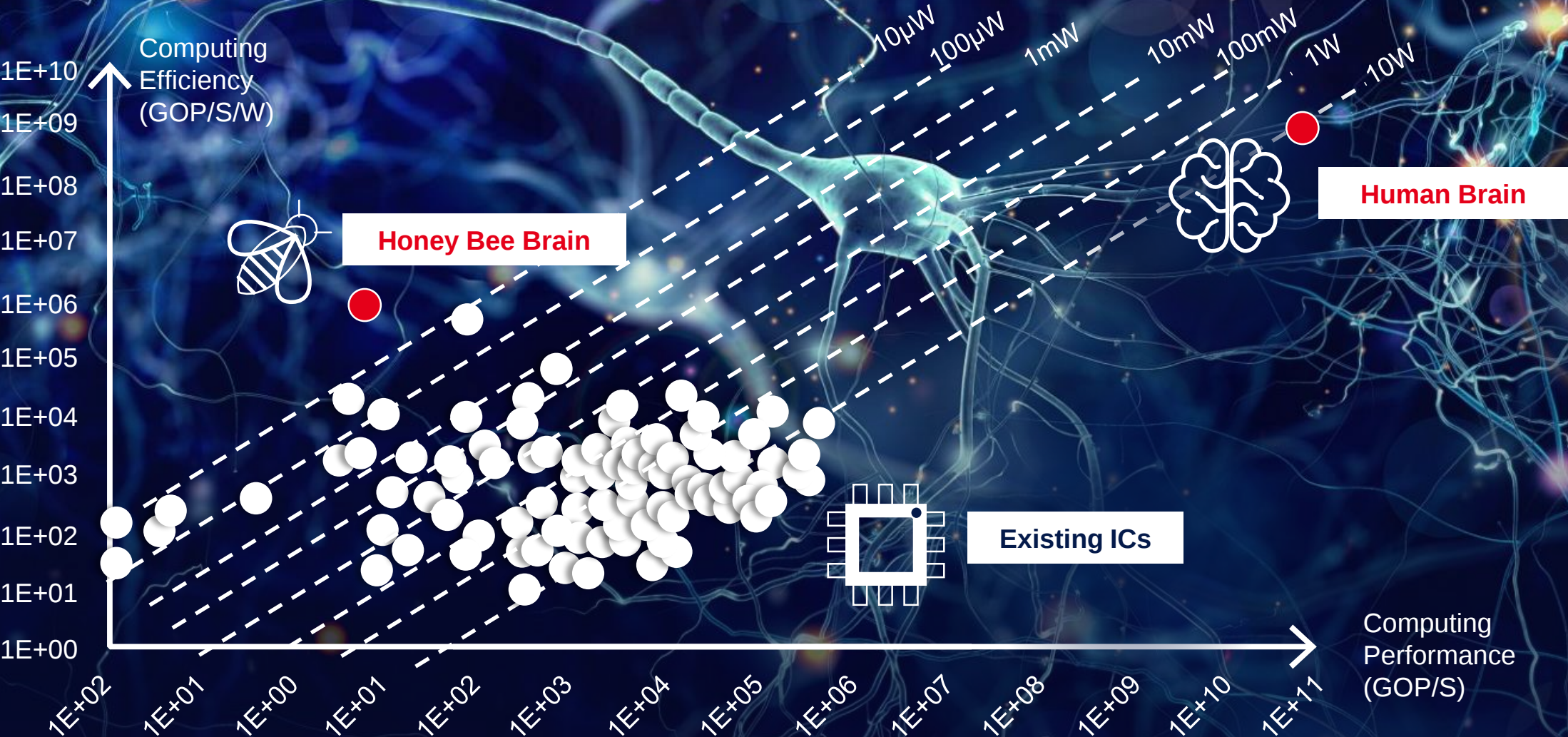
imec

Chip Manufacturing Emissions
Normalized to 2020



Constant electricity mix (0.49 kCO₂ eq/kWh), abatement and GHG global warming potential according to IPCC assumed for the years 2020-2030. Volume technology miw from IBS 'Foundry Market Trends and Strategic Implications' Vol30, N12, Dec 2021. Logic nodes only. *imec.netzero emissions estimates of imec process nodes representative of foundry nodes.

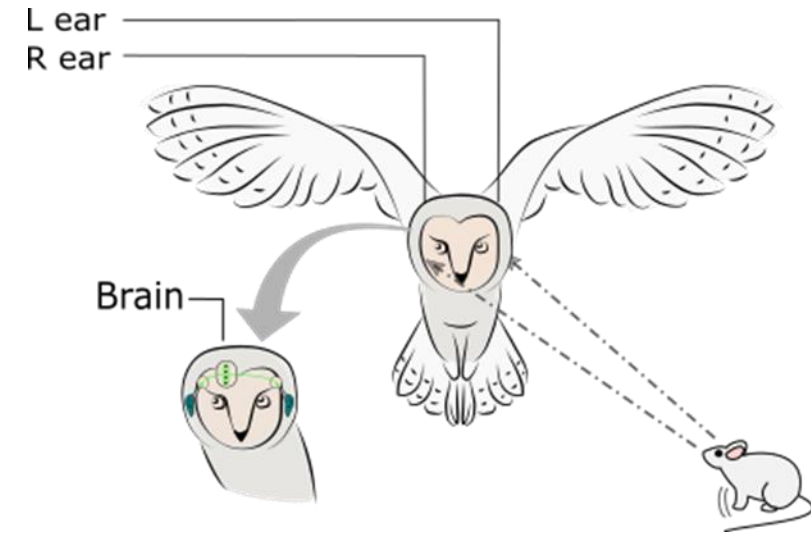
Nature, a source of inspiration for semiconductors



Mimicking the human brain in 3 areas

Memory close to computation

AI at the edge



Proposed neuromorphic system: 83.3nW

Conventional microcontroller: 244.7 μ W

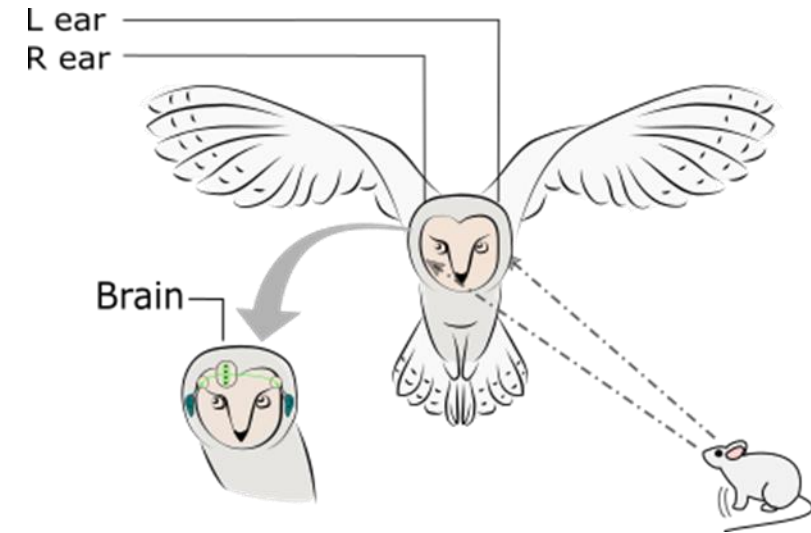
nature communications

[F.Moro et al. at Nat Comm 2022]

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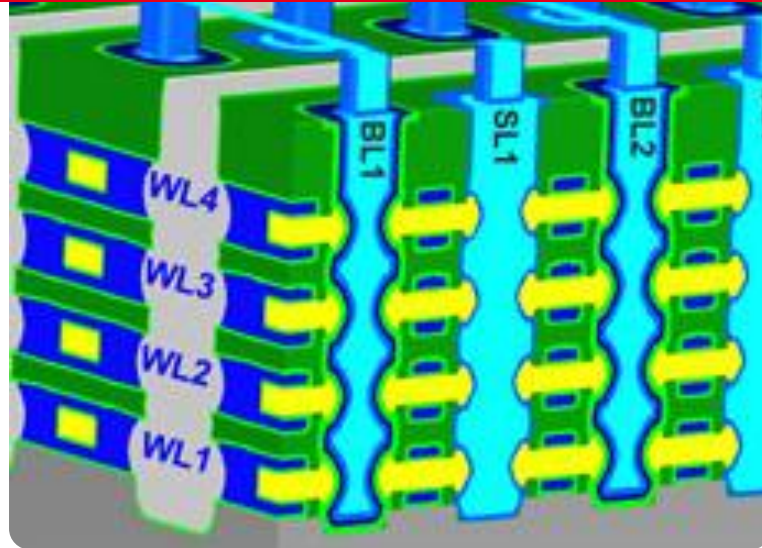
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3D memory connectivity

At the device and system level



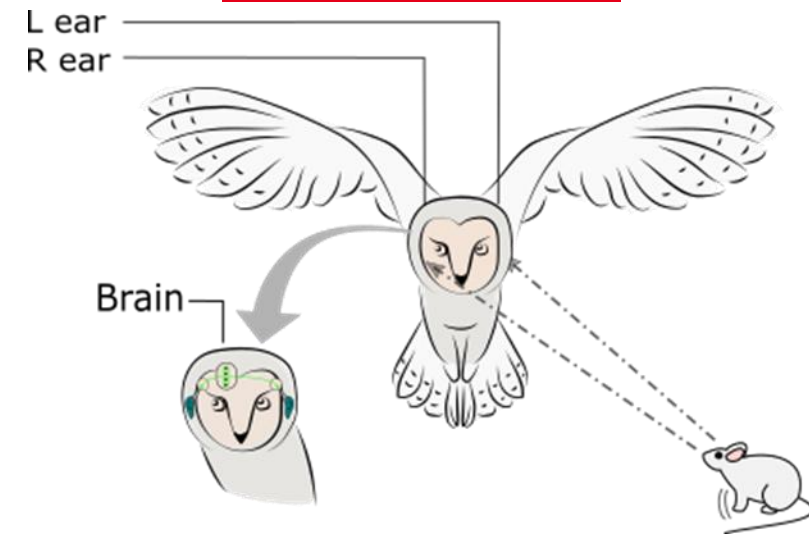
SPICE modeling of this 1T1R RRAM devices have shown low operating current ($<5\mu\text{A}$), large memory window (>100) and low VSET (1.3V) and VRESET (1.1V).

VLSI 2023

[T. Dubreuil et al.]

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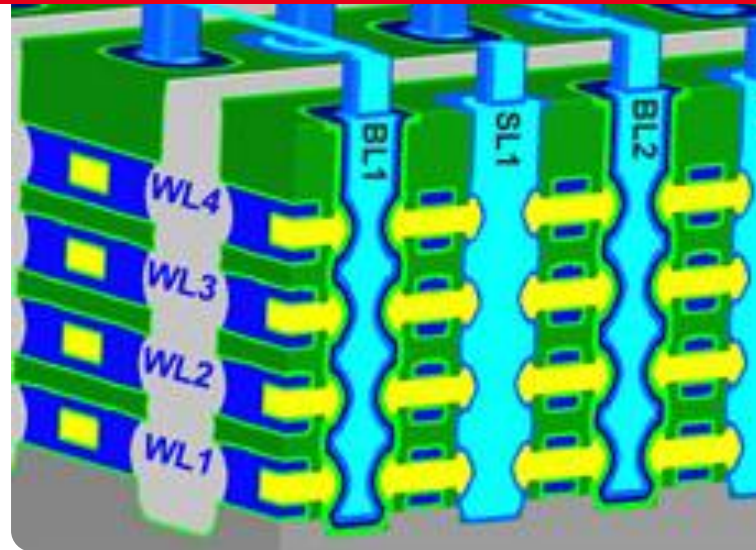


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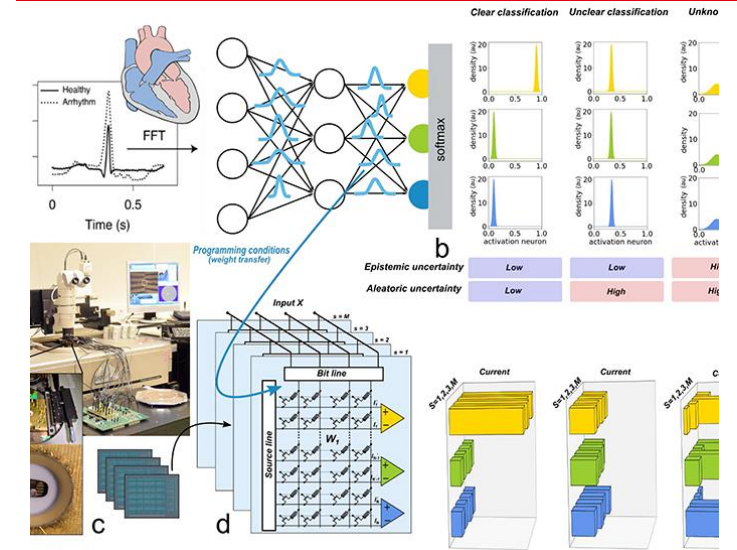


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Exploiting the nanoscale physics Plasticity, “in-situ” learning



We estimate an 800 times improvement in energy efficiency compared to a GPU performing the same task

nature communications

[D. Bonnet, accepted at Nat Comm 2023]

Revolutionizing mobility: Thought-controlled walking with a disruptive brain-spine interface

Clinattec's *Fonds de dotation* thank its patrons



Supported by Defitech Foundation, Rolex Award for Enterprise, International Foundation for Research in Paraplegia, Translational Medical Research Award 2021 from the Leenaards Foundation, Pictet Group Charitable Foundation, ONWARD medical, Medtronic, the Swiss National Science Foundation through the National Centre of Competence in Research in Robotics, Sinergia, the Lead Agency Program with the French National Research Agency, A F Harvey Prize Award, Swiss Innovation Agency InnoSuisse, Eurostars, the European Commission, ETH domain PHRT, Fonds de Dotation Clinattec and Institut Carnot Leti.

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The CEA logo consists of the letters 'cea' in white, lowercase, sans-serif font, positioned inside a solid red square. The 'c' and 'e' are connected, and the 'a' has a small horizontal bar at its base.

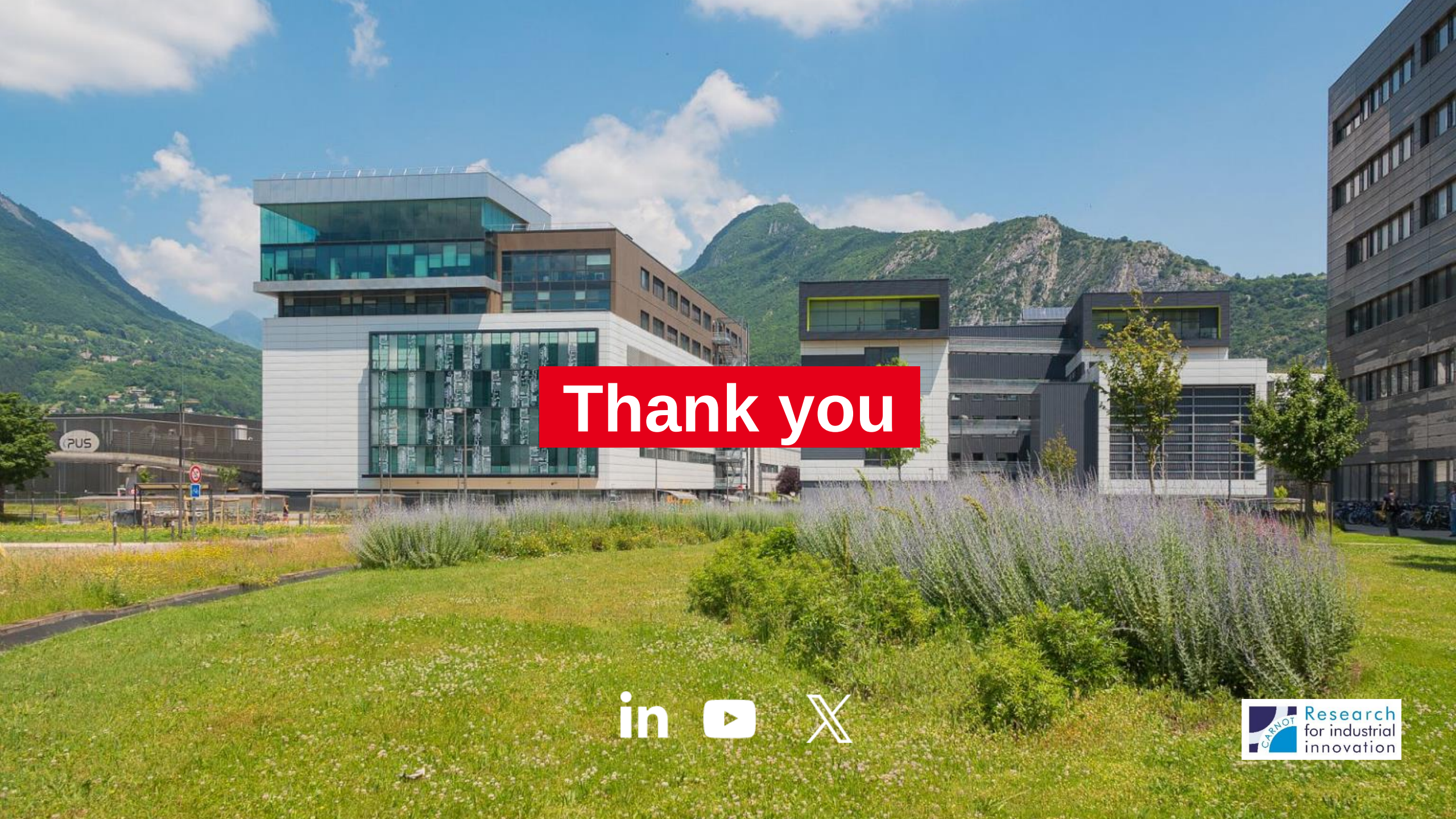
cea

leti

Leti Innovation Days

June 25–27, 2024 — Grenoble, France

leti-innovation-days.com



Thank you

