

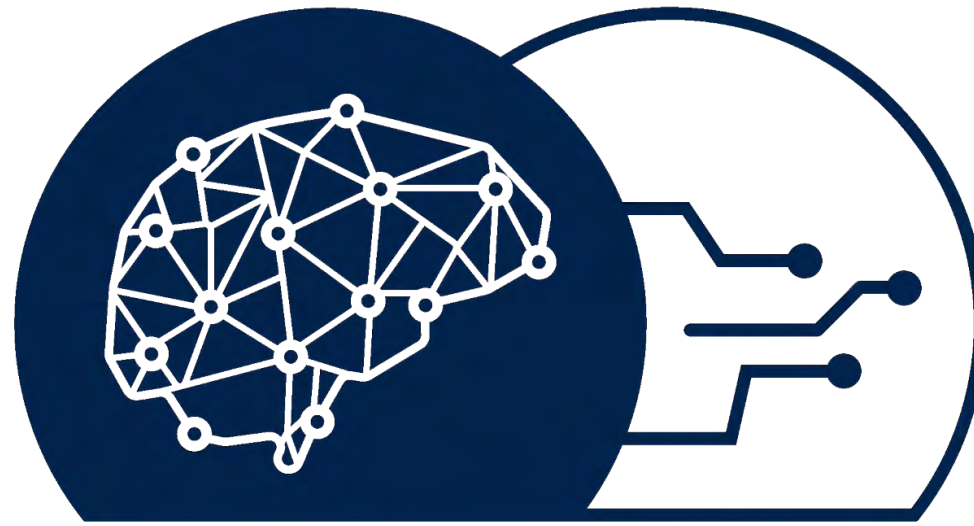
ANDANTE

AI for New Devices And
Technologies at the Edge

EAI4IA WorkShop

July 25th and 26th , 2022





ANDANTE

AI FOR NEW DEVICES AND TECHNOLOGIES AT THE EDGE

ANDANTE OVERVIEW

Mario Diaz Nava

STMicroelectronics

2 ANDANTE EAI4AI JULY 25th -26th, 2022



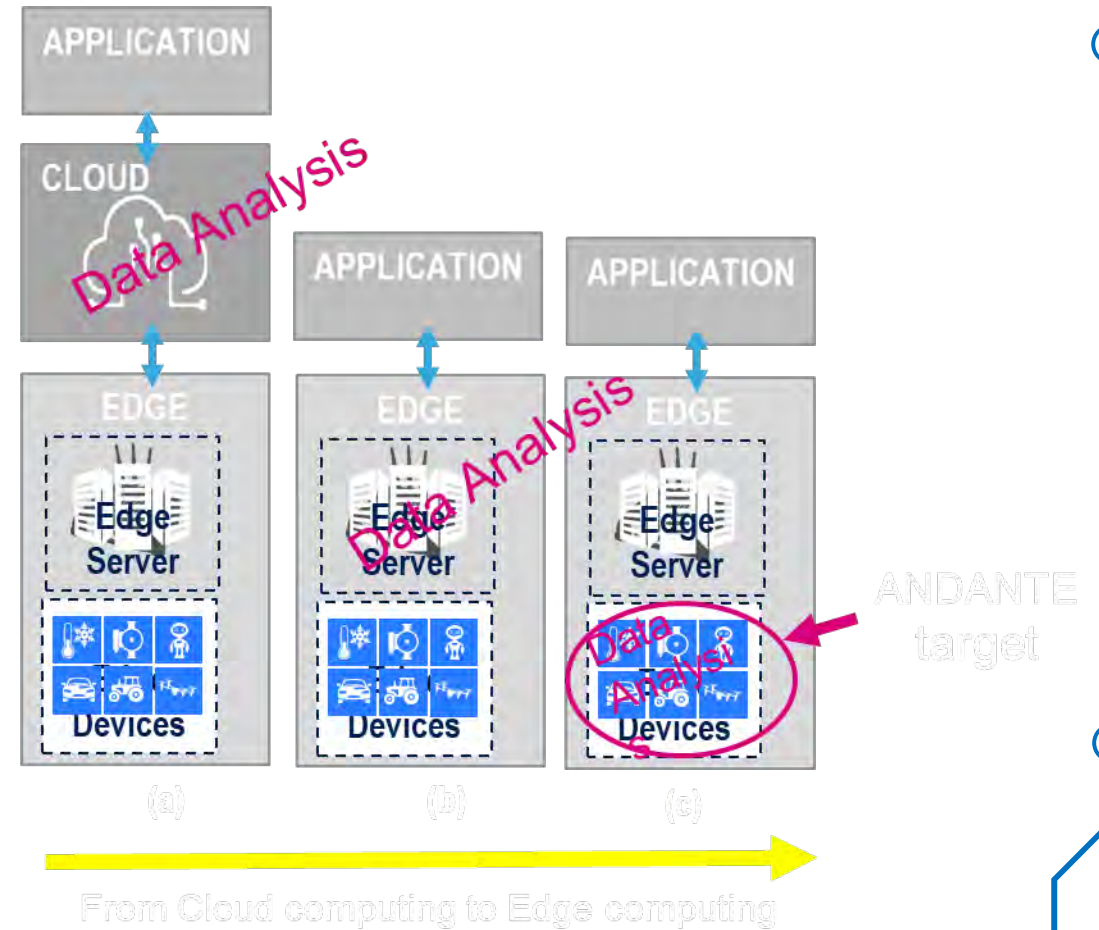
OUTLINE

- Context
- Focus
- Objectives
- Value Chain
- Expected Outcomes
- Ambition
- Market Impact
- Consortium Members

CONTEXT



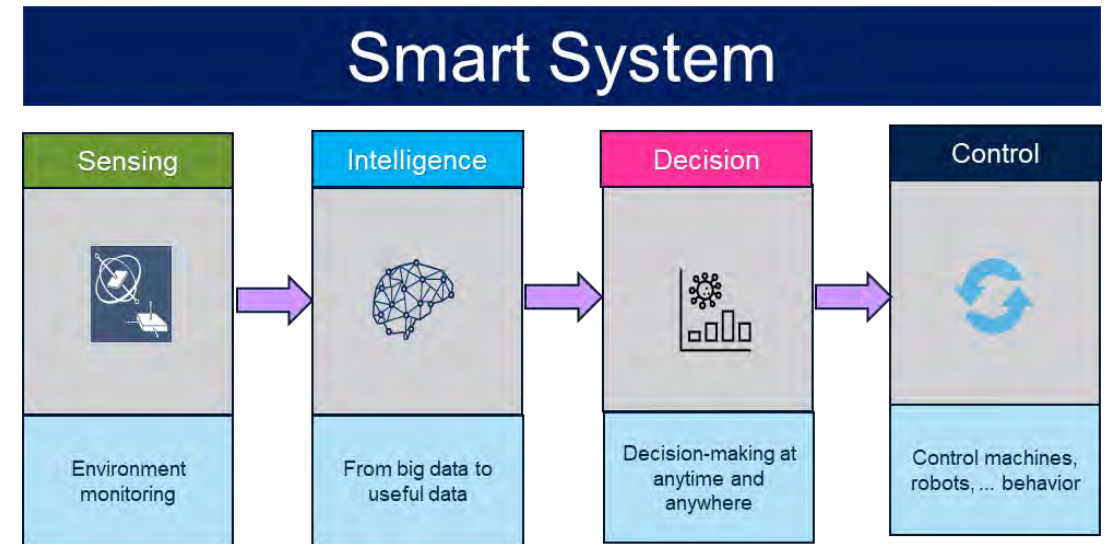
- Nowadays, **AI** is strongly penetrating large market segments.
- Data analysis, in the frame of IOT systems, is moving from the **Cloud** to the **Edge** creating new opportunities for the European semiconductor industry
- An the **Edge**, innovative and cost-effective **IC solutions** are required, providing:
 - High performances, low power consumption and small factor
 - High level of programmability
 - A toolset to facilitate and accelerate the application development
- Synergy with TEMPO is preserved and completed



AI & IOT



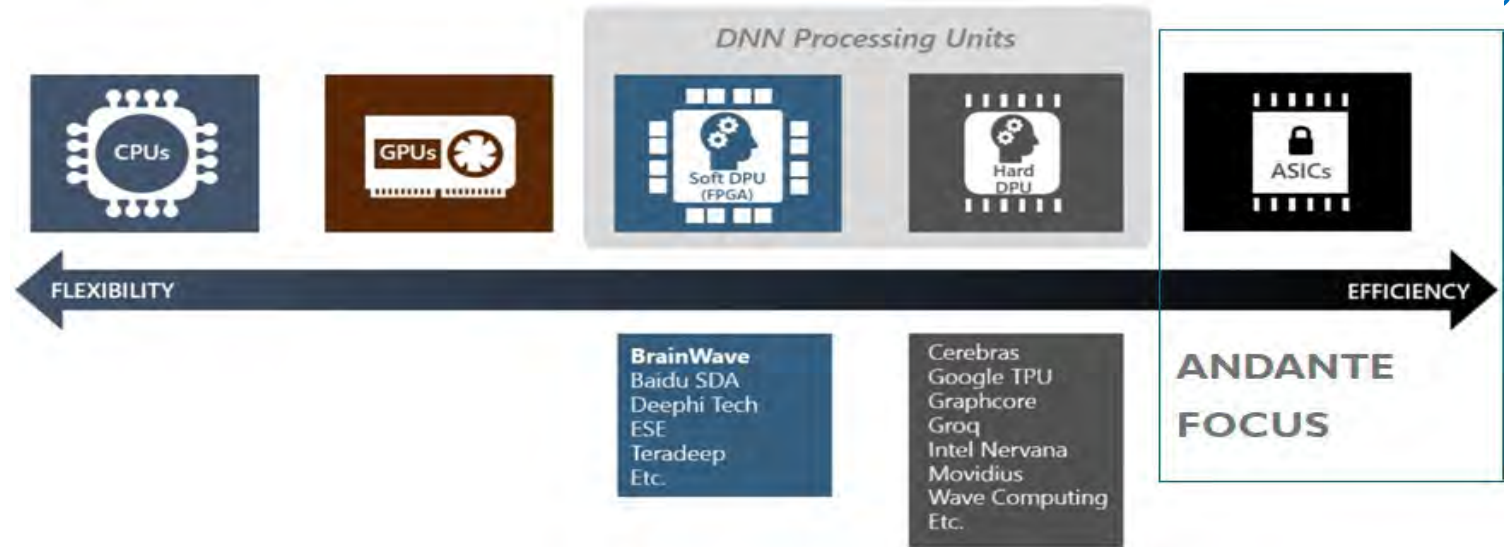
- IoT (Internet of things) is a monitoring / control system
- IoT is an evolution of existing monitoring / control systems.
- IoT is a revolution for the applications in multiples areas such :
 - ✓ Digital Industry, Digital Farming, Transport and Smart Mobility, Smart Health, Digital life, etc.
 - ✓ Bringing higher flexibility, accuracy, precision, distributed computing power, ... at cost effective





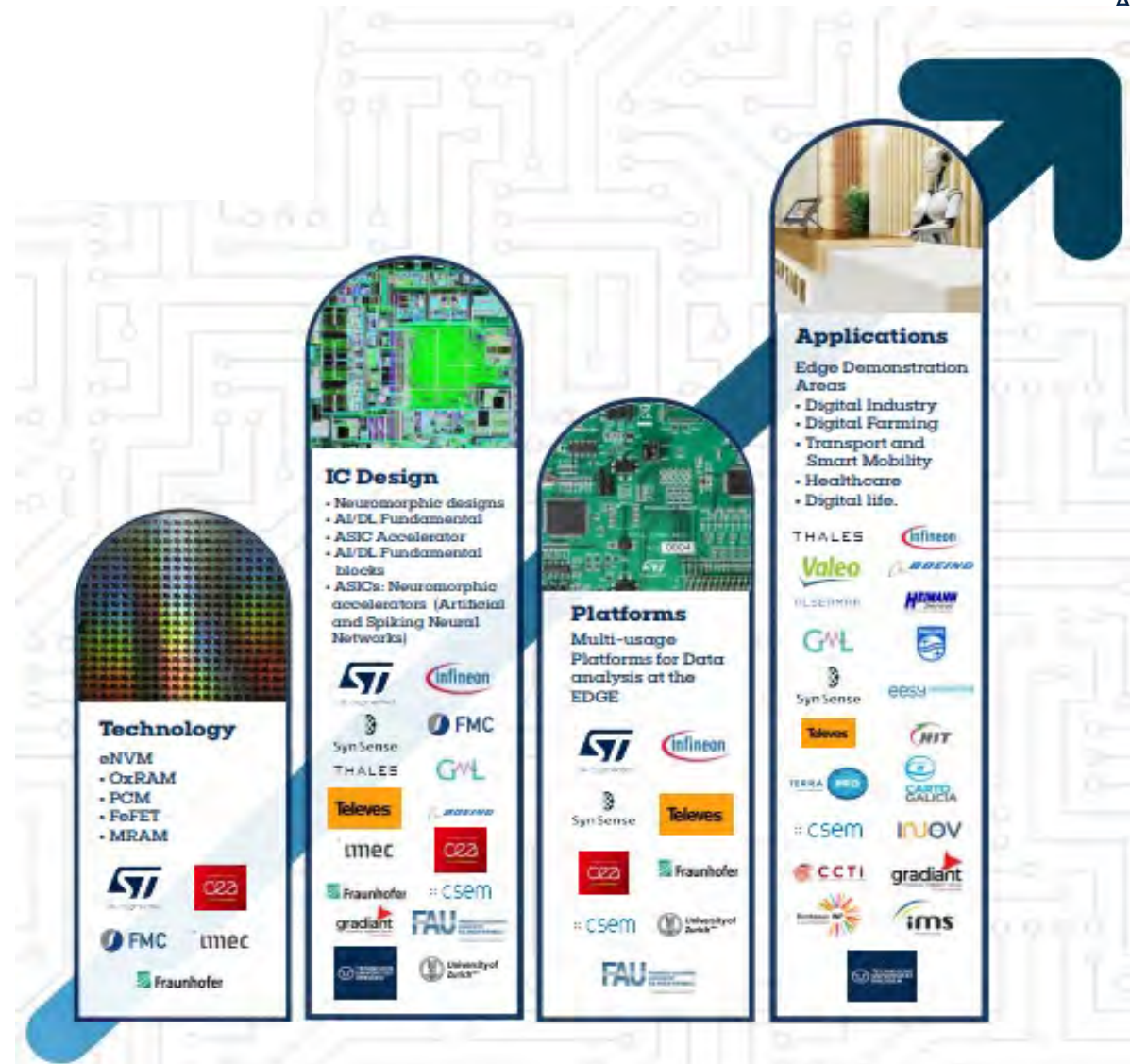
ANDANTE : FOCUS

- ANDANTE is focusing onto highly efficient artificial neural network ASIC implementations for its use in **Edge computing devices** to perform data analysis/inference.



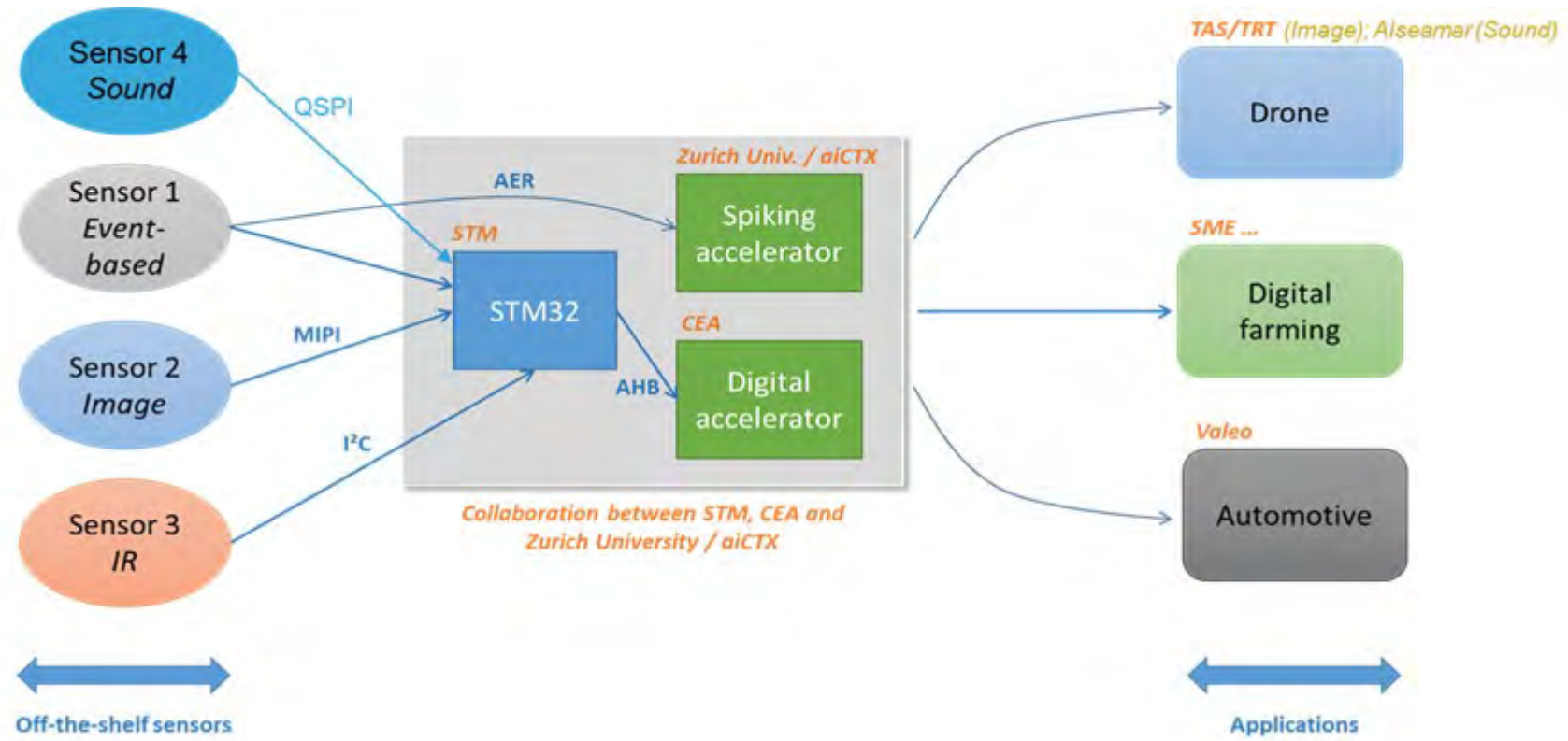
PROJECT VALUE CHAIN

- In the frame of the design of Intelligent devices in the Edge, ANDANTE covers the **complete value chain** from technology formulation towards system realization



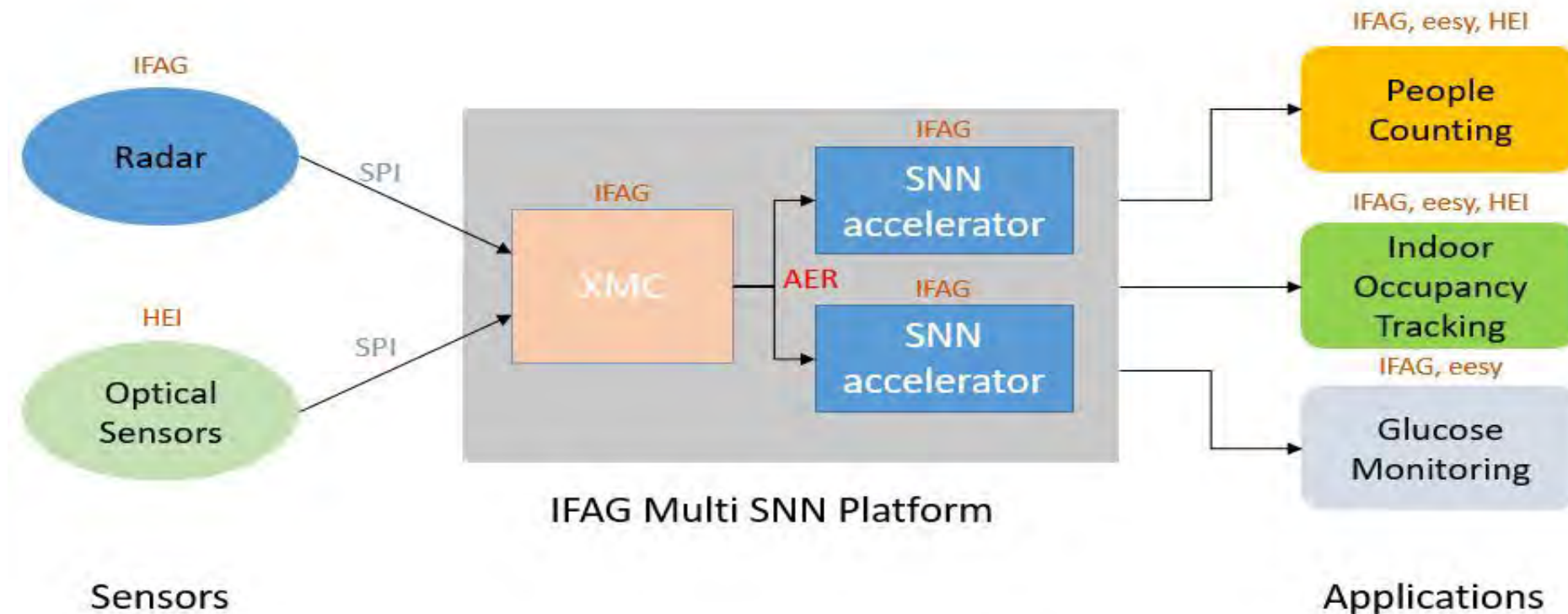
EXPECTED OUTCOMES (1 / 2)

STM32-based platform for spiking acceleration proposed by STM, Zurich University/SynSense (SNN) and digital acceleration by CEA (ANN)



EXPECTED OUTCOMES (2/2)

IFAG Spiking Neural Microcontroller (SNMC) platform





OBJECTIVES

- Develop, based on ANN and SNN building blocks, advanced AI/ML/DL IC prototypes (ASIC accelerators) for future innovative products.
- Build an AI design flow, with its associated methods and toolset, and boards to facilitate the development of smart applications based on different AI techniques.
- Develop innovation applications with strong market impact in different areas: Digital Industry, Digital Farming, Transport and Smart Mobility, Healthcare, and Digital Life.

AMBITION

AI processors overview for Cloud to Edge computing applications. ANDANTE ambition is to focus in **AI solution on the Edge**

By combining architectural innovations, large embedded memories and circuit innovations, the ambition is **to reach energy efficiencies of at least 10 TOPS/W** for classical coding accelerators



Source: ip.cadence.com/ai – April 2019 – AI inferencing on devices

Targeted AI circuits with high efficient processing power, as function of the application

CONSORTIUM AND MEMBER STATES



France: ST (GNB, CRL), CEA, Thales-TRT, Bordeaux-INP, Alseamer



Belgium: imec



CH : SynSense, CSEM, UZH



Germany: Infineon, Valeo-G, FhG (IPMS, IIS, EMFT), eesy-innovation, FAU, TU Dresden, Heimann sensor, FMC



NL: IMEC-NL, Philips Medical Systems, Philips Electronics, GML



Portugal: INESC, CCTI, Italagro, T-PRO



Spain : Boeing, GRADIANT, Televes, Cartogalicia