

Sustainable development

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THE SUSTAINABLE DEVELOPMENT ACTIONS INITIATED AND CARRIED OUT BY THE ACADEMIC AND INDUSTRIAL PLAYERS IN THE ELECTRONICS SECTOR AS PART OF NANOEEC MEET AT LEAST 10 OF THE UN'S OBJECTIVES. HERE ARE A FEW EXAMPLES. THEY CONTRIBUTE TO MEETING TODAY'S NATIONAL AND EUROPEAN COMPETITIVENESS CHALLENGES, AND TO MAKING THE SECTOR EVEN MORE RELEVANT TO TOMORROW'S WORLD.





Smart Pixel

A Life Cycle Analysis of Smart Pixel flow under development as part of the Nanoelec/Displed program was presented at Display Week 2023⁽¹⁾. Since there are no component scale databases for microelectronics, or the literature is outdated and does not reflect current trends, this life cycle assessment (LCA) provides new and previously unseen results. Data are included in the very first demonstration of a calculation tool dedicated to optimizing the key parameters of the environmental footprint of the associated process flow. ◊

Responsible technology dissemination

With the first implementation in 2023 of the Defi-Ino process at the initiating phase of Easytech projects, we are looking to develop an environmental diagnostic offering for SMEs, mid-caps and start-ups wishing to work with us. Our priority is to help companies cope with the environmental issues of public innovation policies and to provide them with competitive advantages. The proposed diagnostic is quick and inexpensive. It does not replace an actual environmental assessment, nor a life cycle assessment (LCA). Instead, it aims to be a simple evaluation, which could encourage companies to commit to a more detailed study and to change their environmental responsibility culture. ◊

Photo,

EVERY YEAR, NANOELC CELEBRATES MARCH 8TH AND JUNE 23RD WITH ROUND-TABLES AND FORUMS QUESTIONING THE ROLE AND THE PLACE OF WOMEN IN OUR BUSINESS

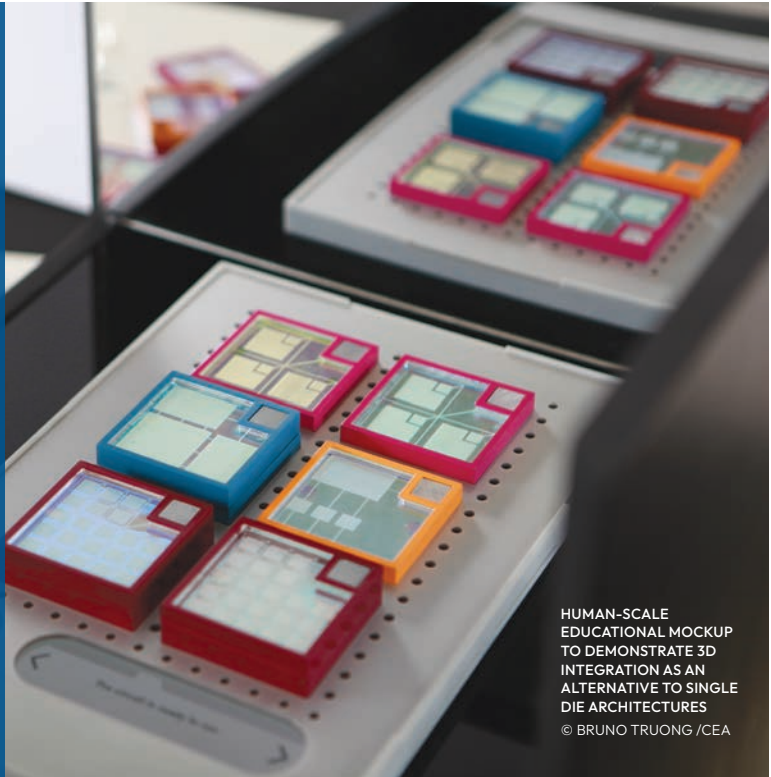
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1. Holo, Antonin, Dubarry, C., Lopes, J.-C., Dupont, M., Chabaud, S., & Templier, F. (12-17 May). MicroLED Display Life Cycle Assessment. Display Week, San Jose, USA



Increased versatility & low power consumption for heterogeneous systems

CEA's advanced packaging research leverages expertise in 3D and heterogeneous integration, especially as part of the Nanoelec/Smart Imager program. We have the full range of technologies needed to break up monolithic circuits into modules, or chipllets, and package them in vertically stacked circuits using 3D integration techniques. Due to the increasing costs of advanced nodes and the difficulties of shrinking analog and circuit input-output signals (IOs), alternatives to single die architectures are becoming mainstream. Chiplet-based systems using 3D technologies are compatible with scalable modular architectures, and with technology partitioning based on reusable IP blocks. Moreover, 3D interconnects increase chip-to-chip bandwidth and limit overall power consumption. Industries across the whole range from automotive to health, will soon be relying on advanced packaging to deliver simpler, faster, and cheaper chip designs that integrate more functions while offering greater performance and versatility. ◊



HUMAN-SCALE EDUCATIONAL MOCKUP TO DEMONSTRATE 3D INTEGRATION AS AN ALTERNATIVE TO SINGLE DIE ARCHITECTURES
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Human at the heart, technology at the edge

In 2023, as part of the Nanoelec/Pulse program, CEA-Leti was selected to coordinate a new project called Earashi: a new cascade funding mechanism that aims to improve working conditions (health and safety), trust, and acceptance of collaborative embodied AI in robotic systems. The goal is to support industrial activities, especially start-ups and SMEs, in the development and uptake of advanced eco-responsible digital technologies (in particular AI, data and robotics) that will help workers in their daily activities and improve their working conditions (safety, health and well-being), leading to a productivity increase. ◊

Reducing e-waste

The European EECONE project, in which CEA is involved via the Nanoelec/Pulse program, aims to structure the electronics ecosystem and develop technical solutions to reduce the environmental impacts of electronic technologies on a European scale. In accordance with the 6R concept (Reduce, Reliability, Repair, Reuse, Refurbish, Recycle), twelve technologies will be developed and then applied to case studies in ten use cases, ranging from integrated circuits to printed circuit board electronics and power electronics, in application areas such as automotive, consumer electronics, healthcare, ICT, aeronautics and agriculture. ◊



Training design for green electronics

The Nanoelec/CHIF program involves transforming the teaching approach to promote more dynamic content, in particular with integration of sustainable development and with transformation of teaching methods aimed at increasing learning through experience and accessibility to resources, through a wide diversity of learners on a shared platform. The achievements of 2023 include the publication of a complete module on eco-design for electronics. It includes basic notions on lifecycle and the fundamental principles of LCA (Life Cycle Assessment: inventory analysis, impact assessment, interpretation of results, etc.) along with an approach to eco-design and the development process for electronic products (rational design in the manufacturing, utilization or end-of-life phases). The CHIF program is also associated, through Grenoble INP-UGA to the EU GreenChips-EDU project: the goal is to increase the number of students pursuing studies in electronics and to enhance the professional development of individuals working within the industry. The focus of the degree programs is the development and production of sustainable and energy-efficient microchips. ◊

Attractiveness of micro-electronics

Tensions over the recruitment of qualified personnel have been acute for the past two years. Against this backdrop, Nanoelec joined forces with local industry players to support the work of the departmental industry committee, chaired by the Prefect. In particular, Nanoelec organized in 2023 a regional forum bringing together institutional players, training providers and manufacturers in the sector. Actions are being launched in coordination with the AMI/CMA FAME project and the Comité stratégique de filière électronique (National electronics sector strategy committee). ◊

Parity and equality at work

Every year, Nanoelec organizes round-tables on March 8th (World Day for Women's Rights) and June 23 (International Women in Engineering Day #INWED). This is an international awareness campaign to raise the profile of women in engineering and focus attention on the amazing career opportunities available to girls in this exciting industry. The permanent exhibition on the 2022 Nanoelec awards for women in technology is presented in the Grenoble-Alpes area. ◊



MAY 2023, DURING A NANOELC/CHIF PROGRAM WORKSHOP: ENGINEERING STUDENTS HAD TO FIND WAYS TO DISCUSS THE CONCEPT OF "SUSTAINABLE ELECTRONICS" AND TO EXPRESS WHAT THEY EXPECT FROM OUR BUSINESS

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