

The grand challenge facing the electronics industry is to find technical solutions that will allow power consumption to be reduced while at the same time increasing the performance and functionalities of electronic chips in the medium to long term (i.e. 10-15 years from now). From an industrial point of view, the way is already paved: the main semiconductor manufacturers (INTEL, Samsung, TSMC) have indeed announced that the next 2 nm technology node (N2) will be realized through the Nanosheet (NS) technology, which represents the next technological leap after the FinFET. The continuation of Moore's Law depends on the ability to further scale the device footprint, which requires the reduction of nanosheet thickness. In this scenario, the 2D-ADDICT project aims to revolutionize nanoelectronics by developing the next generation of energy-efficient devices based on two-dimensional materials (2DMs). These devices will serve as the foundation for smart edge technologies, offering ultra-low power consumption while maintaining high performance. By exploiting the unique properties of 2DMs, such as atomic scale thickness, high carrier mobility and excellent electrostatic control, the project addresses key limitations of traditional semiconductor technology. The 2D-ADDICT project aims to unleash the full potential of 2DMs for the next generation of advanced electronic switches (More Moore), as well as to capture the opportunities offered within the More than Moore paradigm by leveraging 2DMs' compatibility with CMOS technology and their limited thermal budget, compatible with the back-end of line (BEOL) for in-memory processing, opening new avenues for improved circuit density, including novel non-von Neumann architectures.