

PRESS RELEASE

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Groupe PSA teams up with Engineering School Centrale Nantes to accelerate the roll-out of digital simulation for powertrain design

- **Groupe PSA and Centrale Nantes launch a €4 million R&D programme dedicated to digital simulation techniques for powertrain design**
- **The aim of the programme is to bring low-emission vehicles to market faster**
- **Digital simulation reduces engine design turnaround time by reducing the need for physical tests and prototypes, thereby lowering development costs**

Groupe PSA and Ecole Centrale de Nantes today announced the launch of an R&D partnership to optimise powertrain design processes for the group's future vehicles. The aim of the partnership is to accelerate the use of digital simulation techniques in the design, development and testing of powertrains and increase model predictability. In the future, it could be possible to develop a new engine without laboratory tests or prototypes, using only virtual testing.

Digital simulation offers numerous benefits. The first one is the **time saved in the development** stage due to the speed at which digital models can be configured versus the process of building and testing multiple iterations of prototypes. Digital simulation as a design method is also **less expensive** than prototyping, which requires substantial tooling costs. The goal is to **reduce the number of prototypes required by more than 70%** versus the conventional design approach. Digitally simulated designs are also more **robust and of higher quality** as they can be tested against a greater number of customer scenarios.

The two parties will co-finance the project for a total amount of €4 million over five years. Ecole Centrale de Nantes combines simulation and testing capabilities within a single team of teacher-researchers specialising in modelling and state-of-the-art experimental resources, including engine and vehicle test benches equipped with the most powerful supercomputer available on a university campus in France.

The project will cover all types of internal combustion engines for the development of hybrid vehicles and may also be extended to electric vehicles, where opportunities arise. A team of around ten people will focus on three areas: digital modelling of petrol engines, "smart" automatic calibration processes to shorten the testing phase and electric powertrain design.

Groupe PSA is already pioneering the digital design approach. Plans for limiting the quantity of prototypes produced for design purposes were put in place back in 2015 for the development of the 1.5l BlueHDi engine, shrinking the number required by around 40%. Through this new partnership, prototyping and testing requirements can be further reduced.

At Centrale Nantes, the partnership will be coordinated by Alain Maiboom, lecturer and research supervisor at the Research Laboratory in Hydrodynamics, Energy and Atmospheric Environment (LHEEA), a CNRS mixed research unit. His research activities focus primarily on combustion and the reduction of pollutant emissions from internal combustion engines at source, as well as heat transfers in the engine and throughout the powertrain (experimental characterisation using test benches and phenomenological modelling).

Commenting on the partnership, Mr Maiboom said: “Our objective is to enhance the ability of the models to simulate the different physical phenomena at play and the various situations encountered over the lifetime of a powertrain, as well as to develop calibration methodologies. In a way, we’re developing a digital test bench capable of replacing a physical bench, at least in part.”

Alain Raposo, Senior Vice President, Powertrain and Chassis Engineering at Groupe PSA, said: “Through our partnership with Centrale Nantes, we aim to boost the development of digital simulation processes with a view to permanently reducing CO₂ emissions. The key innovation lies in decreasing industrial design turnaround time. For a manufacturing group and a leading school of engineering to be working together on this type of R&D project is a real boon for the growth of French industry around the world.”

Arnaud Poitou, Director of Ecole Centrale de Nantes, said: “At Centrale Nantes, we’re very proud to be partnering with a major name in French manufacturing like Groupe PSA. This partnership is a testament to the unique positioning of Centrale Nantes, which combines outstanding digital expertise with large-scale experimental platforms, including vehicle and engine test benches and a supercomputer.”

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About Groupe PSA

Groupe PSA designs unique automotive experiences and delivers mobility solutions to meet all customer expectations. The Group has five car brands, Peugeot, Citroën, DS, Opel and Vauxhall and provides a wide array of mobility and smart services under the Free2Move brand. Its 'Push to Pass' strategic plan represents a first step towards the achievement of the Group's vision to be "a global carmaker with cutting-edge efficiency and a leading mobility provider sustaining lifetime customer relationships". An early innovator in the field of autonomous and connected cars, Groupe PSA is also involved in financing activities through Banque PSA Finance and in automotive equipment via Faurecia. Find out more at groupe-psa.com/en.

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About Ecole Centrale de Nantes

Founded in 1919, Centrale Nantes is a French engineering school and member of the Ecoles Centrales Group. Its undergraduate, Master and PhD programmes are based on the latest scientific and technological developments and the best management practices. At Centrale Nantes, research and training are organised into three key areas for growth and innovation: manufacturing, energy transition and healthcare. With [research platforms](#) ranging from digital simulation to prototyping using full-scale models and an [incubator](#) with 20 years of experience in supporting start-up projects, the school has two major tools for innovation and creation, working hand in hand with the [world of business](#). Centrale Nantes promotes its teaching and research capabilities at the [international](#) level through around 100 partnerships with prestigious universities and schools worldwide.

Founded in 1919, Centrale Nantes welcomes 2,320 students, including 1,550 undergraduate students, 200 Executive Education and ITII degree apprenticeship students, 260 PhD students and 400 Masters students, on its 40-acre campus. For more information, visit www.ec-nantes.fr

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