



As an international research and training center, IFP is developing the transport energies of the 21st century. It provides public actors and industry with innovative solutions for a smooth transition to tomorrow energies and materials – more efficient, more economical, cleaner and sustainable.

■ To fulfill its mission, IFP has 5 complementary strategic priorities:

- Capturing and storing CO₂ to combat the greenhouse effect
- Diversifying fuel sources
- Developing clean, fuel-efficient vehicles
- Converting as much raw material as possible into energy for transport
- Pushing back the boundaries in oil and gas exploration and production

■ Within its focal areas, IFP fosters knowledge transfers between long-term fundamental research, applied research and industrial development.

It is funded both by a state budget and by resources provided by private French and foreign international partners.

→ IFP-Moteurs research topics

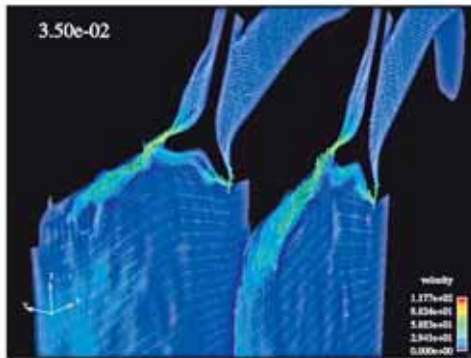
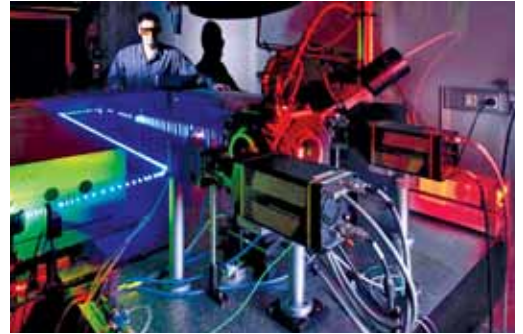
- Fundamental research, in particular combustion, using modelling, simulation, and optical diagnostics
- Hybrid vehicles and advanced control, low-emissions gasoline and diesel engine technologies (low CO₂, pollutants, and noise)
- Advanced fuels and lubricants and alternative fuels with low greenhouse gas emissions (first - and second - generation biofuels, NGV, etc.).

→ Laboratories in the field of the Carnot institute:

- "Facilities and technical support" department
Operation of the test station.
- "Systems modelling and simulation"
Development and use of 3D aerothermochemical physical models and calculation codes, and engine and vehicle system modelling.
- "Engine technology" department
Design, development, and refinement of innovative engine concepts for light vehicles, aimed at reducing pollutant emissions and enhancing fuel efficiency and driving pleasure.
- "Fuels – Lubricants – Emissions" department
Expertise in the matching of engines and fuels, in the matching of engines and lubricants, and in metrology and the precise evaluation of emissions of pollutants, whether regulated or not.
- "Engine laboratory department, IFP-Lyon"
Development and validation of pollution abatement systems, development of combustion systems for trucks, and development of CNG engines.
- "Applied mathematics" department
Expertise in numerical schemas, solvers, optimization algorithms, statistics, and data analysis.
- "Signal processing, automation and control" department
Real-time computing, automation, signal processing, and electronic measurement acquisition techniques.
- "Engine systems analysis"
Understanding and optimization of the physical phenomena occurring during combustion processes using optical diagnostics devices adapted to engines.

→ Areas of expertise

- Diesel and gasoline engine combustion systems
- Exhaust gas after treatment
- Matching of engines and fuels - alternative fuels
- Hybrid powertrains and their controls



→ Facilities and equipment



IFP has advanced testing facilities for Engine and Fuel tests. They include, in particular, computing facilities - workstations and IBM supercomputers, 40 test benches (*from two wheelers to trucks*), some of them with optical access and some of them for gasoline and diesel injector characterizations, and specialized laboratories. These resources are located in the technical centers in Solaize (*IFP-Lyon*) and Rueil (*near Paris*).

→ Markets

The powertrain segment of the automobile and truck market.

→ Main customers

Renault, PSA, Volvo Powertrain, German carmakers, European equipment suppliers, Total, GDF, etc.

→ Key figures

- **Staff:**
Permanent staff (full-time equivalent): 250
PhD students: 20
- **Budget:**
Global budget: 35 000 k€
Contractual incomes: 15 000 k€

→ Contacts

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