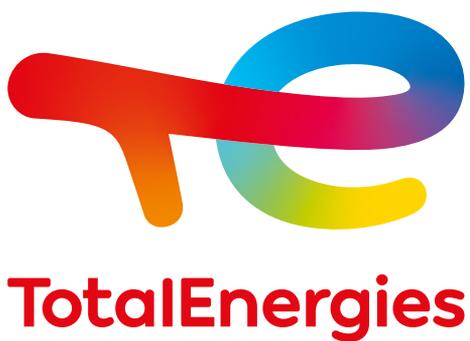




PERL

The Platform
for Experimental
Research at Lacq



“

Established in the Lacq industrial area since 1959 to support the discovery of the Lacq gas field, the PERL (Lacq Research Centre) is an essential link in TotalEnergies' R&D, with internationally renowned scientific and technical expertise.



This R&D platform brings together around 120 employees on three complementary sites, for experiments ranging from the laboratory to semi-industrial pilots. Its four areas of expertise - Environment & Sustainable Development, Separations & Gas Treatment, Physical Chemistry & Analysis, and Implementation/Operation of Semi-industrial Pilots - are dedicated to reducing the environmental and climatic footprint of TotalEnergies' activities and developing new forms of energy. Operated research to provide innovative solutions contributing to TotalEnergies' ambitions.

The operated researches carried out provides innovative solutions in lign with TotalEnergies' ambitions.



PHYSICAL-CHEMISTRY & ANALYSES



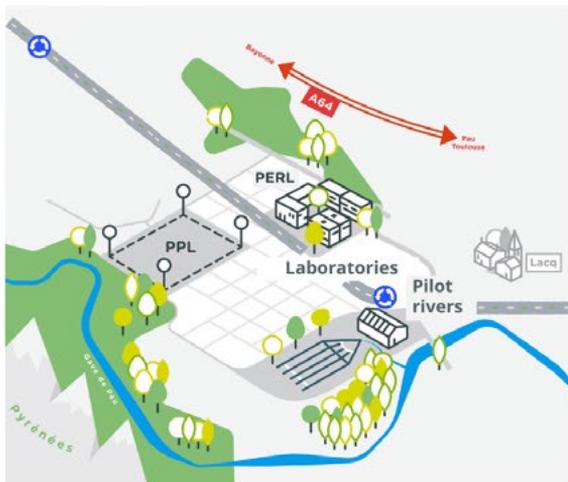
GAS SEPARATION & TREATMENT



ENVIRONNEMENT & SUSTAINABLE DEVELOPMENT



LACQ PILOT PLATFORM



5000
of laboratory space & micro-pilots



25
patents
(in 4 years)



55000
of land on the PPL



120
people



13
Nationalities



1 joint laboratory
with the ESPCI school



ENVIRONMENT & SUSTAINABILITY DEVELOPMENT

Our research teams contribute to TotalEnergies' commitment to the UN Sustainable Development Goals, in terms of environmental responsibility (local scale), impact assessment and sustainable management of resources such as surface water, aquifer, soil and biodiversity.

Our biological skills allow us to work on the development of low-carbon energies, such as biogas production, biomass production as microalgae and photovoltaic energy.

Our areas of expertise are water treatment and recycling, process engineering, bioprocesses, hydrogeology, hydrobiology, ecotoxicology, soil science, plant physiology, agronomy and microbiology.

We are currently running industrial pilot projects on soil valorisation (InnoAgri) and water recycling using solar energy (SWaP project).

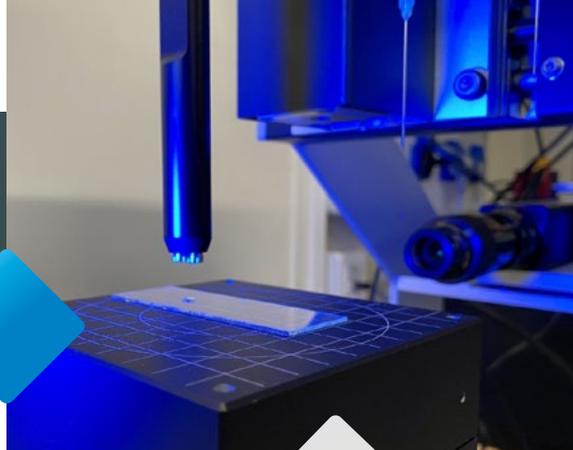


A unique experimental mesocosm to study toxicity on river ecosystems

The PERL pilot rivers are 16 identical and independent artificial waterways fed by the Gave de Pau. This open-air laboratory allows the study of industrial impacts on the natural environment under con-

trolled conditions. The installation allows the simulation of exposure scenarios at different trophic levels with continuous monitoring of physico-chemical parameters.

PHYSICO CHEMISTRY & ANALYSIS DEPARTMENT



Many key products, processes and technologies for the future of energy involve so-called multiphase systems: there are liquids such as water and oils; gases, such as methane, CO₂ or hydrogen; and solids, such as the parts of wind turbines, batteries, engines, the surface of a pipeline or reservoir rocks.

The "Physicalchemistry & Analysis" competence improves the modelling of the behaviour of these multiphase systems to predict their properties and optimise their efficiency, energy saving and footprint.

Our areas of expertise are the physicalchemistry of interfaces, the rheology of these complex systems, the development of specific analytical methods and the integration of these physicochemical descriptions into the flow laws of simulators.

These skills are currently applied in all R TotalEnergies' R&D lines.



A high-level scientific community with a local dynamic:

High level laboratories are the heart of PERL.

Throughout time, our research center has established strategic academic collaborations with targeted universities in order to draw on the best expertise and create an attractive scientific community.

In 2015, a joint laboratory was created with the École Supérieure de Physique et de Chimie Industrielles de Paris (ESPCI),

in the Chemstart'up premises.

Called "PIC" (for Physicalchemistry of Complex Interfaces), it enables the rapid integration of advances in fundamental sciences to strengthen our applied research.

PERL also maintains close collaborations with laboratories at the University of Pau and the Pays de l'Adour. These advances bring a dynamic for local innovation.

GAS SEPARATION AND TREATMENT



Our researchers are specialised in the handling of gases, including hazardous ones, and particularly their separation processes.

In their three fields of expertise (absorption, adsorption, membranes), they measure the physical or chemical quantities essential to characterise gas/liquid, gas/solid, gas/membrane systems using specific tools operating over a wide range of conditions.

They develop and operate these systems on process pilots representative of the

applications. The data collected allows the modelling and evaluation of the technical and economic performance of the processes envisaged.

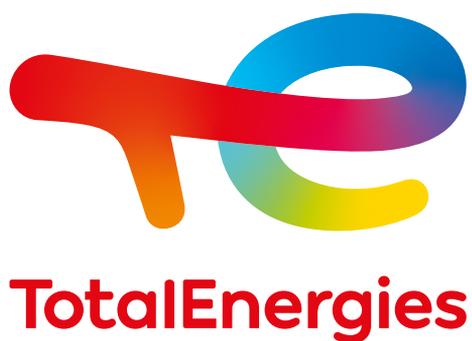
The field of applications is vast: treatment of acid gases and syngas, purification of biogas and hydrogen, CO₂ capture, gas dehydration, reduction of the carbon footprint of the gas chain or gas separation in petrochemical processes. These are just some of the areas in which our expertise is applied.



Multi-activity Pilot Platform

Since 2015, and on 6 hectares in the heart of the SEVESO 3 Lacq plant, the PPL is being supporting the Company's business and innovation by facilitating the deployment and accompanying the operation of large-scale experimental facilities.

A space for testing new technologies in an industrial context, it allows the development or qualification of environmental or safety monitoring tools and the hosting of pilots of all sizes for the evaluation of new processes or new architectures.



TotalEnergies SE

64018 Pau Cedex - FRANCE
Tél. : +33 (5) 59 83 40 00
6 225 655 060 euros
542 051 180 RCS Nanterre

PERL BROCHURES EDITED IN APRIL 2023

D-01704 - Conception: RF
CREATIV' Solutions Numériques
Photos: PERL
TotalEnergies S.E. - © TotalEnergies