

**Energy transition:  
Teréga invests in the development of a new innovative solution: “METHAMAG®”, a  
technology derived from public research in Toulouse**

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Teréga, a major actor in gas transport and storage infrastructures in France, has just signed a 1<sup>st</sup> exclusive partnership with Toulouse Tech Transfer (TTT) for the joint development of an innovative technology created by the Laboratory of Nano-object Physics and Chemistry (LPCNO – INSA Toulouse, CNRS and Toulouse III - Paul Sabatier University). The technology, called “METHAMAG®”, is a new methanation process based on the use of magnetic induction. It provides a response to the challenges of storing renewable energy sources, while demonstrating energy performance that is vastly superior to that of other systems. This partnership with TTT is the practical outworking of Teréga’s commitment to the acceleration of renewable gases, and underlines its partnership-based innovation strategy, being based around the SATT Network.

**Development of innovative solutions to bring about the energy models of tomorrow**

France, like many countries around the world, is committed to a process of energy transition, to deal with the growing threats facing the environment. Targets have been set to provide a fourfold reduction in greenhouse gases by 2050, drawing on energy savings and the vigorous development of renewable energy, to avoid resorting to the use of fossil fuels.

As an accelerator of the energy transition, Teréga is committed to designing innovative solutions which will frame the models of tomorrow and enable those targets to be met. The partnership signed with the LPCNO and TTT will allow **the development of an innovative methane production technology that uses magnetic hyperthermia (methanation) to increase the injection capacities of methanisation sites and to develop the “Power-to-Gas” sector.**

**METHAMAG®: a new industrial route to the production of methane from CO<sub>2</sub> by magnetic hyperthermia.**

“Renewable” or “green” synthetic methane has an important role to play in the energy transition. The methanation reaction, where methane is produced from CO<sub>2</sub> and hydrogen from sources such as the electrolysis of water is one of the production routes for that green methane.

The METHAMAG® technology provides the conversion of CO<sub>2</sub> into CH<sub>4</sub> by hydrogenation, thus enabling the rollout of “Power-to-Gas” solutions based 100% on the storage of renewable energy sources. That innovation therefore provides an answer to the challenge of storing renewable energy sources, while still exhibiting energy performance which is vastly superior to that of other systems.

The LPCNO’s Nanostructures and Organometallic Chemistry team has been working for the last twenty years or so on the synthesis of metallic nanoparticles having valuable properties for both industrial chemistry (catalysis) and microelectronics or nanomedicine. The idea behind the current METHAMAG® technology is the use of both the physical and the chemical properties of a single magnetic particle.

**The METHAMAG® technology brings practical answers to speed up the deployment of renewable energy sources thanks to storage, in the form of methane, in the existing gas grid.**

A catalyst layer is created on the surface, after which iron-based ferromagnetic nanoparticles can heat considerably when magnetic induction is applied. They can then be used as catalysts for a whole series of industrially valuable reactions, including the hydrogenation of CO<sub>2</sub> to methane.

The METHAMAG® technology allows methanation units to be set up which can be supplied from intermittent electricity generation. The present project aims to enrich biogas into methane that can be injected into existing transport and distribution grids, thus directly making use of the biomethane that is produced.

*“The technology is based on many years’ research by the LPCNO. The principle is to use magnetic induction to activate a catalytic reaction – in this case, methanation – which allows you on the one hand to be able to start the reaction almost instantaneously, and thus to be able to deal with intermittency, and on the other hand to heat only the catalyst, making it more efficient in terms of energy use,”* explains Bruno Chaudret, CNRS researcher and director of the LPCNO.

*“A cutting-edge technology supplying an attractive solution to the storage of intermittent energy: this, in a nutshell, is the project established by a company committed to the energy transition, a high-level laboratory, and TTT with the support of the SATT network,”* comments Pierre Dufresne, Chairman of Toulouse Tech Transfer.

*“Teréga is proud to combine its skills with the scientific expertise of Toulouse Tech Transfer and the SATT Network on this large-scale project which goes to the heart of the challenges of energy transition. This innovative solution is the fruit of collaborative labours sustained by shared motivations. It is yet another practical outworking of our commitment to the new energies of tomorrow,”* says Dominique Mockly – Chairman and CEO of Teréga.

*“SATTs are establishing ever more strategic and ambitious partnerships with actors conscious of the challenges of the Green Deal. I’m delighted about this partnership with Teréga which, once again, confirms the excellence of French Public Research,”* adds Laurent Auret, Director of Industrial Partnerships at the SATT Network.



*General view of the laboratory pilot plant (D) and close-up of the reactor with the injection coil and cooling system (G).*

### **About Teréga**

Established in South-West France, at the crossroads between major European gas flows, Teréga has shared exceptional know-how for over 75 years in the development of gas transport and storage infrastructure. Today, it continues to develop innovative solutions to overcome the major energy challenges facing France and Europe. A true accelerator of the energy transition, Teréga operates over 5,000 km of pipelines and 2 underground storage reservoirs representing 16% of the French gas transport network and 26% of national storage capacities. In 2019, the company generated revenues of €500 million and had more than 650 employees.

Find Teréga at [www.terega.fr](http://www.terega.fr), @Teregacontact, Facebook and LinkedIn

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### **About the Laboratory of Nano-object Physics and Chemistry (LPCNO)**

The LPCNO is a mixed multidisciplinary research unit based on the INSA campus in Toulouse, supervised by the INSA, CNRS and Toulouse III - Paul Sabatier University. The LPCNO brings together physicists and chemists for the production, study and application of nano-objects.

Find out more at: <http://lpcno.insa-toulouse.fr/>

### **About INSA Toulouse**

With more than 17,000 engineers present in all sectors of the economy and producing more than 500 scientific articles a year in the best international journals, INSA Toulouse, an international, multidisciplinary state engineering school, is recognised for the excellence of its five-year post-baccalaureate education and the quality of its research, be it at foundation or applied level, covering the great social challenges of the 21st century. It welcomes and supports a diverse range of students, reflecting the values and positive identity culture promoted by the school's leadership: geographical and cultural diversity, diversity of intake, gender equality, support for disabled students, social diversity.

Find out more at: <http://lpcno.insa-toulouse.fr/>

### **About the French National Centre for Scientific Research (CNRS)**

The CNRS is ranked among the world's best known and most highly regarded public research institutions. For more than 80 years it has responded to the need for excellence in its recruitment, developing multi- and interdisciplinary research across France, Europe and internationally. Working toward the common good, it contributes to scientific, economic, social and cultural progress in France. The CNRS comprises 32,000 men and women covering 200 specialisms. Its 1000 laboratories, mostly shared with universities, schools and other research organisations, account for more than 120,000 people; they drive knowledge forward, exploring the living world, matter, the Universe and how human societies operate. The close links it has established between its research activities and their transfer to society makes it one of today's key actors in innovation. Partnership with business forms the bedrock of its value-creation policy. This is rolled out in particular through more than 150 structures which it shares with industrial actors and through the creation of around one hundred start-ups each year, testament to the economic potential of its research work. The CNRS provides access to research work and data; that sharing of knowledge is aimed at different sectors: scientific communities, the media, decision-makers, economic actors and the general public.

More information at: [www.cnrs.fr](http://www.cnrs.fr)

### **About Toulouse Tech Transfer (TTT)**

TTT is a regional operator (Occitanie Ouest) of the development and transfer of technology from public research to businesses. TTT ensures that maturation projects take place, investing in the most promising results from public research to market the innovations to businesses. The aim is to encourage business innovation, greater competitiveness, and job and wealth creation. TTT is a member of the SATT Network.

Find out more at: [www.toulouse-tech-transfer.com](http://www.toulouse-tech-transfer.com)

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### **About the SATT Network**

The SATT Network encompasses 13 Technology Transfer Acceleration Companies (SATTs) in France. Committed to economic dynamism through scientific innovation, SATTs provide companies with risk-free technological solutions with high potential, bringing increased competitiveness. With more than 600 start-ups created, SATTs are the foremost local actors in the French state's DeepTech Plan, operated by Bpifrance. They are connected on a daily basis with more than 150,000 researchers and offer privileged access to innovations from public laboratories. Backed up by their national network, they are the strategic partners for businesses seeking growth through innovation.

Find out more at: [www.satt.fr](http://www.satt.fr)