

Press release

New materials for thermal energy storage

- ▶ *CIC energiGUNE and IK4-TEKNIKER are currently involved in a collaborative effort aimed at creating a patent to develop new materials for the storage of thermal energy in a manner that is less costly, more efficient and stable*
- ▶ *New materials that it will be possible to use at CSP solar power stations and in other industrial activities where high-temperature processes are involved*

(Eibar, Basque Country. 22 November, 2019).- As thermal energy has to be stored in an efficient, stable and low-cost manner, [CIC energiGUNE](#), the research centre for power storage, and the [IK4-TEKNIKER](#) technology centre are working together to deliver a patent within the framework of a shared doctoral thesis focused on **developing new materials for the storage of thermal energy**.

Specifically, this joint research effort has given rise to a patent covering the development of cobalt and nickel-based oxides which, thanks to RedOX reactions, can either store or release energy in the form of heat according to requirements at each point in time.

As demonstrated by previous studies, chemical reactions provide one of the most efficient energy storage techniques. In this regard, RedOx reactions offer the most promising option as they can manage high energy densities, produce no power losses and offer the possibility of transporting materials and, consequently, energy.

Cobalt oxide is the most widely used material in this technology as it allows energy to be stored in very high-temperature processes (900°C).

A unique feature of cobalt and nickel-based mixed oxides is that reaction temperatures can be adjusted and modulated as a function of the amount of nickel that is fed into the cobalt oxide network to cover a 700 – 850°C temperature range.

Reusable energy sources

Thanks to this research, it will be possible to store thermal energy originating from natural sources such as the sun or from the reutilisation of residual heat produced by high-temperature chemical processes. This means that major energy losses can be avoided and that energy can be recovered and reutilised outside the scope of an industrial activity or at any other point in a process where an energy source is required.

Consequently, it will be possible to use the new materials developed under the patent as a medium for energy storage at CSP solar power stations or in industrial activities featuring high temperature processes such as, for instance, steel mills.

Concerning IK4-TEKNIKER

With more than 35 years of experience in applied technology research that has been transferred to companies, IK4-TEKNIKER has achieved a high degree of specialisation in four major areas (Advanced Manufacturing, Surface Engineering, Product Engineering and ICTs). This means that its cutting edge know-how has been made available to customers to meet their requirements.

Concerning CIC energiGUNE

CIC energiGUNE is an outstanding research centre in the field of energy storage as well as a strategic initiative in this field backed by the Department for Economic Development and Infrastructures of the Basque Government and supported by other bodies such as the Provincial Council Álava, the Ente Vasco de la Energía (the Basque Energy Board). The organisation also has some of the Basque Country's leading energy and storage firms on its Governing Board, namely, Iberdrola, Cegasa Portable Energy, Sener, Siemens-Gamesa, Ormazabal, Idom, Solarpack, Corporación Mondragón y Nortegas.

CIC energiGUNE is also a benchmark laboratory in terms of energy storage in southern Europe as it owns state-of-the-art facilities equipped with high-profile infrastructures for electric storage testing and prototyping (including automotive solid-state batteries) and thermal storage (with two testing loops). The organisation has released more than 500 scientific publications and is involved in more than 35 industrial projects every year.

Further information

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IK4-TEKNIKER | Itziar Cenoz

Itziar.cenoz@tekniker.es | Tel. (34) 943 256 929

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GUK | Ane Roteta

ane@guk.es | Tel. (34) 690 212 067

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MBN COMUNICACIÓN | Javier Palacios

javierpalacios@grupombn.com | Tel. (34) 628 538 199

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