# OPPORTUNITIES FOR THE USE OF INDUSTRIAL RESIDUAL HEAT

*Posted on 16/09/2020 by Naider*

***Original article published by Confebask (link)***

The need to improve
energy efficiency in the industrial sector is unquestionable. Is about
a sector that approximately consumes a third of the world's demand for
energy, mostly fossil fuels. An energy source whose consumption
massive and progressive exhaustion can lead to situations of increases in
prices and energy insecurities.

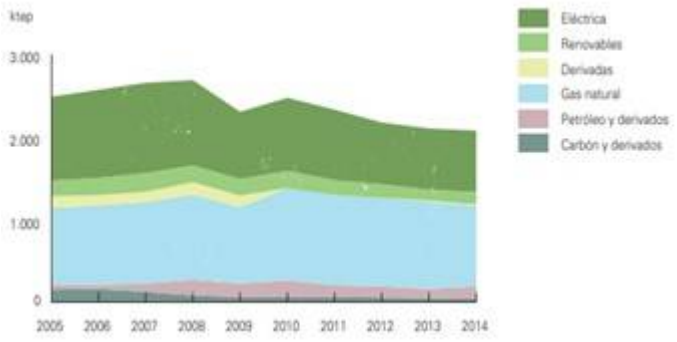


**Figure 1. Evolution of industrial energy consumption in the Basque Country. Source: Euskadi 2030 Energy Strategy (EVE).**

For the industrial sector to reduce dependence on this energy source and in turn reduce its environmental impact, it has two options: increase the use of renewable energy or reduce energy consumption. Or better, combine both options.

In some environments,
as is the case of Euskadi, the industrial sector plays an important role,
both economically and energetically. The Basque industry is responsible for the
42% of final energy consumption, compared to the 26% average in the European Union.
Therefore, it is a fundamental sector, to achieve the objectives of
decarbonization and energy efficiency of the economy as a whole.
For this reason the *Energy Strategy*
*of Euskadi 2030*, establishes that one of the areas of action must be
be to improve competitiveness and energy efficiency in the industry
basque.

One of the areas of
action of greatest industrial interest is the recovery of heat
residual. Waste heat from European industrial production is estimated to
It has a potential value of more than €4,000M (in the Basque Country it could be €180M)
annual energy expenditure. In the productive processes of some subsectors
industries such as foundry, steel, paper or cement is lost between 35%
and 50% of the waste heat.

In turn, these same
subsectors group more than 50% of the industrial GVA, so it is about
key sectors where to work on energy efficiency. In a study conducted
in 2010 by the EVE it was identified that the potential for energy savings in the
Basque industry could be between 5-23% of consumption.

**Figure 2. Potential energy savings according to source and type of industry in the Basque Country. Source: Euskadi 2030 Energy Strategy (EVE)**

With this objective, different energy efficiency research projects are being developed. According to the *Euskadi Energy Strategy,* in recent years, more than 870 energy efficiency projects have been subsidized in industry.

A first case noteworthy in the field of use of residual heat is the project of R&D, **BEROA-GO**, funded by the Elkartek program of the Basque Government. Coordinated by Tekniker and Tecnalia and that Its purpose is to take advantage of the residual heat emanating from the pieces incandescent, that is, solid bodies. Something new since the use of heat from liquids and gases is more frequent.

The project has developed a system that allows heat to be captured and reused in other purposes such as electricity generation or air conditioning. Also, heat absorption irradiated reduces various problems that it generates in the working personnel and in the machinery.

Beyond the Basque Country, in The European Union is also aware of the challenge of improving the energy efficiency of the industry, therefore, in recent years there have been developed numerous R&D projects with European funding that have the same objective, to improve the energy efficiency of the industry through the use of residual heat.

This is the case of the project **TASIO**, financed with H2020 funds, and which has had the participation of Tecnalia together with other European research centers.

This project has analyzed real industrial plants, some of them located in Euskadi, of the industrial subsectors that consume the most energy, such as cement, glass and steel, with the aim of identifying the sources of residual heat most suitable that could be captured for the production of electricity through Organic Rankine Cycles.

Sources are the exhaust gases from different processes and their exploitation for the production of electricity would lead to significant energy recovery, with net production estimates from 560kW to 1,870kW. Analyzing the price of the industrial electricity in Spain, it is estimated that the proposed investments in the case study would be profitable in a period of 7.7 years.

Another R&D project with European funding is the **SUSPIRE** that goes one step further

there and, in addition to proposing the use of residual heat from centers energy-intensive industries, plans to establish a framework to foster the commercialization of surplus energy to residential areas, other companies in industrial parks or sports centers.

this case is analyzed
a plant located in the Basque Country, with an annual consumption of electricity and gas of almost 35,000 MWh, which represents approximately 5,500t of CO2 and more €1M of expenses associated with energy. On the other hand, the losses identified annual energy amounts to 6,500 MWh. It is decided to work with some heat currents that account for approximately 50% of the losses and it is possible to recover 73% of them through different uses such as steam production, office air conditioning, reuse of the plant and its distribution to nearby third parties is also proposed as a sports Center.

Thanks to the systems
of installed heat utilization and the improvement of the efficiency of the process, a reduction in annual consumption of 19.5% of energy is obtained primary, being greater the reduction in the consumption of natural gas for what it also decreases dependence on fossil fuels. Regarding the impact environment, a reduction of almost 1000t of CO2 per year is estimated, that is, 22% of emissions associated with the production process. All this with periods of amortization of the necessary investment between 7 and 14 years depending on the commercialization of energy to third parties.

In some cases the
initial analysis of savings potential is often one of the biggest barriers to develop these investments, so from another project with European funding, **Indus3Es**, have developed a free access tool for potential users to make a first evaluation of the technical and economic potential of the installation of a heat recovery system based on an absorption heat transformer.

They are numerous, for
Therefore, the projects and technologies available to improve efficiency energy of industrial processes through heat recovery residual. But there are many more decarbonization opportunities that arise as well in other areas and in other nodes of the industry value chain. Opportunities that the commitment to the circularity of the economy and the demand of its decarbonization force us to explore without delay and with optimism.

**MIKEL MUÑOZ**
**Energy Specialist**

Photo by JC Bonassin

**There are no comments yet.**