

Non-technological barriers hamper the integration of renewables in production processes

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Dozens of projects have been promoted over the last decade to make industrial processes energy efficient, thus reducing costs and decreasing impact on the environment. However, a definitive solution to reducing energy consumption in such processes is far from being reached.

"In the end," says Anibal Reñones Dominguez, researcher at Cartif, a research centre in Valladolid, Spain, "many bottlenecks are human rather than technical. I think we have a wide range of technologies to be implemented in industrial settings, but in most cases it is their perceived costs that will be the deciding factor. And when I say perceived costs, it is not only about the level of investment needed and the associated time for return on investment. I'm also referring to organisational changes that new approaches to [energy](#) efficiency might bring about in complex environments like production plants. Despite growing awareness about the need to better use resources and energy, many managers remain quite reluctant to change, especially when this means challenging a consolidated practice within the production process".

"We are trying to take those non-technological issues into account – adds Francisco Morentin, responsible at Cartif for the REEMAIN project, funded under the EU Factories of the Future programme – but we have to admit that the first level evaluation made by factory managers almost immediately takes on an economic nature. Process innovation that entails more than a five year return on investment for an existing product will

almost inevitably be discarded, though this may apply differently across various industrial sectors."

"In the REEMAIN project, we are demonstrating different approaches for energy efficiency in three sectors: the food industry with a case in Spain, textile manufacturing in a big factory in Turkey, and the foundry sector with a plant in Italy. Needless to say, energy consumption has a much higher relative weight in the metal casting industry, meaning that interventions on [energy consumption](#) act on a major cost factor. Where energy is a tiny percentage of production costs, changes are less attractive. As a common thread, we are, however, experiencing difficulties in making concrete plans for the integration of renewables in our demo cases. There may be different reasons for this: from subsidised prices for energy to the lack of available space for new systems as we are facing with existing roofs, or very high ROI expectations by financial managers, or, as in Spain, with national regulations that may deter self-consumption. In the U.S. or in the Emirates, huge solar plants are emerging as a solution to satisfy the needs of industry on a very large scale, especially when production sites are designed from scratch. However, this may not be the most appropriate solution in the already existing factories in Europe where space is less easily available and economies of scale are more difficult to attain and factory relocation is always a controversial issue."

In a regulatory landscape where incentives have traditionally been designed to support generation rather than consumption, the pace of innovation could be boosted by policies more suited to paying back some of the investment for industries that are making their production processes more energy efficient.

"The impact that policy may have is, of course, beyond the scope of our investigation," says Morentin, "but it could deserve a proper study to see how some of the main bottlenecks to innovation in production systems

could be overcome. Education could also play a role to help new generations of managers to better understand how [energy efficiency](#) technologies can contribute to their production strategies.

"Even in the specific cases where renewable energies might show good economic performance in terms of ROI values, many factory managers remain extremely conservative, following two classical rules: (A) if it ain't broke, don't fix it, and (B) Keep It Simple Stupid (KISS), especially when new organisational models might be necessary. These managers usually and wrongly perceive integrating renewable energies into factory processes as a loss of reliability since it is slightly more complex. Unless energy costs represent a big share of the production costs or unless energy supply is not constant and secure, which is not the case in Europe, this reluctance will remain as an obstacle to innovation. External forces like regulations or future consumer demand of products manufactured with a higher share of renewable energies might help overcome those barriers."

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