

Waste heat likely to boost energy efficient production

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Europe has a leading position in technologies for clean manufacturing, but significant efforts are needed to lower investment costs and encourage factory managers to adopt energy-efficient innovations.

Waste heat and solar process systems have potential to reduce the environmental impact of industrial production. Yet, their adoption is hampered by cost efficiency concerns as legislation still allows attractive subsidies for [energy](#) from other renewables. A specialist of energy efficient technologies, Dr. Uli Jakob of dr. jakob energy research, points to the key bottlenecks to address in the next decade to unlock real innovation in European and global factories.

What is the first thing a plant manager would need to look at to make production more efficient?

A plant manager is always mindful of his/her energy bills, and therefore has to ponder ways of using waste heat from production. This could include directing it to other industrial processes, or converting it into electricity through organic ranking cycle (ORC) or into cooling via thermally driven sorption chillers. Renewable energy sources could also be called on in order to lower operational costs for future production.

As a second step, it would be worthwhile to install meters to get a clear picture of the energy flows inside the factory and its production processes.

Does the specificity of a given production system favour certain technologies over others? For instance, foundries where temperatures are extremely high may have wildly different requirements in the textile or food sectors.

Yes, depending on the energy demands and/or the temperature level of a given production process, certain types of renewable sources or waste heat technologies can be selected and others disregarded. As an example, for foundries, solar thermal collectors make no sense because the maximum temperature level they can provide is about 100°C to 250°C depending on the technology (non-concentrating or concentrating collectors). However, this technology is very interesting for the food and textile sectors, where lower temperature levels are required for the production process.

Are there technologies that ensure an easier return on investment compared to others?

Yes, such [renewable energy technologies](#) with a faster payback time are available on the market, such as photovoltaics or wind turbines, but this also depends on legislation because of the feed in tariffs applied in different countries. In contrast, waste heat technologies like ORC units that convert waste heat into electricity, which seem to be attractive from an energy point of view, involve high levels of investment, and this can sometimes put off company owners or investors.

Do you see new technologies emerging as a ground-breaking solution in the years to come and how is Europe positioned?

I think there will be ground-breaking solutions delivered over the coming years by solar process heat systems, and through the use of waste heat to run thermally-driven absorption and adsorption chillers as well as combined heat and power (CHP) units. These emerging technologies are set to make future European production more energy-efficient and cost-effective. Europe is a world leader in the development of renewable sources and waste heat technologies and systems for industry.

But we will have to step up our efforts if we are to bring these technologies to users and if investment costs are to be brought down. At the beginning, this may require government support through funding schemes as a way to increase the market share of such technologies and to secure their acceptance for the future. These energy-efficient solutions can be also used and sold outside the EU, meaning that Europe could export its know-how and [products](#) to third countries, thus strengthening its leadership in the sector.

Finally, what is the legacy of the work you are doing in the REEMAIN project in this respect? Can you walk us through some of the project's possible impacts?

REEMAIN will provide a set of tools that a plant manager or company owner can use to explore whether to invest in new renewables or waste heat technologies to make current production processes more energy-efficient, and in the medium term, more cost-effective. We are developing so-called manufacturing reference scenarios that can give an indication as to which renewables and waste heat measures can be implemented, monitored and analysed in different types of production environments.

We expect that the technology roadmap we are producing for [renewable](#)

[energy sources](#), storage and [waste heat](#) recovery for efficient manufacturing, as well as the REEMAIN software tool, will appeal to users and generate a long-lasting impact beyond the project's lifetime.

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