Potential for Success

Reduce energy costs efficiently in the pharmaceutical industry

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The increase in energy efficiency is developing across all sectors into one of the industry's most important competition factors. Most recently, this development has been further strengthened by increasing energy prices, environmental impacts and political demands.

However, even industrial branches which are not energy-intensive have great economical potential for cost reduction through efficient energy utilisation. The pharmaceutical industry is included in this category, with an energy cost proportion of the gross production value amounting to 1.2 %.

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Rethinking

But why are measures for increasing energy efficiency still meeting resistance? Do the high requirements for quality assurance in product finishing prevent their implementation? Or do old behavioural patterns still link energy efficiency primarily with extra costs and high personnel requirements, and thus it is not perceived a necessity in the minds of those responsible? Yet it is completely ignored that these very requirements enable considerable potential to increase energy efficiency and associated cost cutting in the production process to be realised and reflected in the profitability analysis. Figure 1 demonstrates possible approaches.

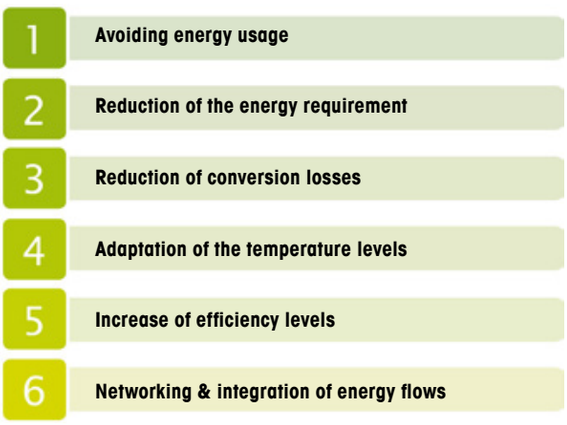

Fig. 1 Efficiency approaches in the pharmaceutical industry
(source: Limón GmbH)

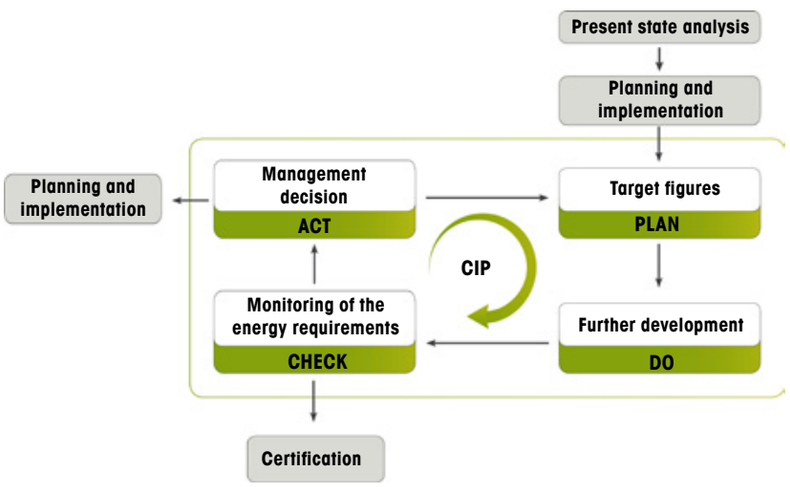

Fig. 2 The path to successful energy management
(source: Limón GmbH)

Efficient production processes

If we look at ventilation and air-conditioning technology as an example, even small changes can lead to enormous savings. In the process for maintaining air quality and quantity, the ventilation and air conditioning equipment alone requires up to 60 % of the total energy consumption just to be able to operate. However, particularly here, the limits for the "air supply" are so tightly set that virtually no regulation can yield an efficient operation. This is especially true for the temperature and humidity ranges, air exchange rate and specific circulating air. In most cases, deviations of only 5 – 10 % of the target value are permitted, although existing GMP guidelines allow for a wider range. Simply by extending the humidity requirements alone, however, it is possible to realise annual savings of up to € 8,000 for only one plant. Similar potential can be found in temperature regulation. Thus, if no personnel are present in the night shift, the temperature can be set to below 22° C, in order to realise considerable savings. The same is true for the air exchange rate, which in normal operation ensures air purity, and that it is free of particles. Where no employers come in, and thus no particles are brought in, HVAC units can be set considerably lower. These measures only constitute control adjustments and can be performed without any large investments.

Considerable potential can be found in biotechnological processes as well; this includes in particular, heating up, cooling down, reheating, deep freezing, and similar processes. Here too, the controls work according to preset programmes and target values. Decisive for many pharmaceuticals is, which temperatures they have to assume in the respective conditions. To avoid losses here, heating and cooling times should be checked and existing valve positions should be checked as necessary. Great potential savings also lie in the temperature differential between flow and return. However, the energy efficiency consideration should not stop at the vessel, but first at the energy and media supply.

The energy and media supply offer further interesting approaches: How much does a CIP process really cost from an energy point of view? (CIP = Cleaning in place, process for cleaning of processing plants) What are the costs for one m³ purified water or one m³ water for injection? Firms should be able to answer these questions to be able to assess the profitability of certain measures in a meaningful way. From time to time it should be asked what pharmaceutical grade water or generally

which media are actually necessary for which production step. The motto here is "production based on demand". This cost transparency, also in the interdisciplinary technologies, increases energy efficiency awareness and again makes considerable savings possible.

Saving systematically

Apart from the measures in the production cycle already named, further savings potentials can be generated by the introduction of an energy management system according to the latest DIN EN ISO 50001. The implementation offers many opportunities for the pharmaceutical industry as well to position itself correctly for the future in the area of energy and to increase competitiveness. Here, the latest legal framework regulations are in the foreground, in addition to enhanced awareness within the firm regarding the ever-growing importance of the production factor energy and the increased transparency for existing energy flows. Besides the energy and power tax, the compensation regulation according to §§ 40 ff. EEG requires an energy management system in place to reduce the contribution to be paid. The firms wanting to use the peak compensation regulation from 2013 onwards have to bindingly introduce and maintain a DIN ISO EN 50001-compliant energy management system. The standard describes the requirements for supply and use of energy, their measurement, documentation and reporting system and the design and procurement processes for plants, systems, processes and personnel using energy. Therefore, an energy management system helps pharmaceutical companies to act in the long term even more sustainably than before, reduce their own energy consumption further, use resources more efficiently and thus realise considerable savings.

Conclusion

Particularly in the pharmaceutical industry, it has been shown that increasing energy efficiency does not mean turning a single screw, but that many different processes are involved. Here, it is important to search systematically for promising economical potential that are promising success, and individually find measures adapted to your own needs. Thus the topic of energy efficiency comprises an innovative, simultaneously complex scope of tasks, which, when supported properly, can bring considerable success to your firm.

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