

ResmaP

Resource efficiency through smart pumps



Resource-efficient Circular Economy – Innovative Product Cycles (ReziProK)

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ResmaP relies on the innovations of smart pumps of the latest generation in order to save valuable resources through new processes, forms of organization, and exchange and spare parts strategies. Innovative approaches, such as remote maintenance or remote-update capability, are used in a targeted manner to increase the service life of the products on the one hand, and to ensure that replaced pumps and components are recycled at a high level of value preservation.



Heating pumps in the internet of things

Modern smart pumps make it possible to record and transmit valuable data on the condition, e.g. malfunctions, and the conditions of use of the product throughout the life cycle of the pump. This data can be used by service personnel and specialist technicians to simplify fault diagnosis and repair. In addition, this data can provide information for further product development. In ResmaP, the project consortium plans to use these new possibilities specifically to increase resource efficiency.

Whereas previous developments in the field of pump technology have focused mainly on energy efficiency in the utilization phase, ResmaP focuses on the area of material efficiency. For example, the technical possibilities of smart pumps should help to reduce resource consumption by extending the service life and targeted recycling of products and components considerably. To this end, the processes along the distribution chain, especially in maintenance and repair and in the return of products, are to be redesigned. This is intended to make optimum use of the resource efficiency potential inherent in smart pumps.

Closer cooperation

The use of resource efficiency potential through smart pumps requires two things in particular: firstly, precise knowledge of resource consumption over the entire product life cycle of the product and secondly, an increased willingness to cooperate between the actors. The skilled tradesmen and women in particular play a decisive role here. The skilled tradesman is usually the one who installs and maintains the heating pump and also decides when and whether a pump needs to be replaced or whether repair or replacement of certain components is sufficient.

In order to achieve the project objectives, the cooperation between pump manufacturers and skilled tradesmen is to be intensified in future. Other parties involved, such as wholesalers and facility management for larger residential units, are also to be involved accordingly. This requires a profound redesign of the processes and organisational structures between the actors. In order to achieve these goals, the project will test and evaluate new processes and organisational forms in maintenance and repair as well as in the return and dismantling of products and components – starting with a detailed investigation of resource consumption – from raw material extraction to recycling.

First results

Throughout the first half of the project, the team was able to gain valuable insights into the potential of selective circulation of pumps as well as levers for increased resource efficiency throughout the pumps' lifecycle enabled by digitalisation and the introduction of smart products. Existing processes for repair and maintenance of pumps were analysed in detail and adapted to allow for the implementation of remote processes enabled by smart pumps. Preliminary assessments hint at potential savings in both repair and maintenance related travel as well as a reduced overall number of spare parts needed. In parallel the LCA study was advanced by gathering information on products, materials and processes involved and a corresponding model is being developed. Initial findings were presented at the Electronics Goes Green 2020 conference in September with additional publications currently being explored.



A new pump from the lead company WILO SE.

reziprok.produktkreislauf.de/en

Expected project results

The aim of the project is a new process of maintenance and repair and the replacement and recirculation of pumps, which has been tested in pilot trials. This new practice, initially tested by service technicians of the Wilo SE company, enables the extensive use of the resource efficiency potentials of smart pumps. In the course of the project, the results will be processed for external actors such as specialist tradesmen in a target-group-oriented manner in order to enable them to act in a resource-efficient manner in the future, which is reflected both in longer product lifetimes and in high-quality closed product cycles.

In order to achieve the project goals, Wilo SE, as a leading pump manufacturer, has joined forces with the Fraunhofer Institute for Material Flow and Logistics IML, whose focus is on recycling management and process design, and the TH Köln University of Applied Sciences with its focus on resource-side evaluation.

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Resource-efficient Circular Economy – Innovative Product Cycles (ReziProK)

As part of the FONA Field of action 6:

The circular economy – efficient use of raw materials, avoiding waste.

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ResmaP – Resource efficiency through smart pumps

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