

Abstract

Project goal was to develop a cost-effective technical solution for reducing energy and water consumption of old washing machines and dishwashers in order to extend the use phase of these devices significantly. The method of a successfully implemented pilot project (specific adjustment of the pressure control of washing machines and thus reduction of energy consumption by about 20% due to lower water consumption) was further developed by the applicant R.U.S.Z - Association for Promoting the Social Economy - in cooperation with scientific partner KERP Research electronics & Umwelt GmbH to achieve serial production and it was proved that the measure was not affecting the cleaning results.

The following procedure was applied:

Within the framework of detailed planning and sequence control the technical and market-oriented tasks for a targeted project execution have been defined, agreed with the parties and assigned to the appropriate persons. In addition, an ongoing evaluation of progress and interim results was performed and the development process subject to a correction loop where appropriate.

To obtain precise measurements of the working parameters of the devices and repeatable benchmarks to ensure the results obtained, a laboratory, consisting of a climatic chamber to stabilize the environment parameters, a water treatment plant to control delivery pressure, temperature and water hardness and a measuring station with various measuring and testing equipment has been designed, procured and installed.

Based on the results of the preliminary project "Trim back the energy consumption of old washing machines," the developed adjustment method has been optimized. In addition, other technical opportunities to increase energy efficiency of used washing machines and dishwashers have been investigated.

In the next step tests were carried out to increase energy efficiency (tuning) of different types of devices. A total of 85 test series were performed with different washing machines.

Additionally a plan for a standardized testing and tuning process was worked out. Core element of this is a semi-automatic test and tuning apparatus for pressure controls developed in the project, which enables large-scale optimization of devices. At the end of the project, the achieved results were evaluated internally and submitted to a technical development and optimization feedback loop to eventually standardize the process and to implement it for everyday use in the workshop and on site with customers. Unfortunately, the innovative tuning could not be extended to dishwashers, although these follow a similar principle of water regulation. No relevant quantities of dishwashers matching the defined selection criteria ("ReUse" criteria) could be identified. It was also detected that all dishwashers delivered to R.U.S.Z for being repaired or made available as donations, are already operating with a minimum of water consumption and therefore the principle of tuning turned out not to be applicable for dishwashers.

The results will be utilized by the applicant himself and will be replicated with relevant social-economic umbrella organizations such as RepaNet (Austria) and RREUSE (EU).

The project began in January 2010, had a duration of 15 months and a planned budget of EUR 159 691, -. Due to various delays in the construction of the research lab (in particular regarding the climatic chamber) it was applied for a project time extension until June 2011, resulting in an actual project duration of 18 months.