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Concept study for energy and resource efficiency for the operation of data centres

With the installation of new servers, the cost of electricity for computing power and, even more so, for the cooling of the corresponding servers rises significantly quicker than the gain in benefits from these servers. This means a much lower return on investment for data centres in the future. Additionally, data centres get the reputation of "climate killers" because of their enormous energy consumption.

At present approximately 40-60% of the energy costs in a data centre are the result of the cooling systems. The steadily increasing amounts of waste heat already challenge the engineering of the systems and facilities. Therefore large investments in air conditioning technology are necessary, or the construction of new buildings has even to be considered. Against this background the "Technologiestiftung Berlin, in cooperation with TU Berlin (department of energy technology), started a project called "energy efficiency in data centres" at the beginning of this year. For the first time ever, a detailed study about data centres and their energy consumption in the Berlin-Brandenburg region is being conducted through this project. The goal of the project is to find innovative solutions for systems, building service and installation engineering of problems concerning cooling and waste heat utilisation. Three existing data centres are therefore being analysed. For each centre a viable short term solution and a long term option will be developed. These solutions will consist of special, technical innovations adjusted to the actual needs of each centre.

In addition to the development of technical solutions, operating cost saving potentials for each solution will be calculated. Furthermore, the importance of energy efficiency in operating data centres in the Berlin-Brandenburg region will be ascertained.

The focus of the project is to identify opportunities for small- and medium-sized businesses arising from the developed concepts. Hence the cooperation between research facilities and

businesses needs to be strengthened. Through the joined efforts to develop innovative solutions for equipment and buildings for data centres, a research cluster for the Berlin-Brandenburg region should be promoted.

The purpose of this project is to gain a leading position in that field in Germany, or possibly world-wide, and thereby boost the local economy and create new job opportunities in the region.

Call for Interest:

The selection of data centres taking part in the project has already begun. All operators of data centres are invited to participate. As a matter of course all published results will be anonymised.

For mapping all crucial processes in data centres the existing project should be expanded by two more essential fields. Firstly, the potential for improving energy efficiency in the field of hardware components (e.g. CPU, server, plugs) needs to be researched and, secondly, innovative software concepts in the field of operating process (e.g. virtualisation) are to be developed.

Partners from research and business are invited to participate in the initiation of corresponding research projects.

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