



VIDEO TRANSLATION

DCA: Welcome to everyone tuning in - To assist in the transfer of knowledge we will be conducting a series of video interviews with partners of the Marie Curie European Exchange Project No 734340 Dew-Cool-4-CDC. Today I am pleased to be joined by Dr Yuanda Cheng, Associate Professor, from Taiyuan University of Technology. Hello, Dr Cheng.

Dr Cheng: Hello.

DCA: To help those watching could you first tell me a little bit about Taiyuan University of Technology and your daily responsibilities within the organisation?

Dr Cheng: Taiyuan University of Technology's key focus is on engineering education, it is the only "211" university in Shanxi Province. The department involved in this data centre cooling technology project is the Built Environment Engineering Faculty at the university. Our department is one of eight of the first departments related to HVAC across all Chinese universities and was established in 1957. Over several decades, we have gained lots of knowledge in the subject of HVAC.

DCA: And can you tell us more about your own daily responsibilities within the organisation?

Dr Cheng: I graduated from Hong Kong Polytechnic University in 2013 and came back to Taiyuan University of Technology in teaching. I am mainly focused on the research around

building energy conservation and AC energy conservation in data centres. Projects we have participated in include National Key Research of China Projects, National Natural Science Foundation of China Projects, and Key Research & Development Projects of Shanxi Province, etc. I am also responsible for an institute team covering six teachers, two professors and three vice professors, and a lecturer working on the research work.

DCA: Can you tell me about your involvement in this Marie Curie European Exchange Project?

Dr Cheng: I participated in this project in a supporting role, other supporters include Dr Zhang Xinwei and Yang Jiping. We are mostly responsible for the control of AC system in this project. The self-control requires a high level because cooling system is complex in this novel AC system. In 2018, I came to Hull University in UK for exchange, working on this research project for a year.

DCA: What are the principal goals and objectives of this project from your perspective?

Dr Cheng: Data centres has developed a lot in recent years with the progress of Internet and information era. However, data centres are always high in energy consumption due to IT equipment and air conditioning, the proportion of the energy consumed by AC can reach 40-50%. Therefore, it is important for the whole industry to target carbon reduction by investigating AC energy conservation in data centres.

DCA: Specifically what work packages and deliverables are you as an organisation responsible for?

Dr Cheng: Our research group is mainly focused on the automatic controls in data centre. We've done some studies on the method of auto control, and developed some control systems including the control cabinet, the hardware control system of DPC, the model machine, the monitoring system and the software platform. Our smart control cabinet can be combined successfully with monitoring software for telecommunications. Our aim is to achieve the control and operation of the AC system in data centre and obtain energy conservation. These are some of the major projects we have worked on.

DCA: Next we'll ask some technical questions. Can you introduce to our audience to the Data centre DPC cooling control system that developed or used in this project?

Dr Cheng: It is the system developed by us. The DPC cooling control system contains smart control cabinets and monitoring software. Model machines of control cabinets have been produced although they still cannot be exhibited. A control cabinet involves the mainboard of

controller, the expansion boards on simulator and switch which are all developed by us. It also contains the manual interface, of which the contents are all researched by us. As for the hardware system in controllers, it consists of core boards of controllers, baseplates of controllers and expansion boards of analogue and switch. The controller can control four expansion boards, which means a great deal of variables are able to be controlled. In addition, core boards and baseplates of controllers are combined by two pin headers in 2*30 dimensions. The baseplates can not only expand the memorizer and line groups, but also are cover the basic switch input & output channels. So, this system is at the highest levels for quantity and quality of monitoring in the industry.

DCA: Can you tell us more about TUT`s work in the development of this technology and why is this technology important to the whole system?

Dr Cheng: As I said earlier, our work is mainly to develop this cooling system from nothing. In the aspect of communication, many of our professors and I have visited other cooperating organisations for an exchange of ideas. During the exchange period, we have communicated and coordinated a lot on the technical issues with organisations including GDUT, CABR and the University of Hull. As for the importance of this technology, the AC system in data centre is complex, so to control the auto operation of all elements, the auto control system should be applied. For example, sometimes in transition seasons, we must increase the cooling capacity of DPC, if this is the case we need to make commands through auto control systems to increase it. Then the energy consumption can be reduced with the use of more natural cooling capacity. Besides, every system within the whole system is also coordinated through this control system, including heat recovery system, reuse system, etc. In other words, this control system is a core part of AC system as it auto controls and operates the whole system based on different conditions to achieve energy conservation.

DCA: Finally, can I ask you to summarise why it was so important for Taiyuan University of Technology to participate in this project and highlight the value of what it has and or will deliver?

Dr Cheng: Firstly, the research - cooling and energy conservation of data centre is the vital research direction in the industry. It is helpful to improve our research ability by participating in this advanced project for TUT. Secondly, our cooperating organisations include CABR, Tsinghua University and GDUT, University of Hull, etc. it has been helpful for us to enhance our research ability and cultivate scientific talents by cooperating with these high-level

institutes. Therefore, participating in this project is a good for us for both research contents and communication.

DCA: That great Dr Cheng, that just about leaves me enough time to thank Dr Cheng, from Taiyuan University of Technology for taking the time today to explain a little more about the Marie Curie European Exchange Project and the valuable contribution it has made to the research and development of the Dew Point Cooler technology. This interview will be available to view on the project website shortly, where you will also find interviews with all the partners involved in this project. Thank you.