



Mitigating the industrial energy efficiency problem in China

Investigating the acceptance of energy services companies using the
Theory of Reasoned Action

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by

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Declaration

I hereby certify that the work embodied in this Dissertation Project is the result of original research and has not been submitted for a higher degree to any other University or Institution.

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Abstract

The rapid growth of the Chinese heavy-industry sector has presented both opportunities and challenges to the country. While the heavy industrial sector contributes significantly to the growth of China's GDP, the energy-intensive nature of this sector has led to unprecedented problems in resource sustainability, pollution, and climate change.

Encouraging firms in the heavy industrial sector to use energy services companies (ESCOs) to improve energy efficiency has been a high-priority of the Chinese Government. According to the traditional view, regulations and incentives are believed to be important drivers for ESCO adoption. It is also believed that energy performance contracting (EPC) is an effective tool for ESCO deployment based on its economic viability. Thus, many policies and incentive schemes in China focus on promoting EPC. However, while there are some successful cases, the current level of adoption of ESCOs in the sector remains generally low.

This research uses the TRA framework to provide a quantitative investigation into how tangible factors such as government incentives and intangible factors such as the perceived capability of and trust in ESCOs are related to the adoption of ESCO services by firms in Chinese heavy industries. A proposed model incorporating the existing views about EPC has been developed and tested.

The results indicate that government incentives significantly predict intention to use ESCOs and the actual use of ESCOs, which is consistent with the traditional view. However, although preference for EPC is a significant predictor of the intention to use ESCOs, it has been demonstrated that attitude to use ESCOs is an even stronger predictor. The attitude is, in turn, strongly affected by the perceived capability of ESCOs and, to a lesser extent, Trust in ESCO. On the other hand, trust directly affects the intention to use ESCOs at a magnitude comparable to preference for EPC. Based on the research findings, we have recommended to develop an ESCO accreditation system and a sector-based collective guarantee scheme.