

Performance-Based Contracts for Energy Efficiency Projects

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Abstract

Energy efficiency projects are often executed by specialized entities, namely energy service companies (ESCOs). A typical ESCO's core business is conducted using performance-based contracts, whereby payment terms depend on the energy savings achieved. Despite their success in public, commercial, and industrial sectors, ESCOs in the residential sector are involved in fewer projects and face several challenges. First, an energy efficiency project often leads to changed consumption behavior; hence it is more difficult to evaluate the energy savings that are due to the project itself. The second challenge is that residential clients are more risk averse and, thus, less willing to contract for projects whose outcomes are uncertain. Third, a lack of monitoring protocols leads to ESCO's moral hazard problems. This paper studies ESCO contract design issues, focusing primarily on the residential market for energy efficiency. As opposed to other sectors, coordinating contracts do not exist. We show, however, that simple piecewise linear contracts work reasonably well. To improve their profitability, ESCOs can reduce uncertainty about the technology employed and/or develop ways of verifying post-project energy efficiency. Since policy makers are understandably keen to promote energy efficiency, we show also how regulations and monetary incentives can reduce inefficiencies in ESCOs' relationships and thereby maximize environmental benefits.

Keywords

Sustainable Energy, Energy Efficiency, Performance-Based Contracts, Double Moral Hazard

Biography

Sam Aflaki Sam Aflaki is an associate professor of operations management in HEC Paris's department of information systems and operations management. Sam holds a Ph.D. in management from INSEAD and his current research focuses on sustainable decision making, operations management, and (energy) policies. His research has been published in leading management and economics journals as well as being recognized in a number of INFORMS' prestigious competitions. Sam teaches the operations management course in various programs including the MSc, MBA and EMBA. Sam serves as the academic director of the operations module in HEC EMBA program as well as the industrial excellence award (French division).