

Standardized Approaches for Measurement and Verification in Household Energy Efficiency Projects

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Energy efficiency in households has a large potential to reduce greenhouse gas (GHG) emissions (Niederberger 2006; Levine 2007). International and national market-based policy instruments exist to foster household energy efficiency. An international market-based policy instrument is the Clean Development Mechanism (CDM). The CDM is a mechanism of the Kyoto Protocol, which allows countries with binding targets under the Protocol to compensate their emissions in countries without binding targets (Michaelowa 2005; Ohndorf 2009; UNFCCC 2012). Tradable White Certificates (TWCs) schemes are a national market-based policy instrument. A precondition for TWCs is Energy Saving Obligations (ESOs), which require energy suppliers to realize energy efficiency improvements among energy end-consumers. The securitization of the achieved reductions in energy demand results in TWCs, with each certificate representing a per-unit reduction in energy demand (Bertoldi 2009; Gerigk et al. 2012, Giraudet 2012). Especially for the process of certification of achieved reductions in market-based policy instruments, the measurement and verification (M&V) of achieved reductions in energy consumption and GHG emissions is of major importance (Michaelowa 2005; Meyers 2008; Bertoldi 2009; Bertoldi 2011). To date, a large amount of academic literature has been published that evaluates the performance of the CDM (Gupta 2003; Michaelowa 2005; Niederberger 2006; Paulsson 2008; Streck 2008; van der Gaast 2008; Michaelowa 2009; Schneider 2009; Lewis 2010; Schneider 2010) and ESOs schemes (Bertoldi 2008; Bertoldi 2009; Broc 2010; Bertoldi 2012; Giraudet 2012). Yet, there is only limited literature that focuses on the standardization of M&V processes used in the two policy instruments (Meyers 2008; Eichhorst 2010; Hayashi 2010; Müller 2011; Füssler 2012).

Part of the research performed in my doctoral thesis focuses on M&V of reductions in energy consumption and GHG emissions achieved by household energy efficiency activities. The main objective is to identify features of optimally standardized approaches that will enable M&V procedures to become more simplified and cost-effective. In order to identify such features I first perform a literature review among existing CDM methodologies, which define the M&V of emission reductions achieved by household energy efficiency projects. Second, I perform a comparative analysis of standardized measures and their calculations used in existing market-based ESO schemes.

Interaction of the public and private sector in my research

The research forms an integral part of the project "Off4Firms", which aims at reducing GHG emissions and energy consumption of employees' private households. The project involves several partners from the public and private sector (South Pole Carbon, ewz, Swiss Re). Due to close collaboration with project partners from the public and private sector, my research investigates into a direction which can be of commercial interest and or be used (firm) internally by all Off4Firms project partners. In my personal view, the collaboration neither deteriorates the quality of research nor poses critical issues of scientific independency. It enables a qualitative and insightful research yielding results that are useful in both sectors.