Energy Policy 88 (2016) 528–543

Contents lists available at ScienceDirect

Energy Policy

journal homepage: www.elsevier.com/locate/enpol

Evaluating public policy instruments in the Greek building sector

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HIGHLIGHTS

- We apply an MCA analysis to evaluate EE and RES policies instruments.
- We focus on the implementation stage through qualitative criteria and ordinal scales.
- We use the probabilistic evaluations of each alternative against each criterion.
- We provide rankings of instruments according to process related criteria.
- Greece should revitalize the implementation of funding mechanisms, GPP and VAs.

ARTICLE INFO

Article history:
Received 25 June 2015
Received in revised form
4 November 2015
Accepted 5 November 2015

Keywords:
Energy efficiency
Renewable energy sources
Policy instruments
Process related criteria
Probabilistic evaluations
MCA

ABSTRACT

This paper applies a multi-criteria analysis (MCA) to evaluate public policy mechanisms that foster energy efficiency and renewable energy sources in the Greek building sector, based on stakeholders' understanding and perceptions of the functionality of policy instruments. The objective is to shed light on the implementation of currently employed policy mechanisms that aim to achieve the 2020 energy savings targets and beyond, providing useful information to policy makers for future policy (re-) formulations. In this framework, policy instruments were evaluated against process-related criteria, such as implementation costs, distributional effects, and coherence of policy processes, so as to highlight successful policy practices during their implementation phase as well as to unveil cases of policy underperformance or unintended policy outcomes. To hedge uncertainties related to policy instrument selection, the method employs probabilistic evaluations of every alternative against each criterion. The MCA results showed that the country is still missing significant energy saving opportunities that could be reached through more streamlined implementation practices and political support. In times of fiscal crisis, the Greek government should also revitalize the implementation of alternative funding mechanisms and support policy alternatives such as green public procurement, voluntary agreements, and energy performance contracting.

1. Introduction

European Union's (EU) buildings account for 40% of final energy consumption and 36% of greenhouse gas (GHG) emissions in the EU, while 35% of them are over 50 years old (European Commission (EC, 2013). Buildings in Greece are a major energy consumer since the majority of buildings was built before 1980 when the Regulation on thermal insulation was introduced (Ministry of Environment Energy and Climate Change (MEECC, 2011). For the household sector the average consumption (for years 2000–2012) per dwelling, scaled to EU average climate was about 23% higher than the EU average, while final electricity consumption of the tertiary sector (for years 2001–2009) per employee was about 6% higher than the EU average (ODYSSEE-MURE Database, 2012). The Greek building sector can largely contribute to GHG emissions reduction while according to a study produced by McKinsey (2012), there is a potential to reduce the sector's GHG emissions by about 15%.

Actions promoting energy efficiency (EE) and renewable energy sources (RES) technologies in the Greek building sector constitute key solutions to achieve energy savings and GHG emissions reduction as well as means to meet EU energy and climate targets for 2020, i.e. a 20% reduction in GHG emissions by 2020 compared to 1990 levels, increase of renewable energy share by 20% and 20% energy savings achievement, and beyond. The 20–20–20 EU targets and relevant Directives have been quickly adopted in Greece causing structural changes in the country's energy and climate

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http://dx.doi.org/10.1016/j.enpol.2015.11.005
0301-4215/

policy over the last years (Spyridaki et al., 2014). Greek energy and climate policy mechanisms have been oriented to meet with the relevant European policy and objectives and have already introduced a number of measures fostering EE interventions and RES installations. More recently, in light of the new Energy Efficiency Directive (EED), the Greek government has proposed a set of eighteen alternative policy instruments (PIs), both from the existing PI mix as well as new ones to fulfil its national requirements (MEECC, 2014a). Reportedly, existing instruments continued in the new National Energy Efficiency Action Plan (NEEAP) submitted in December 2014, such as subsidy programs, demonstrate restrained participation levels both at the residential and tertiary sector, whereas other types of legislated PIs remain still in idle.

In the meantime, the economic slowdown continues to stroke the average household income and final consumption expenditure as well as general investment capacity. Increasing trends in governmental debt to gross domestic product (GDP) ratio over the last years (Eurostat) have hindered the funding and support of energy savings policies. Liquidity shortages have also restrained growth in the energy savings market, whilst restrained consumers' fundability and creditability still prevents them from participating in energy savings and RES installation programs. As a result, reduction observed in energy consumption levels has for the most part been related to the economic recession impacts, combined with escalating energy costs (MEECC, 2011), and has been attributed to a lesser extent to the successful implementation of EE improvements.

In the framework of extended recession and budgetary constraints, divergent interests and legal obligations, decision makers in Greece face major difficulties in the process of finding suitable and reliable solutions to save energy and reduce GHG emissions. Often, the priorities and strategies for supporting energy saving interventions vary between stakeholders, influential over policy decision-making, and compete in multiple aspects. To overcome these challenges, policy makers make use of models and tools to support the process of identifying solutions.

However, PIs often yield different policy outcomes from those anticipated or they might produce a horde of unintended effects (van der Gaast and Lehtonen, 2015). Policy underperformance or unintended policy outcomes can be associated with various reasons, including assumptions embedded in policy design about the causality of policies in relation to their outcomes, as well as unexpected implementation and market barriers. Essentially, best-intended policies and instruments may fail if process-wise they are poorly designed and implemented. The need to focus on specific stages of the policy cycle when evaluating policy mechanisms has been cited by several policy evaluation studies (Crabbé and Leroy, 2008; Goulder and Parry, 2008; Gysen et al., 2006) as well as "the need to look beyond the traditional goal-achievement model" and to fine tune the performance criteria in accordance to the context (van der Gaast and Lehtonen, 2015, p. 7).

In the above framework, this paper applies a multi-criteria evaluation on the grounds of stakeholder perceptions, in order to discuss and evaluate public policy mechanisms in Greece. The aim is to enlighten the scene of PIs employed for the achievement of 2020 targets. Empirical findings on the implementation of policy instruments, complementing the MCA results, were collected from an ex-post policy assessment of Greek EE and RES policy mechanisms, within the framework of the EC FP7 project 'APRAISE – Assessment of Policy Interrelationships and Impacts on Sustainability in Europe' (Tuerk et al., 2014), whose objective was to empirically assess existing environmental policies in selected sectors of EU Member States and enhance research on multiple design parameters of environmental policies. The aim of the present paper is to identify which PIs have been implemented more effectively, as perceived by related policy actors, against process effectiveness criteria such as implementation costs, distributional effects and coherence of policy processes. Addressing such effects in line with their incidence during the implementation phase can facilitate the understanding of the causal chains from policies to outcomes and impacts.

The structure of the paper is as follows: Section 2 presents a literature review of energy and climate policy studies based on MCA applications. Section 3 elaborates on the main steps and concepts of the assessment framework adopted, the stakeholder survey conducted and the choice of the MCA method to be used for the evaluation. Section 4 then describes the fundamentals of the selected MCA method and Section 5 presents the weighting method selected. Section 6 provides the results of the stakeholder survey and the MCA method. The paper concludes with a discussion on policy implications and recommendations.

2. Review of the literature and need for the analysis

Evaluations of climate change mitigation policies are multi-dimensional and complex problems (Grafakos et al., 2010; Oikonomou et al., 2014, 2012, 2011) that incorporate multiple, often conflicting, actors and objectives. In order to deal with these multifaceted decision-making problems and capture the complexity arisen, MCA provides a transparent tool to consider the multiple aspects of the decision problem (Gamper et al., 2006; Grafakos et al., 2010) allowing the inclusion of multiple criteria, policy priorities and goals. It is capable of integrating into the analysis different stakeholders' preferences so as to stress different perspectives (Grafakos et al., 2015). Furthermore, MCA represents a sound methodology that evaluates, compares and rates policies hence enabling the identification of successfully implemented practices, highlighting policies' success factors and weaknesses (de Melo et al., 2013; Tholen et al., 2013).

MCA approaches have been widely applied in technical planning (Kaldellis et al., 2013; Kaya and Kahraman, 2011, 2010; Løken et al., 2009; Mourmouris and Potolias, 2013; Ribeiro et al., 2013; San Cristóbal, 2011; Sliogeriene et al., 2013; Troldborg et al., 2014; Tsoutsos et al., 2009) and policy planning (Browne et al., 2010; Diakoulaki and Karangelis, 2007; Haydt et al., 2014; Javid et al., 2014; Kowalski et al., 2009; Stagl, 2006; Streimikiene and Balezentis, 2013), at either local or national levels. However, only a few multi-criteria evaluation approaches have been conducted focusing on evaluating the performance at a PI level (Spyridaki and Flamos, 2014) and these are summarized in Table 1.

The majority of multi-criteria policy evaluation studies adopt a rational view on policy, implying an ex-ante estimation of the possibility that desired policy impacts[1] will be achieved. They assess PIs by estimating their impacts and congruently their effectiveness as a result of their implementation. By looking at Table 1, one can observe that most multi-criteria evaluations tend to focus primarily on the assessment of policy impacts. More frequently the evaluations carried out use criteria, which concentrate largely on policy effects and to a lesser extent on policy processes and implementation[2]. Each phase in the policy cycle, such as the

[1] According to Crabbé and Leroy (2008), policy effects may refer to policy outputs, policy outcomes or policy impacts. Policy outputs are defined as "the decisions on objectives and instruments meant to achieve policy goals", policy outcomes as "the behavioral changes and responses of actors in society, and policy impacts as "the environmental and other effects resulting from the outcomes" (Nilsson et al., 2012).

[2] Policy processes are defined by Nilsson et al. (2012) as "the procedures and institutional arrangements that shape policy making" and are distinguished primarily between policy making and policy implementation (Rogge and Reichardt, 2013). Policy implementation is defined by Nilsson et al. (2012) as "the arrangements by authorities and other actors for putting policy instruments into action".