



Carbon footprint in green public procurement: Policy evaluation from a case study in the food sector



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ABSTRACT

Several projects across Europe are focused on improving sustainability of public procurements; however, few of them are measuring the environmental savings achieved by specific policies through the application of environmental impact assessment indicators.

In this paper, we calculate environmental savings by applying a carbon footprint analysis to three food policies implemented by the City of Turin (Italy) in the school catering service (school years 2012/13 and 2013/14). The policies are focused on (I) the production of food (with the requirement of integrated or organic products), (II) the geographical origin of the food (with the requirement of regional food provisioning) and (III) the improvement of urban distribution (with the requirement of shifting to natural gas vehicles). The climate change potential of five of the most consumed foods were studied according to three main phases of the supply chain: production (including all processes in a cradle-to-gate perspective), provisioning (focusing on the transportation from production sites to the peripheral food hubs of the city), and distribution (focusing on the transportation from the city hubs to schools).

The results of this study highlight the different climate impacts of the three phases of the supply chain, in particular 61–70% of the greenhouse gases are emitted in the production phase, 6–11% in the provisioning phase and 24–28% in urban distribution. As a consequence, policies that affect production practices have the greatest potential for reducing the carbon footprint of the catering service. Other policies (such as those on transportation) can have controversial effects. Therefore, to improve planning of sustainability policies, the greenhouse gas emission savings achieved by each policy must be analysed in-depth.

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Introduction

Challenges of GPP in the food sector

Analyses of public procurement as a tool for the development of economic, social and environmental issues are finding growing recognition at the international level. According to the report 'Procuring the Future' (Department for Environment, Food and Rural Affairs [DEFRA], 2006), the most agreed-upon definition of sustainable procurement is a process whereby organisations meet their needs for goods, services, works, and utilities in a way that generates benefits not only for the organisation but also for society and the economy while minimising damage to the environment.

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Zhu et al. (2013) calculated that industrialised countries spend over 10% of their gross domestic product on public procurement, and a recent analysis by the United Nations (UNEP, 2013) reports that at least 44 states have adopted Green Public Procurement (GPP) policies to varying degrees. In Europe, the share of gross domestic product devoted to public procurement is approximately 19%, representing a total expenditure of over two trillion euros per year (European Commission, 2011). Within the European Union, there are numerous services run by public bodies (European Commission, 2011); in this study it is highlighted that in Europe, more than in other regions of the world, GPP is considered central to sustainable growth. Public procurement has high potential for the dissemination of best practices by providing an example of sustainable consumption practices to broader society and stimulating eco-innovation (Brammer and Walker, 2011; Testa et al., 2012).

GPP establishes environmental criteria for the purchasing of products and services (Uttam and Roos, 2015). Thus, implementation of an environmentally sustainable supply policy is often

achieved through the definition of specific environmental requirements in the call for tenders (e.g. [European Parliament Directives 2004/17/EC and 2004/18/EC](#)). These requirements may be general criteria (such as a maximum distance for provisioning and seasonality of food) or may refer to standards already developed both at the European level (such as Ecolabel certification or Product Environmental Footprint) and at the level of individual Member States. Such standards often include quantification of direct environmental impacts, such as energy consumption, transportation emissions and natural resource consumption, but sometimes also include indirect impacts, such as those resulting from energy production ([Uttam and Roos, 2015](#)) and other production inputs. Considering both direct and indirect environmental pressures, [DEFRA \(2006\)](#) has estimated that more than 50% of the environmental impact of the public sector comes from the supply chains of products. If this statement holds true for the public sector in general, the percentage is most likely greater in the supply chains of public catering because of the large material and energy intensity of food products in comparison to other products and services ([De Koning et al., 2015](#)). Furthermore, public services related to the food sector are numerous and they support a large number of meals every day throughout a country, including schools, hospitals, universities, prisons and others.

Specifically for the food sector, the European Union takes into account environmental criteria ([European Commission, 2011](#)) based not on threshold values from environmental impact indicators, but rather on the sustainability of practices, such as the seasonality of products, harvesting practices, minimisation of waste and packaging, and professionalisation of operators ([European Commission, 2011](#)). This division between sustainable practices and environmental labelling in the food sector arises from the difficulty of harmonisation ([Notarnicola et al., 2015](#)). Studies on the feasibility of applying the EU Ecolabel to food products ([Sengstschmid et al., 2011](#)) illustrate that the environmental performance of food is strongly related to its whole life cycle, including production, transformation and distribution ([Caputo et al., 2014](#)). Because of this property, in general the use of sustainability practices in public calls for tenders (instead of using threshold values in environmental impact categories) clearly aims to reduce environmental impacts. However, if sustainability practices are not associated with a specific evaluation of an environmental indicator (such as emissions of climate-changing greenhouse gases (GHGs) or water depletion or soil consumption), they do not allow quantification of the actual environmental savings.

Aim of the study

Studies applying life cycle assessment (LCA) to products and services demonstrate that despite the goals of environmental improvement, unless one or more indicators are applied in the policy planning stage, there is a real risk that the environmental impacts will not actually be reduced but simply shifted from one stage of the production process to another ([Ridoutt and Pfister, 2013](#); [Samaras and Meisterling, 2008](#)). As an example close to the case studies of this paper, [Caputo et al. \(2014\)](#) applied LCA to the main foods on the menu of six school caterings in Lombardy (northern Italy). Despite the potential use of results in policy development, life cycle-based methods are rarely used to quantify the environmental performance of GPP policies. In the scientific and technical literature, only a small number of studies can be found for the construction sector ([Tarantini et al., 2011](#); [Uttam and Roos, 2015](#)), the transport sector ([Parikka-Alhola and Nissinen, 2012a, 2012b](#)), and the service sector ([Alvarez and Rubio, 2015](#)), while no studies are available for the food sector. This gap is important because assessment indicators are necessary for

evaluating the environmental performance of public policies ([Bento and Klotz, 2014](#); [Bravo et al., 2013](#)).

The aim of the paper is to quantify the climate change reduction potential of three GPP policies introduced in the school catering service of the City of Turin (Italy) within the context of the INNOCAT project (Procurement of Eco-Innovation in the Catering Sector). In particular, these policies are focused on (I) the production protocols of purchased food (a requirement of integrated or organic products), (II) the geographical origin of the food (a requirement of regional food provisioning) and (III) reducing the impacts of urban distribution (a requirement to shift from petrol to natural gas vehicles). As the focus of the study is to quantify the effectiveness of three specific public food policies in terms of climate change reduction, not all phases and products of the school catering service have been considered, but only those that are targeted by the GPPs.

Food policies for school canteens of Turin

The city of Turin, with a population of more than 900,000 people, is one of the principal cities in north-western Italy and is the administrative centre of the Piedmont region. The municipal commitment to becoming a 'smarter' city is evident from the city's participation in a number of projects focused on fostering sustainable, intelligent and inclusive urban growth, such as the Covenant of Mayors and Smart City initiatives. In 2013, together with the Smart City Foundation, Turin's Smart City Master Plan – 'Smart Mobility Inclusion Life & Health and Energy' (SMILE) – was launched.¹ In this Master Plan, several actions were designed along with relevant key performance indicators to measure their impacts. In particular, one goal was to achieve low-carbon school catering services. School catering represents a significant component of the procurement budget for the City of Turin: approximately eight million meals are delivered annually with a total value of approximately 40 million euros per year. This service is provided to approximately 71,500 pupils between the ages of 0 and 13 years old. Including the children's teachers and families, 230,000–250,000 citizens are connected to the school catering services in some manner. Therefore, policies applied to this service have great potential to reach the urban community. School canteens can be considered as 'a kind of a meeting place for skilled and motivated change agents with a whole host of worthwhile agendas' ([Poppendieck, 2010](#)), and these agendas often conflict on social, cultural and religious issues ([Ashe and Sonnino, 2013a](#)). An example is the 'Create your menu!'² initiative, in which selected school classes in Turin participated in meetings with all the actors of the school catering service (from farmers to suppliers, including the managers of the urban food platforms) to understand the 'history' and the complexity behind the food supply chain. After these meetings, the students were asked to design a new menu that would take into account their wishes, but also the needs of all the actors involved ([Provincia di Torino, 2013](#)), although without including aspects of environmental sustainability. To improve knowledge of environmental issues related to school catering services, Turin decided to participate in the INNOCAT project (Procurement of Eco-Innovation in the Catering Sector),³ coordinated by ICLEI (Local Governments for Sustainability). Within this project, local authorities introduced a number of measures and included various criteria into the school catering contract with the aim of reducing the associated carbon footprint (CF). These included

¹ Official documents of the Turin Smart City Master Plan are accessible at <http://www.torinosmartcity.it/>.

² Translated from the original Italian title: "Il menù l'ho fatto io!" ([Provincia di Torino, 2013](#)).

³ ENT/CIP/11/C/N02C00 Reinforcing Procurement of Eco-Innovation – Network of Green Public and Private Procurers.

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