

# **Monitoring and Evaluation of Green Public Procurement Programs**

***Aure Adell, Ecoinstitut Barcelona***

***Bettina Schaefer, Ecoinstitut Barcelona***

***Kavita Ravi, United States Department of Energy***

***Jenny Corry, The Collaborative Labeling and Appliance Standards Program***

## **Abstract**

Effective procurement policies can help governments save considerable amounts of money while also reducing energy consumption. Additionally, private sector companies which purchase large numbers of energy-consuming devices can benefit from procurement policies that minimize life-cycle energy costs. Both public and private procurement programs offer opportunities to generate market-transforming demand for energy efficient appliances and lighting fixtures.

In recent years, several governments have implemented policies to procure energy efficient products and services. When deploying these policies, efforts have focused on developing resources for implementation (guidelines, energy efficiency specifications for tenders, life cycle costing tools, training, etc.) rather than defining monitoring systems to track progress against the set objectives. Implementation resources are necessary to make effective policies; however, developing Monitoring and Evaluation (M&E) mechanisms are critical to ensure that the policies are effective.

The purpose of this article is to provide policy makers and procurement officials with a preliminary map of existing approaches and key components to monitor Energy Efficient Procurement (EEP) programs in order to contribute to the improvement of their own systems.

Case studies are used throughout the paper to illustrate promising approaches to improve the M&E of EEP programs, from the definition of the system or data collection to complementary instruments to improve both the monitoring response and program results.

## **1. Introduction**

Public procurement is the process whereby government organisations acquire the goods, constructions, and services (referred to hereafter only as “products”) required to operate and perform all necessary functions. By introducing environmental considerations into procurement processes and requirements – that is, by implementing Green Public Procurement (GPP) – the public sector reduces the environmental impacts of its operations, improves efficiency, and can reduce expenditures by reducing purchase needs and minimizing life-cycle costs. GPP requirements encompass a large number of environmental considerations, and usually include energy efficiency as this contributes to reduced energy consumption and costs by organisations.

In OECD countries government procurement represents approximately 18% of GDP [1] and up to 30% of GDP in developing countries [2]. Given the market share that the public sector represents, public procurement can transform the market for green solutions, eco-innovations and new, environmentally conscious business models. Therefore, the public sector is increasingly including procurement as a policy instrument to achieve the objectives set in a wide range of environmental and economic development policies.

To support practitioners implementing green and/or energy efficient procurement, efforts have focused on providing resources for implementation (including guidelines, environmental specifications for tenders with information on verification documents, lifecycle costing tools, best practices

recommendations, or training) while little or no attention has been given to establishing mechanisms or systems to monitor and evaluate policy implementation and results.

When monitoring EEP/GPP programs, organisations track the implementation of the actions and measures taken as part of the program. With this information, policymakers can evaluate progress against policy objectives, and identify areas that need improvement, which will help in the development of supportive measures to improve efficiency and effectiveness in policy deployment. Furthermore, making results available both internally and externally demonstrates political commitment, enhances transparency, legitimizes the promotion of sustainable consumption and production by other sectors of society, and promotes policy embedment throughout the organization by keeping each agency accountable. As is often the case, accountability increases policy compliance. The type of M&E system that an organisation will choose to put in place will depend primarily on the objectives and actions set at the policy level, as the system will serve to track and assess progress in relation to them.

## 2. EEP at Policy Level

### 2.1. Policies Including EEP Requirements

Public authorities around the world are adopting policies that encourage or require the acquisition of energy efficient products by the public organisations within their jurisdiction [3]. The type of policies range from normative regulations and laws to general guidelines or recommendations, and their focus can vary from a specific energy efficient product, to general green procurement, climate protection, green growth or sustainable development as a whole. Table 1 presents the main type of policies where EEP commitments are included, with some examples from countries with different levels of economic development.

**Table 1. Type of Policies Including EPP/GPP Requirements**

Policy scope	Examples
Product-specific policies	Examples from the European Union include: <ul style="list-style-type: none"> <li>- Regulation (EC) No 106/2008 of 15 January 2008 on a Community Energy-efficiency Labelling Programme for Office Equipment.</li> <li>- Directive 2009/33/EC of 23 April 2009 on the promotion of clean and energy efficient road transport vehicles.</li> <li>- Directive 2010/31/EU of 19 May 2010 on the energy performance of buildings.</li> </ul>
Energy efficient procurement policies	<ul style="list-style-type: none"> <li>- China Circular of 17 December 2004 on the Implementation of Government Procurement of Energy-saving Products and Circular of 30 July 2007 on Establishing a Mandatory Government Procurement Scheme of Energy-saving Products.</li> <li>- Japan Green Contract Law (Law No. 56 of 2007) Concerning the Promotion of Contracts Considering Reduction of Emissions of Greenhouse Gases and Others by the State and Other Entities.</li> </ul>
Overarching green procurement strategies	<ul style="list-style-type: none"> <li>- Canada Federal Government Policy on Green Procurement.</li> <li>- Brazil Regulation nº1 of 19 January 2010, on environmental sustainability criteria in the procurement of goods, services and works of the Federal Public Administration and related agencies.</li> <li>- Spain Order PRE/116/2008 of 21 January 2008 publishing the approval of the Plan on Green Public Procurement of the Central Government and Related Agencies.</li> </ul>

Energy/ Environmental operations policies	<ul style="list-style-type: none"> <li>- United States Executive Order 13514 of 5 October 2009 - Federal Leadership in Environmental, Energy and Economic Performance.</li> <li>- United Kingdom Greening Government Commitments: Operations and Procurement (February 2011).</li> <li>- France Circular of 3 December 2008 concerning the exemplarity of the State in respect of sustainable development in the operation of its services and institutions.</li> </ul>
Environment protection policies (such as climate protection strategies, sustainable development strategies, etc.)	<ul style="list-style-type: none"> <li>- Mexico City Climate Action Program 2008-2012.</li> <li>- South Africa Notice 908 of 2009, National Energy Efficiency Strategy of the Republic.</li> <li>- Colombia National Development Plan 2010-2014: Prosperity for all.</li> </ul>
Green growth policies	<ul style="list-style-type: none"> <li>- United States Farm Security and Rural Investment Act of 2002 (FSRIA) and Resource Conservation and Recovery Act (RCRA).</li> <li>- European Union Lead Market Initiative.</li> </ul>

Source: Ecoinstitut.

## 2.2. The Effect of Policy Objectives in the Definition of M&E Systems

The objectives and targets of the policies that include EEP requirements are diverse. For example, in its Communication Green Public Procurement for a Better Environment, the EC proposed that by 2010 50% of all tendering procedures should be green [4]. In Japan, the policy concerning the Promotion of Contracts Considering Reduction of Emissions of Greenhouse Gases and Others by the State and Other Entities, also known as Green Contract Law, sets the objective to reduce direct and indirect GHG emissions by 8% from 2010 to 2012 using the 2001 level as a benchmark through contracts related to the supply of electricity, the procurement and leasing of vehicles, the procurement of ships, the construction and/or renovation of buildings, and contracting Energy Service Companies [5]. In Spain, the GPP Plan of the Spanish Central Government sets different objectives depending on the actions. Thus, the plan includes an objective of energy saving of up to 9% by 2010 and 20% by 2016 in buildings; a reduction of 20% in fossil fuel consumption and an increase in the consumption of biofuels to up to 38% in transportation; and for IT equipment, 100% of all new computers, screens and imaging equipment must comply with the energy consumption limits defined in the Energy Star standard [6]. Mexico City's 2008-2012 Climate Action Program set specific annual CO<sub>2</sub>-equivalent reduction targets for a variety of energy efficient measures in public buildings, transport, and other areas [7].

The different objectives set at the policy level can be classified into four main goals related to procurement that can be present either individually or in combination:

1. To transform the market for energy efficient products
2. To achieve greenhouse gas (GHG) mitigation and reduce other environmental impacts
3. To embed EEP/GPP in the organisations' operations and procedures
4. To increase actual procurement of environmentally preferable products and services

The first two, *final goals*, justify the inclusion of EEP requirements. The other two, more *practical goals*, determine how to reach those final goals.

As the objectives of each policy might be different, the design of the M&E system will vary, as it has to be in line and able to track and assess progress in the achievement of the set goals and commitments.

### 3. Monitoring EEP Requirements

As listed above, one of the principal reasons for introducing EEP requirements in policies is to serve as a catalyst for the market penetration of green products and services. As such, an approach to evaluating the success of EEP commitments could be to assess to what extent EEP has contributed to an increase in the market share of more energy efficient products. However, this approach has rarely been followed, this may be due to the fact that market transformation is used as a motive or justification but no targets are set to monitor against. Also, the public sector is not the only player nor is public procurement the only instrument influencing market changes. Instruments such as taxes, subsidies, regulations, and demand from the private sector and consumers can have a more significant impact, making it difficult to measure the effect of EEP in market changes. Furthermore, such studies might have a negative cost-benefit balance, as the resources required to conduct the research does not justify the benefits yielded. These studies analyze the market and may provide limited useful information for better EEP embedment. We should not forget that monitoring is not only used to evaluate policy compliance and results/impact, but also to hold agencies accountable for better implementation and to identify areas for improvement and this information cannot be obtained through market studies.

In comparison to market transformation monitoring, assessing EEP embedment in operations is a much more straightforward process. In all the cases analyzed, the M&E systems to track and assess compliance are based on surveys, which for the most part require little or no data digging and gather qualitative information, making them easy to complete. One weakness of surveys is that the results are not always precise and may represent only the opinion or perception of people who complete them. This is especially critical when results are compiled to reflect the entire organization, because procurement is decentralized and may be implemented differently in each department. To accurately evaluate the extent to which EEP is actually conducted in procurement processes a more objective and quantitative analysis of procurement of energy efficient products is recommended.

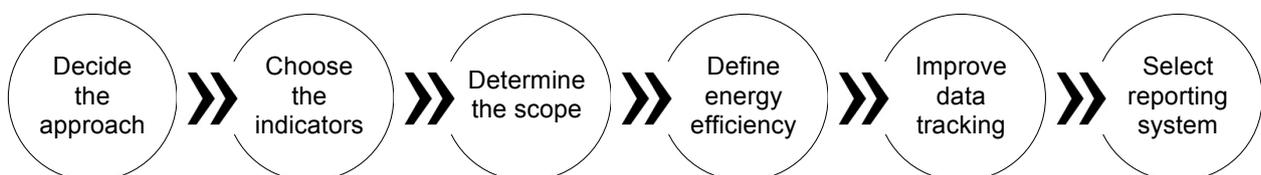
Therefore, this paper focuses on the two M&E approaches to measure EEP implementation and results that have received the most interest from government agencies: 1) the monitoring of the procurement level of energy efficient products and 2) the assessment of the environmental relief achieved through EEP.

#### 3.1. Monitoring the Procurement of Energy Efficient Products

In order to measure actual EEP implementation, many organizations have developed or are developing M&E systems to quantify how many of the products they buy/contract or the tenders they publish include or comply with energy efficient or other environmental criteria. In fact, this is the approach where more examples and experiences from public authorities exist.

In order to set up such a system, different elements have to be considered, which are summarized in Figure 1 and discussed below.

**Figure 1. Steps to Design an M&E system for the Procurement of Energy Efficient Products**



Source: Ecoinstitut.

##### 3.1.1. *Decide the Approach*

The first decision to be made is whether to monitor tenders or actual purchases. This decision can be made at the policy level, or may be defined later if objectives are not specified in such detail in the

policy. In the second case, it is advisable to first analyse existing data tracking systems (see section 3.1.5) before deciding on the approach.

The main advantage of *monitoring tenders* is that they can be tracked more rapidly than product purchases, as all the information is found in the tender itself and does not require data input from different people or from suppliers.

The disadvantages are that when monitoring tenders, direct purchases are frequently, if not always, excluded from the scope of the monitoring, losing what might be an important portion of overall public procurement. Special attention must also be paid to framework agreements; they might approve several products and/or companies, but the resulting secondary contracts might not qualify as energy efficient. Furthermore, monitoring tenders does not show, in general, the actual result of the process and what is purchased or contracted in the end. Thus, a tender counted as “greened” might not yield the acquisition of an energy efficient product, unless only tenders with compulsory environmental criteria qualify as such. Nevertheless, it is often argued that for public procurement to create a market pulling effect for energy efficient and green products, organizations have to clearly signal to suppliers their green purchasing preferences. Public administrations do this through their tender documents and purchase orders, which capture their organizations’ purchasing requirements. Therefore, to evaluate the impact, it would not be necessary to monitor what is actually procured, but the degree to which energy efficiency criteria are included in tender documents.

The advantage of *monitoring acquisition* of energy efficient products is that this shows not just intentions, as could be the case when monitoring tenders, but rather actual purchases. This type of monitoring tends to cover all kinds of purchases—both from contracts and direct purchases—and facilitates the evaluation of environmental relief achieved with EEP (see section 3.2).

However, tracking green product acquisition is less straightforward than tracking tenders. Financial systems and budgets are normally aggregated and coded at a higher level than product procurement, so certain products might not be directly identifiable in existing systems unless they are set up to track information at a product level. Additionally, products used within service contracts cannot be tracked using the organizations’ systems, but require input and reporting from the service providers. That can be an obstacle to tracking given the tendency to outsource services, and to change acquisition models from procurement of products to services. Also, purchases occur more frequently than tenders, increasing the number of transactions to be monitored. Such transactions are normally carried out by a larger number of people, which implies the involvement of more staff in tracking green expenditures, increasing the possibility of data errors.

Therefore, tracking tenders is easier than tracking purchases unless products are purchased through procurement platforms (stores or catalogues), which allow direct and automatic tracking.

### 3.1.2. *Choose the Indicators*

Secondly, organisations must define the Key Performance Indicators (KPIs) to express and evaluate results. According to the case studies analyzed:

- When monitoring tenders, the indicators most commonly used are the total amount and the percentage of tenders (both in number and in economic terms) that are green in relation to the total amount within a given reporting period.
- When monitoring the acquisition of products, the level of EEP is calculated using the total amount and the percentage of energy efficient products purchased in terms of expenditure and, to a lesser extent, in units in relation to the total purchased during the reporting period. This second indicator is relevant to estimate the environmental benefits of EEP based on products, as normally environmental factors for transforming green purchases into environmental benefits use number of units purchased rather than economic ones (see Section 3.2).

### 3.1.3. Determine the Scope

Thirdly, the product groups that will be monitored must be identified. Public administrations buy or contract many different types of energy-consuming products (IT equipment, vehicles and transport services, traffic and street lighting systems, building heating and cooling systems, medical appliances, vending machines and kitchen appliances, etc.). Organizations might focus on all of them, but normally a group of priority products is chosen. Examples of criteria considered when selecting product groups to monitor include: 1) prior selection at policy level; 2) the existence of standardized EEP criteria at the regional, national, or municipal level; 3) the availability of energy efficiency standards and/or labels (if no standards exist, it is very difficult to implement EEP); or 4) the significance in terms of expenditure and/or ubiquity within the organizations being monitored.

### 3.1.4. Define what Qualifies as Energy Efficient

For a tender or purchase to be considered energy efficient, it is necessary to first define the parameters by which it will qualify as such. This is normally based on standardized labels or EEP/GPP criteria implemented at the regional, national, or local levels.

#### Case 1. Chinese Government Definition of Energy Efficient

In 2004, the Ministry of Finance and the National Development and Reform Commission promulgated an EEP policy, the “Implementation Guidelines for Government Procurement of Energy-saving Products”, which required public agencies to give preference to energy efficient products when procuring (becoming mandatory for certain product groups from 2007). Energy efficient products are defined as those that have been awarded the Energy Conservation Certification of the Chinese Government and are included in the Government Procurement List on Energy Conservation Products [8]. The definition refers to the existing National energy label.

#### Case 2. Definition of Energy Efficient in the Pilot M&E Methodology of the European Union

In 2008, the European Commission (EC) contracted the development and testing of a methodology to monitor the implementation of GPP in the European Union (EU). Contractors used the existing EC GPP standard criteria developed the previous year to define what qualified as energy efficient. IT equipment had to comply with the energy consumption thresholds defined in the Energy Star standard [9], thus using a standard as reference. For passenger cars and light duty vehicles, there is not yet an energy efficiency label at the EU level (unlike other energy-consuming products such as electrical appliances/white goods or tires), but all vehicles are sold with a compulsory label that informs consumers of the average CO<sub>2</sub> emissions per kilometre of the vehicle. Therefore, the M&E methodology used this label and the GPP criteria to qualify vehicles as “green” if the CO<sub>2</sub> emissions of awarded vehicles were below the maximum threshold defined for the vehicle’s category. [7]. In this case, the EC GPP criteria in combination with the compulsory label were used as reference to define “green”.

### 3.1.5. Select, adapt or set data tracking systems

One of the difficulties of monitoring EEP in terms of expenditure in green products and services or incorporation of environmental criteria in tender documents is the lack of integration of EEP tracking requirements within existing procurement and/or financial procedures and tools. Because of this, data is not systematically registered and annual tracking of EEP is extremely time-consuming, especially when EEP covers a wide variety of products and services and there is little centralization. Additional difficulties might arise if EEP is monitored as part of GPP policies and the criteria used to define “green products” demands compliance with multiple specifications.

Listed below are methods that may be used to track the purchase of energy efficient products or data on product use in service contracts.

- *Adapt internal financial systems to track expenditure at product level.* This approach might also require adaptation to track the number of units purchased as organizations typically only

record expenditures. However, these systems don't allow the tracking of products used within service contracts and require input by many different people, increasing the risk of errors.

- *Insert reporting requirements in tender and/or contract language.* This approach makes providers accountable for tracking green product sales to public authorities and is crucial for tracking products used within services. If this method is used, it is very important to clearly define: 1) what qualifies as green, as vendors might erroneously describe items as green, and 2) what information is needed to integrate data from other providers, compare results between units or agencies, and/or calculate environmental benefits - thus organisations have to develop data reporting standards. Some downsides are that it is difficult to verify data accuracy and information gathering can be time consuming, requiring tight contract management by the administration to ensure that contractors deliver reports.
- *Use or develop electronic catalogues for centrally purchased items.* These systems make information easily available internally, provide accurate data on energy efficient product purchases (for both expenditures and physical units), and allow central analysis without requiring reporting by each organization or department. The downside is that this method is only useful for a limited number of products, as most purchases are not centralized nor are all of them suitable for an e-catalogue, and cannot yield data on products used within service contracts.

The following strategies may be used to track data more efficiently when the monitoring approach is based on tenders:

- *Insert a section in the tender documents that clearly identifies any applicable energy efficiency criteria.* This method makes it easier for departments or organisations to identify green tenders, but it still requires manual analysis and reporting. This may be done for example with: 1) a simple checkbox to indicate whether green criteria have been introduced in the tender; 2) a table for purchasers to indicate where in the tender EEP criteria have been introduced (technical specifications, award criteria, etc.); 3) a list that indicates if criteria for designated products have been introduced; or 4) a table to indicate if national or local standard green criteria have been introduced (fully vs. partially, core vs. comprehensive, mandatory vs. best practice).
- *Request procurers to complete a form when submitting a bid, awarding a contract, and/or completing a project.* The form can summarize the energy efficiency or green criteria introduced in the tender or complied with by the awarded offer, depending on how the indicator has been defined.
- *Adapt information fields if using an electronic tender publishing platform to track relevant information required for the M&E system.* The benefits of such systems are that they allow automatic data analysis, process larger amounts of information quickly, and minimize bias. However, if not properly programmed they might leave out certain energy efficient tenders, and using such automated systems might limit the awareness raised within the organization of the M&E process as no input is required from them.

Therefore, when quantitatively monitoring the level of green procurement, M&E systems should use data sources that are directly available and require the input of the least number of people in order to minimize errors, eliminate bias, and reduce the time required for M&E from the organisation as a whole. Measures that require adapting financial platforms, electronic catalogues, electronic tendering platforms, or any other procurement management software that can facilitate tracking green tenders or expenditures on green products requires an initial investment, but will save resources that would otherwise be required to collect data.

Some cases of administrations that have applied some of the solutions presented are described below.

### Case 3. Tracking Green Purchases via the Finance System in Cardinia Shire Council (Australia) [10]

Cardinia Shire Council, a public authority in the State of Victoria (Australia), participates in the State's EcoBuy Program and is committed to buy green products and report progress annually. To do so, the Council has set up mandatory fields in its financial software that procurers fill in to accurately and

consistently capture expenditures under various green categories. To ensure appropriate data recording, measuring, and tracking, green procurement has also been integrated into the finance system's procedures and training.

Case 4. Tenders Language for Procurement Tracking by Suppliers in King County (US) [11]

According to the guidelines for procuring environmentally preferable computers by King County, staff are required to include specific language in its call for tenders requiring suppliers to track and report green sales. Two options are provided. The first requires contractors to provide quarterly reports quantifying the EPEAT registered and unregistered products purchased under the contract in a format acceptable to King County. The second option includes a matrix that vendors have to use to report sales (see Figure 2).

**Figure 2. Matrix for vendors to report green sales**

	Unregistered		EPEAT Bronze		EPEAT Silver		EPEAT Gold		Total	
	No. units	\$ spent	No. units	\$ spent	No. units	\$ spent	No. units	\$ spent	No. units	\$ spent
Desktops										
Laptops										
Monitors (LCD)										
Monitors (CRT)										
Total										

Source: Environmental Purchasing Program (2012). Environmentally Preferable Computers. King County.

Case 5. Tracking Sustainable Tenders in Chile Through an E-tendering Platform

The public sector in Chile uses two centralized electronic platforms for its purchasing activities. The national tendering platform, *Mercado Público*, centralizes the call for tenders of goods and services from most public agencies in the country (excluding public companies). The online store, *ChileCompra Express*, is used by public authorities to buy products centrally procured through Framework contracts by the Directorate of Public Procurement of the Ministry of Finance (known as *ChileCompra*).

When tendering through *Mercado Público*, public authorities not only upload their tender documents and publicize them, but also fill in several online forms that correspond approximately to the administrative tendering document. In these forms, procurers have to specify, among other details, the selection criteria for companies to be able to participate, administrative information about the tender (duration, guarantees, insurances, etc.), and the award criteria. Procurers can specify different award criteria from a list of categories, including Energy Efficiency and Environmental Impact. This information is registered in the platform database, making it easy to identify tenders that include energy efficiency or other environmental specifications as award criteria. The limitation of the system is that it excludes tenders conducted by public companies and it doesn't allow tracking of tenders that include compulsory energy efficiency criteria, as they are not registered in the platform database (the technical tender is uploaded as a document, preventing automatic search for environmental requirements).

For purchases conducted via *ChileCompra Express*, the environmental characteristics of awarded products are displayed in the online store as an output of the platform database, making it possible not only to quantify the tenders that included sustainability award criteria, but also tenders that resulted in the selection of more sustainable alternatives.

As the monitoring system is designed to use the parameters and variables registered in the e-procurement platform (in the form of SQL databases), the sustainable procurement indicator is very easy to obtain and therefore to monitor. Through standardized queries to the e-platform database, *ChileCompra* monitors the evolution of the percentage of sustainable procurement each month at the internal level, without requiring input from the organisations tendering through the platforms.

## Case 6. Tracking green tenders in Malta [12 and 13]

Since 2012, procurers in the Government of Malta have been required to include GPP criteria set by the government in the tender documents for certain prioritized product groups. To monitor compliance, all calls for tenders must be supported by a form (Tender Originators Form), which was revised to include data on the application of GPP along with information on the tender (promoter, estimated value, lots, etc.). Procurers must submit a scanned signed copy of this form to the Office of the Prime Minister by e-mail to track and verify compliance.

### *3.1.6. Establish the Data Reporting System*

After tracking the relevant data, information has to be reported to the organisation or department in charge of the overall monitoring for evaluation. As presented in the previous section (3.1.5), each department or organization may track and/or gather information from different data sources. For example, some data can be accessed directly by the “monitoring” agency or a central body reporting for all the organisations subject to the monitoring, while other data collection requires compilation by each department or organization.

Reporting data from procurement or tenders via a survey can be time consuming if too much information is required and no automatic system (not even at department level) exists, reducing the response rate. Moreover, results are rarely verified unless a small amount of data is required, and departments or organizations with low performance might not respond. However, the request can raise awareness and promote EEP implementation in the future. If all information is processed automatically and no benchmarking, training, or communication efforts are in place, departments or agencies may not be aware that EEP requirements exist and have no incentive or knowledge to implement EEP.

If data is centrally available, EEP evaluation can be conducted directly by the “monitoring” agency, reducing the monitoring time as little or no waiting time is required as compared to surveys. A central data source also makes it possible to analyze results from organizations with varying levels of performance. Thus data and results are more reliable and comprehensive than those obtained through a questionnaire/survey.

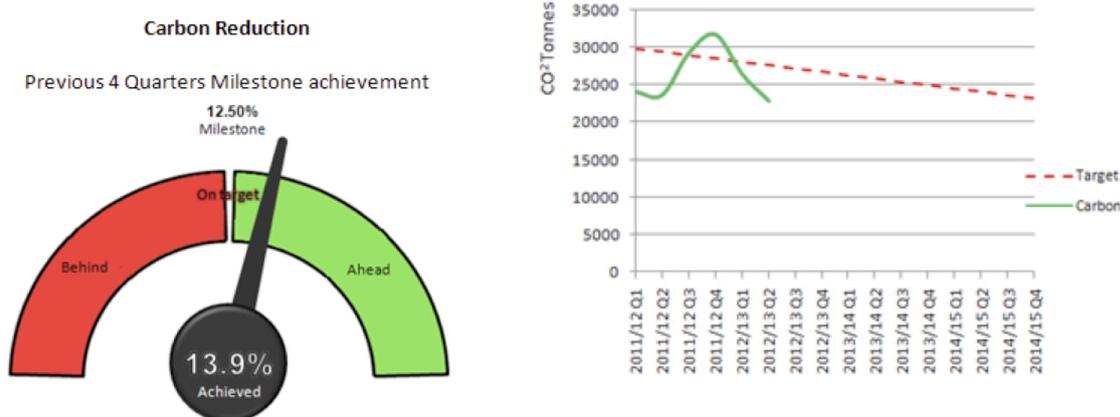
Whenever possible data reporting systems should: 1) be integrated with other reporting tools to simplify procedures; 2) be standardized to allow comparison among organisations; 3) be designed to require information in the same format as organisations gather it to avoid confusion; 4) be in an electronic format to facilitate data aggregation by the “monitoring” agency; and 5) be able to provide instant feedback on performance and progress to the organisations.

## Case 7. Reporting Mechanism for GPP Monitoring in the United Kingdom (UK)

In 2006, the UK Government approved the Framework for Sustainable Operations on the Government Estate (SOGE) and the Sustainable Procurement Action Plan for the public sector as a whole. As the SOGE is the Central Government’s umbrella for sustainable operations, it was agreed to integrate all elements of government sustainable operations, including those from the Sustainable Procurement Action Plan, into the SOGE monitoring and reporting system. The reporting mechanism was through an on-line questionnaire that gathered performance data reported by departments. Each department had its own system to collect and process the required data, but all of them input data in a standardized manner to allow comparison and benchmarking among departments. Until 2008 the questionnaire was a stand-alone tool, but from the fiscal year 2008–09 until the end of the SOGE reporting process in 2010–11 the questionnaire was integrated with the e-PIMS platform, an existing central government property database used to collect building-level data for other SOGE targets.

In 2011, the SOGE framework was replaced by the Greening Government Operations and Procurement Commitments (GGC) and the reporting system changed. The new system uses a spreadsheet as a template. One advantage of this method is that the spreadsheet automatically calculates and graphically presents each organization’s performance against baseline data to show progress towards achieving the targets and forecast the evolution to the GGC deadline in 2014/15.

**Figure 3. Defra's GGC Carbon Dashboard and Carbon Chart**



Source: Department for Environment, Food and Rural Affairs. Greening Government Commitments: Defra's Performance. 2012/13 & Baseline. December 2012.

### 3.2. Monitoring Environmental Relief

Despite the fact that EEP is promoted as a means to reduce the environmental impacts of an organisations' activities and processes, very few of the EEP or larger GPP programs analyzed actually monitor the environmental relief obtained through the procurement of energy efficient or further green products. However, its calculation is more frequent when monitoring "green-the-government" or climate protection policies that include EEP requirements, as most of them set specific environmental relief objectives.

One of the main differences between general GPP and EEP is that purchasing energy efficient products can directly impact an organisation's environmental performance. The impacts of many green products (e.g. products with a high percentage of recycled content, bio-based, or free from certain hazardous substances) occur during the production phase and if they do occur during use by the administration, they don't have a direct impact on organisations' environmental parameters that can be monitored to evaluate environmental results. Energy efficient products influence the organisation's energy consumption, which is a measurable parameter. Therefore, environmental relief achieved through EEP can be measured or calculated by 1) the environmental characteristics of the products purchased or used in services and constructions and 2) on the energy performance of the products, constructions and services during its use phase, that is, while they are used by the organisation.

To evaluate results, the KPIs for EEP programs are quite straightforward and in line with other energy-related policies, namely energy consumption and GHG emissions (expressed frequently as CO<sub>2</sub>-equivalent).

Given that this kind of monitoring tracks or estimates energy consumption, and information on product costs are also available, cost savings achieved with EEP can also be used as KPIs to support EEP in regions or organisations where costs of green products are often highlighted as an obstacle to GPP implementation.

#### 3.2.1. Estimates Based on Products Purchased

When the environmental benefits are calculated based on the purchase of energy efficient products, the resulting figures are only estimates that can either over- or underestimate final performance. Furthermore, impact analysis generally focuses on the impacts during the use phase linked to energy consumption and is therefore expressed as a reduction in energy consumption or GHG emissions.

For such calculations, the first data points to gather are the number of products purchased or used. Data will have to be reported or adjusted to be in units that are consistent with the consumption units (see below). M&E system designers should take into account that sometimes only expenditures are recorded, thus requiring additional information can present a challenge for those that collect data.

Secondly, the environmental characteristics of the products, namely energy consumption per unit and energy source (electricity, gas, diesel, biomass, etc.), have to be registered. These characteristics can be either of the product – direct evaluation – or of an agreed proxy – proxy evaluation. In the first case, the exact energy consumption in each operating mode of the items purchased in a contract has to be registered. In the proxy evaluation, a reference energy consumption value is selected as proxy and applied to all products. For example, if televisions rated class-A according to the national energy label are purchased, reduction in energy consumption can be calculated using the exact energy consumption of each TV (direct evaluation) or using the minimum consumption for class-A as a proxy. While direct evaluation of the estimated environmental benefit is slightly more accurate, that level of data tracking makes the process burdensome and unnecessarily exact given that other approximations have to be used to calculate the environmental benefits afterwards. Proxy evaluation is less precise and might underestimate environmental benefits, but it is simpler and data is easier to track. That is why most organizations use proxy evaluations to estimate the environmental benefits of EEP/GPP.

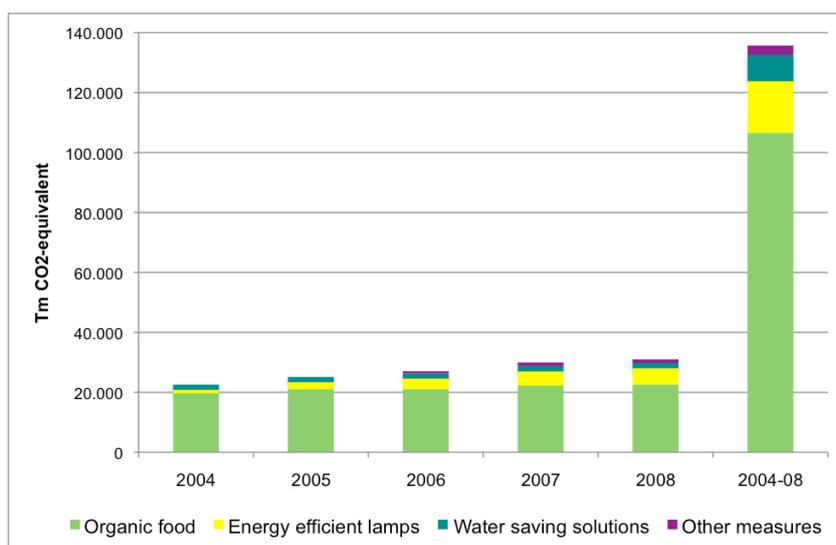
Thirdly, the environmental impact factors have to be established. This includes estimated functioning modes (for computers, it might be hours a day in “on”, “stand-by” and “off” mode and annual workdays; for vehicles annual mileage is normally used) and conversion factors. These conversion factors translate estimated consumption units into GHG emissions by energy source (for example grams of CO<sub>2</sub> by kWh of electricity, litre of fuel or m<sup>3</sup> of natural gas).

Finally, and in order to communicate how EEP has reduced energy consumption and GHG emissions, the environmental characteristics of products used previously or non-efficient alternatives have to be recorded. When doing so, it is recommended to track not only the improvement ratios between green and not-green products, but also the absolute figure to calculate the environmental relief achieved from buying less. GPP is meant to improve the environmental performance of public authorities throughout the whole purchasing cycle. Thus, the effects of these programs can go beyond buying green product and include other activities in the field of responsible consumption, such as reducing needs or using resources more efficiently. If only the environmental benefits of buying green are evaluated, an organization buying a larger quantity of products might show better results in environmental relief than another one that reduced its overall consumption. Therefore, monitoring the environmental performance on the basis of purchased products should also consider overall purchases to avoid penalizing organizations that become more efficient and reduce their purchasing needs.

#### Case 8. Benefits of Vienna's ÖkoKauf Program

The green procurement program of the Vienna City Council, known as *ÖkoKauf Wien*, was set up in 1999 as one of the key elements of the city's climate protection program, *KliP Wien*. Even though *ÖkoKauf* does not maintain detailed records of the environmental relief achieved, some calculations have been done to communicate the environmental benefits and cost reductions of the program, as there is a general misperception that ecological goods and services always come with a price premium. For the environmental component, the program calculated impacts during either the use or production phase of the product or service. For example, with organic food an estimated factor of the environmental relief during production of organic versus conventional food was used. For energy efficient lamps and water-saving devices, the impact was estimated based on the reduction of water, hot water, and electricity consumption during use [14].

**Figure 4. CO<sub>2</sub>-equivalent reduction achieved with GPP in the City of Vienna, Austria (2004-2008)**



Source: Patak, G. *ÖkoKauf Wien* [slides presentation]. European Public Sector Award 2011 (Maastricht, the Netherlands 15-17 November 2011).

### 3.2.2. Calculations Based on Energy Consumption

Due to the influence of energy efficient products on the organisation's energy consumption, the benefits of EEP can also be calculated indirectly by monitoring the energy consumed by the organisation. For example, the reduction in vehicle fuel consumption expected from buying energy efficient vehicles can be estimated, or annual fuel consumption can be tracked to measure the actual reduction due to green procurement.

The procurement of energy efficient products and services is key to reducing energy consumption; however, product use and behaviour may have a greater impact on actual energy consumption. In fact, energy savings estimates based on purchases (see previous section 3.2.1) does not guarantee a decrease in energy consumption, and how the product is used and consumer usage habits must be taken into consideration. Therefore, whenever possible, it is best to calculate real energy savings and CO<sub>2</sub> reduction by monitoring actual energy consumption. This approach reduces the number of parameters to track and makes it possible to monitor the effects of green solutions without making estimates. However, as an indirect evaluation, EEP effects might be masked due to the interaction with other variables.

#### Case 9. Indirect Evaluation of Green Vehicle Procurement in the USA [15]

In the United States, energy efficiency improvements and GHG emissions reduction achieved in government owned vehicle fleets through green procurement actions are not monitored based on annual purchases, but indirectly through the overall performance of the improved fleet using real usage data. Through the web-based Federal Automobile Statistical Tool, agencies input data required by several regulations (both energy and economic/budget related). These inputs include: vehicle inventory, purchases and disposals (actual, planned, projected, forecast), type of fuel, type of ownership (purchased, GSA-leased, commercially-leased), mileage, cost data (acquisition, indirect, maintenance and depreciation costs), and fuel cost and consumption. Using this information, GHG emissions reduction associated with vehicle procurement and use can be calculated and integrated into the overall target for GHG emissions reduction by the federal government.

## 4. Supportive Instruments

### 4.1. Incentives

Even when monitoring is part of EEP policies, organizations' commitment to implement a policy and track progress on achievements may vary, especially when the targets or objectives are voluntary, no enforcement mechanisms are in place, and/or when policy commitments are set at a higher administration level with little or no jurisdiction over other administrations' activities.

In order to promote implementation, monitoring, and reporting some administrations have supplemented EEP policies with incentives. Two types of incentives, economic and reputational, are described below.

#### 4.1.1. Economic Incentives

Monetary incentives reward public administrations that advance EEP implementation and may also punish organisations or departments that fail to comply with minimum green procurement levels. The economic incentive can be designed in many different ways. The following cases reflect some of those options.

##### Case 10. GPP Reporting Incentives in South Korea [16]

To promote the purchase of green products and reporting results, the "Korean Act on Encouragement of Purchase of Green Products" from 2011 states that the Ministry of Environment may grant environment-related subsidies preferentially to local governments with excellent purchase records of green products. This assessment is based on the annual green products records that each public institution submits to the Ministry of the Environment within the three months after the end of each fiscal year.

##### Case 11. Financial Mechanism to Promote Environmental Monitoring and Performance in France's Central Government [17, 18 and 19]

In 2008, the French Central Government, recognizing the unique role of the government in achieving sustainable development, passed a regulation requiring all ministerial departments to develop an Exemplary Administration Plan to achieve sustainable development in their services and operations. To guarantee a certain consistency and efficacy in the government's actions, a set of common measures and targets for all Ministries was defined, focusing on procurement, eco-responsibility (mainly consumption reduction), and social responsibility. To track compliance, mandatory annual reports are also required.

To encourage the achievement of common objectives and the integration of sustainable development in the Ministries' operations, a financial mechanism was established to accompany implementation and reporting of the plans (from 2009 onwards). The mechanism consists of a virtual fund of approximately 100 million Euros created by setting aside ("freezing") 1% of the budget that each Ministry is allocated for procurement at the beginning of each year. Each ministerial department has to report on its achievements against the commonly set targets to recover the "frozen" budget. The frozen funds are redistributed among the departments according to their performance in achieving the targets. Thus, the more targets achieved, the higher the return will be, with a minimum number of targets reached to participate in the redistribution (in 2012, at least 11 out of 18 indicators had to be met- including requirements on energy consumption, procurement of low CO<sub>2</sub> emitting vehicles and work related travels). Two cases may arise:

If a department does not reach the minimum threshold of indicators, it immediately loses 50% of its contribution, which will be redistributed among the departments that meet or exceed the threshold (explained below). The department can recover the other 50% if it complies with the objectives for the previous reporting year during the following year. If it still fails, the money cannot be recovered and is added to the fund for next year's distribution among those that do comply.

If a department meets or exceeds the minimum threshold, it immediately gets 50% of its contribution and benefits from the redistribution of the other portions (from them, the other departments that met

the threshold, and percentages lost by other departments). The amount allocated to each ministry is proportional to its financial contribution to the fund and its performance.

#### 4.1.2. *Reputational Incentives*

Comparison between peers and recognition of achievements and improved efforts can have a positive effect on policy implementation if it impacts the reputation of organizations. Agencies with low performance in certain areas become motivated to improve their results and thus their reputation. Those with higher achievements get recognition for their efforts and improve their image with stakeholders. In order to have an impact, results have to be published internally, or ideally publically, and they can be presented in two ways: 1) as a ranking or benchmark of agencies based on their results, presenting both good and bad performances, or 2) as a list of top-performing agencies based on overall results or on leadership in specific areas of EEP implementation, such as policy quality, supplier engagement, monitoring systems, etc.

These mechanisms require, in general terms:

- Defining simple indicators that easily convey the different performance levels if more than one parameter is monitored (e.g. traffic light indicator, stars rating, medals indicator, etc.).
- Evaluating organizations' performance against the defined indicators to benchmark agencies according to their results.
- Making results public through a regular publication, organization's website, awards ceremony, etc.
- Keeping the mechanism in place for a defined period of time to be able to have an impact on agencies' reputations.

To leverage the impacts from these programs the publication of results should share lessons learned and best practices from departments and organizations excelling in a particular area. These examples can help other organisations improve their performance.

#### Case 12. Green Procurement Performance Appraisal and Award in Taiwan [20]

To promote GPP implementation and recognize efforts of leading agencies, the Government of Taiwan annually evaluates agencies' performance on green procurement based on "Green Procurement Amount Reports" and rewards those with excellent performance at a public event. Performance evaluation is based on three elements:

1. Percentage of total products procured from a list of designated green products—this list covers 20 product groups including: office stationery and paper products, office ICT equipment, electronic appliances, and a set of other items such as cleaning products or paints (70 points)
2. Number of other green products purchased (10 points)
3. Activities to support GPP implementation, including training courses, communication and dissemination actions, involvement of chief officers and subordinated agencies, creative procurement, etc. (20 points)

Depending on the total points obtained, agencies can be classed as Superior, Grade A, Grade B, or Grade C. Results by class from 2002 to 2006 are summarized below:

**Figure 5. GPP Performance Appraisal of Taiwan Government Agencies 2002-2006**

Appraisal class	Points (out of 100)	2002	2003	2004	2005	2006
Superior	More than 90	1	26	17	16	23
Grade A	More than 80	6	33	26	38	41
Grade B	More than 70	32	0	16	7	0
Grade C	Less than 70	21	1	1	0	0

Source: [http://greenliving.epa.gov.tw/GreenLife/eng/E-The\\_Green\\_Procurement\\_Promotion\\_Result.aspx](http://greenliving.epa.gov.tw/GreenLife/eng/E-The_Green_Procurement_Promotion_Result.aspx)

**Case 13. Mayor of London's Green Procurement Code [21]**

The Mayor of London's Green Procurement Code is a support service for organisations committed to reducing their environmental impact through responsible purchasing. Awareness that management and behavioural changes are as important as technical specifications to source green products, the initiative provides assistance to embed green purchasing into all aspects of the organizations.

Organisations that sign the Green Procurement Code commit to achieving progressive environmental targets and can be awarded bronze, silver, or gold status as a mark of their success, depending on the results of their progress review and the completion of a third-party audit. The progress review consists of two parts: 1) performance against a set list of management questions based on the UK Government Flexible Framework; and 2) green purchases of products and services recorded during the previous financial year. Based on the combined results of both parts, organisations can be awarded one of the three levels:

**Figure 6. Level awarding in the Mayor of London's Green Procurement Code**

Part one / Part two	Bronze	Silver	Gold
Bronze	Bronze	Bronze	Bronze
Silver	Bronze	Silver	Gold
Gold	Silver	Silver	Gold

Source: <http://www.greenprocurementcode.co.uk/?q=node/304>

Once organizations have been audited, success is celebrated at an annual awards ceremony, and award winners are listed online and in the initiative's annual progress report.

**4.2. Integration in Environmental Management Systems**

Environmental Management Systems (EMS) are management approaches that serve to systematically:

- Evaluate the environmental performance, risks, and impacts of an organization's operations and activities (caused directly or indirectly);
- Establish objectives, measures, and procedures to address issues causing or threatening significant environmental impacts in order to improve the organization's environmental performance; and
- Monitor and analyze performance in implementation in order to define new actions and ensure continual improvement.

When first implemented, EMS programs tend to focus on direct impacts occurring in the organisation's facilities (e.g. water and energy consumption, waste generation and recycling, use and manipulation of hazardous products, generation of noise, odours, and gases emissions, etc.). Particularly in administrative and office buildings, the scope is soon enlarged to include indirect impacts stemming from the supply chain, including first-tier contractors and following-tier suppliers. Including procurement activities as part of EMS will serve not only to apply EEP as a measure to reduce direct impacts, but also to evaluate the overall effects of unsustainable acquisition practices and help implement EEP in a consistent manner.

As EMS requires regular monitoring of results, such systems help define and implement mechanisms for careful tracking of EEP measures. When doing so, special attention must be given to defining mechanisms and monitoring systems that yield results in line with the EEP monitoring requirements and objectives set at a policy level. In any case, EMS will monitor the impact of EEP actions, though indirectly, when tracking energy consumption.

Additionally, the integration of EEP into the EMS should foresee that adverse findings are fed into the EMS corrective action process to ensure that action is taken and EEP implementation is progressively improved.

#### Case 14. Implementing GPP Requirements in the EMS of U.S. Department of Energy Facilities [22]

Executive Order 13423 directed U.S. federal agencies to implement EMS at all appropriate organizational levels to ensure the use of EMS as the primary management approach for addressing environmental aspects of internal agency operations and activities. In order to coordinate this requirement with others on GPP, the U.S. Department of Energy (DoE) approved an internal order for all facilities managed by federal staff or contractors, requiring: 1) the implementation of EMS in all DoE sites integrated with the site's Integrated Safety Management System, and 2) the inclusion in the EMS of the objectives and targets for annual review that contribute to achieving DoE sustainable environmental stewardship goals, including those on the acquisition and use of environmentally preferable products (including energy efficient products) in the conduct of operations.

## **5. Conclusions and Recommendations**

Even though the results and impacts of many policies that include EEP requirements are not routinely monitored, the proper tracking, evaluation, and reporting of results can yield remarkable benefits to organisations. Through monitoring, policymakers can improve efficiency and effectiveness in policy deployment by identifying areas or elements that need improvement, which will help to target supportive measures. Furthermore, making results available both internally and externally demonstrates political commitment, enhances transparency, and legitimizes the promotion of sustainable consumption and production by other sectors of society. The publication of results also promotes policy embedment by keeping each agency accountable.

Existing M&E approaches applied by different public administrations show a broad range of priorities and systems for the monitoring and evaluation of EEP. Reasons behind this diversity include the variety in policy objectives, targets and goals, the relation to other sectoral policies, the difference between policy development and implementation, the structure and level of centralization of purchasing systems or the commitment level of involved actors, among others. A clear definition of policy goals and indicators, embedment in existing tracking systems, additional facilitating measures, and visibility of results are necessary for successful and cost-effective implementation of M&E systems.

### **5.1. Ensure Leadership and Clearly Define Objectives, Indicators and Progress Tiers**

As can be observed in Table 1, EEP requirements are generally embedded in environmental policies, creating a gap between who is responsible for defining the policy and who is responsible for implementing it. The former (usually the Environment or Energy Departments) predetermines policy objectives and targets that affect the monitoring system, but it is within the Procurement units that

policies are implemented. Therefore, it is key to have procurement managers participate in developing an efficient M&E system that is accurate and representative, but not too complex or burdensome, and that is integrated in existing purchaser workflows (especially when monitoring actual procurement of energy efficient products). The same applies if EEP is monitored based on consumption levels where other staff are involved (for example fleet or building managers).

In general terms, policies tend to define overall EEP targets, however it is recommended to set progress levels and evaluate against them to encourage implementation, as green procurement requires changing habits and practices, and performance tiers convey that sense of progress and the time needed to achieve those targets. Furthermore, tiers help communicate achievements to all relevant stakeholders.

To measure success, key performance indicators have to be identified. Typical indicators used to monitor the procurement of products are the total and percentage of green products and/or tenders (in units and economic terms) in relation to the total acquired or tendered for a list of prioritized product groups. When evaluating the environmental relief obtained with EEP, as highlighted in a recent report by the Energy Sector Management Assistance Program [3], indicators such as energy consumption, GHG emissions, and even cost savings are commonly used.

## **5.2. Set efficient systems to monitor products procurement**

M&E systems might cover different objectives; therefore, an appropriate approach should be selected for each objective and this may result in a mixed system. Regardless of the system(s) selected, it is key to accompany a M&E system with clear definitions, explanations, instructions, and verification documents (if required) to avoid misinterpretations, improve the efficiency of the organisations responsible for monitoring, and ease the centralization of data at a pan-government level. Organisations should be able to invest less time to answer queries or verify data and more on data analysis and evaluation of results. The systems should also be tested in advance, as sometimes definitions are not as straightforward as intended, and defined with the relevant parties. Linked to this, changes in the M&E systems should be minimized to facilitate understanding, ensure data comparability, and identify trends.

In general terms, monitoring green product purchases is more burdensome than monitoring green tenders. Furthermore, with the trend to change contracting models from purchase to service contracts, it can be foreseen that tracking product consumption will be increasingly onerous, as more data will be required from suppliers. Therefore, strong relationships and good reporting habits will need to be established with contractors. When monitoring tenders, the risk is to count as “green” tenders that in the end don’t yield a green result. To avoid it, only compulsory criteria should be used to qualify tenders as “green”.

For quantitative data, an early analysis of existing tracking mechanisms (of tenders, expenditure, consumption, etc.) is advisable in order to start monitoring where data is available or to introduce the required changes for efficient and reliable data tracking. This is especially relevant when monitoring green tenders and/or acquisition of green products. To be efficient, EEP tracking has to be integrated from the beginning into the procurement process and tracking systems.

Tracking mechanisms vary depending on what is monitored; however, for quantitative indicators, it is always preferable to use public data (i.e., from e-tendering platforms) or data centrally collected (such as centralized purchases), as data tracked through questionnaires is less reliable and more time consuming. In the era of electronic information technologies, online applications and internal software are the most efficient solution for compiling information and processing it automatically. Such software can be programmed to retrieve data from other platforms (reducing data input duplication) and to produce direct calculations and graphical outputs of results and their deviation from the set targets. That requires certain standardization in procurement management software and other applications, which might not exist within an organization, let alone between different public authorities. However, when tracking systems are semi-automatic and multiple users are responsible for inputting data, providing training to understand definitions, information requirements, and tool operation (either a spreadsheet or an online platform) is key to ensure appropriate data tracking and minimize errors.

### **5.3. Calculate Representative Environmental Benefits**

As EEP has an impact on organisations' energy consumption, in most cases it is best to evaluate the evolution in real energy consumption when calculating the environmental relief achieved with EEP, to identify if EEP yields results or if other factors are overriding them. If the environmental relief is calculated only on the basis of purchased products, benefits are only theoretical, misrepresenting the EEP impacts. In spite of that, if environmental benefits are calculated directly or by proxies based on purchased products, this has to be taken into consideration from the beginning when identifying the data to be reported, as some parameters might be necessary for a meaningful assessment (for example, to report both in expenditure and physical units). And special attention should be paid to establishing an M&E system that calculates environmental benefits not only in relation to energy efficient versus conventional products, but also in relation to overall purchases and to communicate the benefits of reducing procurement needs and rationalise acquisitions.

In those regions or agencies where green procurement is considered more expensive, it is advisable to evaluate, either as a one-time evaluation or as part of the regular monitoring, the lifecycle cost reductions achieved, to make the business case for EEP and GPP, as savings achieved with EEP can be used to compensate premium costs in other GPP actions.

### **5.4. Implement Facilitating Measures**

In order to ensure or promote better monitoring and overall implementation, organizations might design reputational and/or economic incentives to accompany M&E systems. Reputational incentives are linked to the public presentation of results and can be designed as "rewards", when only the best are acknowledged, or as "rewards and punishment", when all departments or organizations are benchmarked, from the most to the least performing. Economic incentives can also take the form of rewards and/or penalties. In the second case, it is best when all parties agree on how the penalties are to be applied in order to minimize opposition.

Another strategy to facilitate monitoring and implementation is to integrate EEP requirements within existing EMS, as EMS requires regular monitoring of results and therefore they "force" organisations to define and implement mechanisms for careful tracking of EEP measures. When doing so, attention has to be paid to define procedures that yield results in line with the EEP monitoring requirements set at policy level.

### **5.5. Communicate and show results**

Finally, EEP individual results (by department or administration, depending on the level of monitoring) should be published and made publicly available in order to increase government transparency and demonstrate public leadership. Visual elements such as graphics and simple evaluation and rating indicators serve to present progress in an easy-to-understand manner that can be used to openly report on government performance and to benchmark progress by each agency, fostering improvement through reputational incentives. However, reports should not focus only on results but also include information on why and how department or public agency's excelling in a particular area have achieved such results, in order to tie actions to results and share examples that can help others improve.

## **6. Acknowledgement**

This article draws on the study commissioned by the Super-Efficient Equipment and Appliance Deployment Initiative (SEAD): Ecoinstitut. *Resource Guide on Monitoring and Evaluation of Green Public Procurement Programs*. SEAD, 2013 (expected to be published in May/June 2013).

## 7. References

- [1] OECD. Government at a Glance 2011. [http://www.oecd-ilibrary.org/sites/gov\\_glance-2011-en/09/01/index.html?contentType=/ns/Book,/ns/StatisticalPublication&itemId=/content/book/gov\\_glance-2011-en&containerItemId=/content/serial/22214399&accessItemIds=&mimeType=text/html](http://www.oecd-ilibrary.org/sites/gov_glance-2011-en/09/01/index.html?contentType=/ns/Book,/ns/StatisticalPublication&itemId=/content/book/gov_glance-2011-en&containerItemId=/content/serial/22214399&accessItemIds=&mimeType=text/html) [Consulted on 13/02/2012].
- [2] World Bank in Harris, J. et al. Public Sector Leadership: Transforming the Market for Efficient Products and Services. Proceed. *ECEEE 2005 Summer Study*. ADEME Editions, Paris:2005.
- [3] Singh J., Culver A. and Bitlis M. *Technical Report 003/12. Public procurement of energy efficient products. Lessons from Around the World*. Energy Sector Management Assistance Program, The World Bank, Washington DC: 2012.
- [4] European Commission. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Public procurement for a better environment COM(2008) 400 final.
- [5] Government of Japan. Basic Policy concerning the Promotion of Contracts considering Reduction of Emissions of Greenhouse Gases and Others by the State and Other Entities (Approved by the Cabinet on February 5, 2010).
- [6] Government of Spain. Order PRE/116/2008 of 21 January 2008 publishing the approval of the Plan on Green Public Procurement of the Central Government and Related Agencies. BOE nº27, jueves 31 enero 2008, p. 5706-5710.
- [7] District Federal Government. Mexico City Climate Action Program 2008-2012/Summary (second edition, September 2008).
- [8] Fuguo C., Yuying Y. and Fen Z. *Towards Sustainable Public Procurement In China: Policy And Regulatory Framework, Current Developments And The Case For A Consolidated Green Public Procurement Code*. Proc. of the 4<sup>th</sup> International Public Procurement Conference (Seoul, South Korea, 26-28 August 2010).
- [9] PricewaterhouseCoopers, Significant and Ecofys. *Collection of statistical information on Green Public Procurement in the EU. Report on methodologies*. PricewaterhouseCoopers, Digital: 2009.
- [10] EcoBuy. *EcoBuy Awards 2011 Winner: Cardinia Shire Council Tracking green purchases via its finance system. Award for Excellence in Green Purchasing, Measurement and Continuous Improvement*. 9th ECO-Buy Awards, Celebrating Achievements in Green Purchasing, EcoBuy, Digital: 2011.
- [11] King County. *Environmental Purchasing Program. Environmentally Preferable Computers*. (2012).
- [12] Payne, C., Weber, A. & Semple, A. *Energy efficient Public Procurement. Best Practice in Program Delivery*. SEAD, Digital: 2013 (to be published).
- [13] Government of Malta. Contracts Circular N° 21/2011, of 14th November 2011, Green public procurement and other procedures.
- [14] ESMAP. *Good Practices in City Energy Efficiency. Vienna, Austria (European Union) – Municipal Eco-Purchasing*. ESMAP Energy Efficient Cities Initiative. ESMAP, Digital: 2011.
- [15] [https://federalfleets.energy.gov/federal\\_requirements/reporting/fast](https://federalfleets.energy.gov/federal_requirements/reporting/fast)
- [16] Government of Korea. Act on Encouragement of Purchase of Green Products 2011.

- [17] Government of France. Circular n°5351/SG of 3 December 2008 concerning the exemplarity of the State regarding sustainable development in the operation of its services and its public buildings (2008).
- [18] Government of France. Complement to the Circular n°5351/SG - operation of the financial mechanism accompanying the implementation of the Exemplary Administration Plans (2010).
- [19] Government of France. Complement to the Circular n°5351/SG – 2012 Indicators (2012).
- [20] Environmental Protection Administration of the Government of Taiwan. *The Green Procurement Promotion Result in the Government Agency*, GreenLiving Information Platform [website]. Retrieved on 20 November 2012, [http://greenliving.epa.gov.tw/GreenLife/eng/E-The\\_Green\\_Procurement\\_Promotion\\_Result.aspx](http://greenliving.epa.gov.tw/GreenLife/eng/E-The_Green_Procurement_Promotion_Result.aspx)
- [21] Mayor of London's green procurement code. *Achieving gold, silver and bronze* [website]. Retrieved on 16 November 2012 <http://www.greenprocurementcode.co.uk/?q=node/304>
- [22] US Department of Energy. Order DOE O 450.1A Environmental Protection Program. US Department of Energy, Washington DC: 2008.