Assessing the Potential Cost Savings and Resource Savings of Investments in 4 SME sectors

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Author(s)	David Fleet Michele Palladino Shaun Da Costa
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Executive Summary

Need for the study

The aim of this study is to provide evidence to inform discussions on a potential investment plan for SMEs, within the context of the EU Agenda for Green Growth and Jobs, and the European Semester 2015 exercise. The rationale of the study is based on the importance given to resource efficiency as a tool to promote sustainable development, as recognized in the EU policy framework and in different initiatives at the Member State level.

A previous study conducted by Risk and Policy Analysts (RPA, 2014), which was published by the EC DG-Environment at the beginning of 2014, evaluated the potential for resource cost savings at the firm level connected to business support programmes targeted at SMEs across Europe.

The present study builds upon the main findings of RPA (2014).

Objectives of the study

This study assesses the potential benefits from implementing business support programmes across the Member States targeted at SMEs investing in resource efficiency. In RPA (2014), the ENWORKS programme in the UK was identified as having adopted a particularly effective approach to working with SMEs on resource efficiency issues. As a result of its comprehensive data collection system, it was decided to utilise the programme's data on cost and resource savings to extrapolate the potential savings that might be made if similar programmes were implemented across all Member States. Potential benefits were estimated with regard to:

- Cost savings from investments in resource efficiency measures, based on hypothetical scenarios modelling the implementation of an ENWORKS-type programme across the EU;
- Possible reductions in resource use by SMEs supported by such a programme;
- Potential employment effects (jobs created and secured) in SMEs across the EU as a result of support provided by these types of programmes;
- The possibility of rolling out the ENWORKS online monitoring software tool across the EU.

The analysis is focused on four economic sectors: Food and Beverages; Construction; Energy, Power, and Utilities; and Environmental Technology.

Approach to the study

Two primary approaches were used to calculate the potential resource and cost savings across the four SME sectors:

- Estimated savings approach: Calculates the cost savings that could be realised by a €4 billion public investment based on the relative cost of implementing ENWORKS-type programmes in individual Member States; it also makes assumptions regarding the baseline levels of resource efficiency that may exist across the EU-28 Member States; and
- Validation approach: Measures the cost savings that could be made if an €11 billion private sector investment in resource efficiency measures was leveraged through a mix of (co) funding, loans and other financial instruments.

Once costs savings were estimated, the associated reductions in resource use and the potential employment effects were also calculated.

Data on the outcomes of ENWORKS support, and information relating to the online monitoring software were collected through extensive consultation with ENWORKS project managers.

Main findings

Under the first approach, which calculates the cost savings that could be realised by €4 billion of public investment, it was estimated that total resource cost savings of € 8.7 billion/year across EU-28 could be realised.

The second validation approach, which assumed that the public investment would leverage a further €11 billion in private investment, yields cost savings more than three times higher than those estimated using the first approach (i.e. €32.8 billion per year). However, this higher estimate should be interpreted with caution, as it does not explicitly account for underlying levels of resource efficiency.

In terms of reductions in resource use, the results indicate that the savings could be significant. For instance, the investment could lead to 181.3 million tonnes of waste being diverted from landfills each year. Similarly, it could also lead to reductions in the use of 1.7 billion tonnes of material resources annually. Lastly, the results indicate that around 128,000 jobs could be created as an indirect benefit of the induced resource efficiency savings; this rises to 268,000 under the other scenario. Furthermore, the findings point towards the safeguarding of an extra 360,000 jobs, which would have been otherwise lost.

Finally, regarding the possibility of rolling out the ENWORKS Online Resource Efficiency Toolkit across EU-28, no significant costs are expected to be incurred by the companies using this tool, and the use of such a toolkit in other Member States should not face any major technical hurdles. The costs of implementing such measures to monitor the outcomes of support at a programme are expected to mirror those of the ENWORKS programme. The most significant of which are only around €18,600 annually for software maintenance, licences and secure socket layers (SSL), €18,600-€24,180 for server hosting and a variable budget for software development to add future functionality. It is noted however, that the monitoring software developed and used under the ENWORKS programme is part of wider programme support involving professional advice and assistance to SMEs. As a result, it cannot be considered as a stand-alone product to be used without appropriate support for identifying relevant opportunities for cost and resource savings.

Résumé analytique

Nécessité de l'étude

L'objectif de cette étude est de fournir des preuves pour informer les discussions sur un plan d'investissement possible pour les PME, dans le cadre du Programme UE pour la croissance verte et l'emploi, et l'exercice semestre européen 2015. La justification de l'étude se repose sur l'importance accordée à l'efficacité de ressources comme un outil pour promouvoir le développement durable, comme le reconnaissent le cadre politique de l'UE et les différentes initiatives au niveau des États membres.

Une étude précédente menée par *Risk and Policy Analysts* (RPA, 2014), qui a été publié par DG-Environnement de la CE au début de 2014, a évalué la possibilité d'économiser les couts de ressources au niveau de l'entreprise relié aux programmes de soutien aux entreprises destiné aux PME dans toute l'Europe.

La présente étude se fonde sur les principales conclusions de RPA (2014).

Objectifs de l'étude

Cette étude évalue les avantages possibles de la mise en œuvre des programmes de soutien aux entreprises dans les États membres destinés aux PME qui investissent dans l'efficacité de ressources. À RPA (2014), le programme ENWORKS au Royaume-Uni a été identifié comme ayant adopté une approche particulièrement efficace de travailler avec PME sur les questions d'efficacité de ressources. Grâce à son système complet de collecte de données, il a été décidé d'utiliser les données du programme sur les économies de couts et de ressources pour extrapoler les économies possibles qui pourraient être fait si des programmes similaires étaient mis en œuvre dans tous les États membres. Les avantages possibles ont été estimés à l'égard de:

- Réduction des couts grâce à l'investissement dans les mesures d'efficacité de ressources, basé sur scenarios hypothétiques qui modélisent la mise en œuvre d'un programme de type ENWORKS dans toute l'UE;
- Réductions possibles dans l'utilisation de ressources par PME soutenues par un tel programme;
- Effets possibles sur l'emploi (emplois créés et sécurisés) dans les PME dans toute l'UE grâce au soutien fourni par ces types de programmes;
- La possibilité de déployer l'outil logiciel de surveillance en ligne ENWORKS dans toute l'UE.

L'analyse se concentre sur quatre secteurs économiques: aliments et boissons; construction; énergie, alimentation, et services publiques; et technologie environnementale.

Approche de l'étude

Deux approches principales ont été utilisées pour calculer les économies de ressources et les économies des coûts possibles dans les quatre secteurs PME :

- Approche économies estimées: calcule les économies qui pourraient être réalisées via un investissement public de €4 milliards basées sur le cout relatif de la mise en œuvre des programmes de type ENWORKS dans les États membres; elle fait également des hypothèses

concernant les niveaux de référence de l'efficacité de ressources qui peuvent exister dans tous les 28 États membres de l'UE; et

- Approche validation: mesure les économies de couts qui pourraient être fait si un investissement de €11 milliards du secteur privé dans les mesures d'efficacité de ressources est exploité via un mélange de (co)financement, prêts et autres instruments financiers.

Une fois que les économies de couts avaient été estimées, les réductions associées dans l'utilisation de ressources et les effets possibles sur l'emploi ont également été calculées.

Des données sur les résultats du soutien ENWORKS, et des informations relatives au logiciel de surveillance en ligne ont été recueillies via une vaste consultation avec les gestionnaires de projet ENWORKS.

Les principales conclusions

En vertu de la première approche, qui calcule les économies de couts qui pourraient être réalisé par un investissement public de €4 milliards, il a été estimé que le total des économies de couts de ressources de €8.7 milliards/an dans les 28 membres de l'UE pourrait être réalisé.

La deuxième approche validation, qui avait supposé que l'investissement public mobiliserait un montant supplémentaire de €11 milliards de l'investissement privé, crée des économies de couts plus de trois fois plus élevées que celles estimées en utilisant la première approche (c'est à dire €32.8 billion par an). Toutefois cette estimation plus élevée doit être interprétée avec prudence, car il ne tient pas compte explicitement des niveaux sous-jacents d'efficacité de ressources.

En termes de réduction de l'utilisation de ressources, les résultats indiquent que les économies pourraient être importantes. Par exemple, l'investissement pourrait conduire à 181,3 millions de tonnes de déchets détournés des sites d'enfouissement chaque année. De même, il pourrait également conduire à une réduction de l'utilisation de 1,7 milliards de tonnes de ressources matérielles par an. En fin, les résultats indiquent qu'environ 128 000 emplois pourraient être créés comme un avantage indirect des gains d'efficacité de ressources induits; cela s'élève à 268 000 dans l'autre scénario. En outre, les résultats impliquent qu'il y aura une sauvegarde de 360 000 emplois supplémentaires, qui auraient été autrement perdus.

Enfin, concernant la possibilité de déployer l'outil ENWORKS en ligne de l'efficacité de ressources dans tous les 28 membres de l'UE, pas de couts importants devraient être engagés par les entreprises utilisant cet outil, et l'utilisation d'un tel outil dans les autres États membres ne devrait pas faire face à des obstacles techniques majeurs. Les couts pour la mise en œuvre de telles mesures pour suivre les résultats du soutien à un programme devraient refléter celles du programme ENWORKS. Le plus importants de ces couts étant environ €18 600 par an pour la maintenance des logiciels, licences et *secure socket layers (SSL),* €18,600-€24,180 pour l'hébergement du serveur et un budget variable pour le développement de logiciels pour ajouter fonctionnalités futures. Cependant, il est à noter que le logiciel de surveillance élaboré et utilisé en vertu du programme ENWORKS fait partie un programme de soutien plus large comprenant de conseils professionnels et de l'aide aux PME. En conséquence, il ne peut pas être considéré comme un produit autonome à utiliser sans le soutien approprié pour identifier les opportunités pertinentes pour les économies de couts et de ressources.

Zusammenfassung

Notwendigkeit dieser Studie

Das Ziel dieser Studie ist es, Belege für eine Diskussion über einen potentiellen Investierungsplan für KMUs zu liefern im Rahmen der EU Agenda für grünes Wachstum und Arbeitsplätze und des Europäischen Semesters 2015. Das Grundprinzip dieser Studie basiert auf der Bedeutung welche von Materialeffizienz als ein Werkzeug für die nachhaltige Entwicklung ausgeht. Dies wurde auch im politischem Rahmen der EU Gesetzgebung und in verschiedenen nationalen Initiativen auf der Ebene der Mitgliedsstaaten anerkannt.

Eine vorherige Studie (RPA, 2014), welche von Risk & Policy Analysts durchgeführt wurde und von der Generaldirektion Umwelt der Europäischen Kommission Anfang 2014 veröffentlicht wurde, hat das Potential für Kosteneinsparungen durch Materialeffizienz auf der Unternehmensebene, verbunden mit Programmen zur Unternehmensförderung welche auf KMUs in Europa ausgericht waren, bewertet.

Die vorliegende Studie baut auf den Ergebnissen der RPA Studie von 2014 auf.

Zielsetzung dieser Studie

Diese Studie bewertet die potentiellen Vorteile welche von einer Umsetzung der Unternehmensförderungsprogramme ausgehen. Diese finden in der gesamten EU statt und sind auf KMUs ausgerichtet welche in Materialeffizienz investieren. In der RPA Studie von 2014 wurde das ENWORKS Programm des Vereinigten Königreichs als ein besonders effektiver Ansatz ausgewählt welcher mit KMUs an Materialeffizienzproblemen arbeitet. Als Folge seines umfassenden Datensammlungssystem wurde beschlossen die Daten über Kosten- und Materialeinsparungen dieses Programms zu verwenden um die potentiellen Einsparungen zu berechnen welche möglichweise erzielt werden könnten wenn ähnliche Programme in allen Mitgliedsstaaten umgesetzt würden.
Mögliche Vorteile wurden im Bezug auf die folgenden Punkte geschätzt:

- Kosteneinsparungen durch Investitionen in Materialeffizienzmaßnahmen basierend auf hypothetischen Szenarien welche die Umsetzung von ENWORKS-typischen Programmen in der EU erstellen;
- Mögliche Materialeinsparungen von KMUs welche durch ein solches Programm gefördert werden;
- Potentielle Beschäftigungsauswirkungen (Beschäftigungsmöglichkeiten schaffen und erhalten) in KMUs in der EU als eine Folgen von der Unterstützung welche von dieser Art an Programmen ausgeht;
- Die Möglichkeit die ENWORKS Online Überwachungssoftware in der gesamten EU einzuführen.

Diese Analyse konzentriert sich auf vier Wirtschaftsbereiche: Nahrungsmittel und Getränke; Baugewerbe; Energieversorgung; und Umwelttechnologie.

Ablauf der Studie

Zwei Hauptansätze wurden verwendet um die potentiellen Material- und Kosteneinsparungen in den vier KMU Sektoren zu berechnen:

- Ansatz der geschätzen Einsparungen: Berechnet die Kosteneinsparungen welche durch eine öffentliche Investition von €4 Milliarden erreicht werden könnten basierend auf den relativen Kosten welche von der Umsetzung der ENWORKS-typischen Programme ausgehen in einzelnen Mitgliedsstaaten. Dieser Ansatz stellt auch Vermutungen auf im Bezug auf das Basisniveau von Materialeffizienz welches in den 28 EU Mitgliedsstaaten möglicherweise existiert; und
- Ansatz der Validierung: Misst die Kosteneinsparungen welche erzielt werden könnten wenn Materialeffizienzmaßnahmen durch eine €11-Milliarden Investierung des Privatsektors durch eine Mischung an (Ko)-Finanzierungen, Krediten und andere finanzielle Maßnahmen aufgebaut werden könnte.

Nachdem Kosteneinsparungen geschätzt wurden, konnten die damit verbundenen Einsparungen in Materialverbrauch und die potentiellen Auswirkungen auf die Beschäftigungssituation berechnet werden.

Daten über die Auswirkungen der Unterstützung durch das ENWORKS Programm im Bezug auf die Online-Überwachungssoftware wurden durch umfangreiche Konsultationen mit den ENWORKS Projekt-Managern gesammelt.

Wesentliche Ergebnisse

Durch die Verwendung des ersten Ansatzes, mit welchem die Kosteneinsparungen berechnet werden welche durch eine öffentliche Investition von €4 Milliarden zustande kommen könnten, wurde eine gesamte Materialkosteneinsparung von € 8.7 Milliarden/Jahr in der gesamten EU geschätzt.

Der zweite Ansatz, hat die Annahme, dass öffentliche Investitionen zu weiteren €11 Milliarden an privaten Investitionen führen könnten, erbringt Kosteneinsparungen welche mehr als dreimal so hoch sind wie die Einsparungen welche mit dem ersten Ansatz berechnet wurden (d.h. €32.8 Milliarden pro Jahr). Jedoch sollten die höheren Schätzungen mit Vorsicht interpretiert werden da es nicht ausdrücklich die zugrunde liegenden Ebenen der Materialeffizienz mit einberechnet.

Im Bezug auf Materialeinsparungen zeigen die Ergebnisse signifikante Einsparungen auf. Zum Beispiel, könnten die Investitionen dazu führen das 181.3 Millionen Tonnen an Abfall nicht auf der Mülldeponie landen. Ebenso könnte dies auch zu einer Einsparung von 1.7 Milliarden Tonnen an Materialien führen. Als letzter Punkt zeigen die Ergebnisse das umgerechnet 128,000 Arbeitsplätze geschaffen werden könnten als ein indirekter Vorteil der herbeigeführten Materialeffizienzeinsparungen; diese würden auf 268,00 Arbeitsplätze ansteigen unter dem anderen Szenario. Zudem, deuten die Ergebnisse darauf hin das zusätzlich 360,000 Arbeitsplätze erhalten werden könnten welcher andernfalls verloren gehen.

Schlussendlich, werden keine signifikanten Kosten, für die Firmen welche die ENWORKS Materialeffizienzsoftware verwenden, in der EU erwartet wenn das Programm in der gesamten EU eingeführt werden sollte. Die Einführung dieser Software lässt keine großen technischen Hürden erwarten. Es wird angenommen das die Kosten der Umsetzung von solchen Maßnahmen für die Überwachung der Ergebnisse der Unterstützung durch ein solches Progamm ähnlich zu denen des ENWORKS Programm sein werden. Die Hauptkosten von rund €18,600 pro Jahr ergeben sich aus der Wartung der Software, Lizenz und Secure Software Layers (SSL), €18,600-€24,180 für die Serverbereitstellung und ein variables Budget für Software-Entwicklung um weitere Funktionen bereitzustellen. Es wurde jedoch bemerkt, dass das Überwachungsprogramm welches in dem ENWORKS Programm entwickelt und verwendet wurde Teil eines größeren Programms ist welches die KMUs professionell berät und diese auch bei der Umsetzung der Maßnahmen unterstützt.

Infolgedessen kann das Programm nicht als ein eigenständiges Produkt angesehen werden welches ohne die angemessene Unterstützung, um die relevanten Einsparmöglichkeiten von Kosten und Material zu erkennen, verwendet werden kann.

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1 Introduction

1.1 Aim of the Study

The aim of this study is to provide **evidence to underpin a potential investment plan for SMEs,** which would form part of the wider EU Agenda for Green Growth and Jobs. It does this by assessing whether small, targeted investments in EU Member States could lead to multiplier effects by simultaneously improving EU business competitiveness and reducing pressure on the environment while also addressing the increasing scarcity of raw materials.

The study will also provide **input for the European Semester 2015 exercise.**

1.2 Background

1.2.1 Policy Framework

Europe faces a dual challenge of stimulating growth to provide jobs and well-being to its citizens while ensuring that the quality of its growth leads to a sustainable future (EU Commission, 2011). Resource efficiency is instrumental for decoupling economic growth from the consumption of natural resources and to promoting sustainable development (Van der Voet, 2005). This is recognised in the EU-28 policy framework and on different initiatives at the Member State level.

The Europe 2020 strategy for smart, sustainable and inclusive growth, launched in 2010, provides the EU's growth strategy for the coming decade. The strategy seeks to ensure that the EU economy delivers high levels of employment, productivity and social cohesion in a sustainable way. It sets out objectives in the fields of employment, innovation, education, social inclusion and climate/energy, which are to be achieved by 2020[1]. To catalyse progress, seven flagship initiatives have been proposed by the European Commission. The most relevant communications related to resource efficiency from these flagship strategies include:

- Innovation Union flagship initiative
- The Resource Efficient Europe flagship initiative and The Resource Efficiency Roadmap
- Communication on 'Tackling the Challenges in Commodity Markets and on Raw Materials'
- Communication on 'Making raw materials available for Europe's future well-being: Proposal for a European innovation partnership on raw materials'
- Communication on 'Innovative and sustainable forest-based industries in the EU – a contribution to the EU's Growth and Jobs Strategy'
- EU Commission Communication 'Small Business Act'.

The overall goal of the initiative and its relevant policies is best summarised by the European Commission:

> *"it is necessary to develop new products and services and find new ways to reduce inputs, minimise waste, improve management of resource stocks, change consumption patterns, optimise production processes, management and business methods, and improve logistics. This*

[1] EC (2013), Europe 2020 website, online resource accessed at: http://ec.europa.eu/europe2020/index_en.htm

will help stimulate technological innovation, boost employment in the fast developing 'green technology' sector, sustain EU trade, including opening up new export markets, and benefit consumers through more sustainable products[2]".

In 2014, Jean Claude Juncker announced his agenda for an investment plan worth €300 billion to stimulate growth, investment, competitiveness and jobs within the EU[3]. The agenda has emphasised that new, sustainable and job-creating projects are required to help restore Europe's competitiveness. Within this context, DG Environment has recognised that targeting resource efficiency in small and medium size enterprises (SMEs) could address some of the issues included in the agenda through promoting efficiency savings and subsequent job creation/securement.

1.2.2 Past studies

A number of past studies that have attempted to assess the potential for resource efficiency savings at the sectoral and European levels were identified in the RPA (2014) study. For instance, the COWI (2011) study identified two schemes that can be considered to provide hands-on direct support to SMEs to make improvements in terms of resource efficiency: the PIUS-CHECK Programme in Germany and the National Industrial Symbiosis Programme in the UK. The results for both of these programmes were extrapolated to the EU-27 levels, and are presented in Table 1-1.

Table 1-1: Programme outcomes

Programme	Description	Savings/benefits
PIUS-Check (Produktionsintegrierter Umweltschutz), Germany	Launched in 1998 by the North Rhine-Westphalia Ministry, the Effizienz-Agentur (EFA) initiative has developed a toolbox with a range of consulting services to assist SMEs to improve resource conservation in production.	Estimated €333,000 in economic benefits to participating SMEs over 10 years. Extrapolating EU27-wide, based on same share of manufacturing SMEs benefitting from a PIUS-check, economic benefits would be €776 million.
National Industrial Symbiosis Programme, UK	Free to business advice and networking programme aimed at reducing waste by partnering waste producers with waste users.	Applying a similar system across the EU27 would generate €1,411 million in cost savings and additional sales for participating companies of €1,591 million.

Source: RPA (2014) based on information from COWI (2011)

Studies such as AMEC (2013) and Oakdene Hollins (2011) have assessed the potential for resource efficiency savings at the sectoral levels in the EU-27 and UK respectively. For example, AMEC (2013) provides estimates of potential gross annual benefits (i.e. not taking into account the investment costs required to achieve the resource efficiency savings) at both the EU27 level and the firm level. These estimates are shown in Table 1-2 below.

[2] EC (2011), A resource-efficient Europe – Flagship initiative under the Europe 2020 Strategy COM (2011) 21.

[3] 'A New Start for Europe: My agenda for Jobs, Growth, Fairness and Democratic Change. Political guidelines for the next European Commission' 15 July 2014, accessed at http://ec.europa.eu/about/juncker-commission/docs/pg_en.pdf

Table 1-2: Benefits of implementing resource efficiency measures		
Sector	**Annual benefit (EU27) € billions**	**Average Annual Benefit (per company) € 000s / % avg. turnover**
Food & Drink Manufacturing	€64 - 118	€424 (11%)
Fabricated Metal Products	€44 – 82	€164 (17%)
Hospitality and Food Services	€18 - 43	€27.5 (27.5%)
Source: RPA (2014) based on information from AMEC (2013)		

However, the AMEC report notes that the difference in the levels of savings for each of the sectors is, in part, down to the fact that the average size of companies in each sector differs significantly and that the estimated savings assume that all measures identified are implemented by companies. In this sense, the estimates are likely to be overestimates, particularly for SMEs. The report also notes that larger companies will benefit from a greater proportion of the overall benefits identified, although smaller companies may gain proportionally more (in terms of their own turnover, for example) than larger ones from action on resource efficiency.

1.2.3 RPA Study on the EU Semester

In 2014, RPA carried out a study for the European Commission (DG Environment) titled the 'Study on Economic and Social Benefits of Environmental Protection and Resource Efficiency Related to the European Semester'. The second task of the study set out to achieve two objectives:

- to identify the key success factors involved in the provision of more hands-on, direct support to SMEs for improving resource efficiency, and
- to utilise this and broader information on SME support to assist in estimating more accurately the potential economic and environmental savings as well as the costs of providing such support.

To meet the second objective, the study extrapolated savings data from the ERDF funded ENWORKS programme in the UK to other Member States. Four indices based on comparative data for water, energy, material and waste efficiency were calculated for each of the Member States, with the UK set as the base. The savings data from the ENWORKS programme were then weighted for each country based on their relative index scores. The final analysis covered four broad sectors: construction; food and beverages; energy, power and utilities; and environmental technologies. The annual cost savings were calculated at the firm level and are displayed in Table 1-3 . These savings were also calculated in terms of the volumes of resources saved due to resource efficiency measures.

Overall the task identified **230+ programmes** providing general and bespoke support to SMEs to implement measures to become more efficient, resulting in lower costs, energy and water use, and decreased waste and CO_2 emissions. It also found that investment in support programmes can **generate 10-20 times** its value in cost and environmental savings. Lastly, the modelling component of the task showed that significant potential savings could be made across the EU (as shown in Table 1-3).

Table 1-3: Cost savings per business (SMEs) due to resource efficiency measures						
Member State	Average (2004-9) resource productivity (UK base)	Savings per business (€)[4]				*Companies taking action in terms of material efficiency*
		Energy, power and utilities	Food and drink	Environmental technologies	Construction	
Austria	0.5176	€9,709	€17,339	€23,640	€12,487	*63%*
Belgium	0.6734	€12,630	€22,556	€30,754	€16,244	*62%*
Bulgaria	0.2175	€4,080	€7,286	€9,934	€5,247	*38%*
Croatia	0.4280	€8,027	€14,336	€19,546	€10,324	*44%*
Cyprus	0.3514	€6,591	€11,771	€16,049	€8,477	*34%*
Czech Republic	0.4307	€8,079	€14,428	€19,671	€10,390	*66%*
Denmark	0.4481	€8,406	€15,012	€20,467	€10,811	*45%*
Estonia	0.2717	€5,097	€9,102	€12,410	€6,555	*34%*
Finland	0.3087	€5,790	€10,341	€14,099	€7,447	*80%*
France	0.7802	€14,635	€26,136	€35,634	€18,822	*41%*
Germany	0.7309	€13,710	€24,484	€33,382	€17,632	*61%*
Greece	0.5665	€10,627	€18,978	€25,875	€13,667	*68%*
Hungary	0.4136	€7,758	€13,856	€18,891	€9,978	*53%*
Ireland	0.3014	€5,653	€10,096	€13,764	€7,270	*46%*
Italy	0.7664	€14,375	€25,673	€35,002	€18,488	*40%*
Latvia	0.2801	€5,254	€9,383	€12,792	€6,757	*61%*
Lithuania	0.4464	€8,374	€14,955	€20,389	€10,770	*55%*
Luxembourg	1.0909	€20,462	€36,542	€49,822	€26,316	*61%*
Malta	1.8385	€34,484	€61,585	€83,966	€44,350	*50%*
Netherlands	1.1472	€21,518	€38,428	€52,393	€27,674	*65%*
Poland	0.3463	€6,495	€11,600	€15,815	€8,354	*56%*
Portugal	0.4078	€7,649	€13,661	€18,625	€9,838	*85%*
Romania	0.2155	€4,043	€7,220	€9,844	€5,200	*60%*
Slovakia	0.4642	€8,707	€15,550	€21,202	€11,199	*77%*
Slovenia	0.4265	€8,001	€14,288	€19,481	€10,290	*27%*
Spain	0.5234	€9,817	€17,533	€23,904	€12,626	*91%*
Sweden	0.5622	€10,545	€18,832	€25,676	€13,562	*58%*
UK	1	€18,757	€33,498	€45,672	€24,124	*71%*
Source: RPA (2014)						

[4] Figures calculated based on ENWORKS data in £. An average ECB £/EUR exchange rate for the period between 6 January 2004 and 29 December 2008 was used (i.e. 1 EUR is £ 0.70451): http://www.ecb.europa.eu/stats/exchange/eurofxref/html/eurofxref-graph-gbp.en.html.

1.3 Structure of the report

The remainder of this report has been organised into four broad sections. Section 2 describes the methodology used to calculate the potential resource savings and subsequent employment impacts of the proposed investment. This section lists the sources of data used alongside the assumptions made in the analysis. It also discusses difficulties faced in terms of gaps in the available data and the robustness of the assumptions that have been applied.

Section 3 provides an overview of the SMEs sector across the EU-28, and some selected Member States, representative in terms of geographic and size balance. The distribution of some of the key variables is described, with a focus on the four sectors under analysis; this includes the number of enterprises, employment, and turnover. The overall goal of this section is to show how the selected SME sectors are more concentrated towards labour-intensive sectors such as construction, rather than the utilities sector.

The results of the analysis are presented in Section 4. This section is set out in three parts. The first and second parts present the outputs for Tasks 1 and 2 respectively. Task 1 presents the expected resource cost savings, reduction in resource use and jobs created/secured as combined aggregates for the four selected sectors at the EU-28 and individual Member State levels. On the other hand, Task 2 presents the same outputs in terms of each individual sector (per Member State and at the EU-28 level).

The third part presents some examples of existing resource efficiency programmes across the EU-28 taken from RPA (2014). The section also briefly describes the distribution of such programmes across the Member States, and reviews the results of these programmes in terms of the cost savings made, reductions in resource use and the numbers of jobs created/safeguarded.

Section 5 investigates the possibility of up-scaling the monitoring software used by the ENWORKS programme to other EU Member States. To this end, a SWOT analysis is conducted to identify the overall costs of implementing the system as well as the critical factors that will determine its success or failure.

Section 6 brings together the results from the analysis and weighs up the costs of the investment against its potential benefits. It also identifies potential issues within the work, in terms of the assumptions made, instances of missing data and the sectors analysed.

2 Methodology

2.1 Data collection

2.1.1 Resource efficiency

The main dataset for analysis is taken from RPA (2014). Using different resource efficiency indices, the study extrapolated cost and resource savings from the ENWORKS programme in the UK to each Member State (see Table 1-3). The dataset contains figures on annual resource efficiency cost savings as well as savings in energy, water, material resources and waste covering. The figures are presented for all EU-28 Member States; however, data for water use savings in Croatia and waste savings in Bulgaria and the Netherlands are missing. The data are taken from the period 2004-9 in order to account for the two periods of recession that occurred within the EU-28 after the financial crisis. Currently, the European Commission forecasts that the real GDP growth rate of the EU-28 will reach 1.3% by the end of 2014[5]. It further expects growth to increase to 1.5% and 2.0% in the years 2015 and 2016 respectively. Thus, including, data from the period 2004-9 is more likely to represent the overall picture in the coming years as the average growth rate for these six years was 1.22%[6]. Nonetheless, it should be noted that many Member States have experienced significant structural changes since the period 2004-9 and growth rates still remain low in some areas. The applicability of the results in different Member States should therefore be treated with caution.

One of the main issues with the RPA (2014) dataset is that the cost savings reflect prices from the period 2004-9 using an average exchange rate over the period of €1 = 0.70451. As the exchange rate and price level have changed significantly since this period, it was necessary to recalculate the figures in terms of more recent price levels. The cost savings presented in Table 1-3 were therefore recalculated in 2013 equivalent values using a GDP deflator index from Eurostat[7] and average exchange rates from HM Revenue and Customs[8]. The revised figures are given in Table 2-1 below.

To further improve the breadth and precision of the data, direct consultation has taken place with the ENWORKS programme. Through this process, more sector specific data has been gathered in terms of the level of investments made by SMEs as a result of the programme, as well as the resulting resource efficiency cost savings. The consultation has also provided data on the number of jobs created and secured within each sector that have occurred due to the programme's assistance. Data have also been sought from the programme on the total level of expenditure on assistance for SMEs and the number of SMEs assisted. These data have allowed for a relationship to be modelled between the level of public expenditure necessary to induce investments within SMEs and the subsequent resource efficiency savings and jobs created/secured.

[5] European Commission, 2014 Autumn Economic forecast: Slow recovery with very low inflation, Brussels, 4 November 2014 accessed at http://europa.eu/rapid/press-release_IP-14-1362_en.htm on 10/12/14

[6] Based on real GDP growth rate data from Eurostat, calculation includes six years from 2004-9. In 2009, real GDP growth was -4.5% and potentially biases the result, excluding this year brings average growth to 2.36% across the period 2004-8.

[7] Price converted using a GDP deflator of 1.179146205 [(Q1-Q3 2013) / (Q1 2004 – Q4 2008)], data taken Eurostat website (year 2000 = 100), accessed at: http://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=en&pcode=teina110 on 15/12/14

[8] HM Revenue and Customs, Exchange Rates – Yearly List, accessed at www.hmrc.gov.uk/exrate/exchangerates-1314.pdf on 10/12/14

Table 2-1: Annual cost savings per business (SMEs) due to resource efficiency measures recalculated using 2013 prices and average exchange rate					
Member State	Average (2004-9) resource productivity (UK base)	Savings per business (€)[9]			
		Energy, power and utilities	Food and drink	Environmental technologies	Construction
Austria	0.5176	€ 9,504	€ 16,973	€ 23,142	€ 12,224
Belgium	0.6734	€ 12,364	€ 22,081	€ 30,106	€ 15,902
Bulgaria	0.2175	€ 3,994	€ 7,132	€ 9,725	€ 5,136
Croatia	0.4280	€ 7,858	€ 14,034	€ 19,134	€ 10,106
Cyprus	0.3514	€ 6,452	€ 11,523	€ 15,711	€ 8,298
Czech Republic	0.4307	€ 7,909	€ 14,124	€ 19,256	€ 10,171
Denmark	0.4481	€ 8,229	€ 14,696	€ 20,036	€ 10,583
Estonia	0.2717	€ 4,990	€ 8,910	€ 12,148	€ 6,417
Finland	0.3087	€ 5,668	€ 10,123	€ 13,802	€ 7,290
France	0.7802	€ 14,326	€ 25,585	€ 34,883	€ 18,425
Germany	0.7309	€ 13,421	€ 23,968	€ 32,678	€ 17,260
Greece	0.5665	€ 10,403	€ 18,578	€ 25,330	€ 13,379
Hungary	0.4136	€ 7,594	€ 13,564	€ 18,493	€ 9,768
Ireland	0.3014	€ 5,534	€ 9,883	€ 13,474	€ 7,117
Italy	0.7664	€ 14,072	€ 25,132	€ 34,264	€ 18,098
Latvia	0.2801	€ 5,143	€ 9,185	€ 12,522	€ 6,615
Lithuania	0.4464	€ 8,197	€ 14,640	€ 19,959	€ 10,543
Luxembourg	1.0909	€ 20,031	€ 35,772	€ 48,772	€ 25,761
Malta	1.8385	€ 33,757	€ 60,287	€ 82,196	€ 43,415
Netherlands	1.1472	€ 21,064	€ 37,618	€ 51,289	€ 27,091
Poland	0.3463	€ 6,358	€ 11,355	€ 15,482	€ 8,178
Portugal	0.4078	€ 7,488	€ 13,373	€ 18,232	€ 9,631
Romania	0.2155	€ 3,958	€ 7,068	€ 9,636	€ 5,090
Slovakia	0.4642	€ 8,523	€ 15,222	€ 20,755	€ 10,963
Slovenia	0.4265	€ 7,832	€ 13,987	€ 19,070	€ 10,073
Spain	0.5234	€ 9,610	€ 17,163	€ 23,400	€ 12,360
Sweden	0.5622	€ 10,323	€ 18,435	€ 25,135	€ 13,276
UK	**1**	**€ 18,362**	**€ 32,792**	**€ 44,709**	**€ 23,615**
Source: Derived from RPA (2014) Notes: Price converted to 2013 values using a GDP deflator of 1.179146205 (Q1-Q3 2013 / Q1 2004 – Q4 2008) and an average annual exchange rate for the year 2013 of £1= €1.178398113 (01.01.2013 – 31.12.2013)					

2.1.2 SMEs in the four selected sectors

The DG Enterprise Annual Report on European SMEs[10] dataset has been used to provide information on SMEs across the four sectors within the EU-28 and individual Member States. The dataset covers a broad range of indicators for each Member State by broad one and two digit NACE codes. These indicators include the number of enterprises and employees in each SME sector, as well as levels of gross value added, turnover, personnel costs, investment and gross operating surplus. While estimates for most countries were available up until 2015, the study used data from 2014 to

[9] Figures calculated based on ENWORKS data in £. Values converted using exchange rate for the year 2013 (£1 = €1.1783981132075) from HM Revenue and Customs – Yearly List, accessed at: www.hmrc.gov.uk/exrate/exchangerates-1314.pdf on 15/12/14

[10] Database for the annual report, accessed at http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/index_en.htm on 10/12/14

represent the current situation within Europe. The key indicators taken from the dataset were the number of SMEs and employees in each SME sector, and the associated levels of turnover. Based on expert judgement and suggested classifications by Eurostat[11], the following NACE codes have been chosen to represent the sectors for the study:

- Construction
  - F41: Construction of building
  - F42: Civil engineering
  - F43: Specialised construction activities
- Food and Beverages
  - C10: Manufacture of food products
  - C11: Manufacture of beverages
- Energy, Power and Utilities
  - D35: Electricity, gas, steam and air conditioning supply
  - E36: Water collection, treatment and supply
- Environmental Technologies
  - E37: Sewerage
  - E38: Waste collection, treatment and disposal activities; materials recovery
  - E39: Remediation activities and other waste management services.

Data on the number of SMEs in each sector were largely available for each country in the year 2014. In terms of missing data, Greece was the only country that lacked information on the number of SMEs and gross value added in the Energy, Power and Utilities[12] and Environmental Technologies[13] sectors. This meant that resource cost savings could not be calculated for Greece in these sectors.

Information from another DG Enterprise dataset was also used in this study. The SBA Fact Sheets database[14] provides data on a number of indicators for SMEs in particular countries. Broadly, the fact sheets compile data on indicators such as entrepreneurship, the environment, skills and innovation, and public procurement. The main focus of this study was on the indicators for the environment. Data was extracted from each individual Member State's fact sheet on *the proportion of SMEs that have benefitted from public support measures for resource efficiency actions*. Data was available for each country and for the year 2014.

2.1.3 Other data sources

A number of supporting data sources were consulted in order to carry out the final analysis. For instance, purchasing price parities (PPPs) from Eurostat were gathered for each Member State for the latest available year – 2013. The PPPs selected were based on ESA95 aggregate prices for

[11] Environmental goods classification based on information from the 'Data Collection Handbook on Environmental Goods and Services Sector Final Draft' ICEDD for Eurostat – Unit E3

[12] NACE Rev.2 codes D35 and E36

[13] NACE Rev.2 codes E37, E38 and E39

[14] European Commission, DG Enterprise, SBA Fact Sheet Database, accessed at: http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/index_en.htm on 10/12/14

government services[15], which consider the prices of collective and individual public services in each country. Collective public services comprise the expenditures made by general government on services that benefit households collectively; examples include public order and safety, economic affairs and environment protection. Health, education and social protection are examples of individual public services that households purchase for themselves and which NPISHs[16] and general government provide to specific identifiable households. As such services rarely have a market price; the PPPs generated by Eurostat are based on the costs of provision and inputs, with a focus on labour cost[17]. This category was chosen because the ENWORKS programme is a publicly funded programme that provides advisory services to SMEs on how to increase resource efficiency. The PPPs based on government services were therefore selected to provide some insight on the possible cost of implementing ENWORKS-type programmes in other EU Member States.

In addition, data on the average annual exchange rates between the UK pound sterling and other national currencies were collected from the HM Revenue and Customs website[18]. The data were collected for the year 2013, to be in line with the PPPs gathered for the same year. Other sources, such as the Bank of England and European Central Bank, were also consulted to ensure the rates were consistent.

2.1.4 Identified data issues

The assessment relies heavily on data taken from the RPA (2014) study. As noted by that study, the predicted savings figures should be taken as indicative, i.e. they only provide an indication of the magnitude of potential savings that could be achieved as a result of participation in an ENWORKS-type programme. Furthermore, the calculations are based on carefully monitored outcomes resulting from the delivery of the ENWORKS programme in the North West of the UK. Thus, whilst it may be possible to design a programme similar to ENWORKS in another Member State, it would not be possible to replicate it identically. The degree of uncertainty therefore increases when such figures are applied to Member States at the aggregate level. However, it was agreed with the Commission for the previous RPA (2014) study that **data from ENWORKS programme is the most comprehensive set of data available.**

2.1.5 Summary of data sources

Table 2-2 provides a summary of the key indicators and data sources used in the assessment. In general, data collection methods have comprised both desk research and consultation (i.e. with the ENWORKS programme). Where possible, the study has attempted to use the most recent available data to ensure that the final analysis is robust in its conclusions.

[15] Eurostat, Purchasing Price Parities, accessed at: http://epp.eurostat.ec.europa.eu/portal/page/portal/purchasing_power_parities/data/database on 10/12/14

[16] Non-profit Institutions Serving Households

[17] Eurostat-OECD Methodological Manual on Purchasing Power Parities, Eurostat Methodologies and Working Papers, 2012 Edition

[18] HM Revenue and Customs, Exchange Rates – Yearly List, accessed at www.hmrc.gov.uk/exrate/exchangerates-1314.pdf on 10/12/14

Table 2-2: Identified Data Sources, Indicators and Uses		
Source	**Key Indicators**	**Use(s)**
RPA (2014)	Cost savings per business (SMEs) due to resource efficiency measures (€)	The basis for calculating the cost and resource savings across SMEs in different European countries
	Energy, Material, Water and Waste Savings per Business (SMEs) due to resource efficiency measures (quantity/year)	
DG Enterprise – Database for Annual Report on European SMEs	Number of SMEs per NACE division and country	Used to generate aggregate values for the cost and resource savings per sector and Member State. It will also be used to assess the potential employment effects of such savings
	Gross operating costs per NACE division and country	
	Number of employees in SMEs per NACE division and country	
	Value added at factor costs per NACE division and country	
DG Enterprise – SBA Fact Sheets for Member States	SMEs that have benefited from public support measures for their resource efficiency actions (%)	Used to form the baseline for the model and will be used to assess where public investments could be most effective
ENWORKS	Expenditure of the programme in terms of SMEs assisted	Data used for establishing a relationship between investments made per SME and the resulting cost savings. Also used to determine the coverage of the ENWORKS-type programmes in other Member States
	Number of SMEs assisted	
	Numbers of jobs created/secured	
	Average investment per SME assisted	
	Average cost saving resulting from investment by SME	
Eurostat	Purchasing Price Parities	Used to calculate the relative cost of implementing an ENWORKS-type programme in other Member States
HM Revenue and Customs	Exchange rates	Used to assist in the process of calculating the relative cost relative cost of implementing an ENWORKS-type programme in other Member States using PPPs from Eurostat

2.2 Modelling of the resource efficiency cost savings

2.2.1 Overview of the approach

For the calculation of resource cost savings a three stage approach has been implemented. Firstly, the maximum potential resource cost savings that could be realised if all SMEs in the sectors per Member State benefitted from an ENWORKS-type programme are estimated. It is assumed in this approach that the roll out of an ENWORKS-type programme across individual Member States is not limited by the size of public funding. Furthermore, it is assumed that the resulting cost savings are not compounded by existing levels of resource efficiency.

After this initial set of calculations the methodology applies some more realistic assumptions regarding the size of the public investment and the baseline levels of resource efficiency. The overall coverage of the proposed €4 billion public investment is estimated for each Member State and sector in terms of SMEs assisted. Here, the cost of implementing ENWORKS-type programmes in each Member State is taken into account. Moreover, the approach uses data from the SBA Fact Sheets to make some assumptions on existing levels of resource efficiency per Member State. These assumptions are then used to estimate the number of SMEs that, once assisted by an ENWORKS-type programme, will benefit from resource efficiency cost savings.

However, it should be noted that the proposed investment plan comprises two elements. Firstly, the plan consists of a public investment worth €4 billion - €3 billion EIB investments and €1 billion EU investment. This plan is expected to leverage, based on the Commission's past experience with EU and EIB investments, an additional €11 billion in private investment. The public investment is expected to comprise a mix of (co)funding, loans and other financial instruments. However, the above approach does not explicitly account for the €11 billion private sector investment. This is because the original RPA (2014) dataset does not provide an unequivocal link between private sector investment in resource efficiency measures and the subsequent cost savings. Instead, it assumed that the roll-out of ENWORKS-type programmes across the EU-28 will leverage private sector investment and thus lead to the resulting cost savings.

As a result, a validation approach has also been used. This validation approach uses new data provided from detailed discussions with ENWORKS to establish a direct link between investments in resource efficiency measures by private companies and the resulting cost savings. In this approach, we assume that the public sector investment leverages the €11 billion in private sector investment using a variety of instruments. This leveraged private sector investment is then translated into resource cost savings using the data provided by the ENWORKS programme for each sector. The results from this approach will allow for a relative comparison between the roll-out of an ENWORKS-type programme across the EU and leveraging of private investment through traditional methods.

The three primary approaches can thus be summarised as follows:

- **Maximum potential savings:** Estimates the total resource cost savings that could be realised if all SMEs across the EU-28 benefitted from an ENWORKS-type programme and made the subsequent cost savings given in RPA (2014)

- **Estimated savings:** Calculates the cost savings that could be realised by €4 billion public investment based on the relative cost of implementing ENWORKS-type programmes in individual Member States; it also makes assumptions regarding the baseline levels of resource efficiency that may exist across the EU-28 Member States, and

- **Validation approach:** Measures the cost savings that could be made if an €11 billion private sector investment in resource efficiency measures was leveraged through a mix of (co) funding, loans and other financial instruments.

2.2.2 Maximum potential savings

Key assumptions made

The first stage of this assessment measured the potential savings that could be realised if all SMEs implement resource efficiency measures, i.e. all SMEs receive direct support. For this initial assessment a number of key assumptions are made, including:

1) ENWORKS-types programmes are rolled out across all Member States and all SMEs in the four listed sectors; individual Member States are provided with direct support
2) All SMEs are willing to participate in the programme and make the necessary investments to realise resource efficiency savings
3) The ENWORKS-type programme is reproduced in all Member States in a manner which ensures the same levels of realised savings and jobs secured/created per business per € invested
4) SMEs in the Member States are not already benefitting from other resource efficiency programmes, and
5) SMEs in Member States do not display a high baseline level of energy efficiency.

It should be noted that the aim of this set of calculations is to capture the potential level of savings that could be realised across the EU-28 if every SME was assisted by an ENWORKS-type programme, assuming that they are willing to participate in the programme and have not been targeted by any other programmes. It should be noted that, at this stage, the size of the investment has not been taken into account.

Clearly these assumptions are overly optimistic. For instance, the previous RPA (2014) study highlights a number of factors that may influence companies' willingness to take up more or fewer actions to improve resource efficiency, including:

- a company's historical performance with respect to resource efficiency and its current "baseline" level
- a company's internal financial situation
- general economic conditions and market demand
- differing levels of competition within sectors and across Member States
- differing industry structures and their scale across Member States
- access to different resources/technologies
- availability of external finance, and
- general attitudes to resource efficiency and the environment.

Nevertheless, this initial assessment provides an upper limit to the benefits of resource efficiency that could be realised due to a wide scale implementation of the ENWORKS-type programme. It also provides a basic model upon which more realistic assumptions and factors can be included in the further analysis to be undertaken.

Calculation of maximum potential cost savings

Using the dataset on resource cost savings from RPA (2014) and the numbers of SMEs in the four selected sectors for each Member State, the total efficiency savings are calculated at the aggregate levels for the EU-28, individual Member States and the four selected sectors. The respective cost saving in each sector is applied to the corresponding number of SMEs for each individual Member State, and from these the aggregate cost savings estimates are derived. With the exception of the Energy, Power and Utilities and Environmental Technologies sectors in Greece, the aggregate values contain inputs from each sector and individual Member State.

2.2.3 Estimated resource cost savings

Determining coverage

This scenario asks the broad question: *how many ENWORKS-type projects could be funded by a €4 billion public investment across the EU-28?* During the period 2004-9, data received from the ENWORKS programme show that the programme spent around **£10.9 million** assisting **2,402 SMEs** to implement resource efficiency measures (see Table 2-3). **This means that the average cost of assisting an SME was approximately £4,522** – this includes the direct expenditure that ENWORKS pays to its consultants providing advice to SMEs, as well as the apportioned amount of overheads.

However this expenditure is in terms of 2004-9 prices; it is therefore necessary to transform the value into a 2013 equivalent. Using price indices from Eurostat, an average price level has been calculated for the period 2004-9 and compared to the average level for 2013. These indices have then been used to transfer the value into a 2013 equivalent, which is equal to **£5,333**[19].

Table 2-3: Total expenditure and SMEs assisted by the ENWORKS Programme 2004-9

Sector	Expenditure	Number of SMEs assisted
All	£10,862,982 (£12,809,044[1])	2,402
Construction	-	229
Food and beverages	-	220
Energy, Power and Utilities	-	16
Environmental Technologies	-	37

Source: Direct consultation with the ENWORKS Programme
[1] Recalculated in 2013 prices

To apply this to the EU-28 level, it is necessary to take into account differences in price levels between Member States, as it may cost more/less to implement an ENWORKS-type programme in the different countries. As a result, Purchasing Price Parities (PPPs) from Eurostat have been used in order to determine the value of £5,333 in real terms for other Member States. As stated in Section 2.3.1, the PPPs are based on the relative prices of government services in each Member State, with

[19] Price converted using a GDP deflator of 1.179146205 [(Q1-Q3 2013) / (Q1 2004 – Q4 2008)], data taken Eurostat website (year 2000 = 100), accessed at: http://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=en&pcode=teina110 on 15/12/14

the EU-28 level set as the base. For this study, the PPPs were recalculated with the UK level set as the base.

To calculate the cost of assisting a SME in real terms for each Member State, the initial pound sterling value (£5,333) was converted into the equivalent national currencies using average annual exchange rates taken from HM Revenue and Customs for the year 2013. This generated the national expenditure associated with assisting a SME in each Member States. These national expenditures were then transformed to real expenditures in terms of the Purchasing Power Standard (PPS) – an artificial currency unit in which values are expressed after being adjusted for price level differences. An index was then generated using the PPS values with the UK level set as the base (i.e. re-based to the UK = 1 rather than the EU-28 = 1). The cost of assisting a SME was then derived using this index. Table 2-4 presents the figures used to derive the cost per SME assisted in each Member State.

The values show that the relative cost of implementing an ENWORKS-type programme and assisting a SME is likely to be much higher in some countries (e.g. Luxembourg, Denmark and Sweden) while in others it theoretically should be significantly lower (e.g. Slovakia, Romania, Bulgaria and Poland). Using the SME data from DG Enterprise it was then possible to calculate the total cost (in terms of PPS) of implementing an ENWORKS-type programme to assist all SMEs in the four selected sectors.

The next issue was to decide how to apportion the €4 billion public investment between the individual Member States. A simple methodology was applied based on calculation of the percentage of SMEs in each country out of the total EU number for the sector. This meant that countries with a higher number of SMEs per sector received a larger proportion of the available funding. Ideally, the investment would seek to ensure allocative efficiency, i.e. funding is directed to those countries and sectors where the returns would be the highest. Such an approach was not adopted as it was considered important to account for political factors that may determine the final allocation of any such investment. We have thus assumed that weighting the investment by the relative number of SMEs in each Member State and sector is a simple and apolitical allocation method. It will also ensure that the results of the assessment are relatively conservative in nature.

Lastly, the total investment was converted into PPS at the EU-28 level (EU-28 = 1). The investment apportioned to each country was then used to determine the total number of SMEs that could be assisted in each Member State given the expected costs of undertaking one ENWORKS-type project in each country.

Factoring in the baseline level of resource efficiency investments

The methodology then builds on the above calculations and factors in the baseline level of resource efficiency investments implemented by SMEs in the Member States. Data on the proportion of *'SMEs that have benefited from public support measures for their resource-efficiency actions'* from the SBA Fact Sheets are used here as a proxy for the baseline number of SMEs that have already benefitted from resource efficiency measures. It is reasonable to assume that such SMEs would not realise the full benefits of an ENWORKS-type programme, as they would face diminishing returns when making further investments in resource efficiency measures. As a conservative approach, we have assumed that the effectiveness of ENWORKS-type programmes across Member States depends in part on the proportion of SMEs that have already benefitted from public support measures. Thus, the analysis assumes that if 45% of the SMEs in Austria have already benefitted from such measures then only 55% of SMEs assisted by an ENWORKS-type programmes will benefit from resource efficiency savings.

Table 2-4: PPPs and the relative cost of assisting a SME in each Member State					
Country	**National Expenditure (national currency)**	**PPPs (national currency per PPS_UK)**	**Real Expenditure (PPS)**	**Index (UK = 1)**	**Cost per SME assisted (PPS)**
Austria	6,284	1.47	4,285	0.80	6,636
Belgium	6,284	1.48	4,242	0.80	6,704
Bulgaria	12,291	0.56	21,773	4.08	1,306
Croatia	47,576	4.27	11,149	2.09	2,551
Cyprus	6,284	0.98	6,385	1.20	4,454
Czech Republic	162,688	15.32	10,620	1.99	2,678
Denmark	46,864	12.67	3,700	0.69	7,686
Estonia	6,284	0.59	10,728	2.01	2,651
Finland	6,284	1.38	4,548	0.85	6,253
France	6,284	1.30	4,850	0.91	5,863
Germany	6,284	1.18	5,323	1.00	5,343
Greece	6,284	0.83	7,588	1.42	3,748
Hungary	1,863,501	133.74	13,933	2.61	2,041
Ireland	6,284	1.36	4,618	0.87	6,158
Italy	6,284	1.19	5,298	0.99	5,367
Latvia	6,284	0.49	12,867	2.41	2,210
Lithuania	6,284	1.55	4,066	0.76	6,994
Luxembourg	6,284	1.93	3,250	0.61	8,749
Malta	6,284	0.69	9,161	1.72	3,104
Netherlands	6,284	1.32	4,773	0.90	5,958
Poland	26,340	2.00	13,149	2.47	2,163
Portugal	6,284	0.82	7,635	1.43	3,725
Romania	27,757	1.47	18,866	3.54	1,507
Slovakia	6,284	0.52	12,066	2.26	2,357
Slovenia	6,284	0.80	7,829	1.47	3,632
Spain	6,284	0.96	6,521	1.22	4,361
Sweden	54,270	14.34	3,785	0.71	7,513
United Kingdom	5,333	1.00	5,333	1.00	5,333

Table 2-5: SBA Fact Sheet Data – Environment, 2013		
	Percentage of SMEs that have taken resource-efficiency measures	Percentage of SMEs that have benefited from public support measures for their resource-efficiency actions
Austria	97	45
Belgium	97	43
Bulgaria	86	47
Croatia	95	64
Cyprus	73	52
Czech Republic	93	52
Denmark	89	19
Estonia	58	70
Finland	88	54
France	93	43
Germany	95	48
Greece	91	52
Hungary	91	16
Ireland	97	36
Italy	95	15
Latvia	89	57
Lithuania	84	52
Luxembourg	93	42
Malta	97	41
Netherlands	95	45
Poland	92	40
Portugal	98	46
Romania	89	23
Slovakia	95	64
Slovenia	90	56
Spain	99	24
Sweden	94	35
UK	99	39
EU	**95**	**35**
Source: SBA Fact Sheets database accessed at http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/ on 03/11/14		

Other proxy variables were also considered. For instance, the SBA Fact Sheets also provide data on the proportion of SMEs that have undertaken resource-efficiency measures. However, the data show that a high proportion of SMEs in the Member States have already implemented some form of resource efficiency measure (See Table 2-5 above). For instance, the average level across the EU-28 shows that 95% of SMEs have already implemented some resource efficiency measure. Unfortunately, the data do not provide information on the types of measures implemented. At such a higher percentage, it is therefore reasonable to expect that the figures in Table 2-5 include the implementation of small or minor resource efficiency measures and therefore do not accurately reflect the baseline level of resource efficiency potential that could be realised across SMEs.

For this study, we have therefore decided to use the proportion of 'SMEs that have benefited from public support measures for their resource-efficiency actions' as a proxy. The decision to use this variable was based on the strong assumption that public support measures (such as the ENWORKS programme) induce the implementation of more far reaching resource efficiency measures than SMEs would undertake on their own. Consequently, SMEs that have benefitted from such support would have a higher level of resource efficiency than non-supported SMEs; as a result, they are unlikely to be able to gain as much in efficiency savings and thus investments from further measures would display diminishing returns.

Calculation of potential reduction in resource use and cost savings

Using the same methodology described in Section 2.2.2, the cost savings and overall reductions in resource use were calculated using the new figures for the number of SMEs covered by the investment in each Member State and Sector. Outputs were once again provided in terms of the total cost savings made by SMEs across the four sectors, as well as the reductions in the use of energy, water and material resources, and waste.

One of the key limitations of this approach is that it assumes that the results of the ENWORKS programme can be extrapolated to other Member States, i.e. that cost savings per unit of funding would be realised at the same rate across all Member. Although price differences have been taken into account, there may be other factors that hamper the success of similar programmes in other Member States. These may include governance and institutional factors that affect the implementation of such programmes, or labour supply issues i.e. a shortage of skilled resource efficiency advisors.

Furthermore, it should be noted that the SBA Fact Sheet data is not sector specific. As a result, there could be wide variations in the number of SMEs in the different sectors that have benefited from public support measures towards resource-efficiency actions in the past. For example, it may be the case that a wide-scale resource efficiency programme has been implemented in one sector while in another it has not. This would clearly affect the effectiveness of an ENWORKS-type programme being applied in either sector.

It is also possible that those who have previously benefitted from public support measures in the past may be more willing to participate in future programmes. For instance, such SMEs may be located in resource intensive industries with greater total potential cost savings to be made. Likewise, those SMEs that haven't benefitted from public support measures in the past may be located in sectors where the potential resource efficiency savings are low. However, without further disaggregation of this indicator, it is not possible to account for these factors.

As a result, the findings from this step (presented in Section 4.2.1) should be treated as purely indicative of the magnitude of savings that could be made given a broad range of assumptions.

2.2.4 Validation approach

The relationship between investment in resource efficiency measures and subsequent cost savings

While the calculations presented above (Approach 1) were based on the relationship between public sector investment and resource efficiency savings, this second approach factors in the level of private sector investment that the specifications have mentioned will be leveraged from the €4 billion private sector investment. As stated in Section 2.2.1, the private sector investment is viewed as a single component in this scenario. It is assumed that the public sector investment has leveraged through conventional means €11 billion in private sector investments to implement resource

efficiency measures. The key issue is therefore to develop a relationship between investments made by SMEs and the resulting resource efficiency cost savings.

Working closely with the ENWORKS programme, data have been collected on the average level of investment[20] and resulting cost savings due to assistance provided by the programme. The levels for the four selected sectors are presented in Table 2-6. Furthermore, the table shows the implied return on investment for a £1 investment in resource efficiency measures.

Table 2-6: Investment and Cost Savings per SME in each Sector, 2004-2009

Sector	Investment Achieved per business	Cost Savings Achieved per business (annual)	Return on Investment (ROI)
Food & Beverages	£4,233 (£4,991)	£10,099 (£11,909)	£2.39
Energy, power and utilities	£1,731 (£2,041)	£13,049 (£15,386)	£7.54
Environmental Technologies	£379 (£447)	£8,126 (£9,582)	£21.43
Construction	£1,256 (£1,481)	£4,473 (£5,274)	£3.56

Source: Direct consultation with the ENWORKS Programme
Notes: Values in parentheses are converted to 2013 prices using Eurostat GDP Deflator Index (year 2000 = 100)

Table 2-6 indicates that the returns on investment for the Food and Beverages and Construction sectors are significantly lower than the returns in the Energy, Power and Utilities and Environmental Technology sectors. For instance, the return in the Environmental Technologies sector is almost nine times higher than that for the Food and Beverages sector.

The next step is to extrapolate these ROIs to the Member States. Due to the limited time available for this exercise the resource efficiency index constructed in RPA (2014) was applied to the ROIs in Table 2-6. These ROIs were then then subsequently converted to Euros[21]. The final ROIs for each Member State and Sector are presented in Table 2-7.

Table 2-7: Cost savings per business (SMEs) due to resource efficiency measures

Member State	Average (2004-9) resource productivity (UK base)	ROI per business (€)			
		Energy, power and utilities	Food and beverages	Environmental technologies	Construction
Austria	0.5176	€ 4.60	€ 1.46	€ 13.07	€ 2.17
Belgium	0.6734	€ 5.98	€ 1.89	€ 17.00	€ 2.83
Bulgaria	0.2175	€ 1.93	€ 0.61	€ 5.49	€ 0.91
Croatia	0.4280	€ 3.80	€ 1.20	€ 10.81	€ 1.80
Cyprus	0.3514	€ 3.12	€ 0.99	€ 8.87	€ 1.48
Czech Republic	0.4307	€ 3.83	€ 1.21	€ 10.87	€ 1.81
Denmark	0.4481	€ 3.98	€ 1.26	€ 11.31	€ 1.88

[20] Investment by the business in implementing recommendations made by ENWORKS

[21] Using exchange rate for the year 2013 from HM Revenue and Customs – Yearly List, accessed at www.hmrc.gov.uk/exrate/exchangerates-1314.pdf (£1 = € 1.1783981132075) 15/12/14

Table 2-7: Cost savings per business (SMEs) due to resource efficiency measures					
Member State	Average (2004-9) resource productivity (UK base)	ROI per business (€)			
		Energy, power and utilities	Food and beverages	Environmental technologies	Construction
Estonia	0.2717	€ 2.41	€ 0.76	€ 6.86	€ 1.14
Finland	0.3087	€ 2.74	€ 0.87	€ 7.79	€ 1.30
France	0.7802	€ 6.93	€ 2.19	€ 19.70	€ 3.27
Germany	0.7309	€ 6.49	€ 2.06	€ 18.45	€ 3.07
Greece	0.5665	€ 5.03	€ 1.59	€ 14.30	€ 2.38
Hungary	0.4136	€ 3.67	€ 1.16	€ 10.44	€ 1.74
Ireland	0.3014	€ 2.68	€ 0.85	€ 7.61	€ 1.27
Italy	0.7664	€ 6.81	€ 2.15	€ 19.35	€ 3.22
Latvia	0.2801	€ 2.49	€ 0.79	€ 7.07	€ 1.18
Lithuania	0.4464	€ 3.96	€ 1.26	€ 11.27	€ 1.87
Luxembourg	1.0909	€ 9.69	€ 3.07	€ 27.54	€ 4.58
Malta	1.8385	€ 16.33	€ 5.17	€ 46.42	€ 7.72
Netherlands	1.1472	€ 10.19	€ 3.23	€ 28.97	€ 4.82
Poland	0.3463	€ 3.08	€ 0.97	€ 8.74	€ 1.45
Portugal	0.4078	€ 3.62	€ 1.15	€ 10.30	€ 1.71
Romania	0.2155	€ 1.91	€ 0.61	€ 5.44	€ 0.90
Slovakia	0.4642	€ 4.12	€ 1.31	€ 11.72	€ 1.95
Slovenia	0.4265	€ 3.79	€ 1.20	€ 10.77	€ 1.79
Spain	0.5234	€ 4.65	€ 1.47	€ 13.22	€ 2.20
Sweden	0.5622	€ 4.99	€ 1.58	€ 14.20	€ 2.36
UK	1	€ 8.88	€ 2.81	€ 25.25	€ 4.20
Source: Derived from data supplied by the ENWORKS programme Notes: Values converted using exchange rate for the year 2013 (£1 = €1.1783981132075) from HM Revenue and Customs – Yearly List, accessed at: www.hmrc.gov.uk/exrate/exchangerates-1314.pdf on 15/12/14					

Calculation of total SME cost savings in the sectors

In order to calculate the total cost savings that could be realised by SMEs, the public investment was apportioned to the Member States and Sectors based on the methodology set out above (i.e. by the relative percentage of SMEs within a sector falling in each country). However, in this case, no assumptions are made with regards to the cost of implementing the investment. This is because we are assuming that the leveraging of private investment in resource efficiency measures takes place by traditional means (i.e. a mix of co-funding, loans and other financial instruments) and not through the wide scale implementation of ENWORKS-type programmes.

The apportioned public investment in each Member State and respective sector was scaled up by a factor of 2.75 to calculate the levels of induced private investment. This factor is based on the Commission's previous experience with EU and EIB investments as stated in the specifications:

> *3 bn € EIB investments could generate 9 bn private investments, and Ibn EU investment could generate 2 bn private investments; together this is 4 bn public and 11 bn private investments.*

After the private sector investment for each Member State and Sector was calculated, the ROIs derived in Table 2-7 were applied in order to generate the resource cost savings. Due to the limited time period for this exercise, data for the reduction in resource use associated with an investment

was not sourced directly from the ENWORKS programme. Nevertheless, the outputs from this scenario provide broad resource cost savings in terms of the EU-28, individual Member States and for the four selected sectors as a whole.

To test the robustness of the investment, we have also assumed a lower multiplier effect in a second set of calculations. In this calculation we have assumed an arbitrary multiplier of 0.5. As a result, the initial €4 billion public investment only generates €2 billion in subsequent private sector investment. The aim of this calculation is to discover whether the total resource cost savings still outweigh the initial public sector investment when low levels of private sector investment are generated.

2.3 Modelling of reduction in resource use

2.3.1 Overview of the approach

The approach uses a similar methodology to that used for calculating resource cost savings. Firstly the maximum potential savings are calculated by applying figures from RPA (2014) to the total number of SMEs per Member State and sector. Next, the same assumptions regarding the coverage of the €4 billion investment are applied along with those made on the existing levels of resource efficiency.

For this approach a validation methodology is not applied. This is because the broad data requirements and limited timescale do not allow for the full completion of such a task, i.e. linking private investments to the resulting reductions in energy, material and water use. The methodology therefore only explicitly takes into account the proposed €4 billion public investment element and assumes that this leads to direct reductions in resource use. The two approaches used are described in the following sections.

2.3.2 Maximum potential savings

In order to calculate the maximum potential reduction in resource use, figures from the RPA (2014) study for savings in energy, water, material resources and waste are applied to the number of SMEs in the corresponding sectors. Aggregate figures are then derived for the EU-28, the individual Member States, and the four sectors as a whole. The outputs are given in terms of the resource savings that could be made per year, i.e. the kilowatt hours and CO_2 that could be saved annually as a result of assistance provided to SMEs by an ENWORKS-type programme (see Table 2-8).

Table 2-8: Reduction in resource use indicators

Resource	SME resource savings indicator
Energy	Energy savings per business(kwh/year)
	Energy savings per business (tonnes CO_2/year)
Material	Unit savings per business (tonnes/year)
Water	Savings from reduction in water usage per business (m^3/year)
Waste	Savings from diversion of waste from landfill per business (tonnes/year)

Source: RPA (2014)

2.3.3 Estimated reduction in resource use

In order to account for the size of the €4 billion public sector investment and existing levels of resource efficiency, the same assumptions made in Section 2.2.3 are taken into account. The total reductions in resource use are then recalculated using the revised estimates of SMEs benefitting from cost savings as a result of ENWORKS-type programme support and the RPA (2014) dataset. The figures are provided again in terms of reduced energy, material and water use, as well as the total amount waste diverted from landfill.

2.4 Modelling of jobs created/secured

2.4.1 Overview of the approach

To calculate the number of jobs created and secured through the proposed investment, a three stage approach is once again adopted. Firstly, the maximum potential jobs created and secured are estimated using the ratios derived from data supplied through discussions with ENWORKS. These ratios are applied to the total number of SMEs per Member State and sector. After this, the same ratios are applied to the numbers of SMEs assisted by and benefitting from the €4 billion public sector investment (as estimated in Section 2.2.3).

To further improve the accuracy of the estimates, a separate validation approach has been implemented. This approach uses turnover to employment ratios to estimate the number of jobs created in each sector per Member State. These ratios are then applied to the cost savings estimates generated using the approach in Section 2.2.3. However, this methodology only provides broad estimates for the number of jobs created. This is because a number of additional assumptions would have to be made in order to derive the number of jobs secured.

2.4.2 Maximum potential jobs created and secured

The modelling approach for assessing the jobs that would be created or secured through such an investment plan is also based on extrapolation of ENWORKS data. Aggregate data for the period 2004-9 has been provided by the ENWORKS programme on the number of jobs created and secured in SMEs as a result of the programme's assistance. The ENWORKS programme defines a job created as when:

- It is new, i.e. it should not have existed in the region or with that employer in the UK before, and the post is actually filled
- It is created as a result of the ENWORKS Programme intervention
- It is a permanent job, i.e. it should have a life expectancy of at least 1 year (at appraisal and when claimed), and
- It is a full-time equivalent (FTE) post, i.e. it requires undertaking paid work for 30 hours or more per week (part time can be converted to FTE jobs on a pro rata basis or by using the EC approach)[22].

Similarly, a job that is secured or safeguarded is defined by the ENWORKS programme when:

[22] Eurostat, Statistics Explained, Glossary: Full Time Equivalent, accessed at http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Full-time_equivalent_%28FTE%29 on 03/02/15

- An existing paid permanent position was forecast as 'at risk', but is no longer at risk of being lost within one year, and
- The job being safeguarded is as a result of ENWORKS Programme intervention.

Unfortunately, sector specific data was only available for the period after 2009. For consistency, the post 2009 data has been used to derive the number of jobs created/secured in each sector during the 2004-9 period. From these derived data, sector specific ratios have been generated for the number of jobs created/secured per SME assisted by an ENWORKS-type programme (see Table 2-9).

The Table shows that the highest ratio of jobs created and secured per SME assisted was in the Environmental Technology sector. In contrast, no jobs were created per SME assisted in the Energy, Power and Utilities sector.

Table 2-9: Derived estimates of jobs created/secured by ENWORKS programme 2004-9

Sector	Number of SMEs assisted	Jobs created	Job secured	Jobs created to SME assisted ratio	Jobs secured to SME assisted ratio
Food and Beverages	220	37	77	0.17	0.35
Energy	16	0	0	0	0
Environmental Tech.	37	10	41	0.27	1.11
Construction	229	51	41	0.22	0.63

Source: Derived from data provided by the ENWORKS programme

The above ratios have been applied to the total number of SMEs in each of the four selected sectors per Member State. This provides an indication of the maximum number of potential jobs that could be created or secured through the wide scale implementation of an ENWORKS-type programme, which assists all SMEs in the EU-28.

2.4.3 Estimated jobs created and secured

In line with the earlier approaches, the estimated numbers of jobs created/secured are derived using the assumptions made on the overall coverage of the €4 billion public investment and existing baseline levels of resource efficiency along with the job ratios derived in the previous section. This provides an indication of the number of jobs that could be created or safeguarded through the roll out of an ENWORKS-type programme using a €4 billion public investment.

An obvious limitation of this approach is that it does not take into account the labour market differences within each Member state, in terms of the current levels of unemployment and the availability of skilled workers. Furthermore, the methodology does not consider the potential for any adverse employment impacts upon the suppliers of resources (i.e. the loss of jobs due to the loss of demand for resources). Nevertheless, it does take into account the factors that may influence the level of jobs/created in each sector due to resource efficiency savings. For instance, in Table 2-9 it can be seen that in the Energy, Power and Utilities sector no jobs have been created for each SME assisted. This could be due the fact that the sector is highly capital intensive, so any savings made may not necessarily be reinvested into new employment. However, it should also be recognised that the sample size for this sector is relatively small.

2.4.4 Validation approach

As a validation approach, a separate methodology has been used to calculate the direct employment effects of the investment. Under this methodology, it has been assumed that resource efficiency savings are translated into direct increases in total revenues. Using data from the DG Enterprise country SME datasets on total revenue and employment by NACE division[23], the number of employees per €1,000 in total revenue has been estimated for each Member State and sector. These ratios have then been applied to the resource efficiency savings (calculated using the approaches in Sections 2.2.3 and 2.2.4) per Member State and sector to derive the direct employment effect associated with the investment.

Table 2-10 displays the derived turnover to employment ratios. Malta and Greece were excluded from the analysis due to a lack of consistent data. All the data refers to the year 2014. However, while data on employment and number of enterprises are readily available for 2014, at two digit level the DG Enterprise database provides data on turnover only up to 2011. As a result, the 2011 turnover values were converted to 2014 price levels using GDP deflators for each Member State. This method makes the strong assumption that turnover levels will remain consistent (in terms of the quantity of goods sold) and that only the price level changes. It may therefore be the case that the values are under or overestimated in some instances.

The turnover to employment ratios were then weighted by each sector's share of the total number of enterprises (across the four sectors). This adjustment was made to take into account the unequal distribution of companies across the four sectors. For example, in the UK's Food and Beverage sector there are 141,711 employees and the sector's turnover is € 30,948 million. Over the four sectors, however, Food and Beverage accounts for only 2.7% of the number of enterprises. The turnover/employment weighted ratio is therefore € 5,976[24].

Table 2-10: Turnover on Employment weighted ratios – 2014 (€)

	Food and beverage	Energy Power and Utilities	Environmental Technologies	Construction
Austria	21,877	165,357	12,735	110,242
Belgium	31,503	54,527	6,394	190,507
Bulgaria	9,172	37,355	1,186	33,973
Croatia	7,776	2,588	1,744	44,354
Cyprus	20,503	1,944	5,509	103,456
Czech Republic	4,447	28,923	3,184	59,737
Denmark	11,128	288,010	7,523	124,125
Estonia	5,139	8,377	2,088	69,141
Finland	9,279	34,144	4,828	129,390
France	25,641	38,335	4,502	131,917
Germany	16,761	17,475	3,058	85,599
Hungary	8,088	12,931	2,207	49,254
Ireland	8,980	10,734	2,591	148,221
Italy	27,436	32,419	2,896	127,199
Latvia	5,103	5,904	1,262	41,309
Lithuania	3,250	2,837	819	27,913
Luxembourg	7,490	27,769	2,567	140,240

[23] DG Enteprise, Annual Report on European SMEs, available at http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/index_en.htm

[24] [(€ 30,948 million/141,711)* 0.027]

Table 2-10: Turnover on Employment weighted ratios – 2014 (€)				
	Food and beverage	Energy Power and Utilities	Environmental Technologies	Construction
Netherlands	12,858	18,752	2,641	174,535
Poland	4,831	3,404	1,580	62,065
Portugal	14,128	12,369	1,707	78,068
Romania	5,378	5,098	3,532	33,339
Slovakia	2,409	2,066	376	40,875
Slovenia	8,162	53,091	2,044	77,230
Spain	22,964	64,946	1,439	138,822
Sweden	9,062	24,549	2,804	131,132
UK	5,976	6,246	3,935	148,823
Source: our elaboration based on DE Enterprise database				

One benefit of this approach is that it takes into account differences in the productivity levels of employees across the sectors. On the other hand, it will not be possible to disaggregate the results by secured/new employment. Nevertheless, it allows us to validate the results from the initial extrapolation. It also allows us to provide an approximate range for the number of jobs directly created through the investment, of which the lower bound can be taken as a conservative estimate to include in the investment plan.

3 Overview of SME sectors

3.1 Sector context

This section provides an overview of the distribution of SMEs across the four sectors being examined for this study: Food and Beverage, Utilities, Environmental Technologies and Construction. The distribution of variables such as the number of enterprises, employment, and turnover are analysed below, focusing on the EU-28 and some selected countries. It should be noted that this section presents data on the number of SMEs and employment from the year 2013. In contrast, the final assessment uses estimates for the year 2014 provided in the DG Enterprise dataset.

As several studies have remarked, SMEs can be still considered as a key driver of European economic growth. In 2013, in the EU 28 there were 21,614,909 non-financial enterprises, of which 99.8% can be considered as SMEs. As reported in Table 3-1 below, across the four sectors considered in this study, there were 3,428,030 SMEs employing 14,361,120 people, representing 15.9% of European SMEs, and 16.1% of the total employment provided by SMEs across Europe. However, it should also be noted that both the number of enterprises and employment levels are not equally distributed.

The Construction sector accounts for about 88% of total enterprises, followed by Food and Beverage (7.8%). The remaining two sectors together represent 4% of the total number of enterprises. This figure can be attributed to the fact that the energy sector is usually composed of larger companies, compared to the construction sector for example.

Regarding employment, Utilities and Environmental Technologies are more capital intensive than the other two sectors analysed in this study. As a consequence, they account for only the 7.2% of total employment. In contrast, Construction and Food and Beverage represent 73.2% and the 19.5% of total employment respectively.

The last key variable to be considered is turnover, the distribution of which is more balanced across the sectors, although Construction still accounts for a large share (49.7%) of the total turnover, followed by utilities (24.2%) and food and beverage (21.3%).

Table 3-1: EU-28 - SMEs in the selected sectors

Sector	NACE code	N. of Enterprises		Employment		Turnover	
		n°	%	n°	%	€ million	%
Food and Beverages	C10	246,605	7.2%	2,590,810	18.0%	465,386	18.8%
	C11	22,366	0.7%	212,233	1.5%	62,530	2.5%
Energy Power and Utilities	D35	65,182	1.9%	261,436	1.8%	577,976	23.3%
	E36	14,240	0.4%	141,295	1.0%	22,101	0.9%
Environmental Technologies	E37	11,498	0.3%	95,822	0.7%	15,114	0.6%
	E38	44,056	1.3%	516,492	3.6%	101,284	4.1%
	E39	2,986	0.1%	24,978	0.2%	4,143	0.2%
Construction	F41	741,463	21.6%	2,817,417	19.6%	425,690	17.2%
	F42	89,353	2.6%	920,136	6.4%	142,788	5.8%
	F43	2,190,282	63.9%	6,780,506	47.2%	662,963	26.7%
	Total	**3,428,031**	**100.0%**	**14,361,124**	**100.0%**	**2,479,973**	**100.0%**

Note: N. of Enterprises and employment refer to 2013; Turnover refers to 2012
Source: DG Enterprise; Eurostat

3.2 SME characteristics in selected countries

The EU-28 trend shown in the above table is also reflected in the distribution of key variables across sectors in some selected Member states, which are representative in terms of geographic location and size: Germany, United Kingdom, Italy, France, Sweden, and Czech Republic. The DG Enterprise database does not provide updated data on turnover at this level of statistical disaggregation, with the most recent available data being for 2011. For this reason, data on the number of enterprises and employment are also for 2011 (rather than 2013 as reported above).

In all the selected economies, Construction is the sector which accounts for the largest share of total enterprises.

Food and Beverage follows the Construction sector in terms of the next largest share of the number of SME enterprises in Germany (11.3%), France (10.7%) and Italy (8.7%), out of the four sectors considered here. In Czech Republic, the food and beverage sector accounts for only 4.2% of the total number of SMEs within the four sectors.

Table 3-2: Number of SMEs: Distribution across sectors in selected countries - 2011

Sector	NACE code	Germany		UK		Italy	
		n°	%	n°	%	n°	%
Food and Beverages	C10	29,678	10.6%	6,189	2.2%	55,106	8.3%
	C11	1,982	0.7%	1,005	0.4%	2,856	0.4%
Energy, Power and Utilities	D35	1,604	0.6%	1,192	0.4%	6,503	1.0%
	E36	1,652	0.6%	104	0.0%	819	0.1%
Environmental Technologies	E37	1,337	0.5%	892	0.3%	1,395	0.2%
	E38	1,726	0.6%	4,907	1.8%	6,040	0.9%
	E39	57	0.0%	457	0.2%	554	0.1%
Construction	F41	21,920	7.8%	73,650	26.3%	151,418	22.8%
	F42	6,203	2.2%	20,008	7.2%	7,958	1.2%
	F43	214,770	76.4%	171,368	61.3%	431,096	64.9%
	Total	**280,929**	**100.0%**	**279,772**	**100.0%**	**663,745**	**100.0%**
Sector	**NACE code**	**France**		**Sweden**		**Czech Republic**	
		n°	%	n°	%	n°	%
Food and Beverages	C10	56,207	10.2%	3,378	3.4%	7,038	3.6%
	C11	2,937	0.5%	170	0.2%	1,253	0.6%
Energy, Power and Utilities	D35	16,657	3.0%	1,990	2.0%	5,169	2.6%
	E36	3,034	0.6%	211	0.2%	368	0.2%
Environmental Technologies	E37	1,663	0.3%	188	0.2%	405	0.2%
	E38	6,647	1.2%	785	0.8%	5,490	2.8%
	E39	232	0.0%	113	0.1%	90	0.0%
Construction	F41	34,020	6.2%	20,062	20.4%	33,196	16.9%
	F42	5,858	1.1%	1,707	1.7%	2,592	1.3%
	F43	423,937	76.9%	69,727	70.9%	140,400	71.6%
	Total	**551,192**	**100.0%**	**98,331**	**100.0%**	**196,001**	**100.0%**

Source: DG Enterprise

As already remarked, Utilities and Environmental technologies are more capital intensive compared to the other two sectors included in our analysis. This is also reflected in the distribution of employment across the four sectors in the selected Member states. In the UK, Sweden and the Czech Republic, the Construction sector accounts for a share of total employment higher than the EU-28 average (73.2%). While in France (74%) and Italy (76.9%) the Construction sector represents a

share of employment similar to the EU-28 average, in Germany (69.5%) the figure is slightly below the European average. As expected, Food and Beverage follows the Construction sector in terms of the level of total employment across the six countries.

Table 3-3: Employment: Distribution across sectors in selected countries - 2011

Sector	NACE code	Germany		UK		Italy	
		n°	%	n°	%	n°	%
Food and Beverages	C10	510,956	21.3%	131,273	10.0%	326,146	15.6%
	C11	39,258	1.6%	13,282	1.0%	24,474	1.2%
Energy, Power and Utilities	D35	61,344	2.6%	8,675	0.7%	23,590	1.1%
	E36	26,511	1.1%	3,222	0.2%	13,468	0.6%
Environmental Technologies	E37	19,499	0.8%	5,563	0.4%	9,802	0.5%
	E38	71,069	3.0%	57,395	4.4%	79,708	3.8%
	E39	2,221	0.1%	2,017	0.2%	4,147	0.2%
Construction	F41	240,655	10.0%	300,443	22.9%	472,515	22.6%
	F42	144,494	6.0%	109,583	8.3%	80,755	3.9%
	F43	1,278,605	53.4%	681,843	51.9%	1,053,491	50.5%
	Total	**2,394,612**	**100.0%**	**1,313,296**	**100.0%**	**2,088,096**	**100.0%**
Sector	**NACE code**	**France**		**Sweden**		**Czech Republic**	
		n°	%	n°	%	n°	%
Food and Beverages	C10	415,996	20.6%	33,100	9.7%	7,038	3.6%
	C11	24,367	1.2%	1,457	0.4%	1,253	0.6%
Energy, Power and Utilities	D35	8,770	0.4%	14,139	4.1%	5,169	2.6%
	E36	9,329	0.5%	1,009	0.3%	368	0.2%
Environmental Technologies	E37	10,053	0.5%	1,898	0.6%	405	0.2%
	E38	52,942	2.6%	8,938	2.6%	5,490	2.8%
	E39	4,083	0.2%	377	0.1%	90	0.0%
Construction	F41	107,532	5.3%	68,321	20.0%	33,196	16.9%
	F42	89,365	4.4%	9,345	2.7%	2,592	1.3%
	F43	1,301,864	64.3%	203,819	59.5%	140,400	71.6%
	Total	**2,024,301**	**100.0%**	**342,403**	**100.0%**	**196,001**	**100.0%**

Source: DG Enterprise

In terms of turnover, as expected and in line with the EU-28 average, a more balanced distribution across sectors is observed. With the exception of France (5.1%) and the UK (7.7%), where the Energy, Power and Utilities accounts for a comparatively low share of total turnover, this sector accounts for a share of total turnover above the EU-28 average in particular in Czech Republic (34.3%). In contrast, the Construction sector is more significant in the UK, where it accounts for the 73.3% of total turnover.

In summary, the above analysis indicates that across the four sectors of interest to this study, most of the companies and employment are concentrated in the Construction and Food and Beverage sectors, although some differences can be found across the Member States, due to differences in their underlying productive structures.

Table 3-4: Turnover: Distribution across sectors in selected countries - 2011							
Sector	NACE code	Germany		UK		Italy	
		€	%	€	%	€	%
Food and Beverages	C10	73,694	18.1%	27,738	12.5%	74,101	20.1%
	C11	9,898	2.4%	2,797	1.3%	12,963	3.5%
Energy, Power and Utilities	D35	123,005	30.2%	16,402	7.4%	79,231	21.4%
	E36	6,830	1.7%	839	0.4%	3,338	0.9%
Environmental Technologies	E37	5,821	1.4%	681	0.3%	1,436	0.4%
	E38	19,564	4.8%	10,789	4.8%	15,063	4.1%
	E39	320	0.1%	289	0.1%	732	0.2%
Construction	F41	36,728	9.0%	57,253	25.7%	72,965	19.7%
	F42	18,221	4.5%	24,217	10.9%	19,043	5.2%
	F43	112,641	27.7%	81,631	36.7%	90,610	24.5%
	Total	**406,721**	**100.0%**	**222,636**	**100.0%**	**369,480**	**100.0%**
Sector	**NACE code**	**France**		**Sweden**		**Czech Republic**	
		€	%	€	%	€	%
Food and Beverages	C10	85,264	24.2%	8,238	12.1%	6,971	13.2%
	C11	12,526	3.6%	426	0.6%	930	1.8%
Energy, Power and Utilities	D35	15,073	4.3%	15,548	22.8%	17,800	33.6%
	E36	2,919	0.8%	346	0.5%	358	0.7%
Environmental Technologies	E37	2,051	0.6%	401	0.6%	111	0.2%
	E38	15,245	4.3%	2,507	3.7%	2,697	5.1%
	E39	686	0.2%	51	0.1%	46	0.1%
Construction	F41	41,470	11.8%	12,714	18.7%	9,234	17.5%
	F42	19,304	5.5%	2,309	3.4%	4,121	7.8%
	F43	157,561	44.7%	25,583	37.6%	10,631	20.1%
	Total	**352,100**	**100.0%**	**68,123**	**100.0%**	**52,900**	**100.0%**
Source: DG Enterprise							

4 Results

4.1 Task 1: Savings aggregated at the Individual Member and EU-28 levels across four SME sectors

4.1.1 Overview

The estimates provided below stem from the methodology set out in Section 2.2.2 and assume that the €4 billion public investment is apportioned to Member States based on the percentage of SMEs in each sector and Member State. The number of SMEs assisted is based on the share of total investment and the relative cost of assisting a SME in each Member State. It further assumes that a proportion of the SMEs assisted will have already benefitted from previous public support measures and will therefore not benefit from the implementation of further resource efficiency measures.

The results for the resource cost savings are presented in terms of the two approaches detailed in Sections 2.2.3 and 2.2.4, both taking into account an initial €4 billion public investment. However, the two approaches make different assumptions on how this investment is spent. The first approach assumes the €4 billion is used to fund ENWORKS-type programmes across the EU-28. In contrast, the second (validation) approach assumes that the €4 billion is used to leverage a total of €11 billion in private sector investment, a ratio that is based on the Commission's past experience with EU and EIB investments. This private sector investment is then converted into resource cost savings using a relationship derived from data provided by ENWORKS.

Next the savings in terms of the total reduction of resources used are indicated in Section 4.1.3. Savings are presented in terms of energy, CO_2 emissions, material resources, water and waste diverted from landfill. Totals are presented for each individual Member State and for the EU-28 as a whole.

Lastly, the indirect employment effects of the resource efficiency measures are considered in Section 4.1.4. Figures are presented for jobs created and jobs secured (broadly defined as a position that was at risk but is now safeguarded due to an ENWORKS-type programme's intervention). Once again, the results are presented for the Individual Member States and at the aggregate EU-28 level.

4.1.2 Resource cost savings

a) Maximum potential resource cost savings

This first set of results displays the maximum level of savings that could be generated, as well as the jobs that could be created/secured, if all of the SMEs across the EU-28 (in the four selected sectors) were assisted by an ENWORKS-type programme. These initial calculations rely on a broad range of assumptions, as set out in Section 2.2.

At this stage, the size of the proposed investment is not taken into account. The results are intended to provide a tentative indication of the potential benefits that could be realised if the initial public investment was expanded beyond the initial €4 billion set out in the specifications. This set of calculations provides an upper bound to the potential benefits which could be realised, and upon which further assumptions are made in Section 4.2.

Using the methodology set out in Section 2.2.2, the overall potential savings that could be realised, if all SMEs were assisted by an ENWORKS-type programme, have been calculated. Table 4-1 presents the aggregate maximum potential resource cost savings[25] for each individual Member State and the EU-28 as a whole for the four sectors covered by this analysis.

Table 4-1: Maximum potential cost savings per Member Sector due to resource efficiency measures (based on four sectors)

Country	Number of SMEs in the four sectors	Total Resource Cost Savings €	% of Total Savings
Austria	39,565	€ 510,832,886	0.94%
Belgium	104,273	€ 1,721,658,822	3.15%
Bulgaria	24,271	€ 136,085,330	0.25%
Croatia	22,359	€ 242,563,937	0.44%
Cyprus	5,524	€ 49,259,773	0.09%
Czech Republic	189,125	€ 1,995,503,590	3.66%
Denmark	37,160	€ 395,914,353	0.73%
Estonia	8,904	€ 58,757,294	0.11%
Finland	46,935	€ 349,110,575	0.64%
France	579,131	€ 11,159,617,211	20.45%
Germany	303,228	€ 5,482,380,112	10.04%
Greece	38,578	€ 578,176,126	1.06%
Hungary	66,933	€ 690,409,298	1.26%
Ireland	25,836	€ 186,819,912	0.34%
Italy	547,308	€ 10,394,585,589	19.05%
Latvia	9,307	€ 64,683,130	0.12%
Lithuania	21,220	€ 230,971,391	0.42%
Luxembourg	3,511	€ 92,717,898	0.17%
Malta	4,399	€ 202,426,958	0.37%
Netherlands	132,464	€ 3,658,551,797	6.70%
Poland	241,171	€ 2,055,555,006	3.77%
Portugal	87,082	€ 882,057,185	1.62%
Romania	56,704	€ 320,272,615	0.59%
Slovakia	100,914	€ 1,125,207,706	2.06%
Slovenia	18,502	€ 191,118,941	0.35%
Spain	290,335	€ 3,700,787,591	6.78%
Sweden	103,563	€ 1,399,380,981	2.56%
UK	275,160	€ 6,703,076,404	12.28%
EU-28	**3,383,462**	**€ 54,578,482,412**	**100.00%**

From the above table, it can be seen that if resource efficiency measures were implemented across all SMEs in the four sectors, the potential savings could be in the region of **€54.6 billion**. Across the individual Member States, the highest potential savings could be realised in France, which accounts for 20.45% of the total EU-28 savings. Italy, the UK and Germany could also account for significant proportions of the total savings that could be realised across the EU-28. This is because these countries make up a significant proportion of the total number of SMEs within these sectors; for instance, France alone accounts for 17% of the total SMEs in the four sectors assessed in this study.

[25] These savings represent the total level of savings that could be made assuming that all SMEs are assisted by an ENWORKS-type programme. It should be noted that these findings are likely to be an overestimate of the potential savings as they do not take into account the existing level of resource efficiency across the EU-28.

b) Estimated resource cost savings

The results from the first calculation approach, given in Table 4-2 below, show that the resource cost savings that could be realised through the implementation of an ENWORKS-type programme across the EU-28 is approximately **€8.7 billion**. It can be seen that the €4 billion public sector investment could assist around **975,219** SMEs in the four sectors of which **602,274** would realise resource efficiency cost savings; this equates to around one fifth of the total number of SMEs in these sectors (and takes into account the fact that some SMEs have already benefitted from public support for resource efficiency measures across the Member States).

In contrast to the figures presented in Table 4-1 on the maximum potential savings, the results given in Table 4-2 indicate that the highest resource cost savings could be made in Italy, taking into consideration the cost of implementing an ENWORKS-type programme and a proxy for the baseline level of resource efficiency. France is the next largest country in terms of resource cost savings, followed by the UK, Spain and Germany.

Given that the above estimates are annual savings, the benefits stemming from the €4 billion in funding clearly outweigh the value of that funding (costs).

It is recognised that different SME targeting strategies could influence the effectiveness of the public investment and thus the final level of resource cost savings (i.e. screening and identifying those which have not benefited from previous public support measures). The estimation is thus very conservative in nature as it assumes that a significant proportion of the overall public investment would not be effective in terms of inducing SMEs to implement resource efficiency measures. This is also reflected in the ENWORKS programme itself, which differentiates between opportunities identified and actual savings made.

Table 4-2: Cost savings per Member Sector due to resource efficiency measures (based on four sectors)				
Country	**Number of SMEs assisted**	**SMEs making cost savings**	**Total Resource Cost Savings €**	**% of Total Savings**
Austria	7,049	3,877	€ 50,053,821	0.58%
Belgium	18,389	10,482	€ 173,064,373	1.99%
Bulgaria	21,969	11,644	€ 65,284,631	0.75%
Croatia	10,363	3,731	€ 40,472,582	0.47%
Cyprus	1,466	704	€ 6,276,562	0.07%
Czech Republic	83,502	40,081	€ 422,903,555	4.86%
Denmark	5,716	4,630	€ 49,325,218	0.57%
Estonia	3,971	1,191	€ 7,861,582	0.09%
Finland	8,873	4,082	€ 30,361,196	0.35%
France	116,771	66,560	€ 1,282,575,083	14.74%
Germany	67,099	34,892	€ 630,844,614	7.25%
Greece	12,170	5,842	€ 87,549,603	1.01%
Hungary	38,771	32,568	€ 335,934,910	3.86%
Ireland	4,960	3,174	€ 22,953,198	0.26%
Italy	120,552	102,469	€ 1,946,120,873	22.37%
Latvia	4,979	2,141	€ 14,878,298	0.17%
Lithuania	3,587	1,722	€ 18,740,704	0.22%
Luxembourg	474	275	€ 7,266,734	0.08%
Malta	1,675	988	€ 45,483,876	0.52%
Netherlands	26,285	14,457	€ 399,284,494	4.59%
Poland	131,831	79,099	€ 674,176,197	7.75%
Portugal	27,640	14,925	€ 151,179,410	1.74%
Romania	44,473	34,245	€ 193,418,360	2.22%
Slovakia	50,621	18,224	€ 203,195,897	2.34%
Slovenia	6,022	2,650	€ 27,370,241	0.31%
Spain	78,713	59,822	€ 762,523,390	8.77%
Sweden	16,295	10,592	€ 143,122,269	1.65%
UK	61,001	37,211	€ 906,481,569	10.42%
EU-28	**975,219**	**602,274**	**€ 8,698,703,239**	**100.00%**

c) Validation approach

This approach assumes that the public sector investment of €4 billion leverages €11 billion in private investment through a mix of (co)funding, loans and other financial instruments (see Section 2.2.4). The public investment is apportioned again using the relative number of SMEs in each Member State and sector. The public investment in each Member State and sector is then scaled up by a factor of 2.75 to estimate the relative amount of leveraged private sector investment. These levels of investment are then converted to resource efficiency cost savings using an indexed return on investment derived from data provided by ENWORKS.

The resource cost savings per individual Member State and sector are listed in Table 4-3. From the table, it can be seen that the leveraged €11 billion investment could result in a resource cost savings of approximately **€32.8 billion** across the EU-28. This is significantly higher than the cost savings estimated using the first approach. Individual Member States such as France, Italy, the UK and Germany could expect to see the largest savings based on the estimations given in Table 4-3. In total, the resource cost savings per county range from a high of €6.7 billion (France) to a low of €29.9 million (Cyprus).

Table 4-3: Annual cost savings per Member Sector due to resource efficiency measures (based on four sectors)			
Country	**Public sector investment apportioned**	**Private sector investment leveraged**	**Total resource cost savings**
Austria	€ 46,774,576	€ 128,630,084	€ 348,044,772
Belgium	€ 123,273,736	€ 339,002,773	€ 1,002,155,914
Bulgaria	€ 28,693,687	€ 78,907,640	€ 82,327,643
Croatia	€ 26,433,280	€ 72,691,521	€ 148,137,524
Cyprus	€ 6,530,589	€ 17,959,120	€ 29,897,729
Czech Republic	€ 223,587,556	€ 614,865,779	€ 1,315,353,263
Denmark	€ 43,931,334	€ 120,811,169	€ 267,344,311
Estonia	€ 10,526,496	€ 28,947,865	€ 36,321,384
Finland	€ 55,487,545	€ 152,590,749	€ 217,442,671
France	€ 684,660,859	€ 1,882,817,363	€ 6,718,087,884
Germany	€ 358,482,525	€ 985,826,943	€ 3,112,677,863
Greece	€ 45,607,724	€ 125,421,240	€ 267,786,243
Hungary	€ 79,129,602	€ 217,606,404	€ 415,742,372
Ireland	€ 30,543,863	€ 83,995,623	€ 112,482,039
Italy	€ 647,039,039	€ 1,779,357,356	€ 6,043,008,099
Latvia	€ 11,002,931	€ 30,258,061	€ 42,314,849
Lithuania	€ 25,086,731	€ 68,988,509	€ 140,346,110
Luxembourg	€ 4,150,778	€ 11,414,640	€ 57,100,429
Malta	€ 5,200,590	€ 14,301,624	€ 122,225,751
Netherlands	€ 156,601,729	€ 430,654,755	€ 2,157,622,401
Poland	€ 285,117,433	€ 784,072,941	€ 1,292,105,564
Portugal	€ 102,950,174	€ 283,112,977	€ 501,027,293
Romania	€ 67,036,662	€ 184,350,822	€ 210,074,601
Slovakia	€ 119,302,655	€ 328,082,302	€ 661,630,816
Slovenia	€ 21,873,454	€ 60,151,998	€ 123,570,728
Spain	€ 343,240,149	€ 943,910,409	€ 2,253,680,813
Sweden	€ 122,434,359	€ 336,694,486	€ 853,965,514
UK	€ 325,299,944	€ 894,574,847	€ 4,224,958,355
EU-28	**€ 4,000,000,000**	**€ 11,000,000,000**	**€ 32,757,432,934**

In order to test the robustness of the above estimates, the results were recalculated to determine the break-even point in terms of the public sector investment multiplier (i.e. where public and private sector investment are equal to resource cost savings). It was found that this multiplier was equal to approximately 0.51[26], which is significantly lower than the multiplier of 2.75 used in the previous estimation[27].

Table 4-4: Robustness test of annual cost savings per member state			
Country	**Public sector investment apportioned**	**Private sector investment leveraged**	**Total resource cost savings**
Austria	€ 46,774,576	€ 23,648,026	€ 63,986,367
Belgium	€ 123,273,736	€ 62,324,039	€ 184,241,572
Bulgaria	€ 28,693,687	€ 14,506,792	€ 15,135,543
Croatia	€ 26,433,280	€ 13,363,989	€ 27,234,375
Cyprus	€ 6,530,589	€ 3,301,698	€ 5,496,555

[26] Actual value is 0.505574349

[27] €11 billion ÷ €4 billion = 2.75

Table 4-4: Robustness test of annual cost savings per member state			
Country	**Public sector investment apportioned**	**Private sector investment leveraged**	**Total resource cost savings**
Czech Republic	€ 223,587,556	€ 113,040,133	€ 241,821,407
Denmark	€ 43,931,334	€ 22,210,556	€ 49,149,973
Estonia	€ 10,526,496	€ 5,321,926	€ 6,677,513
Finland	€ 55,487,545	€ 28,053,079	€ 39,975,795
France	€ 684,660,859	€ 346,146,968	€ 1,235,088,331
Germany	€ 358,482,525	€ 181,239,569	€ 572,250,940
Greece	€ 45,607,724	€ 23,058,095	€ 49,231,220
Hungary	€ 79,129,602	€ 40,005,897	€ 76,432,247
Ireland	€ 30,543,863	€ 15,442,194	€ 20,679,285
Italy	€ 647,039,039	€ 327,126,341	€ 1,110,978,141
Latvia	€ 11,002,931	€ 5,562,800	€ 7,779,383
Lithuania	€ 25,086,731	€ 12,683,208	€ 25,801,961
Luxembourg	€ 4,150,778	€ 2,098,527	€ 10,497,641
Malta	€ 5,200,590	€ 2,629,285	€ 22,470,620
Netherlands	€ 156,601,729	€ 79,173,817	€ 396,668,561
Poland	€ 285,117,433	€ 144,148,061	€ 237,547,429
Portugal	€ 102,950,174	€ 52,048,967	€ 92,111,472
Romania	€ 67,036,662	€ 33,892,017	€ 38,621,211
Slovakia	€ 119,302,655	€ 60,316,362	€ 121,637,662
Slovenia	€ 21,873,454	€ 11,058,657	€ 22,717,887
Spain	€ 343,240,149	€ 173,533,415	€ 414,328,440
Sweden	€ 122,434,359	€ 61,899,671	€ 156,997,476
UK	€ 325,299,944	€ 164,463,308	€ 776,738,390
EU-28	**€ 4,000,000,000**	**€ 2,022,297,398**	**€ 6,022,297,398**
Note: Leveraged private sector investment based on a multiplier of 0.505574349			

4.1.3 Reduction in resource use

a) Maximum potential reduction in resource use

Table 4-5 denotes the annual reductions in resource use that could be realised through the implementation of a wide scale ENWORKS-type programme[28]. The figures assume that all SMEs in the four selected sectors are assisted by an ENWORKS-type programme and thus are able to achieve reductions in the use of resources. The results suggest that substantial resource savings could be made across the four sectors in the individual Member States and across the EU-28 as a whole. In terms of energy savings, the EU-28 could save approximately **907.3 billion kWh** per year while also reducing CO_2 emissions annually by around **339.6 million tonnes.** Italy and France could expect to make the largest savings in terms of kWh and CO_2 emissions.

Material resource savings could also be significant if all SMEs were assisted by an ENWORKS-type programme. Material resources are defined as the total amount of raw materials extracted from the domestic territory of a focal economy, plus all physical imports minus all physical exports. The data show that the EU-28 could save around **10.7 billion tonnes in material resources** each year. In

[28] These results assume that all SMEs are assisted by an ENWORKS-type programme and benefit from subsequent resource efficiency savings. The size of the public investment and existing level of resource efficiency is not taken into account.

particular, France could achieve the largest savings at around 2.5 billion tonnes per year. The smallest savings would be achieved in Estonia, with annual savings of around 8.6 million tonnes.

There could also be substantial savings in terms of water use across the EU-28, with the analysis predicting that **348.1 million m^3 of water** could be saved annually if all SMEs benefitted from such a programme. Once again, the savings would be highest in France at around 72.8 million m^3 per year, followed by Germany, the UK and Italy.

Lastly, the analysis suggests that a considerable amount of waste could be diverted from landfills each year. For the EU-28 as a whole, this reduction could equate to nearly **1.3 billion tonnes of waste** annually. It should also be noted that this aggregate annual savings excludes those that could be achieved in three Member States (Bulgaria, Croatia, and Malta) due to missing data. Amongst the individual Member States, waste savings could be highest in Germany at nearly 249.6 million tonnes per year.

a) Estimated reduction in resource use

Table 4-6 denotes the annual reductions in resource use that could be realised through the implementation of a wide scale ENWORKS-type programme from the €4 billion in public investment. The results show that substantial resource savings could be made across the four sectors in the individual Member States and across the EU-28 as a whole. In terms of energy savings, the EU-28 could save approximately **157 billion kWh** per year whilst CO_2 emissions could also decrease annually by around **58.9 million tonnes.** Italy and France could expect to make the largest savings in terms of kWh and CO_2 emissions.

Material resource savings could also be significant, with the calculations suggesting that the EU-28 could save around **1.7 billion tonnes in material resources** each year. In particular, Italy could make the largest savings at around 446.8 million tonnes per year. In contrast, the figures indicate that the smallest savings could be made be made in Luxembourg, with annual savings of 994,699 tonnes.

There could also be substantial savings in terms of water use across the EU-28. As can be seen from Table 4-6, an estimated **51.3 million m^3 of water** could be saved annually if all SMEs that have not already undertaken investment benefitted from such a programme. Once again the savings could be highest in France at around 8.4million m^3 per year, followed by Italy, Germany and the UK.

Table 4-5: Maximum potential reductions in resource use across the four selected sectors						
Country	**Number of SMEs in the four sectors**	**Energy savings kWh/year**	**Energy savings CO2 tonnes/year**	**Material resource savings tonnes/year**	**Water use savings m^3/year**	**Waste savings tonnes/year**
Austria	39,565	11,457,178,491	4,616,829	108,467,546	5,927,522	38,503,898
Belgium	104,273	35,876,162,157	13,010,789	321,242,779	9,334,419	81,061,739
Bulgaria	24,271	6,009,915,934	2,450,632	53,012,194	411,819	..
Croatia	22,359	4,206,321,654	1,596,831	66,796,215	..	..
Cyprus	5,524	1,831,082,309	670,458	12,479,402	956,870	409,193
Czech Republic	189,125	67,740,315,489	25,716,551	272,129,587	16,243,772	24,203,165
Denmark	37,160	12,178,511,225	5,105,820	52,595,511	27,836,363	18,423,228
Estonia	8,904	3,255,051,905	1,215,843	8,557,706	86,488	2,826,394
Finland	46,935	17,177,628,836	6,473,931	43,986,964	5,522,530	23,266,957
France	579,131	134,042,188,643	51,242,114	2,562,719,100	72,789,052	246,659,294
Germany	303,228	97,402,238,983	35,818,005	1,295,901,698	50,527,674	249,559,659
Greece	38,578	14,091,808,556	5,289,050	305,542,954	4,854,648	5,633,532
Hungary	66,933	13,507,391,114	4,984,350	154,115,426	2,383,900	11,768,829
Ireland	25,836	10,515,112,800	3,798,067	19,938,717	5,256,279	12,021,471
Italy	547,308	138,792,426,032	51,565,832	2,386,564,068	39,818,283	151,720,094
Latvia	9,307	1,235,502,843	491,308	13,637,354	737,621	665,440
Lithuania	21,220	3,873,924,635	1,449,794	38,376,574	345,552	1,321,088
Luxembourg	3,511	2,419,218,948	898,478	12,691,592	2,400,659	2,253,799
Malta	4,399	853,318,438	313,493	45,313,935	903,910	781,351
Netherlands	132,464	42,447,380,261	15,298,503	459,686,555	6,926,402	..
Poland	241,171	63,718,143,637	23,375,566	320,882,009	7,605,541	27,070,509
Portugal	87,082	18,336,385,416	6,785,796	217,953,224	3,920,250	18,606,376
Romania	56,704	10,068,102,264	3,861,722	99,959,656	1,995,276	947,717
Slovakia	100,914	23,496,186,137	8,415,418	131,525,879	8,570,754	7,114,229
Slovenia	18,502	5,068,595,853	2,049,696	33,833,657	1,085,680	4,860,678
Spain	290,335	75,174,419,032	29,502,006	767,254,548	17,150,826	124,929,969
Sweden	103,563	19,333,036,899	7,159,217	172,652,176	13,566,105	70,337,676
UK	275,160	73,240,568,875	26,426,208	765,191,491	40,981,502	131,748,616
EU-28	**3,383,462**	**907,348,117,366**	**339,582,307**	**10,743,008,517**	**348,139,697**	**1,256,694,901**

Table 4-6: Potential reductions in resource use across the four selected sectors						
Country	**SMEs making cost savings**	**Energy savings kWh/year**	**Energy savings CO2 tonnes/year**	**Material resource savings tonnes/year**	**Water use savings m^3/year**	**Waste savings tonnes/year**
Austria	3,877	1,122,628,518	452,379	10,628,163	580,807	3,772,794
Belgium	10,482	3,606,339,094	1,307,869	32,291,927	938,313	8,148,478
Bulgaria	11,644	2,883,155,337	1,175,649	25,431,702	197,563	0
Croatia	3,731	701,838,446	266,436	11,145,166	..	0
Cyprus	704	233,312,097	85,428	1,590,095	121,922	52,138
Czech Republic	40,081	14,356,085,533	5,450,063	57,671,943	3,442,514	5,129,334
Denmark	4,630	1,517,266,836	636,112	6,552,642	3,468,009	2,295,268
Estonia	1,191	435,517,951	162,677	1,145,000	11,572	378,165
Finland	4,082	1,493,891,590	563,020	3,825,426	480,279	2,023,464
France	66,560	15,405,472,072	5,889,257	294,533,370	8,365,648	28,348,559
Germany	34,892	11,207,847,061	4,121,494	149,116,367	5,814,101	28,716,244
Greece	5,842	2,133,834,629	800,888	46,266,463	735,109	853,051
Hungary	32,568	6,572,339,381	2,425,253	74,988,491	1,159,943	5,726,401
Ireland	3,174	1,291,915,123	466,641	2,449,725	645,801	1,476,990
Italy	102,469	25,985,339,677	9,654,386	446,823,215	7,454,957	28,405,716
Latvia	2,141	284,188,163	113,010	3,136,840	169,666	153,063
Lithuania	1,722	314,324,963	117,634	3,113,823	28,038	107,191
Luxembourg	275	189,605,466	70,418	994,699	188,151	176,641
Malta	988	191,734,492	70,440	10,181,714	203,102	175,564
Netherlands	14,457	4,632,592,809	1,669,637	50,168,953	755,929	0
Poland	79,099	20,898,130,017	7,666,664	105,242,142	2,494,448	8,878,523
Portugal	14,925	3,142,748,542	1,163,045	37,355,900	671,908	3,189,023
Romania	34,245	6,080,307,034	2,332,163	60,367,424	1,204,983	572,343
Slovakia	18,224	4,243,064,270	1,519,700	23,751,632	1,547,752	1,284,725
Slovenia	2,650	725,876,187	293,538	4,845,335	155,481	696,100
Spain	59,822	15,489,203,693	6,078,698	158,087,846	3,533,817	25,741,014
Sweden	10,592	1,977,294,347	732,212	17,658,073	1,387,479	7,193,815
UK	37,211	9,904,590,337	3,573,713	103,479,647	5,542,079	17,816,848
EU-28	**602,274**	**157,020,443,661**	**58,858,425**	**1,742,843,723**	**51,299,369**	**181,311,452**

4.1.4 Jobs created and secured

a) Maximum potential jobs created and secured

Table 4-7 presents predictions of the number of jobs that could be created as well as secured if all SMEs in the four selected sectors were assisted by an ENWORKS-type programme across the EU-28. The table shows that in total **720,535 new jobs** across the EU-28 could be created as a result of such assistance. A further **2 million jobs** could also be secured across the EU-28 as a whole[29].

Table 4-7: Maximum potential jobs created/secured using ENWORKS derived ratios

Country	Number of SMEs in the four sectors	Jobs created	Jobs secured
Austria	39,565	8,037	22,826
Belgium	104,273	22,660	63,652
Bulgaria	24,271	4,754	13,057
Croatia	22,359	4,702	13,173
Cyprus	5,524	1,193	3,356
Czech Republic	189,125	40,377	115,301
Denmark	37,160	7,351	20,806
Estonia	8,904	1,911	5,408
Finland	46,935	10,040	28,452
France	579,131	120,967	338,422
Germany	303,228	64,943	180,995
Greece	38,578	7,892	20,906
Hungary	66,933	14,362	40,380
Ireland	25,836	5,661	16,043
Italy	547,308	117,124	327,493
Latvia	9,307	1,915	5,414
Lithuania	21,220	4,546	12,824
Luxembourg	3,511	756	2,139
Malta	4,399	950	2,674
Netherlands	132,464	29,029	81,994
Poland	241,171	52,344	148,728
Portugal	87,082	18,627	51,879
Romania	56,704	11,905	33,666
Slovakia	100,914	22,198	62,736
Slovenia	18,502	3,747	10,559
Spain	290,335	59,699	166,975
Sweden	103,563	22,304	63,107
UK	275,160	60,544	172,726
EU-28	**3,383,462**	**720,535**	**2,025,690**

Within the individual Member States, the largest number of jobs could be created and secured in France, followed by Italy, Germany, the UK and Spain. However, it should be noted that these figures do not take into account differences in the labour market situations within these countries. The results are therefore purely indicative of the employment effects that could occur if labour market conditions in other Member States were similar to those of the UK. Clearly, this is a simplifying assumption.

[29] These calculations assume that all SMEs in the EU-28 benefit from an ENWORKS-type programme and subsequent investments in resource efficiency measures. The size of the public investment and existing level of resource efficiency is not taken into account.

b) Estimated jobs created and secured

This section describes the findings from the approach used to calculate the number of jobs that could be created/secured across the EU-28 and in individual member states. These estimates take into account the coverage of the €4 billion investment in terms of the number of SMEs assisted. Furthermore, they assume that only a proportion of the SMEs assisted will benefit from the resulting resource efficiency measures.

The results given in Table 4-8 indicate that despite conservative assumptions on the number of jobs that could be created or secured, a €4 billion public investment in the implementation of an ENWORKS-type programme across the EU-28 could have a significant impact on employment. Across the EU-28, the calculations suggest that around **128,180 new jobs** could be created. Moreover, as indicated by the results presented in Table 4-8, an estimated **360,630 jobs could be safeguarded** as a result of the investment.

Table 4-8: Estimation of jobs created/secured using ENWORKS derived ratios

Country	Number of SMEs assisted	SMEs making cost savings	Jobs created	Jobs secured
Austria	7,049	3,877	787	2,237
Belgium	18,389	10,482	2,278	6,398
Bulgaria	21,969	11,644	2,281	6,264
Croatia	10,363	3,731	785	2,198
Cyprus	1,466	704	152	428
Czech Republic	83,502	40,081	8,557	24,436
Denmark	5,716	4,630	916	2,592
Estonia	3,971	1,191	256	724
Finland	8,873	4,082	873	2,474
France	116,771	66,560	13,903	38,895
Germany	67,099	34,892	7,473	20,827
Greece	12,170	5,842	1,195	3,166
Hungary	38,771	32,568	6,988	19,648
Ireland	4,960	3,174	695	1,971
Italy	120,552	102,469	21,928	61,315
Latvia	4,979	2,141	440	1,245
Lithuania	3,587	1,722	369	1,041
Luxembourg	474	275	59	168
Malta	1,675	988	213	601
Netherlands	26,285	14,457	3,168	8,949
Poland	131,831	79,099	17,168	48,779
Portugal	27,640	14,925	3,192	8,892
Romania	44,473	34,245	7,189	20,331
Slovakia	50,621	18,224	4,009	11,329
Slovenia	6,022	2,650	537	1,512
Spain	78,713	59,822	12,301	34,404
Sweden	16,295	10,592	2,281	6,454
UK	61,001	37,211	8,188	23,358
EU-28	**975,219**	**602,274**	**128,181**	**360,634**

Across the individual Member States, the largest number of jobs could be both created and secured in Italy. The results indicate that the jobs created per Member State could range from a low of 59 in Luxembourg to a high of 21,928 in Italy.

However, as noted earlier these figures do not take into account differences in the labour market situations within these countries. The results are therefore purely indicative of the employment effects that could occur if labour market conditions in other Member States were similar to those of the UK. Clearly this is an over simplification for many Member States.

c) Validation approach

For validation, the turnover on employment ratios were calculated, and then applied to cost savings as calculated under the initial resource cost savings approach (see Section 4.1.2b). The results are shown below.

Table 4-9: Jobs created using the validation measure

	Number of SMEs assisted	SMEs making cost savings	Total Resource Cost Savings €	Country Total
Austria	7,049	3,877	€ 50,053,821	919
Belgium	18,389	10,482	€ 173,064,373	1,968
Bulgaria	21,969	11,644	€ 65,284,631	5,817
Croatia	10,363	3,731	€ 40,472,582	3,106
Cyprus	1,466	704	€ 6,276,562	170
Czech Republic	83,502	40,081	€ 422,903,555	19,592
Denmark	5,716	4,630	€ 49,325,218	782
Estonia	3,971	1,191	€ 7,861,582	337
Finland	8,873	4,082	€ 30,361,196	565
France	116,771	66,560	€ 1,282,575,083	23,939
Germany	67,099	34,892	€ 630,844,614	15,504
Hungary	38,771	32,568	€ 335,934,910	17,601
Ireland	4,960	3,174	€ 22,953,198	418
Italy	120,552	102,469	€ 1,946,120,873	40,655
Latvia	4,979	2,141	€ 14,878,298	1,401
Lithuania	3,587	1,722	€ 18,740,704	1,833
Luxembourg	474	275	€ 7,266,734	189
Netherlands	26,285	14,457	€ 399,284,494	6,137
Poland	131,831	79,099	€ 674,176,197	42,649
Portugal	27,640	14,925	€ 151,179,410	5,152
Romania	44,473	34,245	€ 193,418,360	17,361
Slovakia	50,621	18,224	€ 203,195,897	16,179
Slovenia	6,022	2,650	€ 27,370,241	1,058
Spain	78,713	59,822	€ 762,523,390	19,511
Sweden	16,295	10,592	€ 143,122,269	2,920
UK	61,001	37,211	€ 906,481,569	22,559
EU Total	**975,219**	**602,274**	**€ 8,698,703,239**	**268,321**

Source: our elaboration based on DG Enterprise database

This approach shows that in total across the EU-28 approximately 268,300 jobs will be created due to resource efficiency cost savings made by SMEs in the four sectors. Among the individual Member States, the largest number of jobs could be created in Poland. The calculations indicate that the number of jobs created in Poland could be around 42,700. Likewise countries such as Italy could also expect significant job increases (40,655). Interestingly, the data show that countries with the highest total resource cost savings do not necessarily create the most jobs. For instance, France is

expected to make total resource cost savings of around €1.3 billion, which could create approximately 23,940 jobs. In contrast, Poland is only expected to realise total savings of around €700 million, which would create nearly twice as many jobs compared to France.

4.2 Other resource efficiency programmes with the EU

4.2.1 Distribution of resource efficiency programmes

Almost 230 programmes supporting the identification and implementation of resource efficiency measures for businesses were identified in the previous RPA (2014) study. Due to the very short timescale for this exercise it is not possible to highlight all of these programmes. Nevertheless this section will attempt to provide an overview of the location and results of such programmes as well as some prominent examples of best practice.

Table 4-10 presents an overview table taken from RPA (2014) on the number of resource efficiency support programmes within the EU. The table shows that in the majority of Member States (with the exception of Austria and Germany), there are more programmes concentrating on the provision of information and generic support than those providing direct, hands-on support.

Table 4-10: Identified programmes providing resource efficiency support

Member State	No. of general programmes providing information, grants etc.	No. of direct, hands-on support programmes
Austria	4	9
Belgium	10	9
Bulgaria	2	-
Croatia	1	-
Cyprus	1	-
Czech Republic	5	2
Germany	13	24
Denmark	9	4
Estonia	3	-
Finland	3	1
France	9	6
Greece	-	-
Hungary	2	-
Ireland	9	8
Italy	2	3
Latvia	1	-
Lithuania	-	1
Luxembourg	1	-
Malta	3	-
Netherlands	8	7
Poland	-	4
Portugal	1	1
Romania	-	-
Spain	15	10
Sweden	3	3
Slovakia	4	-
Slovenia	1	-
United Kingdom	10	10
Total	**126**	**102**

4.2.2 Outputs from other resource efficiency programmes

In terms of the outputs of such programmes, the RPA (2014) report provides an overview of some of the most prominent examples. Four programmes in particular are reviewed in the report, including the PIUS-CHECK Programme (Germany), the National Industrial Symbiosis Programme (UK), the ENWORKS programme (UK) and ÖkoBusinessPlan Wien (Austria). The outputs of the first three programmes have been highlighted within this study (see Section 1.2). The main outputs of the ÖkoBusinessPlan Wien programme are highlighted below in Table 4-11.

Table 4-11: Savings identified from the ÖkoBusinessPlan Wien Programme, 2010

Category	Units	Amount saved
Raw materials	Tonnes/year	192.90
Materials	Tonnes/year	1,468.43
Water	'000 m^3/year	10.72
Dangerous waste (incl. oil)	Tonnes/year	288.58
Non-dangerous waste	Tonnes/year	1,852.24
Waste water	'000 m^3/year	0.03
Electricity	GWh/year	6.20
Electricity from renewable sources	GWh/year	2.88
Gas	GWh/year	2.85
Oil	GWh/year	0.15
Biomass	GWh/year	0.08
Heating	GWh/year	0.63
Other energy	GWh/year	0.04
CO_2 emissions – energy	Tonnes/year	7,042.99
CO_2 emissions - transport	Tonnes/year	283.59

Source: Evaluation des ÖkoBusinessPlan Wien, Programmjahr 2010, May 2011, Wuppertal (Germany)

These outputs relate to measures implemented across the 144 businesses supported by the programme in 2010. Furthermore, these figures should be considered underestimates as outcomes from 66% of the measures implemented have not been quantified by the evaluation report. On the other hand, the evaluation report also states that the figures do not make a clear a distinction between those savings resulting from measures specifically implemented with programme support and those corresponding to measures that companies would have implemented anyway. As a result the savings could be lower than displayed in Table 4-11.

In addition to the programmes reviewed in detail in RPA (2014), the report also provided a broad overview of the outputs from a number of other resource efficiency support programme. Table 4-12 below provides information on the overall cost and savings associated with programmes across the EU-28 providing direct hands on support for businesses.

Table 4-12: Quantitative information on outcomes of programmes providing hands-on, direct support to SMEs												
Programme	**Period**	**Coverage**	**Cost/€**	**Energy saved**	**Materials saved /tonnes**	**Cost savings/€**	**Increased turnover /€**	**CO_2 emission savings / tonnes**	**Waste reduction / tonnes**	**Water reduction /m^3**	**Jobs created**	**Jobs safeguarded**
Eco-Efficiency Scan, Belgium	2006-10	1,000 SMEs	€2.6m	8% per company						4% per company		
PIUS-Check, Germany	2000-10	216 (implemented)	€36m (to firms)	50.5 GWh per year, 300 MWh per SME				20,000 (total at 2008) 113 per SME		1.2m per year, 6,000 per SME		
Effnet, Germany	2006-13	80				€5.9m per year		20,810				
National Industrial Symbiosis Programme (UK)	2005-13	By 2008, 8,000 (all) and 7,600 SMEs By 2010, 13,400 (all) and 12,730 SMEs	€21.8m (2005-8) €33.2m (2005-10)		950,137 (2005/6) 9.7m (2005/10)	€44m (2005/6) €188.5m (2005-10)	19.9m (2005/6) 211.3m (2005-10)	328,964 (2005/6) 6m (2005-10)	636,852 and 221,625 hazardous waste, 2005/6 7m and 363,626 hazardous waste, 2005-10	264,475 (tonnes, 2005/6) 9.6m (tonnes, 2005-10)	3,683 (2005-10)	5,087 (2005-10)
National Industrial Symbiosis Programme (Yorkshire, UK)	2005-9				609,629	€35.8m		474,478	£21.4m invested in waste diversion 813,376 (diverted from landfill)		310	723
Bright Green Business (UK)	2001-13	700 placements in 500 firms				€12m potential		33,000	80,000		80	
Green Business Network, UK[30]		2,000 over 15 years Project 1,200 from 2011-14	€420,000 per year			€100,000 (2011-14)		5,000 (2011-14)			21	
Envirowise, UK	2006-7		€15.1m		62,700	€146m		85,500	466,000	11.5m		

[30] Estimates for savings, jobs etc. cover 2011 -14

Table 4-12: Quantitative information on outcomes of programmes providing hands-on, direct support to SMEs												
Programme	**Period**	**Coverage**	**Cost/€**	**Energy saved**	**Materials saved /tonnes**	**Cost savings/€**	**Increased turnover /€**	**CO_2 emission savings / tonnes**	**Waste reduction / tonnes**	**Water reduction /m^3**	**Jobs created**	**Jobs safeguarded**
			(2006-7)		(2006-7)	(2006-7)		(2006-7)	(2006-7) 986 hazardous waste (2006-7)	(2006-7)		
Envirowise Resource Efficiency clubs, UK	2006-7		€1.98m (2006-7)		6,340 (2006-7)	€7.9m		8,360 (2006-7)	37,800 (2006-7) 409 hazardous waste (2006-7)	435,000 (2006-7)		
WRAP, UK	2008-11					€2.28 billion (business, consumers and public sector)	451m per year	6.6m	12.6m per year	5.7m per year		
B2B Green Mentors, Ireland	01/05 – 06/06	60	€109,855			€24,000 p.a. (1 case study						
Green Business Initiative, Ireland	2008-12	700 members 300 resource efficiency assessments		€12.8m	€2.7m	€1.35m (2010) €4m (2011) 18m (2008-12)			1.3m	1.3m		
SME Programme, Ireland	2007-11	1,470 from 2007-11 (97% SMEs in 2009)	€1.2m per year	Cumulative value of energy, CO2 and other saved: €6m in 2009, €15m in 2010		Average 10.3% per year		19,500 (2009) 51,800 (2010)				

Table 4-12: Quantitative information on outcomes of programmes providing hands-on, direct support to SMEs												
Programme	**Period**	**Coverage**	**Cost/€**	**Energy saved**	**Materials saved /tonnes**	**Cost savings/€**	**Increased turnover /€**	**CO_2 emission savings / tonnes**	**Waste reduction / tonnes**	**Water reduction /m^3**	**Jobs created**	**Jobs safeguarded**
SMILE, Ireland	2010-13	1,000 users, 2,318 potential exchanges identified, 550 directly supported	€0.15m per year			€81,200 (actual and potential in 2011)			25,721 potentially diverted (2010-13)			
EnVol, France		160										
PBE+, France	2010	1,700	€493,117 per year									
Plan PME, France	2011 – 07/2013	>1,500	€15m per year									
GREEN, covering Italy, Romania, Greece, Bulgaria, Slovenia, Montenegro, Croatia, Macedonia, Serbia, Turkey	04/2010 – 04/2012	Varied for different programme services			8.54% reduction in amount of water/raw materials/ electricity	9.66% reduction in cost of water/materials/elect. 9.6% reduction in fines			9.35% (8.25% increase in re-use, 22.18% increase in amount sold)			

4.3 Task 2: Savings aggregated for the four individual sectors at the EU-28 and individual Member State levels

4.3.1 Overview

The results presented in this section align with those given in Section 4.1, the main difference being that the data are now presented at the aggregate sector levels. This allows for a relative comparison of the benefits of the proposed investment across the four selected sectors: Food and Beverages; Energy, Power and Utilities; Environmental Technologies; and Construction.

4.3.2 Resource cost savings aggregated by Sector

a) Maximum potential savings

The maximum potential cost savings are presented in Table 4-13. The table indicates that across the sectors the largest maximum cost savings could be realised in the Construction sector. In fact, the estimations show that the Construction sector accounts for nearly 85% of the maximum potential savings that across all four sectors. The second largest sector in terms of maximum potential savings is Food and Beverages, which makes up for around €5.8 billion of the total savings.

Table 4-13: Maximum potential cost savings

Country	Food and Beverages	Energy, Power and Utilities	Environmental Technologies	Construction
Austria	€ 62,903,719	€ 26,212,933	€ 36,239,825	€ 385,476,410
Belgium	€ 166,597,388	€ 6,738,244	€ 39,980,346	€ 1,508,342,845
Bulgaria	€ 36,910,198	€ 6,725,880	€ 6,389,051	€ 86,060,201
Croatia	€ 42,115,392	€ 4,392,502	€ 12,858,018	€ 183,198,026
Cyprus	€ 7,605,086	€ 148,397	€ 2,827,921	€ 38,678,368
Czech Republic	€ 114,064,185	€ 51,003,132	€ 115,691,971	€ 1,714,744,302
Denmark	€ 22,131,476	€ 31,096,616	€ 11,340,116	€ 331,346,145
Estonia	€ 3,733,341	€ 1,107,680	€ 1,895,148	€ 52,021,123
Finland	€ 16,429,635	€ 8,150,501	€ 9,937,283	€ 314,593,155
France	€ 1,501,969,356	€ 304,624,005	€ 330,305,306	€ 9,022,718,544
Germany	€ 760,404,273	€ 43,551,089	€ 102,217,665	€ 4,576,207,085
Greece	€ 221,709,006	..	..	€ 356,467,120
Hungary	€ 88,924,960	€ 6,865,388	€ 29,052,131	€ 565,566,820
Ireland	€ 5,514,808	€ 1,366,856	€ 3,813,098	€ 176,125,150
Italy	€ 1,387,224,726	€ 103,260,071	€ 276,751,384	€ 8,627,349,408
Latvia	€ 7,807,419	€ 2,715,632	€ 3,631,477	€ 50,528,603
Lithuania	€ 18,607,106	€ 3,983,970	€ 6,746,204	€ 201,634,111
Luxembourg	€ 5,186,892	€ 1,642,513	€ 2,731,216	€ 83,157,277
Malta	€ 26,164,445	€ 1,181,497	€ 9,452,532	€ 165,628,483
Netherlands	€ 165,255,470	€ 16,704,056	€ 60,520,448	€ 3,416,071,823
Poland	€ 149,210,784	€ 21,655,622	€ 101,172,305	€ 1,783,516,295
Portugal	€ 130,440,394	€ 6,783,904	€ 18,742,877	€ 726,090,010
Romania	€ 66,119,239	€ 5,576,499	€ 31,212,562	€ 217,364,315
Slovakia	€ 42,332,921	€ 3,008,778	€ 16,770,077	€ 1,063,095,930
Slovenia	€ 17,581,405	€ 10,730,296	€ 6,140,645	€ 156,666,595
Spain	€ 429,822,796	€ 150,695,195	€ 74,435,671	€ 3,045,833,929
Sweden	€ 61,941,623	€ 25,466,109	€ 30,563,832	€ 1,281,409,418
UK	€ 246,889,735	€ 35,639,842	€ 309,790,039	€ 6,110,756,787
EU-28	**€ 5,805,597,779**	**€ 881,027,206**	**€ 1,651,209,147**	**€ 46,240,648,280**

b) Estimated savings

The estimated savings take into account the coverage of the €4 billion public investment and existing baseline levels of resource efficiency. The results show that the Construction sector could account for the largest proportion of total savings across the four sectors at approximately €7.3 billion (see Table 4-14). In comparison, the other three sectors make up for a small proportion of the total savings across the EU-28. For instance, savings in the Energy, Power and Utilities sector only account for 1.62% of the total. Likewise, savings in the Environmental Technologies sector are only marginally higher as a proportion of the total at 3.29%. It is therefore clear from the analysis that the largest savings could be realised in the Construction sector.

Table 4-14: Estimated savings taking into account €4 billion public investment and baseline resource efficiency

Country	Food and Beverages	Energy, Power and Utilities	Environmental Technologies	Construction
Austria	€ 6,163,604	€ 2,568,467	€ 3,550,949	€ 37,770,801
Belgium	€ 16,746,682	€ 677,341	€ 4,018,899	€ 151,621,451
Bulgaria	€ 17,707,042	€ 3,226,627	€ 3,065,039	€ 41,285,923
Croatia	€ 7,027,090	€ 732,903	€ 2,145,402	€ 30,567,186
Cyprus	€ 969,022	€ 18,908	€ 360,327	€ 4,928,305
Czech Republic	€ 24,173,421	€ 10,809,004	€ 24,518,395	€ 363,402,734
Denmark	€ 2,757,263	€ 3,874,190	€ 1,412,815	€ 41,280,950
Estonia	€ 499,512	€ 148,205	€ 253,566	€ 6,960,299
Finland	€ 1,428,841	€ 708,827	€ 864,218	€ 27,359,310
France	€ 172,621,375	€ 35,010,445	€ 37,961,997	€ 1,036,981,266
Germany	€ 87,497,935	€ 5,011,322	€ 11,761,947	€ 526,573,410
Greece	€ 33,572,011	..	..	€ 53,977,591
Hungary	€ 43,268,534	€ 3,340,516	€ 14,135,999	€ 275,189,861
Ireland	€ 677,564	€ 167,936	€ 468,487	€ 21,639,211
Italy	€ 259,722,427	€ 19,332,813	€ 51,814,634	€ 1,615,251,000
Latvia	€ 1,795,849	€ 624,645	€ 835,306	€ 11,622,499
Lithuania	€ 1,509,755	€ 323,254	€ 547,378	€ 16,360,317
Luxembourg	€ 406,521	€ 128,731	€ 214,058	€ 6,517,423
Malta	€ 5,878,962	€ 265,474	€ 2,123,916	€ 37,215,524
Netherlands	€ 18,035,537	€ 1,823,036	€ 6,605,039	€ 372,820,882
Poland	€ 48,937,809	€ 7,102,561	€ 33,182,260	€ 584,953,567
Portugal	€ 22,356,716	€ 1,162,721	€ 3,212,419	€ 124,447,554
Romania	€ 39,930,591	€ 3,367,747	€ 18,849,824	€ 131,270,198
Slovakia	€ 7,644,701	€ 543,341	€ 3,028,428	€ 191,979,427
Slovenia	€ 2,517,842	€ 1,536,691	€ 879,405	€ 22,436,303
Spain	€ 88,562,212	€ 31,049,772	€ 15,336,989	€ 627,574,416
Sweden	€ 6,335,105	€ 2,604,557	€ 3,125,929	€ 131,056,678
UK	€ 33,387,803	€ 4,819,706	€ 41,894,041	€ 826,380,018
EU-28	**€ 952,131,726**	**€ 140,979,739**	**€ 286,167,667**	**€ 7,319,424,107**

c) Validation approach

The validation approach yields similar findings to those in the previous section albeit at larger magnitudes (see Table 4-15). Again, the results show that the investment could lead to the highest resource cost savings being realised in the Construction sector at around €26.7 billion. This represents around 82% of the total savings across the four sectors, which is in line with the previous results. Likewise, the Food and Beverages account for the next largest proportion of total savings at around 5%.

Table 4-15: Estimation of resource cost savings using validation approach				
Country	**Food and Beverages**	**Energy, Power and Utilities**	**Environmental Technologies**	**Construction**
Austria	€ 17,535,304	€ 41,219,359	€ 66,537,575	€ 222,752,534
Belgium	€ 46,445,749	€ 10,596,985	€ 73,409,477	€ 871,703,703
Bulgaria	€ 10,289,238	€ 10,575,820	€ 11,730,204	€ 49,732,380
Croatia	€ 11,741,495	€ 6,908,254	€ 23,609,891	€ 105,877,884
Cyprus	€ 2,120,114	€ 233,369	€ 5,192,245	€ 22,352,001
Czech Republic	€ 31,796,901	€ 80,201,032	€ 212,415,272	€ 990,940,058
Denmark	€ 6,168,982	€ 48,895,010	€ 20,819,597	€ 191,460,721
Estonia	€ 1,040,680	€ 1,741,628	€ 3,479,326	€ 30,059,750
Finland	€ 4,580,035	€ 12,817,644	€ 18,245,260	€ 181,799,731
France	€ 418,691,994	€ 479,008,468	€ 606,444,420	€ 5,213,943,001
Germany	€ 211,976,101	€ 68,483,409	€ 187,674,665	€ 2,644,543,688
Greece	€ 61,801,578	..	..	€ 205,984,665
Hungary	€ 24,787,521	€ 10,795,970	€ 53,338,114	€ 326,820,767
Ireland	€ 1,537,415	€ 2,149,577	€ 7,001,815	€ 101,793,232
Italy	€ 386,716,281	€ 162,385,000	€ 508,143,671	€ 4,985,763,147
Latvia	€ 2,176,435	€ 4,270,313	€ 6,667,946	€ 29,200,156
Lithuania	€ 5,186,607	€ 6,264,309	€ 12,385,736	€ 116,509,458
Luxembourg	€ 1,445,994	€ 2,582,923	€ 5,014,803	€ 48,056,708
Malta	€ 7,294,021	€ 1,857,994	€ 17,355,711	€ 95,718,025
Netherlands	€ 46,069,549	€ 26,267,880	€ 111,122,522	€ 1,974,162,450
Poland	€ 41,596,949	€ 34,057,271	€ 185,771,473	€ 1,030,679,871
Portugal	€ 36,361,651	€ 10,668,126	€ 34,412,900	€ 419,584,617
Romania	€ 18,429,124	€ 8,767,403	€ 57,297,961	€ 125,580,113
Slovakia	€ 11,801,025	€ 4,731,431	€ 30,789,132	€ 614,309,228
Slovenia	€ 4,900,811	€ 16,871,446	€ 11,273,424	€ 90,525,047
Spain	€ 119,821,207	€ 236,984,629	€ 136,671,616	€ 1,760,203,360
Sweden	€ 17,268,067	€ 40,047,250	€ 56,118,410	€ 740,531,787
UK	€ 68,825,744	€ 56,045,177	€ 568,789,412	€ 3,531,298,022
EU-28	**€ 1,618,406,573**	**€ 1,385,427,677**	**€ 3,031,712,579**	**€ 26,721,886,105**

4.3.3 Reduction in resource use aggregated by Sector

a) Maximum potential reduction in resource use

Table 4-16 presents the maximum potential reductions in resource use across the four sectors. From the figures, it can be seen that with the exception of water use, the largest reductions in resource use could occur in the Construction sector. With regards to water usage, the Food and Beverages sector could make the largest reductions with savings of 238 million m^3 annually. The smallest reductions could occur in the Energy, Power and Utilities and Environmental Technologies sectors.

Table 4-16: Estimation of maximum potential reductions in resource use across the EU-28				
Type of resource	**Food and Beverages**	**Energy, Power and Utilities**	**Environmental Technologies**	**Construction**
Energy (kWh/y)	120,540,883,485	31,235,022,373	890,368,686	754,681,842,822
Energy (CO_2/y)	48,499,693	23,852,664	353,461	266,876,489
Material resources (t/y)	7,317,789,739	6,113,625	36,617,989	3,382,487,164
Water use (m^3/year)	238,095,850	4,652,988	583,249	104,807,610
Waste diverted from landfill (t/y)	15,485,592	1,300,667	170,439,594	1,069,469,048

b) Estimated reduction in resource use

The results set out in Table 4-17 reaffirm those in Table 4-16. They suggest that despite taking into account the overall coverage of the €4 billion public investment and existing baseline levels of resource efficiency, the largest reductions could occur in the Construction sector. The only exception to this trend is in water use where the largest reductions could be realised by the Food and Beverages sector. Once again, the smallest reductions could be expected in the Energy, Power and Utilities and Environmental Technologies sectors.

Table 4-17: Estimation reductions in resource use across the EU-28 taking into account €4 billion public investment and baseline resource efficiency

Type of resource	Food and Beverages	Energy, Power and Utilities	Environmental Technologies	Construction
Energy (kWh/y)	21,669,653,339	5,483,023,733	175,703,906	129,692,062,683
Energy (CO_2/y)	8,719,364	4,186,310	69,935	45,882,816
Material resources (t/y)	1,200,133,156	978,900	6,346,205	535,385,461
Water use (m^3/y)	35,356,692	650,808	89,831	15,202,037
Waste diverted from landfill (t/y)	2,242,929	191,087	25,233,289	153,644,148

The results above are presented for each sector at the aggregate EU-28 level. Annex 1 provides the calculations for each Sector per Member State.

4.3.4 Jobs created and secured aggregated by Sector

a) Maximum potential jobs created and secured

The maximum potential jobs that could be created and secured if all SMEs made cost savings across the EU-28 are presented in Tables 4-18 and 4-19 below. The figures show that the largest number of jobs could be created in the Construction sector, which alone could account for around 91% of the maximum potential jobs created. Likewise, Table 4-19 shows that the Construction sector would account for a disproportionate amount of the maximum potential jobs secured among the sectors.

Table 4-18: Maximum potential jobs created by sector

	Food and beverage	Energy Power and Utilities	Environmental Technologies	Construction	Country Total
Austria	615	0	424	6,998	8,037
Belgium	1,252	0	360	21,048	22,660
Bulgaria	859	0	178	3,718	4,754
Croatia	498	0	182	4,022	4,702
Cyprus	110	0	49	1,034	1,193
Czech Republic	1,340	0	1,627	37,410	40,377
Denmark	250	0	153	6,947	7,351
Estonia	70	0	42	1,799	1,911
Finland	269	0	195	9,576	10,040
France	9,740	0	2,564	108,663	120,967
Germany	5,264	0	847	58,832	64,943
Greece	1,980	..	..	5,912	7,892
Hungary	1,088	0	425	12,848	14,362
Ireland	93	0	77	5,492	5,661
Italy	9,158	0	2,187	105,778	117,124
Latvia	141	0	79	1,695	1,915

Table 4-18: Maximum potential jobs created by sector					
	Food and beverage	Energy Power and Utilities	Environmental Technologies	Construction	Country Total
Lithuania	211	0	92	4,244	4,546
Luxembourg	24	0	15	716	756
Malta	72	0	31	847	950
Netherlands	729	0	320	27,981	29,029
Poland	2,180	0	1,770	48,394	52,344
Portugal	1,618	0	278	16,730	18,627
Romania	1,552	0	877	9,475	11,905
Slovakia	461	0	219	21,518	22,198
Slovenia	209	0	87	3,451	3,747
Spain	4,155	0	861	54,683	59,699
Sweden	557	0	329	21,418	22,304
UK	1,249	0	1,876	57,419	60,544
EU Total	45,742	0	**16,145**	**658,648**	**720,535**
Source: our elaboration based on DE Enterprise database					

Table 4-19: Maximum potential jobs secured by sector					
	Food and beverage	Energy Power and Utilities	Environmental Technologies	Construction	Country Total
Austria	1,299	0	1,733	19,794	22,826
Belgium	2,644	0	1,470	59,538	63,652
Bulgaria	1,813	0	727	10,517	13,057
Croatia	1,052	0	744	11,378	13,173
Cyprus	231	0	199	2,926	3,356
Czech Republic	2,830	0	6,650	105,822	115,301
Denmark	528	0	626	19,652	20,806
Estonia	147	0	173	5,089	5,408
Finland	569	0	797	27,087	28,452
France	20,570	0	10,481	307,370	338,422
Germany	11,117	0	3,462	166,416	180,995
Greece	4,182	..	..	16,724	20,906
Hungary	2,297	0	1,739	36,344	40,380
Ireland	196	0	313	15,534	16,043
Italy	19,342	0	8,940	299,211	327,493
Latvia	298	0	321	4,795	5,414
Lithuania	445	0	374	12,004	12,824
Luxembourg	51	0	62	2,026	2,139
Malta	152	0	127	2,395	2,674
Netherlands	1,539	0	1,306	79,149	81,994
Poland	4,604	0	7,233	136,890	148,728
Portugal	3,418	0	1,138	47,323	51,879
Romania	3,278	0	3,585	26,802	33,666
Slovakia	974	0	894	60,867	62,736
Slovenia	440	0	356	9,762	10,559
Spain	8,775	0	3,521	154,679	166,975
Sweden	1,177	0	1,346	60,584	63,107
UK	2,638	0	7,669	162,419	172,726
EU Total	**96,606**	**0**	**65,988**	**1,863,096**	**2,025,690**
Source: our elaboration based on DE Enterprise database					

b) Estimated jobs created and secured

When the overall size of the investment is taken into account along with assumptions on the baseline level of resource efficiency in Member States, the overall result remains unchanged (see Tables 4-20 and 4-21). The Construction sector still accounts for a significantly large proportion of the overall jobs that could be created and secured. The next largest sector is Food and Beverages accounting for 6.7% and 5.0% of the jobs created and secured respectively. Notably, the calculations suggest that in each instance the Energy, Power and Utilities sector does not create or secure any jobs. This is due to the fact that the sample data provided by ENWORKS shows that no jobs were created in this sector during the period 2004-9. It could therefore be inferred that this sector is highly capital intensive by nature and that accrued resource efficiency savings may not be reinvested into additional labour[31].

Table 4-20: Estimated jobs created by Sector

	Food and beverage	Energy Power and Utilities	Environmental Technologies	Construction	Country Total
Austria	60	0	42	686	787
Belgium	126	0	36	2,116	2,278
Bulgaria	412	0	85	1,784	2,281
Croatia	83	0	30	671	785
Cyprus	14	0	6	132	152
Czech Republic	284	0	345	7,928	8,557
Denmark	31	0	19	866	916
Estonia	9	0	6	241	256
Finland	23	0	17	833	873
France	1,119	0	295	12,489	13,903
Germany	606	0	97	6,770	7,473
Greece	300	..	..	895	1,195
Hungary	529	0	207	6,252	6,988
Ireland	11	0	9	675	695
Italy	1,715	0	410	19,804	21,928
Latvia	32	0	18	390	440
Lithuania	17	0	7	344	369
Luxembourg	2	0	1	56	59
Malta	16	0	7	190	213
Netherlands	80	0	35	3,054	3,168
Poland	715	0	580	15,872	17,168
Portugal	277	0	48	2,867	3,192
Romania	937	0	530	5,722	7,189
Slovakia	83	0	40	3,886	4,009
Slovenia	30	0	12	494	537
Spain	856	0	177	11,267	12,301
Sweden	57	0	34	2,191	2,281
UK	169	0	254	7,765	8,188
EU Total	**8,595**	**0**	**3,348**	**116,238**	**128,181**

Source: our elaboration based on DE Enterprise database

[31] As noted in Section 2.4 this could also be due to the fact that the sample size for this Sector was small with data for only 16 SMEs recorded.

Table 4-21: Estimated jobs secured by Sector					
	Food and beverage	Energy Power and Utilities	Environmental Technologies	Construction	Country Total
Austria	127	0	170	1,939	2,237
Belgium	266	0	148	5,985	6,398
Bulgaria	870	0	349	5,045	6,264
Croatia	175	0	124	1,898	2,198
Cyprus	29	0	25	373	428
Czech Republic	600	0	1,409	22,427	24,436
Denmark	66	0	78	2,448	2,592
Estonia	20	0	23	681	724
Finland	49	0	69	2,356	2,474
France	2,364	0	1,205	35,326	38,895
Germany	1,279	0	398	19,149	20,827
Greece	633	..	..	2,532	3,166
Hungary	1,118	0	846	17,684	19,648
Ireland	24	0	38	1,909	1,971
Italy	3,621	0	1,674	56,020	61,315
Latvia	69	0	74	1,103	1,245
Lithuania	36	0	30	974	1,041
Luxembourg	4	0	5	159	168
Malta	34	0	29	538	601
Netherlands	168	0	143	8,638	8,949
Poland	1,510	0	2,372	44,897	48,779
Portugal	586	0	195	8,111	8,892
Romania	1,980	0	2,165	16,187	20,331
Slovakia	176	0	162	10,992	11,329
Slovenia	63	0	51	1,398	1,512
Spain	1,808	0	725	31,871	34,404
Sweden	120	0	138	6,196	6,454
UK	357	0	1,037	21,964	23,358
EU Total	**18,153**	**0**	**13,682**	**328,799**	**360,634**
Source: our elaboration based on DE Enterprise database					

c) Validation approach

In contrast to the figures presented in Table 4-22, the results from the validation approach show a more balanced picture across the sectors. Furthermore, in contrast to the previous results, the Environmental Technologies sector could account for the largest proportion of jobs created at around 42% of the total. The Construction and Food Beverage sectors could make up for 76,330 and 71,510 newly created jobs respectively.

It is also worth noting that 7,700 jobs could be created in the Energy, Power and Utilities sector. Nevertheless, this sector still accounts for the smallest proportion of newly created employment, as indicated in Table 4-22. This could further point to the fact that this sector is highly capital intensive thus accrued savings would not necessarily be reinvested into new labour.

Table 4-22: Jobs created under "Estimated cost savings approach: €4 billion Public Investment"					
	Food and beverage	Energy Power and Utilities	Environmental Technologies	Construction	Country Total
Austria	282	16	279	343	919
Belgium	532	12	629	796	1,968
Bulgaria	1,931	86	2,584	1,215	5,817
Croatia	904	283	1,230	689	3,106
Cyprus	47	10	65	48	170
Czech Republic	5,435	374	7,700	6,083	19,592
Denmark	248	13	188	333	782
Estonia	97	18	121	101	337
Finland	154	21	179	211	565
France	6,732	913	8,433	7,861	23,939
Germany	5,220	287	3,846	6,152	15,504
Hungary	5,350	258	6,406	5,587	17,601
Ireland	75	16	181	146	418
Italy	9,466	596	17,894	12,699	40,655
Latvia	352	106	662	281	1,401
Lithuania	465	114	669	586	1,833
Luxembourg	54	5	83	46	189
Netherlands	1,403	97	2,501	2,136	6,137
Poland	10,130	2,086	21,007	9,425	42,649
Portugal	1,582	94	1,882	1,594	5,152
Romania	7,425	661	5,337	3,937	17,361
Slovakia	3,174	263	8,046	4,697	16,179
Slovenia	308	29	430	291	1,058
Spain	3,857	478	10,655	4,521	19,511
Sweden	699	106	1,115	999	2,920
UK	5,587	772	10,647	5,553	22,559
EU Total	**71,510**	**7,714**	**112,768**	**76,330**	**268,321**
Source: our elaboration based on DE Enterprise database					

5 Task 3: Up-scaling the ENWORKS Monitoring Approach

5.1 Introduction

Task 3 is aimed at assessing the possibility of up-scaling the ENWORKS approach to monitoring resource efficiency savings resulting from targeted support to SMEs to other Member States. The main focus is on the feasibility of expanding the use of ENWORKS online software in terms of costs and ease of use at both the company and programme levels[32].

At the core of the ENWORKS monitoring approach is its Online Resource Efficiency Toolkit ("the Toolkit"), a bespoke piece of web-based software, developed to capture and report the economic and environmental outcomes of resource efficiency activity.

In the following sections, the main features of the toolkit are described, focusing on its structures, the costs of implementation and maintenance, and some opportunities and concerns that should be considered in extending the use of this type of software to programmes in other Member States.

5.2 The Online Resource Efficiency Toolkit structure

The design of the Toolkit structure resembles that of a "family tree", as shown in Figure 5-1**,** with security access built into each of the four levels. This "cascade approach" of the four hierarchical levels could be tailored to represent different forms of support and different geographical scales. The structure allows for adaptation to fit multiple uses and users, and could easily be adapted to different organisations and/or projects.

For example, users can be created with viewing/editing credentials at any of the four levels, creating privacy blocks for confidential information and allowing consolidated reporting. In addition to the four levels, the software allows bespoke groups to be created at any level to aid reporting and provide greater flexibility; for example, regions could be grouped to generate reports for an entire country.

[32] This section is largely based on consultation with ENWORKS projects managers, who provided further documentation as a follow up.

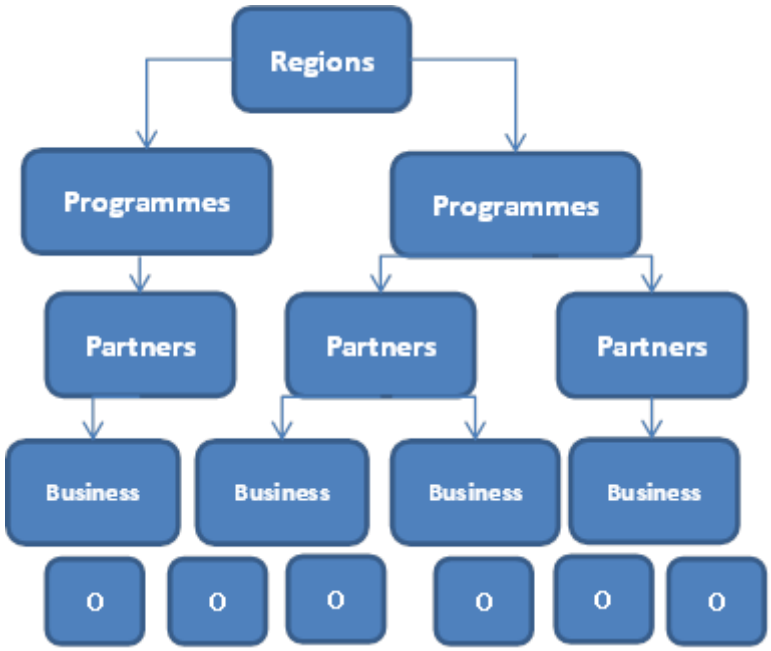

Figure 5-1: Cascade Approach showing the "family tree" architecture of the Toolkit

5.3 Functionality

Resource Efficiency Opportunities function

The primary functionality of the Toolkit is the logging, prioritising, quantifying and reporting of resource efficiency opportunities (hereafter, Opportunity function). This function is applicable to environmental projects in any geographical location, and any sector of business. It is based on standard principles that are aligned to core environmental audit processes and relies on drop down menus to assist the user and standardise the data entry process. As a result, ENWORKS notes that many aspects of the Opportunity function would not require any updates to be adopted by other Member States. For example, "Opportunity Status", "Saving Type", "Resource Use", "Supplier Location" and "Method". These elements already have built-in dropdown lists that cover a wide range of possible efficiency improvement scenarios that would currently be applicable (but these can be expanded if required).

The "List of Resources" contains 26 different energy types, water sources and commonly used materials. Associated with the Resource Types are default prices and CO2e conversion factors, which would need to be updated. The default prices embedded into the Toolkit are based on UK averages and therefore new figures for each Member State would need to be developed and uploaded. This is not a mandatory feature, as manual price entries are added (with the default prices just providing a guide).

The CO_2e conversion factors that are used in Toolkit to calculate CO_2e savings from different Resource Types is one area where significant further development would be required. The factors currently used are from the UK government Department for Environment Food & Rural Affairs (Defra) "Carbon Conversion Factors for Businesses". These are applied across the whole Toolkit and should be considered to be specific to the UK unless demonstrated to also apply to business in other Member States. It is expected that this aspect of any software would need to include a list of factors

for each Member State, with a link created between the Region/Programme level and the conversion factors to be used. A secondary issue is the availability of these data for each Member State.

Annual Resource Data

The Toolkit also enables the recording of Annual Resource Use Data for up to 30 resource types. This function captures a business's use of resources; both number of units (tonnes, m^3 etc.) and/or cost, allowing businesses to establish an annual baseline position against which improvements can be measured. Clearly this function would need to operate in other currencies, as appropriate to the Member State where the tool is to be implemented.

Reports

The reporting functionality of the Toolkit is operated using drop-down lists and embedded calendars to summarise the data entered in a variety of ways. The structure allows different users to generate different reports depending on their requirements and priorities.

5.4 User interface, Data entry, and branding

Users can be created for individuals in the structure equal to or below the existing user in the hierarchy. New users are provided with a unique username and required to enter their own password for security in order to login to the Toolkit. At present, forgotten passwords are resolved manually within project structures. Ideally, the system would also include an automated password recovery function and this could also be developed.

Data entry is a straightforward task. The Toolkit operates as a system to record the findings of an audit and calculations are embedded into the functionality.

Entry requirements and estimated times are as follows:

a) Creating a business – 2 minutes
b) Creating a user – 2 minutes
c) Adding an opportunity – 5 minutes

As an illustration, if a project supports a company through a review of its resource use and operations and identifies four improvement opportunities, it will take the advisor 24 minutes to create the business on the Toolkit, create and assign a user to the business and create the opportunity data. This can then be used to report the audit findings to businesses and to track improvements over time. Updating an Opportunity function (either value or status) can be carried out simply and quickly at the click of a button.

It is important to understand that the time requirements are minimal because the Toolkit is not a substitute for a professional environmental audit or support service from a suitably qualified individual. The Toolkit is used by ENWORKS and the businesses it supports as part of an overall business support programme and should not be considered as a standalone package.

The "branding" of the Toolkit webpage is simplified to two colours and a logo. There is flexibility within these specified boundaries to change the colour scheme and have a personalised logo in the top banner. The cost associated with the design and upload of personalised pages would be roughly € 2,480 per Member State, Region or Programme. Each uniquely designed page could also be linked to specified domain names.

Once logged in, a user's homepage could be additionally personalised to show a live link to relevant statistics, as per the efficiencytoolkit.net landing page. If this was a requirement of Member State, Region or programme, the estimated development and upload costs would be roughly € 6,200 each.

Finally, it should be noted that the Toolkit content is currently in English. Translation is possible but would involve additional associated costs.

5.5 IT support and associated costs

The IT support required for the toolkit is summarized in the following table:

Table 5-1: ENWORKS Toolkit: IT support and costs

IT functions	Cost[(a)]	Description
Software maintenance, licenses and Secure Socket Layers (SSL)	€ 18,600 (annual)	This covers software upgrades, licence renewals and patches (A check is required to see if different licenses are required in different countries). The cost of scaling this up is unlikely to be as high as current costs multiplied by the number of new countries/regions or programmes.
Server hosting	€ 18,600 to € 24,810	Costs are based on stored memory and traffic. The current levels are 10,000 businesses and 40,000 opportunity records. Costs will increase based on the increased memory required and users.
Domain names	€ 124	At present there are a number of domains including .net and .com which could be applied in any country. Individual domain names could also be purchased if required (many are available for € 25 annually)
Software development	Varies	The cost is based on the functionality improvement and complexity required and includes time for testing. Recent projects have had an annual development budget of € 37,200 to cover known developments, e.g. CO_2e factor & default price updates but also new functionality to remain aligned to business need, regulations, best practice etc.
Issue resolution	6-10 days	This has been at a very low level over the 10 years of Toolkit usage. Issues have been minor and fixes can typically be applied within 72 hours.
Help desk function	Varies	Providing telephone support to respond to queries and resolve operational issues. This could be rolled out to individual Member States, regions or programmes with training.

Note: (a) Costs are estimated based on 2014 prices. Values were converted to Euro using the 2014 average nominal exchange rate- Euro 1 = GBP 0.806

All support services can be provided remotely and do not need to be in the country/area of delivery.

The Toolkit has operated under a strict rule that all developments will apply to all businesses, regardless of Programme, Project or Region. However, in exceptional circumstances, functions can be hidden from view for certain users but the functionality will remain in the background.

In order to maintain the accuracy and continuity of the Toolkit, two additional sites have been created: a training site, and a test site. The training site mimics the live Toolkit in all functionality and therefore all developments will need to be applied to the training site. The test site is an

environment in which new developments can be trialled and is restricted to the development and test teams.

5.6 Training

Advisers[33]

Adviser training has typically taken the format of a 1-day "train the trainer" session that can then be rolled out across a project or to multiple projects. The training format is easy to replicate and can be undertaken at any location with internet access, although translators may be required.

The "Train the Trainer" approach allows knowledge to cascade down to a wide number of individuals, whilst minimising the time requirement to attend specific events. This maximises delivery time and keeps costs low.

In addition, the Toolkit already contains help boxes within several sections that open on a click, providing in-application support. The only additional requirement would be translation.

User and Technical Manual

A user manual has previously been developed for specific projects and could be updated to provide a useful reference point for advisers/project managers. This could be translated for non-English speaking users.

A detailed technical manual, explaining the various functionalities exists in English and could be translated for other Member States.

Further training and guidance could be provided by the development of online videos, animations, and screen shots.

Business Users

Training has historically been done via business advisers as part of the overall package of support. A business user's functionality is limited to a single company view and they can be restricted from edit functionality to avoid data deletion/errors. In most cases, the reporting function is the most relevant for business users, and therefore a quick induction of 1 hour is usually sufficient and can be done alongside the communication of audit findings. On-going support is still made available via telephone or in person as appropriate for the project.

It may not be necessary in all projects to allow business user access and this element could be ignored if not required.

5.7 SWOT analysis of the ENWORKS Toolkit

Strengths

The Toolkit operates within a very robust but also flexible structure. It has been tested on 67 different programmes to date, and all of these have been able to map their delivery structure to that of the Toolkit. Similarly, the functionality to accommodate users at different operating levels

[33] These are the same advisors that support businesses on identifying and implementing resource efficiency measures. They are therefore not specific advisors who train businesses to use the toolkit.

provides several options for project delivery and also provides security over the entered data. At present 890 users are registered on the Toolkit which demonstrates the success of the adopted training approach, particularly as help desk queries are virtually zero.

Further flexibility around the fixed structure is provided by the 'Groups' function, which allows for tailored reporting at a variety of scales. At present 229 Groups exist on the Toolkit and can be created at all user levels.

The Toolkit exists online, meaning that it can be accessed from anywhere there is an internet connection, and avoids the need for complicated or expensive software to be downloaded onto individual devices. It operates across all main internet browsers, including Internet Explorer, Firefox, Safari and Chrome.

The user interface has been specifically designed to be simple to operate, with a logical process flow, drop down boxes and detailed help sections. This ensures that training requirements are minimal. The simplified data entry process also ensures a consistent approach allowing for detailed analysis.

One of the great strengths of the Toolkit is that it has allowed the meaningful measurement and analysis of important metrics that have previously been difficult to assess. The cost and environmental savings that are reported can have a significant political and policy impact, allowing programmes to move beyond simply knowing 'how many businesses have been supported' to understanding the impact of that support, thus creating a step-change in business resource efficiency.

Weakness

The roll-out of systems can sometimes face the 'not made here' response; however, the ability to personalise the Toolkit branding, translate it and defer training responsibilities and ownership locally through the cascade approach have overcome this in previous roll-outs.

Another factor that should be considered, but that is also very sensitive, is the increase in transparency of data that the Toolkit creates/requires. Projects that captured the number of businesses they supported, may have only estimated the impact; however, with the Toolkit, scrutiny can be brought to bear, representing a significant shift in the data capture associated with delivery.

The availability of data, which includes data that is embedded into the Toolkit (national CO_2e factors) and gathered as part of the business support service, also forms an important consideration. The ability of individuals to accurately process energy, waste, water and materials calculations is crucial in the accurate reporting of the Toolkit.

Opportunities

The primary opportunity presented by a roll-out of the Toolkit is that it can provide transparent and consistent data on business resource use and the types of opportunities to reduce it; it will also clearly demonstrate levels of uptake, potential savings (both cost and environmental) and implemented savings in real time at a range of organisational or geographical scales.

This data not only forms a robust audit trail that is compliant with European Funding requirements, but can also be used strategically by policy makers and programme managers to understand the effectiveness of the interventions and enable targeted support in specific areas. While most projects in this area will track 'process' outputs (e.g. number of businesses they have assisted), very few are able to track the impact of this work. Therefore, the Toolkit provides a means for projects to demonstrate the added value that they are creating.

The Toolkit could integrate with other business services, accelerating the cohesion and reporting of projects through its adoption in innovation, manufacturing or digital support, for example. A centrally financed and coordinated roll-out may also encourage a greater take-up of an integrated system.

Threats

One particular risk is 'scope creep'. A temptation exists to expand the functionality of the Toolkit to incorporate very specific project requirements. However, this can quickly inflate development costs and add unnecessary levels of complexity. In previous roll-outs, development suggestions have been centrally coordinated to maximise collective benefit and deliver value for money.

Further developments

Several upgrades are currently planned, the majority of which are minor functionality improvements but a couple of the more significant developments are described below.

- The alignment of the Toolkit with best practice reporting of Scope 1, 2 and 3 emissions is currently under review. This will present a significant challenge and completion time is estimated at 6 months.
- Additional developments are planned for the annual resource use data, which will allow businesses to produce simplified Carbon Footprints.
- A function for emailing users key achievements/dates to increase their interaction with the Toolkit.
- Bespoke homepages for specific programmes/users that displays live data.

5.8 Concluding remarks

Following on from the above analysis, some conclusions can be drawn about the opportunity to extend a monitoring such as that developed and utilised by ENWORKS to other programmes in other Member States, as well as the related costs.

Regarding the costs of implementation of a toolkit similar to the ENWORKS software, it should be noted that, from a business perspective, no cost is expected to be sustained by individual companies assisted by the programme. Potential "license costs", for example, can be discounted by programme funding. In other words, the potential funding available for support to each company could also involve the financial resources needed to sustain the access to the software.

An estimate, provided in Table 1-1, defines the annual average cost of running the Toolkit as €40,000 (excluding annual software development, estimated at 37,200 € per year). This estimate is based on 10,000 UK businesses which can access and use the toolkit. In case of the extension of the programme to other Member States, similar annual costs could be expected for each programme that runs it. However, it has not possible to also provide an indication of the initial costs associated with the development of the software. One would have expected that this would comprise a significant up-front investment if similar software were to be created from scratch.

On the technical side, some features of the toolkit that would need to be adapted at the Member State level have been identified, such as:

- The price of energy, water resources, and commonly used materials should be updated to meet the market trend in any single Member State, as well as the CO_2 conversion factors which should take into account the national average;

- Translation into national languages of both the content and the instruction manual of the software.

Although an estimate of the previous investment and other up-front costs cannot be provided, it can be expected that they will be sustained at start-up of the project, and they will not be charged to a single business. In other words, given the current data, the expanded adoption of monitoring software such as that used by ENWORKS should not face any major technical difficulties.

With regards to the SWOT analysis provided, it was pointed out that previous roll-outs of the Toolkit have been shown to be successful as the design allows for a wide number and variety of projects to be accommodated into its structure. It has proven to be an immensely useful project management tool, providing: a mechanism for performance management; a key element for businesses in catalysing the implementation of improvement opportunities; and a valuable resource for government and policy makers to identify future priority areas.

Given the resources allocated to the present study, it was not possible to evaluate the potential demand from enterprises located outside the UK for a toolkit similar to the one provided by ENWORKS. A future assessment of this demand could be implemented in three main steps:

1) A desk analysis about the productive structure of any Member State, to understand the potential number of SMEs that could be interested in use of such software;
2) An evaluation of similar software tools that may have been implemented in other Member States, focusing on the same topics as the ENWORKS toolkit;
3) Stakeholder engagement, involving questionnaires and telephone interviews with enterprises, business associations, and (potentially) project managers of similar toolkits, if any.

6 Overall findings

6.1 Summary of main findings

This study has used a range of data to investigate the impacts of a proposed €4 billion public investment, which aims to stimulate the uptake of resource efficiency measures in SMEs across four sectors in the EU-28. Table 6-1 presents the overall findings of the study in terms of the resource cost savings, reduction in resource use, and jobs created/secured at the EU-28 level[34].

Table 6-1: Overview of the results	
Indicator	**Aggregate value for the EU-28 (across SME four sectors)**
Resource cost savings	
Estimated savings	€ 8.7 billion
Validation approach[1]	€ 32.8 billion
Reduction in Resource Use	
Energy savings	157 billion kWh/year
CO_2 emissions	58.9 million tonnes/year
Material resources	1.7 billion tonnes/year
Water	51.3 million m^3/year
Waste diverted from landfill	181.3 million tonnes/year
Jobs	
Number created	128,180
Number created (Validation approach)	268,320
Number secured	360,630
Notes: [1]Validation approach does not explicitly account for underlying levels of resource efficiency and assumes a €11 billion leveraged private sector investment	

From the Table it can be seen that the €4 billion public investment could lead to total resource cost savings across the EU-28 of around €8.7 billion. Across the four selected sectors, the results indicate that the largest cost savings could be realised in Construction and Food and Beverages. As shown in Section 3, these two sectors account for the highest number of SMEs among the four included within this study. Notably, the validation approach yields cost savings more than three times higher than those estimated using the first approach. However, this higher estimate should be interpreted with caution, as it does not explicitly account for underlying levels of resource efficiency and assumes that €11 billion will be invested by the private sector.

In terms of reductions in resource use the results indicate that the savings could be significant. For instance, the investment could lead to approximately 181.3 million tonnes of waste being diverted from landfills each year. Similarly, it could also lead to reductions in the use of around 1.7 billion tonnes of material resources annually. Again, the results indicate that the majority of these savings could be realised in Construction and Food and Beverages sectors.

With regards to employment, the results indicate that significant gains could be made. Firstly, the two approaches used indicate that around 128,000-268,000 jobs could be created as an indirect benefit of the induced resource efficiency savings. Secondly, the findings point towards the safeguarding of an extra 360,000 jobs, which would have been otherwise lost. With regards to the

[34] Please note that the potential maximum findings are not presented in this table.

selected sectors, the results indicate the highest employment gains could be realised in either the Construction or Environmental Technologies sectors, dependent on the approach used.

Finally, regarding the possibility of rolling out the ENWORKS Online Resource Efficiency Toolkit across EU-28, no significant costs are expected to be incurred by the companies using this tool, and the use of such a toolkit in other Member States should not face any major technical hurdles. The costs of implementing such measures to monitor the outcomes of other support programmes are expected to mirror those of the ENWORKS programme, the most significant of which are only approximately €18,600 annually for software maintenance, licences and secure socket layers (SSL), €18,600-€24,180 for server hosting and a variable budget for software development to add future functionality. It is noted however, that the monitoring software developed and used under the ENWORKS programme is part of wider programme support involving professional support and advice to SMEs on resource efficiency and is not considered as a stand-alone product to be used without appropriate support for identifying relevant opportunities for cost and resource savings.

6.2 Limitations of the report

6.2.1 Missing data

The analysis has found that the results for some countries may be underestimated due to missing data. For instance, cost savings have not been estimated for Greece using the first approach as data for the number of SMEs in the Environmental Technologies and Energy, Power and Utilities sectors is missing. This will also mean that the outputs of Task 2 for Greece are limited as information for these sectors is not available.

6.2.2 Allocation of public sector investment

The study has assumed that the allocation of the proposed public sector investment is weighted by the number of SMEs per sector and Member State. It is entirely possible that the savings could be larger if a more efficient allocation was adopted, i.e. based on the relative returns of each sector and Member State. Thus the results in Table 5-1 may be underestimated to some degree.

6.2.3 Choice of sectors

Although this initial analysis does not focus on the individual sectors, it has become clear that the majority of SMEs included in this analysis are within the construction sector (see Section 3). Likewise, although not presented in this study, the initial findings show that the majority of savings accrue to this sector. Section 2.2.4 shows that the returns per € invested in this sector are low in relation to two of the sectors included in this study[35]. It may, therefore, be the case that targeting other sectors (aside from the four included in this study) could lead to higher overall resource cost savings.

6.2.4 Additionality

It should also be noted that the analysis assumes that the public sector investment will directly generate private investment and subsequent cost savings. It may be the case that a majority of these private investments would have occurred without the initial public investment anyway. This relates to the long standing debate on the 'additionality' of public investments (i.e. does a public

[35] Energy, Power and Utilities, and Environmental Technologies

investment generate additional benefits over what would have occurred without such an investment)[36]. The results of this analysis should therefore be interpreted with caution as the overall direct effect of a public investment may be difficult to ascertain.

[36] 'Leveraging private sector finance: How does it work and what are the risks?', Bretton Woods Project, accessed at http://www.brettonwoodsproject.org/wp-content/uploads/2013/10/leveraging.pdf on 19/12/14

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Annex 1

7.1 Reductions in resource use for individual Member State by Sector

7.1.1 Food and Beverages

Table 7-1: Estimated reductions in resource use in the Food and Beverages sector

Country	SMEs making cost savings	Energy savings kWh/year	Energy savings CO2 tonnes/year	Material resource savings tonnes/year	Water use savings m^3/year	Waste savings tonnes/year
Austria	363	174,422,180	70,084	7,769,196	447,378	46,118
Belgium	758	444,838,032	178,991	21,108,834	668,183	86,462
Bulgaria	2,483	928,620,991	374,875	22,318,741	178,749	..
Croatia	501	154,129,659	62,090	8,857,353	..	..
Cyprus	84	46,727,642	18,837	1,221,489	99,569	841
Czech Republic	1,712	1,069,962,787	431,306	30,470,412	2,036,724	27,385
Denmark	188	102,020,070	41,090	3,475,394	1,967,820	14,260
Estonia	56	35,372,973	14,240	629,623	7,064	2,523
Finland	141	89,545,632	35,993	1,801,047	255,478	10,022
France	6,747	2,569,514,954	1,032,286	217,582,942	6,564,799	431,806
Germany	3,651	1,941,861,099	781,236	110,289,375	4,599,802	463,631
Greece	1,807	948,484,315	381,296	42,316,653	686,695	54,213
Hungary	3,190	1,082,075,037	433,837	54,535,834	899,573	79,749
Ireland	69	49,243,879	19,813	854,019	268,471	4,593
Italy	10,334	4,362,333,017	1,756,851	327,373,655	5,807,942	423,711
Latvia	196	43,110,383	17,401	2,263,483	128,845	1,955
Lithuania	103	32,171,254	12,994	1,903,006	18,357	928
Luxembourg	11	13,567,323	5,455	512,417	109,200	1,034
Malta	98	31,952,018	12,872	7,410,291	158,465	2,340
Netherlands	479	268,768,419	108,353	22,733,616	394,100	..
Poland	4,310	1,983,372,201	797,281	61,683,690	1,611,800	64,644
Portugal	1,672	580,650,361	234,049	28,179,493	539,984	55,169
Romania	5,650	1,643,359,423	661,009	50,332,748	1,039,536	11,299

Table 7-1: Estimated reductions in resource use in the Food and Beverages sector						
Country	SMEs making cost savings	Energy savings kWh/year	Energy savings CO2 tonnes/year	Material resource savings tonnes/year	Water use savings m^3/year	Waste savings tonnes/year
Slovakia	502	205,567,606	82,864	9,636,358	736,236	5,022
Slovenia	180	81,560,572	32,763	3,173,675	107,829	7,201
Spain	5,160	2,191,755,190	882,351	111,630,325	2,647,054	350,876
Sweden	344	111,445,918	44,674	7,985,288	720,624	34,021
UK	1,018	483,220,404	194,471	42,084,196	2,656,417	63,127
EU-28	**51,805**	**21,669,653,339**	**8,719,364**	**1,200,133,156**	**35,356,692**	**2,242,929**

7.1.2 Energy, Power and Utilities

Table 7-2: Estimated reductions in resource use in the Energy, Power and Utilities sector						
Country	SMEs making cost savings	Energy savings kWh/year	Energy savings CO2 tonnes/year	Material resource savings tonnes/year	Water use savings m^3/year	Waste savings tonnes/year
Austria	270	114,972,786	87,829	17,836	14,323	9,458
Belgium	55	28,460,562	21,749	4,711	2,082	1,753
Bulgaria	808	267,654,756	204,391	22,620	2,424	..
Croatia	93	25,429,397	19,400	5,130	..	..
Cyprus	3	1,442,323	1,102	132	149	9
Czech Republic	1,367	756,778,972	578,125	75,170	71,070	6,834
Denmark	471	226,747,212	173,258	26,836	214,218	9,887
Estonia	30	16,600,235	12,683	1,040	149	386
Finland	125	70,273,121	53,650	4,877	9,880	2,501
France	2,444	824,337,926	630,489	241,932	102,638	43,988
Germany	373	175,922,595	134,422	34,726	20,537	13,442
Greece	..	..	..	..	..	
Hungary	440	132,157,127	100,729	23,313	5,278	3,079
Ireland	30	19,307,211	14,749	1,153	5,159	577
Italy	1,374	513,661,740	391,548	134,638	32,972	16,486
Latvia	121	23,719,232	18,096	4,372	3,522	364
Lithuania	39	10,895,915	8,320	2,248	315	118
Luxembourg	6	6,795,860	5,186	893	2,680	167
Malta	8	2,282,338	1,746	1,840	558	55

Table 7-2: Estimated reductions in resource use in the Energy, Power and Utilities sector						
Country	SMEs making cost savings	Energy savings kWh/year	Energy savings CO2 tonnes/year	Material resource savings tonnes/year	Water use savings m^3/year	Waste savings tonnes/year
Netherlands	87	42,972,888	32,801	12,636	3,116	..
Poland	1,117	455,362,461	347,416	49,152	17,873	4,468
Portugal	155	47,770,972	36,492	8,075	2,174	1,398
Romania	851	219,231,957	167,631	22,975	6,807	851
Slovakia	64	23,111,772	17,658	3,761	4,080	191
Slovenia	196	78,735,397	60,037	10,595	5,101	2,158
Spain	3,231	1,215,580,933	927,288	216,475	71,081	61,388
Sweden	252	72,476,785	55,257	18,167	22,961	7,065
UK	262	110,341,257	84,259	33,599	29,661	4,462
EU-28	**14,273**	**114,972,786**	**4,186,310**	**978,900**	**650,808**	**191,087**

7.1.3 Environmental Technologies

Table 7-3: Estimated reductions in resource use in the Environmental Technologies sector						
Country	SMEs making cost savings	Energy savings kWh/year	Energy savings CO2 tonnes/year	Material resource savings tonnes/year	Water use savings m^3/year	Waste savings tonnes/year
Austria	153	2,442,216	921	78,717	1,688	1,146,381
Belgium	133	2,594,304	1,068	89,173	1,068	899,476
Bulgaria	315	3,906,398	1,576	68,080	315	..
Croatia	112	1,143,567	449	47,541	..	..
Cyprus	23	422,282	161	7,981	229	13,279
Czech Republic	1,273	26,374,408	10,186	543,684	12,733	1,236,340
Denmark	71	1,270,477	494	31,309	6,558	316,896
Estonia	21	436,380	167	5,615	21	55,270
Finland	63	1,316,260	501	19,161	1,002	262,050
France	1,088	13,732,909	5,441	842,323	9,794	4,122,376
Germany	360	6,343,795	2,520	260,950	3,959	2,704,166
Greece	..	..	..	..	..	..
Hungary	764	8,591,935	3,058	313,407	1,529	1,107,626
Ireland	35	827,564	313	10,396	1,217	136,994
Italy	1,512	21,151,311	9,073	1,149,281	7,561	3,689,798

Table 7-3: Estimated reductions in resource use in the Environmental Technologies sector						
Country	SMEs making cost savings	Energy savings kWh/year	Energy savings CO2 tonnes/year	Material resource savings tonnes/year	Water use savings m^3/year	Waste savings tonnes/year
Latvia	67	487,349	200	18,544	400	38,289
Lithuania	27	283,491	110	12,149	55	14,590
Luxembourg	4	173,619	70	4,749	373	23,643
Malta	26	280,541	103	47,106	362	36,873
Netherlands	129	2,392,126	901	146,425	901	..
Poland	2,143	32,683,704	12,860	735,164	6,430	1,871,131
Portugal	176	2,027,807	881	71,182	529	341,286
Romania	1,956	18,852,796	7,824	418,603	3,912	224,950
Slovakia	146	1,979,016	730	67,120	1,897	88,715
Slovenia	46	692,306	277	19,506	231	107,630
Spain	655	9,225,100	3,933	340,165	3,277	2,632,185
Sweden	124	1,336,447	497	69,272	2,239	726,303
UK	937	14,735,797	5,622	928,601	21,552	3,437,041
EU-28	**12,362**	**2,442,216**	**69,935**	**6,346,205**	**89,831**	**25,233,289**

7.1.4 Construction sector

Table 7-4: Estimated reductions in resource use in the Construction sector						
Country	SMEs making cost savings	Energy savings kWh/year	Energy savings CO2 tonnes/year	Material resource savings tonnes/year	Water use savings m^3/year	Waste savings tonnes/year
Austria	3,090	830,791,336	293,545	2,762,414	117,418	2,570,837
Belgium	9,535	3,130,446,195	1,106,060	11,089,208	266,980	7,160,787
Bulgaria	8,038	1,682,973,191	594,807	3,022,261	16,076	..
Croatia	3,025	521,135,824	184,497	2,235,142	..	..
Cyprus	594	184,719,849	65,328	360,493	21,974	38,009
Czech Republic	35,729	12,502,969,365	4,430,446	26,582,677	1,321,988	3,858,776
Denmark	3,901	1,187,229,077	421,270	3,019,103	1,279,413	1,954,226
Estonia	1,085	383,108,363	135,587	508,723	4,339	319,986
Finland	3,753	1,332,756,577	472,876	2,000,341	213,920	1,748,891
France	56,281	11,997,886,282	4,221,041	75,866,173	1,688,416	23,750,389
Germany	30,508	9,083,719,572	3,203,316	38,531,316	1,189,803	25,535,005

Table 7-4: Estimated reductions in resource use in the Construction sector						
Country	SMEs making cost savings	Energy savings kWh/year	Energy savings CO2 tonnes/year	Material resource savings tonnes/year	Water use savings m^3/year	Waste savings tonnes/year
Greece	4,035	1,185,350,314	419,592	3,949,809	48,414	798,838
Hungary	28,174	5,349,515,281	1,887,630	20,115,938	253,562	4,535,947
Ireland	3,041	1,222,536,470	431,766	1,584,156	370,954	1,334,826
Italy	89,249	21,088,193,609	7,496,914	118,165,640	1,606,482	24,275,721
Latvia	1,757	216,871,199	77,313	850,441	36,899	112,455
Lithuania	1,552	270,974,303	96,210	1,196,420	9,311	91,555
Luxembourg	253	169,068,663	59,706	476,640	75,898	151,796
Malta	857	157,219,594	55,718	2,722,477	43,717	136,295
Netherlands	13,762	4,318,459,375	1,527,582	27,276,277	357,812	..
Poland	71,529	18,426,711,651	6,509,108	42,774,136	858,344	6,938,280
Portugal	12,922	2,512,299,401	891,624	9,097,150	129,221	2,791,171
Romania	25,788	4,198,862,858	1,495,698	9,593,098	154,727	335,243
Slovakia	17,512	4,012,405,876	1,418,449	14,044,392	805,539	1,190,796
Slovenia	2,227	564,887,912	200,462	1,641,559	42,320	579,112
Spain	50,775	12,072,642,470	4,265,126	45,900,881	812,405	22,696,564
Sweden	9,872	1,792,035,197	631,784	9,585,346	641,655	6,426,427
UK	34,993	9,296,292,878	3,289,361	60,433,252	2,834,449	14,312,218
EU-28	**523,834**	**129,692,062,683**	**45,882,816**	**535,385,461**	**15,202,037**	**153,644,148**

Risk & Policy Analysts Limited
Farthing Green House, 1 Beccles Road
Loddon, Norfolk, NR14 6LT, United Kingdom

Tel: +44 1508 528465
Fax: +44 1508 520758
E-mail: post@rpaltd.co.uk
Website: www.rpaltd.co.uk