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**Topic: Waste prevention and reuse**

**Energy Balance of Waste Prevention and Reuse**

Mwandira Wilson (Copperbelt University, Zambia)

**The Impact of Waste Prevention on Climate Change - A Review of the Current Knowledge and Assessment of Future Work**

Liz Nimmo-Scott and Mike Read (Mike Read Associates)

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Mrs. Sari Kemppainen et al (Waste Management Department of the YTV Helsinki Metropolitan Area Council, Finland)

## **Energy Balance of Waste Prevention and Reuse**

Mwandira Wilson (Copperbelt University, Zambia)

At present the volume of solid waste produced in modern consumer societies is increasing, requiring environmental policy measures to reduce the volume of waste. This increasing rate is alarming and threatening the very existence of human life and the natural habitat. Therefore, political, social liabilities, ecological and financial implications must be taken into account to attain sustainable waste prevention and waste reuse to achieve the sustainability of environmental policies and activities.

However, for this to be achieved needs consented efforts from all stakeholders: Governments, Industry, Technology providers, Communities (Consumers), Non-Governmental organizations (NGOs) and Consultants. Using all these stakeholders can bring about the unlocking of the barriers to waste prevention and waste reuse. Governments can provide the others (stakeholders) with the environment and legal support who in turn can have market, funding and technology.

This presentation focuses on a model that describes on how this integration can help achieve a sustainable environment without leaving damages to the environment and all the players (Governments, Industry, Technology providers, Consumers, Non-Governmental organizations (NGOs) and Consultants) satisfied. Acting in this way most of the issues that are of concern can either be completely or partially cushioned to avoid potential conflicts.

**Keywords:** Waste Prevention - Waste Reuse - Sustainable Development -Integration - Environmental Policies

### **BIOGRAPHY**

I am **Mwandira Wilson**, a Zambian aged twenty-five (25). Currently pursuing a Degree in Environmental Engineering in my final year at the Copperbelt University, Kitwe Zambia. With the passion and desire towards a sustainable and safe environment I have joined various societies and organizations that are involved in preventing and mitigating environmental issues such as; The Citizens for a Better Environment (CBE)(2004) and The Copperbelt University Environmental Engineering Society (EES)(2005) locally. Internationally, I like researching using the Internet to find out what is going on in other parts of the world in their desire to try and combat major global environmental damages.

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## **The Impact of Waste Prevention on Climate Change**

### **A Review of the Current Knowledge and Assessment of Future Work**

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### **Biography**

Liz Nimmo-Scott has been working on climate change issues for the last 4 years, and has been developing a novel programme of multi-faceted community action. Liz has a BSc in Environmental Science from the University of Nottingham. Mike Read has been working on waste minimisation and prevention for the last five years and runs Beyond Recycling [www.beyondrecycling.net](http://www.beyondrecycling.net) and the environmental consultancy Mike Read Associates (MRA). MRA recently completed a scoping study for Defra on the potential for a national waste prevention 'network'. Mike has an MSc in Environmental Technology from Imperial College, has lectured at the University of Melbourne and is an Associate of the University of Northampton. He has a background in international resource management, having worked for WWF International, FSC and the German, Australian and UK Governments.

### **Summary of Paper**

Waste prevention, i.e. making fewer things more efficiently, and consuming fewer things more efficiently, is necessary to turn the tide of increasing waste in the UK. Climate change is also a pressing issue and will increasingly be a motivator for political, commercial and individual action. Where the two disciplines of waste prevention and climate change mitigation meet has only been peripherally explored and could provide a great insight into the way forward on both issues.

#### **Objectives**

This paper reviews the current state of knowledge from around the world of the greenhouse gas (GHG) impacts of waste prevention. It particularly focuses on methodologies that go beyond assessing the GHG benefits associated with avoided disposal, and that include the GHG benefits of avoided extraction, manufacture, transport, and recycling. Politically there is a strong will to reduce waste and a growing realisation that recycling of some materials can be of marginal GHG value. This is demonstrated by waste prevention now featuring strongly in the Government's Waste Strategy 2007. This paper thus also sets out to put the considerable GHG benefits of waste prevention into a political and strategic context.

#### **Results**

The paper assesses current best practice and innovation in means to assess the GHG reduction potential of waste prevention. It highlights areas where the logical framework requires development and recommends areas for further work. The paper also proposes an outline logical process and methodology for comparisons of GHG benefits with other waste management options.

#### **Conclusions**

The paper concludes that

1. Potential climate change mitigation benefits of waste prevention are significant, especially when compared to recycling and landfilling of waste.
2. Existing logical frameworks and methodologies are flawed.

#### **Suggests**

3. That developing a widely agreed system would hold considerable advantages.
4. A means to establish such a system.

#### **Identifies**

5. Areas which need to be focussed on as next steps.

## **Reducing greenhouse gas emissions in the waste sector - ICLEI's Cities for Climate Protection (CCP) Campaign encourages local governments to lead the way**

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- climate change and greenhouse gas emissions pose a major challenge to the environmental agenda
- the European Commission wants to incorporate lifecycle thinking into all waste management policies
- according to the Environmental Assessment of Plans and Programmes, it is now mandatory for local authorities to submit plans and programmes, including those relevant to energy and waste management, for environmental assessment
- Controversies surrounding the respective benefits of recycling and energy recovery options are core issues in waste management policy. Continuous developments in recycling and mounting pressure on conventional energy supplies make debates on this issue increasingly acute

### **1) Objectives**

The Cities for Climate Protection (CCP) Campaign is one of the most well-known international campaigns for local governments active in climate protection, bringing together more than 800 participants from around the world. The focus is on identifying greenhouse gas reduction actions that work well, sharing information on these, encouraging other communities to become active in this important area, and generally helping to raise awareness on the need for mitigation and adaptation at a community level ([www.iclei-europe.org/ccp](http://www.iclei-europe.org/ccp)).

Reducing greenhouse gas emissions in the waste sector is one area where many CCP participants have made excellent progress, often handled within a Climate or Energy Action Plan.

The European campaign currently has 162 participants, and the presentation will focus on some examples from these communities – showing a diversity of effective solutions, from waste management strategies to waste-to-energy, waste prevention, and recycling.

### **2) Results**

Successful waste management is closely linked to the way local inhabitants and businesses regard waste, and their level of participation in local programmes. In the modern world waste does not have a very positive image, and a change in lifestyle is needed to reduce waste, to recycle or re-use where possible, and to use it as a source for energy or compost.

The local government plays a key role in this regard, firstly by changing its own municipally-owned operations to address sustainable waste management. It has to lead by example, and can gain financial benefits (saving money) by reducing waste paper, glass and plastic, which in turn can help to inspire other actors to replicate good practices.

A second area where local governments can encourage large-scale change in their communities is through regulations, and by transforming the waste collection and disposal systems. Here for example they can help to reduce the need for landfill or incineration, by encouraging recycling of household and business waste, or find waste-to-energy solutions by capturing methane or collecting wood chips for fuel. The local sewage system can also be transformed into a bio-energy plant for local electricity production.

In the CCP Campaign a 5 step methodology is used to guide local governments in the planning, implementing and monitoring of local actions to reduce greenhouse gas emissions.

An example of an effective approach to waste management is the City of Copenhagen, Denmark. The city's objective was to reduce incineration of waste and landfill, and it developed a flexible system which is open to input from developers, contractors and the community. It addresses the different needs of citizens and businesses, and treats every type of waste distinctively. In 2004, 56% of the waste has been recycled and 39% has been incinerated, whereas the incinerated waste has been re-used as a source of power. The power generated could provide 70.000 households with energy.

### **3) Conclusions**

Local governments are vital actors in the field of community waste management. They not only have an huge influence on the local system of waste collection and treatment, but can use their information

systems to effectively raise awareness on the need for waste reduction and recycling, as well as on the options locally available.

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### **Biography – Maryke van Staden**

Maryke joined the European Secretariat of ICLEI – Local Governments for Sustainability in March 2006, after a five year stint focusing on renewable energy at the International Solar Energy Society (ISES) Headquarters, also as the Head of Scientific Projects for ISES.

Currently she is the Coordinator of the European Cities for Climate Protection (CCP) Campaign, with has 160 participants from 16 countries, many of which are also in the area of GHG reductions in the waste sector. The CCP Campaign focuses on greenhouse gas reduction, improved air quality and local resilience, through sustainable energy (energy conservation, energy efficiency, renewable energy, waste-to-energy), sustainable transport (public transport, clean fuels, reducing congestion, non-motorised mobility), as well as water and waste management strategies and activities.

Maryke is also the ICLEI European Secretariat (ES) coordinator on climate change adaptation in communities, as a cross-cutting theme linked to sustainability and resilience.

## **Waste Prevention Kit: An Advisory Project on Waste Prevention in the Helsinki Metropolitan Area**

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### **Background**

Waste Prevention Kit is an EU LIFE ENVIRONMENT founded demonstration project within the time frame from year 2005 to year 2008. The beginning of the Waste prevention project was in 2002, when the Board of Directors of the Helsinki Metropolitan Area Council (YTV) accepted the Waste Prevention Strategy.

### **Objectives**

The target of the strategy is to utilise regional and national advice and guidance, so as to motivate the residents, enterprises and the public sector to avoid waste production, so that less waste will be produced per resident and per workplace in 2007 than in 2000.

Waste prevention is on the highest level of the target hierarchy of EU waste legislation. It should be a primary measure, before the reuse of waste as material or energy or final disposal.

The subject is related as well to climate change as the acts taken to promote material efficiency also affect the amount greenhouse gases produced.

### **Methods and actions**

#### **1 Household Campaigns – Smart with Less Waste**

The aim of the campaigns for households was to create positive attitudes towards sustainable consumption and waste prevention, to enhance knowledge about possible actions, as well as boosting willingness to act in ways which generate as little waste as possible.

#### **2 Material Efficiency in the General Education and in the Vocational Education Institutions**

Teaching material on waste prevention and eco-efficiency for pre-schools, elementary schools, high-school levels plus vocational institutions has been produced. A wide network has been established in the Metropolitan Area between the YTV waste management, municipal authorities, schools and day-care centres.

#### **3 Smart Ways of Action (SMAC) Models: Tools for Waste Prevention in the workplace**

Best Practice models for reducing waste at grocery stores, offices, educational institutions, day care centres and building sites has been made in co-operation with actors within the field. The SMAC models has been integrated into the training of the personnel of enterprises and public bodies.

#### **4 Waste Benchmarking Service for Companies, the Public Administration and Education**

YTV monitors the waste streams of companies and public organisations. Ca 600 annual waste reports were checked and approved by the administrator of Petra Waste Benchmarking system in 2006.

#### **5 Dissemination of the Deliverables**

Information about the produced material has been distributed to households, enterprises, educational institutions and public administration of the area. A web portal ([www.ytv.fi/fiksu](http://www.ytv.fi/fiksu)) has been established in

Finnish, Swedish and English. Supported methods and materials will be introduced nationally and in the EU-area.

### **Results and conclusions**

The project will be completed in the end of 2007 and the final results will be available at the beginning of 2008. To examine the outcome and influence of the project the following indicators has been chosen:

- the change of the attitudes towards waste prevention among the households, educational institutions and some enterprises
- a follow-up on the waste amounts generated in different sectors, specially the branches of retail trade and offices
- a follow-up on the total frequency teachers touch waste avoidance in their lessons
- a follow-up on the rate of web-portal visitors consisting of different target groups