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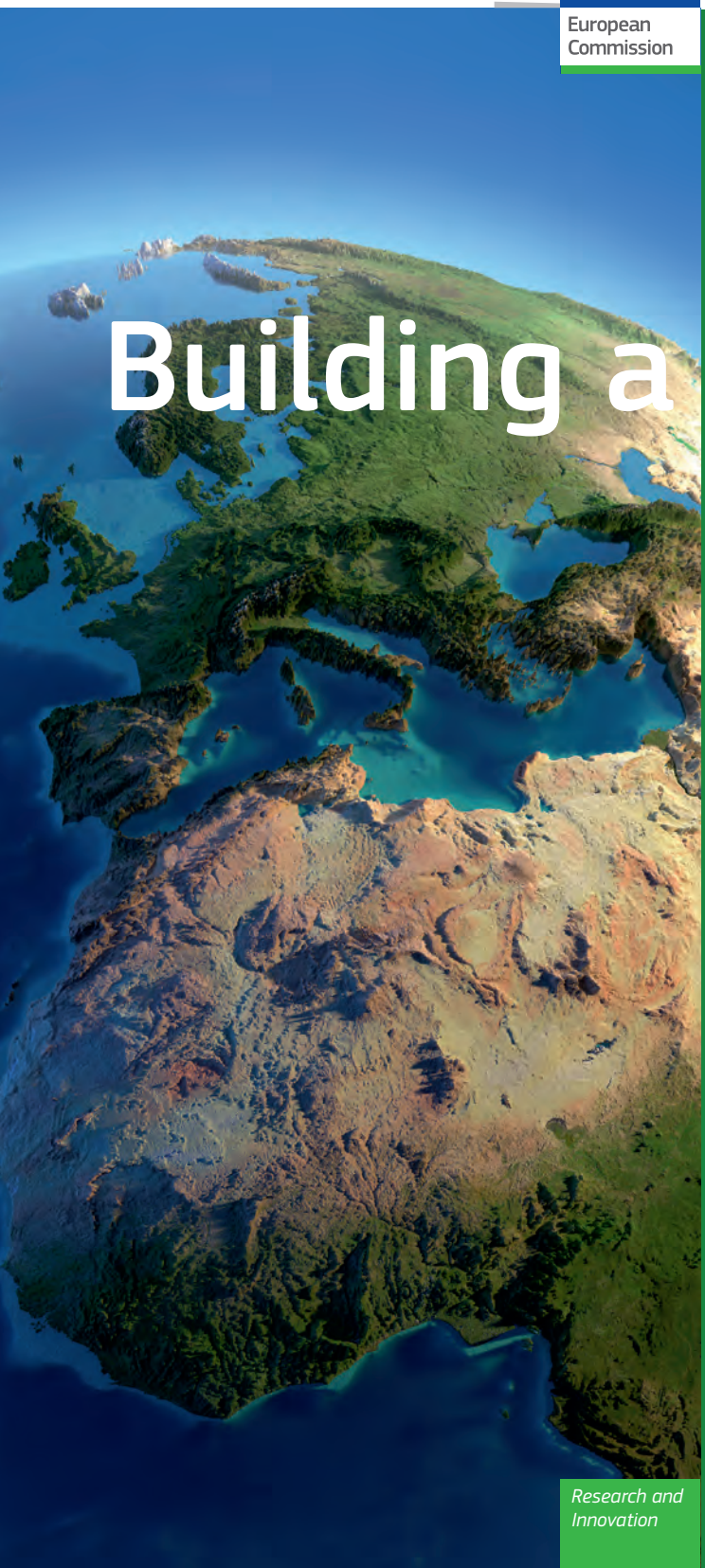

Building a "Joint European and African Research & Innovation Agenda On Waste Management"

Waste as a Resource: Recycling & Recovery of Raw Materials

(2014-2020)

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Title

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Foreword

Europe is heavily reliant on raw materials; it is the region with the highest net-imports of resources in the world. As such, the European Union has had to focus on a variety of ways to ensure its raw materials supply. It is in this context, that the European Commission launched its Raw Materials Initiative in 2008 and updated it in 2011. This strategy focuses on three pillars: promoting global trade and cooperation, fostering sustainable mining in the EU, and advancing recycling and resource efficiency. Particularly the last pillar is of great importance. Recycling and efficient waste management plays a major role in not only securing raw materials at a cheaper price but also with a smaller environmental impact; advancing a closed-loop system will also ensure the availability of our raw materials for future generations.

The European Commission has worked tirelessly to promote such an agenda. The EU Waste Framework Directive is the cornerstone of EU waste policy and has led to a new approach to waste management, marking a shift away from thinking about waste as an unwanted burden, to seeing it as a valuable resource. The Waste Framework Directive applies a waste hierarchy, which envisages prevention of waste as the best option, followed by re-use, recycling and other forms of recovery, with disposal such as landfills as the last resort. It has also introduced the concept of life-cycle thinking into waste policies, in order to effectively measure the full impacts of waste management strategies.

The European Raw Materials Policy is investing heavily into research and innovation. The EU's 7th Framework Programme for Research (FP7) has advanced important R&D efforts into recycling and the European Commission has also launched a European Innovation Partnership on Raw Materials. This EIP on Raw Materials has defined technological and non-technological priority areas including on waste management and is also promoting an international framework to provide for a policy dialogue with international organisations.

The EU and Africa already have some successful co-operation when it comes to raw materials. Projects have been financed by the EU-Africa Infrastructure fund and in Addis Ababa in June 2010, the EU Commission agreed with the African Union Commission to establish bilateral co-operation on raw materials and development issues based on the RMI and the AUC's policy on mining and minerals namely the 2009 Africa Mining Vision.

As the European Parliament's Rapporteur on Raw Materials, I followed these developments closely. In 2012, I teamed up with colleagues from other political groups to contribute to this agenda by proposing to widen EU-Africa co-operation into the field of waste management policy. We submitted a pilot project proposal entitled "*Recovering critical raw materials through recycling: an opportunity for the EU and AU*", to the EU's budget 2013. And we were successful. We wanted to help promote a European-African Recycling Partnership and this project is the result. After all, waste is a common challenge for both Europe and Africa.

Europe has the know-how, technology and legislative experience that could be of value to African countries as they build up their recycling structures, frameworks, and value-chains. Such a recycling partnership would promote a sector with a high potential of job creation and growth that would contribute to a sustainable supply of raw materials at lower prices and a safer environment.

We should find agreement that recycling and recovery of raw materials from waste should be in our political agendas, as a global issue that concerns all of us. We should build a joint research and innovation agenda on this and flag up actions that we need to develop together. And we take home to our countries one common message: that we need to build our future innovation strategies on resource efficiency and recycling and promote a European-African Recycling Partnership as a relevant part of such a strategy.

Next year on the 4th of April, the EU-Africa Summit will take place again, following the 3rd Summit in 2010. This Summit can be an ideal opportunity to get high-level endorsement for a European-African recycling partnership and put this issue on the political agenda as well as ensure that it is mentioned in the Summit conclusions.

In the run-up to the Summit, my colleagues and I in the European Parliament will do our part in promoting such an agenda. I would welcome if you were to do the same and we could continue working on such an agenda together. For us in the European Parliament, the issue of waste as a valuable resource is high on the political agenda and we will continue to support this perspective in our bilateral and global relations.

Reinhard Bütikofer
Member of the European Parliament

Foreword

Waste management presents a very real challenge for many countries, as it does on the African continent. Levels of waste service delivery vary greatly within and between countries and waste management facilities, such as waste disposal sites, are often not designed or operated according to set standards. There is still much to be done in achieving the level of waste management on the continent that will result in a reduced impact of waste on the environment and on human health. The need to improve the way in which waste is managed also presents many opportunities for Africa. It is possible to leapfrog outdated approaches being used elsewhere in the world, and create the space for local innovation as well as local economic development and job opportunities.

By embracing the opportunities that waste provides as a renewable resource, African countries will be able to comprehensively address the problems of cleansing, collection and disposal as part of a process that harnesses the opportunities created through waste minimisation, reuse and recycling. Despite limited levels of the formal recycling sector on the continent, the informal recycling and reuse sector is already very active. Many garner a livelihood through the separation of recyclables from landfills or from kerbside collection schemes.

Harnessing the full opportunities provided by a waste economy requires the integration of the informal and formal sectors to ensure that fair market value is given for the resources recovered. Such integration will allow for up-scaling of recycling and recovery activities on the African continent with the associated economic opportunities that come with increased economies of scale. This will lead to improved livelihoods through local enterprise development.

Not at all surprisingly, waste management is also becoming increasingly relevant in the African and global discussion on climate change. The increasing trend to move away from traditional landfilling to find alternative uses for waste requires a strong investment in technological and social innovation.

A research and innovation partnership between Africa and Europe, supported by a joint high-level Europe-Africa Waste Research and Innovation Agenda, provides the platform for addressing these basic waste management practices in our municipalities, in innovative ways that will realise the potential provided by waste as a renewable resource and thus grow the waste economy in Africa.

The high level conference, entitled '*Waste as a Resource: Recycling & Recovery of Raw Materials*', held in Belgium, Brussels on 25 November 2013, confirmed that waste is both a priority to be tackled and represents a valuable resource; that waste management is a shared challenge for Europe and Africa, bringing clear benefits for the environment, economy, employment and society; that opportunities for cooperation between Africa and Europe in research and innovation exist and that this cooperation should involve a multi-stakeholder approach that includes governments, private sector, municipalities, academic institutions and citizens; and finally, that research and innovation are essential to unlock the potential for solid waste management.

It is hoped that waste research and innovation partnerships between Europe and Africa will also support learning from best practices; technology transfer, adoption and adaptation; and local skills development in ways that will create the necessary conditions for a sustainable waste economy on the African continent. We look forward to this future research and innovation engagement and encourage the waste community, including academia, business and government to put the necessary mechanisms in place to give effect to this Joint Waste Research and Innovation Agenda.

I would like to thank the European Parliament and the European Commission for their engagement with the African Union and member countries. Through this engagement, we have been able to explore the potential for collaboration and to identify opportunities for such collaboration in the areas of waste management, recycling and recovery of raw materials. Finally, I would like to thank the members of the Joint EU-AU Working Group who demonstrated considerable commitment to the outcome of this process and also drafted this final Research Agenda.

Derek Hanekom
Minister of Science and Technology,
South Africa

1 Background

The intention of this paper is to inform and to mobilise stakeholders from business, academia and government towards the implementation of a "*Joint European-African Research and Innovation Agenda on Waste Management*" (JR&IA) with the goal of advancing collaborative research and innovation between Africa and Europe in the area of waste management; and to leverage institutional, technical, and financial resources to support such collaboration.

A Pilot Project

This paper is the outcome of a European Parliament Pilot Project, entitled "*Recovering critical raw materials through recycling - an opportunity for the European Union and African Union*". The pilot project was implemented by the European Commission Directorate-General for Research and Innovation during 2013, and overseen by invited members of a European Union - African Union Working Group.

The pilot project carried out two events, the first, a workshop held in Addis Ababa, Ethiopia in August 2013, and the second, a high-level conference held in Brussels, Belgium in November 2013. The two events gathered more than one hundred participants from more than 28 different African and European countries representing business, industry, research and academia, and government. The events provided an opportunity to exchange best practice and identify common challenges as well as future research and innovation needs. The findings of the workshop and conference have been captured in two reports by the European Commission (EC, 2013a, b).

High Level Conference Statement

Through this participatory process, conference participants recognised that, for both continents:

- Waste represents a valuable resource and a priority to be tackled;
- Waste management (including recycling and recovery of raw materials) is a shared challenge bringing clear benefits for the environment, economy, employment and society;
- Opportunities for cooperation between Africa and Europe in research and innovation exist and go beyond technological innovation to new business models and managerial, organisational and social innovation;
- This cooperation should involve a multi-stakeholder approach that includes governments, private sector, municipalities, academic institutions and citizens;
- Research and innovation is essential to unlock the potential for solid waste management.

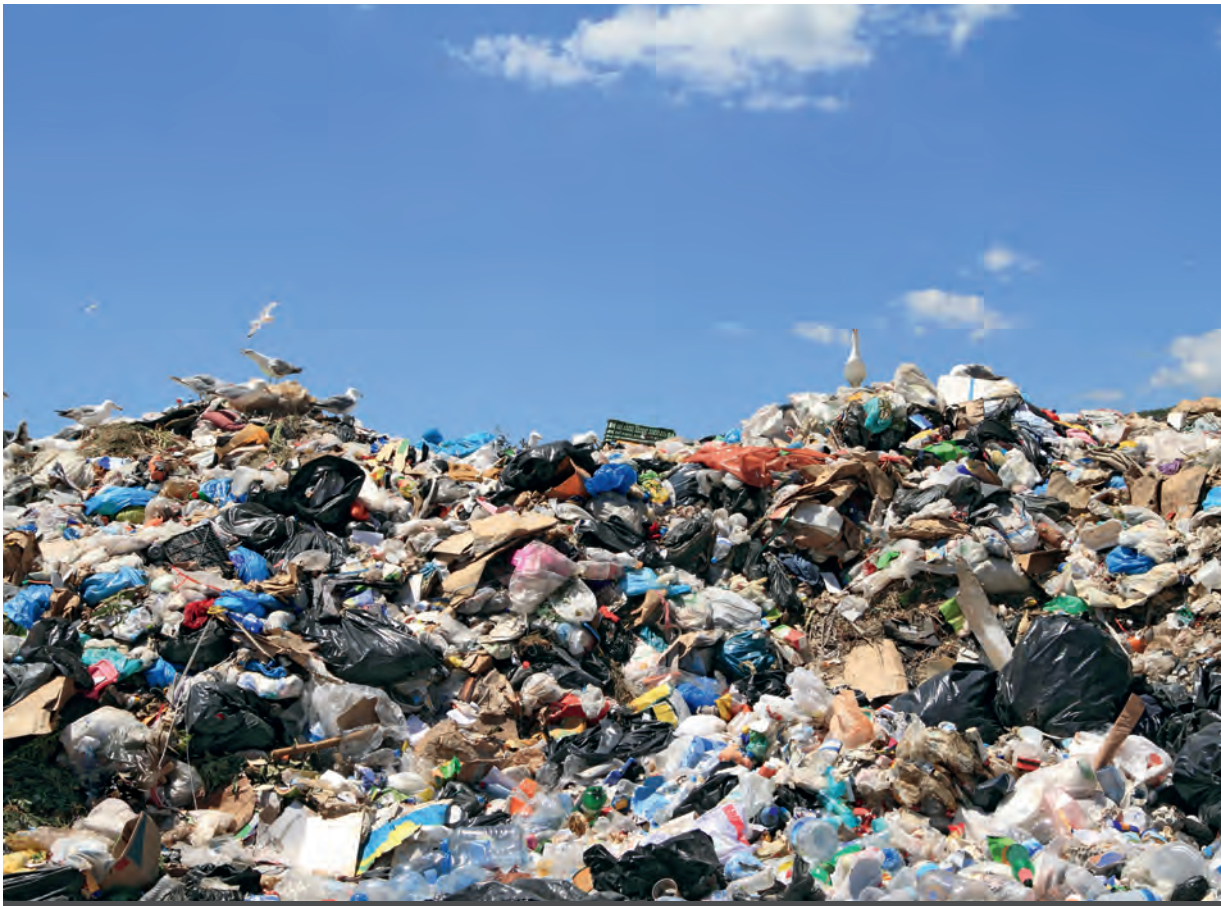
Waste in Africa and Europe

Solid waste management[1,2] is a growing challenge for both developed and developing countries, and according to the World Bank (2012: vii) "*the global impacts of solid waste are growing fast*".

In Africa, waste management practices differ vastly, both between countries, as well as within countries. The differences in waste management practices between rural and urban areas tend to differ vastly. In rural areas there tends to be no waste management infrastructure and collection service, while in urban areas collection coverage is estimated at ~ 40% of the population, reaching mainly the more wealthy areas

1 For the purposes of this research agenda, solid waste is taken to include any waste (excluding wastewaters) originating from municipal, commercial, industrial, agricultural and mining activities, whether hazardous or non-hazardous in nature.

2 The reader is referred to the country-specific waste legislation for the appropriate waste definition(s).



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(UNECOSOC, 2009). In some African countries, such as South Africa, service delivery to urban households has reached 90%[3], but this has been achieved through a strong political will and an investment in waste management within municipalities (DEA, 2011).

While accurate waste data for Africa is scarce, the average municipal solid waste generation rate is estimated at approximately 237 kg/capita/annum, with the majority of this waste going to landfill, in most instances open dumpsites (World Bank, 2012). This is against a global average waste generation rate of 438 kg/capita/annum (World Bank, 2012). The waste is characterised by a high organic content, estimated at an average of 56% for urban municipal solid waste, which poses both human health and environmental risks if not properly managed (Couth & Trois, 2010). Waste generation in sub-Saharan Africa was estimated at approximately 62 million tons in 2012 (World Bank, 2012).

The expected growing population of the African continent together with the rapid annual urbanisation rate of 3.5% over the past two decades (UNIDO, 2009) will affect its cities in many ways, including the quantities and types of waste generated. Changes in population consumption patterns, due to the emerging middle class, are expected to increase waste generation, with generation rates expected to more than double over the next twenty years in lower income countries, many of which are

3 Level of waste service delivery to households was last calculated at 62.1% (estimated at 90% for urban households and 47% for rural households) (DEA, 2011; StatsSA, 2012).

on the African continent (World Bank, 2012). The need for sustainable waste management is therefore identified by African nations as an emerging urban challenge as well as an economic opportunity.

While the municipal solid waste (MSW) generated in Africa contains relatively large quantities of recyclables (organic waste, paper, plastic, glass, metals), typical overall recycling rates remain low at below 10% (World Bank, 2012). However, research based on recent data for MSW in urban areas (cities) shows that recycling rates as high as 20–30% for MSW are being achieved mainly by the informal sector in lower income countries (Wilson *et al.*, 2013). Indeed, most large African cities have an active informal waste sector which plays a significant role in the recovery of recyclables; however there are typically a number of middle men in the recycling economy and large price fluctuations (UN-HABITAT, 2010; World Bank, 2012). Waste-to-energy (WtE) is only emerging on the continent, with projects focused mainly on small-scale anaerobic digestion and landfill gas recovery.

There is no data available on the total number of persons employed in the waste sector in Africa, or the number of persons earning a living through the collection and sorting of recyclables in the informal waste sector. Data from South Africa suggests that while approximately 30 000 people are employed in the formal waste sector, an estimated 2-3 times this number earn a livelihood from the informal sector (DST, 2013).

Total waste generation for the EU-28 member states was estimated at 2505 million tonnes[4] as at 2010 (EC, 2013). The average annual municipal solid waste generation rate, per capita in the European Union, is estimated to be more than double that of Africa, at approximately 500 kg/capita/annum (as at 2011) (EUROSTAT, 2013). The total *municipal solid* waste generation reached 253 million tons in 2011 (EUROSTAT, 2013a). This is on top of the amounts of waste generated from activities such as construction (860 million tonnes), mining and quarrying (672 million tonnes) and manufacturing (276 million tonnes) (2010) (EUROSTAT, 2013b).

The 2011 data on municipal waste showed that 37% was landfilled, 23% incinerated, 25% recycled and 15% composted. (EUROSTAT, 2013a). Landfill is still the dominant method of treatment but the EU wants to reduce landfilling. Member States are required to reduce the amount of biodegradable municipal waste that they landfill to 35% of 1995 levels by 2016 (for some countries by 2020) (European Parliament, 1999, 2008; EC, 2012). In Europe, recycling and other material recovery operations are expected to increase from the current level of 36% to around 50% by 2020, while energy recovery used 17% of municipal waste in 2004 is likely to increase to about 25% by 2020 (EEA, 2008).

Over the last 30 years the European Union's Waste Framework Directive (European Parliament, 1999, 2008), has established both the principles (waste hierarchy) and the policy measures required for a consistent European waste management system. The objective of the framework is to minimise the negative effects of waste on human health and the environment and to preserve natural resources. EU waste legislation has made a significant difference in reducing waste disposal to land. Thousands of sub-standard landfill sites have been closed across Europe and the amount of municipal waste disposed of to landfills has decreased by more than 25% since 1995 (EC, 2010). The setting of recycling targets for wastes such as old vehicles, electronic equipment, batteries and packaging, municipal waste and waste from construction and demolition activities has also helped to divert waste away from landfilling. Extended producer responsibility (EPR) has been an important policy instrument in working towards these targets, with producers and importers working closely with industry, government and the waste sector to ensure that their products are designed for recycling, and are collected, sorted and recycled (EC, 2010).

4 Made up of 2404 million tonnes of non-hazardous waste and 101 million tonnes of hazardous waste.

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EU efforts demonstrate the importance of adopting an integrated approach to waste management and recycling that combines policies, regulations, financial instruments, infrastructure and communications together. However, for some EU Member States the implementation of the Waste Framework Directive remains a real challenge. As with Africa, waste management approaches differ greatly between the EU member states in terms of technology mix for final treatment and disposal (i.e. recovery, energy recovery, incineration, and disposal). Percentage of waste landfilled, for example, varies from in excess of 70% for countries such as Greece and Estonia, to less than 10% in the Netherlands and Denmark (excluding major mineral wastes) (EC, 2013).

The waste management and recycling sectors in the EU were estimated to employ over 2 million people, with an annual turnover, as at 2010, of €137 billion, an estimated 1.1% of the EU's Gross Domestic Product (GDP) (EC, 2010).

The United Nations Conference on Sustainable Development (Rio+20) stressed the potential of the Green Economy as a means to achieve sustainable development and poverty eradication. Waste management was identified as a particular area that could deliver social and economic benefits while achieving the objective of sustainable development. Europe, for example, has encouraged the growth of its eco-industries, which now corresponds to over 2.5% of EU GDP and provides jobs to over 3.4 million people (EC, 2011). However, the potential created by a transition to a Green Economy is also highly relevant to developing economies. Studies have shown that green business opportunities can be found in solid waste management and recycling in urban areas in developing countries. Projects that maximize local content and local knowledge are shown to contribute to local job creation and income generation (UNEP, 2011).

"*The economic potential of waste management is growing in many regions of the world, offering important business and job opportunities. It is crucial to ensure that these jobs are decent, in particular in terms of working conditions. As developing countries grow economically, there are increasing needs and economic opportunities for better waste management*" (EC, 2011a).

The opportunities that the Green Economy provides to both Europe and Africa have been captured in the Joint Africa EU Strategy: Action Plan (2011-2013), Partnership 6: Climate change and Environment (AU/EU, 2010), in particular the opportunities the Green Economy provides for new jobs and growth.

2 A Joint Research & Innovation Agenda (JR&IA)

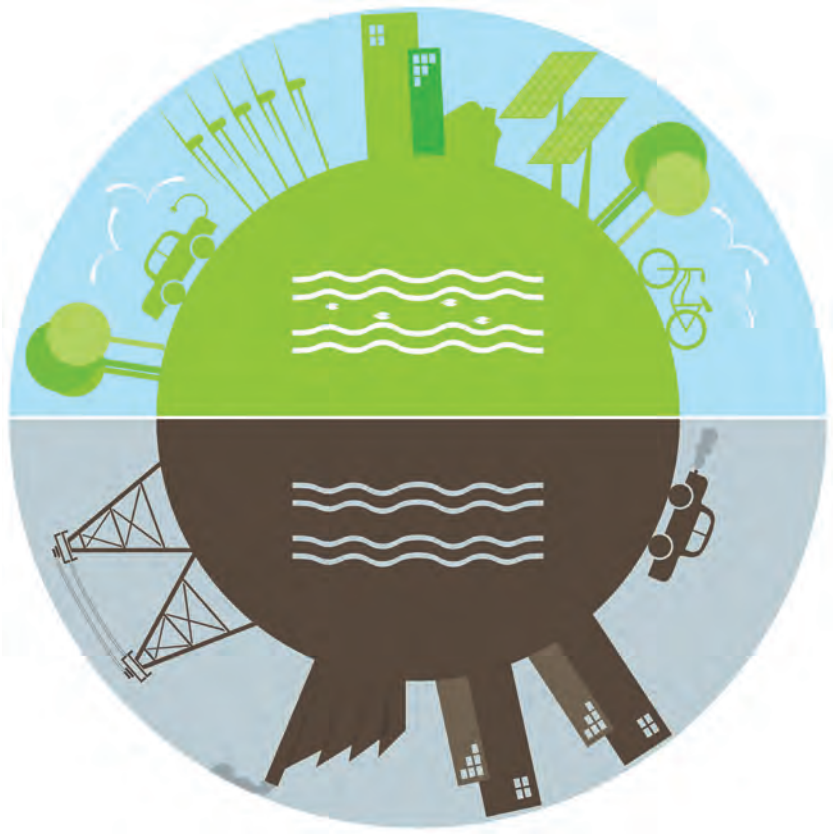
This section defines the vision and intended impact of a JR&IA and gives examples of common thematic areas for cooperation. A number of principles to guide the collaborative research and innovation work and the minimum required enabling conditions in Europe, Africa and between Europe and Africa to achieve such principles are also presented. Finally, the section identifies potential supporting mechanisms that should be considered in the development and implementation of a JR&IA.

Vision

The vision for a Joint European-African Research and Innovation Agenda on Waste Management is to *"Boost collaborative research and innovation in the field of waste management in Europe and Africa".*

Intended Impact

By investing in waste research and innovation, African and European countries can unlock the economic and social potential stored within



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their waste, while at the same time reducing the negative environmental impacts associated with inappropriate solid waste management. This requires a paradigm shift to "waste-as-resource", a critical shift in the realisation of a circular economy.

The development and implementation of a Joint Research and Innovation Agenda on Waste Management between Africa and Europe will lead to a visible impact on the ground, evident in a *"Move away from the landfilling of waste; to the recycling and recovery of waste; and to the introduction of these resources back into the economy, so as to improve environmental and social conditions and exploit the economic opportunities of the collaboration between African and European countries".*

Common Thematic Areas for Cooperation

To achieve the goal and intended impact, actions undertaken in support of a JR&IA will be consistent with the broad thematic areas of:

- Solid waste management
- Recycling and recovery of raw materials

The mapping of potential collaborative research and innovation themes was conducted as part of the pilot project; the participatory process did highlight the following areas (EC, 2013a) that could drive future collaboration:

- Development of best practice guidelines for waste management
- Public and green procurement
- Standardisation and certification
- Sustainable product / material design, e.g. design for recycling
- Mapping of components and traceability, e.g. electronic waste
- New frontiers for dismantling and separation
- Waste logistics
- Technology mapping
- Raising awareness on waste management, e.g. using social / new media
- Support to skills development and education
- Impact assessments
- Life cycle analysis of products, processes and services
- Motivational and behaviour research to drive recycling

This is by no means an exhaustive list and the mapping of further shared thematic priorities in waste research and innovation between Africa and Europe is supported, as and when appropriate.

Guiding Principles

Since waste management priorities are expected to vary both spatially and temporally within Europe and Africa, a JR&IA put forward a number of principles to guide future collaborative research and innovation work. Achieving these principles will contribute towards the improved management of waste, the increased recovery and recycling of waste, and the increased return of resources into the global economy. Further work should therefore ensure that these principles are considered within the scope of any future work.

These guiding principles are by no means exhaustive and are not listed in any order of importance or priority.

1. Multi-stakeholder participation

Addressing the complex issues associated with waste management, and the new opportunities that waste provides, requires strong partnerships between government, business, academia and civil society[5]. The positive role of business in resolving waste management problems has been well documented in both Africa and Europe. Pressure on the science community to show impact and relevance also requires a closer research and innovation relationship

5 The concept of twinning EU research organisations with AU research organisations, EU companies with AU companies, EU municipalities with AU municipalities has been proposed as one such mechanism to ensure that collaborative research and innovation is not one-side, i.e. only EU research organisations and businesses partnering with AU municipalities in a one-directional transfer of technologies, knowledge and funding.

with business and government, focussed on real issues. Civil society, as the generator of much of this waste, is also an important player in ensuring sustainable waste management practices. Moving towards source separation of recyclables, necessary for achieving increased recycling and recovery, requires an investment in behavioural change and local awareness rising.

2. Integrating the informal waste sector

Material flow analyses shows that the informal waste sector is an important component of the waste economy in Africa, particularly in the collection and separation of recyclables. In low- and middle- income economies the informal sector often collects larger quantities of recyclables than the formal sector (GIZ, 2011; Wilson *et al.*, 2013). In Europe, the informal sector has been largely neglected to date, however with the impact of the global economic recession, many people in Europe are turning to the waste sector for the economic opportunities it provides (TransWaste, 2012). To maximise the collection of recyclables from our waste streams, the integration of the informal sector into the formal waste economy is crucial. This must be done in a way that preserves existing livelihoods, either through the creation of formal employment opportunities and/or through the integration of informal and formal activities (Velis *et al.*, 2013). It is important that livelihoods in the informal sector are not destroyed through the creation of formal employment.

3. Development of SMEs in the waste sector

Both Africa and Europe recognise the importance of small- and medium-sized enterprises (SMEs) as a means of achieving economic growth and job creation (EC, 2008; AU, 2013). In many areas of waste management, such as cleansing and collection, the low entry level and skill requirements makes the sector a suitable one for SME development. However, as downstream users they are also most affected by market imbalances. Development of SMEs involves both stimulating new SME development as well as supporting existing SMEs in the waste sector.

4. Creation of decent jobs in the formal waste sector

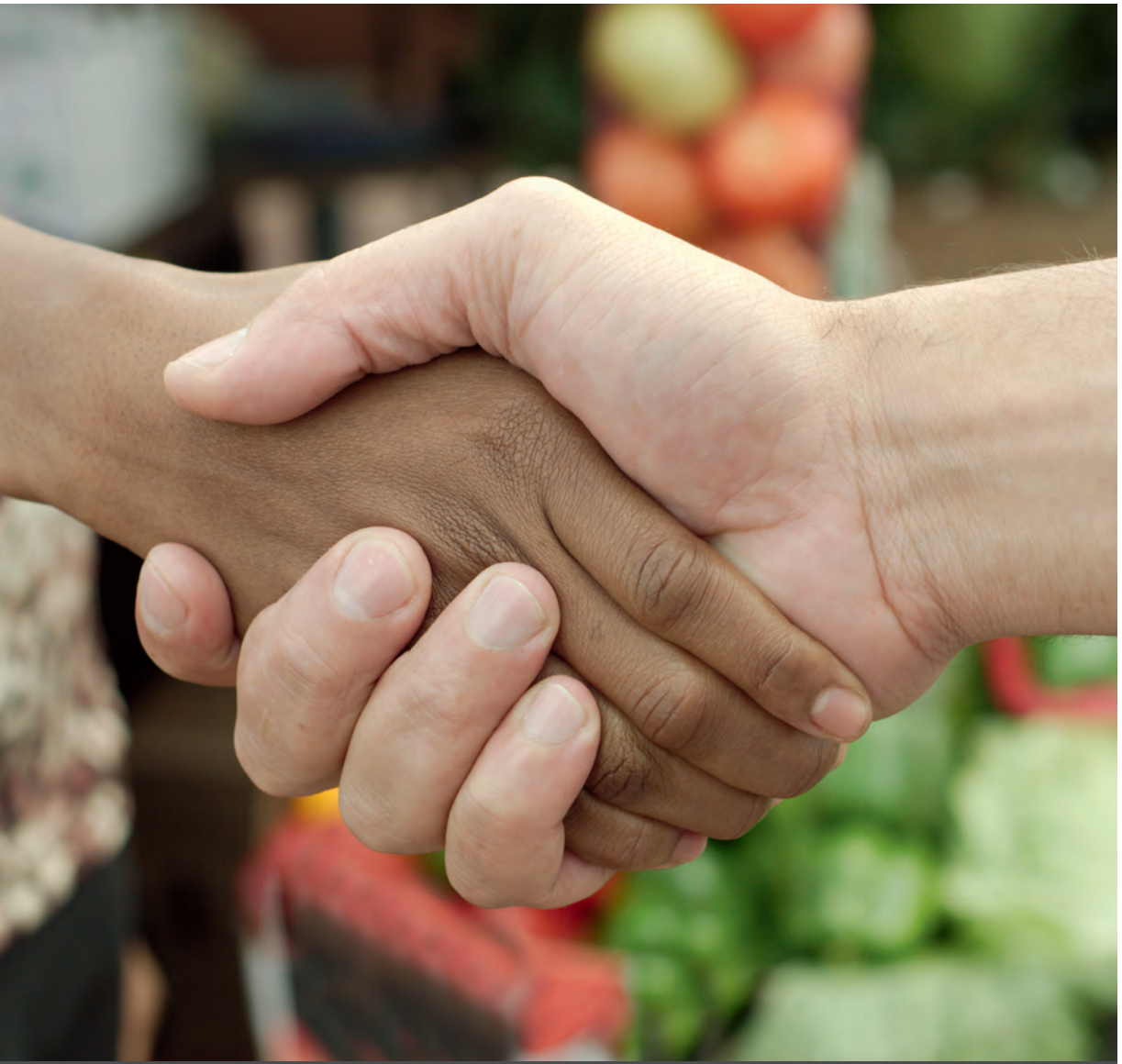
"*Decent work sums up the aspirations of people in their working lives. It involves opportunities for work that is productive and delivers a fair income, security in the workplace and social protection for families, better prospects for personal development and social integration, freedom for people to express their concerns, organize and participate in the decisions that affect their lives and equality of opportunity and treatment for all women and men*" (ILO, 2013). The recycling and recovery of waste provides significant opportunities for the creation of decent and formal employment (UNEP, 2011). This involves improving current working conditions and livelihoods, e.g. occupational health and safety, income and benefits. Training and education of people working in the waste sector is an important component of this.

5. Innovation transfer between the private and public waste sectors

Technological and social innovation is a key aspect to remaining competitive in the private waste sector. As such, the private sector is an important conduit for the flow of technological innovation into the public sector, e.g. municipal solid waste management (DST, 2013). Technology transfer between the private and public sectors, and vice versa, can be achieved through mechanisms such as public private partnerships.

6. Local innovation

It is acknowledged that European innovations (technological and social) are not always directly transferable into the African waste economy, and vice versa. Institutional, policy and financial support therefore needs to be given to identifying and developing local innovations suitable for local conditions and given local skills. This includes the adaptation of inbound technologies for local conditions. Mechanisms for transferring innovation from academia and science councils to business should be identified and supported, e.g. incubators, entrepreneurs-in-residence, technology parks.



7. Uptake of waste innovation by SMEs

SMEs are often reluctant or unable to adopt technological innovation, due to the high costs associated with technologies and the high financial and organisations risks associated with innovation. Support is therefore required to encourage SMEs to adopt innovation. This can be achieved through a number of mechanisms, for example, via partnerships between research and small businesses, and with financial instruments that incentivise local innovation by SMEs.

8. Promoting a circular economy

While a JR&IA in waste management is aimed at boosting collaborative research and innovation between Africa and Europe, it is important that projects understand their positioning with the global waste value chain. Important aspects to consider include extended producer responsibility, life-cycle of products (design for dismantling and recycling, cradle to cradle), and industrial symbiosis. Implementing the concept of a circular economy on the

ground often requires connecting local recycling with trans-boundary flows and a global value chain, transferring benefits and risks. A systems approach to minimising local and global environmental and social impacts of resource recovery, along with promoting clean material cycles, should also be prioritised (Velis and Brunner, 2013).

Enabling Conditions

It is recognised that achieving the above principles requires an enabling environment in Europe, Africa and between Europe and Africa, which is outside of the scope of this JR&IA. However, it is important to note in particular, the need for a:

- Supportive legal framework for waste management and resource recovery that recognises the role of e.g. the waste hierarchy, extended producer responsibility, and the polluter pays principle, and that this legislation is appropriately enforced on all;
- Supportive economic environment which stimulates local business development; creates a stable and secure business environment for the growth and development of SMEs in the waste economy; treats all players in the market on equal terms, neither favouring the big organisations nor the public sector; fights corruption; and allows for foreign investments.

Next Steps

It is acknowledged that individual European and African countries have, in instances, their own waste research and innovation agendas, roadmaps and research priorities. It is the intention of this paper to support these existing agendas, and to find synergies for research and innovation between the continents, building upon existing mechanisms and structures in individual countries.

Where countries do not have existing waste research and innovation agendas in place, they are encouraged to develop them; to identify priority waste issues which require addressing through focussed research, and which will lead to the adoption and local adaptation of technological and social innovations.

A JR&IA in Waste Management between Africa and Europe should be developed and conceived within the existing institutional and financial mechanisms, whether at national and/or international level. The following are some examples of such support mechanisms:

Joint Africa EU strategy (JAES)

The international situation and EU-Africa relations are constantly evolving, presenting new challenges and opportunities. Much remains to be done at the political and operational level in the run-up to the Africa-EU Summit in 2014, and both partners need to define the priorities of their cooperation in the years to come. By introducing the Agenda for Change and reconceptualising its development policy, the EU is putting greater emphasis on democratic governance, private sector development, and inclusive and sustainable growth, while pursuing a more focused and results-oriented approach. The AU will celebrate 50 years of continental integration in May 2013, and has embarked upon the definition of its own policy agenda and the reappraisal of its relationships with strategic partners. These crucial processes will be mainstreamed into the JAES and call for a refocusing of the Africa-EU Partnership. The joint agenda in waste management needs to feed such dialog.

The EU-Africa High-Level Policy Dialogue (HLPD) on science, technology and innovation (STI) between the EU and Africa is a key milestone in the implementation of JAES. The second meeting of the HLPD in November 2013 recommended that future STI cooperation would focus, among others, on eco/sustainable intensification pathways to food security (covering the whole supply chain, including waste).

Horizon 2020

The EU framework programme for research and innovation (EC, 2011b) called Horizon 2020, aims to tackle, among else, challenges in our societies, through bridging the gap between research and the markets. International

cooperation and partnerships are a major element and Africa is seen as a key regional partner. Horizon 2020 can be a valuable tool to support common research and innovation initiatives in the fields of waste management and resource recovery. For example, under Societal Challenge 5, Climate action, environment, resource efficiency and raw materials, a follow up of the pilot project on waste has been envisaged, aiming at developing a roadmap of potential joint European-African research and innovation actions, including knowledge transfer in the field of waste management.

European Innovation Partnership on raw materials

The EIP published a Strategic Implementation Plan (SIP) which sets out actions to support the delivery of the European raw materials strategy (EC, 2013c). One of the identified priority areas of the SIP is International Cooperation, which includes action areas on technology; governance and dialogues; health safety and environment; skills, education and knowledge; investment activities. These action areas provide considerable opportunity for collaborative research and innovation in the areas of by-products recovery and recycling. The European Innovation Partnership is a 'new' approach to EU research and innovation, which brings together all relevant actors at EU, national and regional levels in order to: (i) step up research and development efforts; (ii) coordinate investments in demonstration and pilots; (iii) anticipate and fast-track any necessary regulation and standards; and (iv) mobilise 'demand' in particular through better coordinated public procurement to ensure that any breakthroughs are quickly brought to market.

Country-to-country bilaterals

Many African countries have research and innovation bilateral agreements in place with individual EU member states. Where bilateral agreements identify waste or the green economy as priority areas, they provide mechanisms to give effect to this JR&IA.

One example is the South Africa – European Commission Joint S&T Cooperation Bilateral Agreement, where Waste Management and in particular this JR&IA will be flagged and proposed as a potential common area for cooperation.

UNEP/global partnership on waste management

The GPWM is a voluntary and collaborative relationship between various international stakeholders, in which all participants agree to work together and coordinate activities in a systematic way to enhance international cooperation and avoid duplication of efforts.

The GPWM supports the development of work plans to facilitate the implementation of integrated waste management at national and local levels to overcome environmental, public health, social and economic issues inflicted by waste and its impact. The GPWM also supports policy dialogues and other activities to exchange experiences, practices, and other information.

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