

# **NATIONAL CLEANER PRODUCTION STRATEGY**

**DRAFT FOR COMMENT- NATIONAL AND  
REGIONAL WORKSHOPS**

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**THE GOVERNMENT OF THE REPUBLIC OF  
SOUTH AFRICA**

# **NATIONAL CLEANER PRODUCTION STRATEGY**

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National and Regional Workshops

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**ABBREVIATIONS**

## **EXECUTIVE SUMMARY**

This draft of the National Cleaner Production and Sustainable Consumption strategy has been prepared for a series of consultation workshops to be conducted in November 2004. The strategy as contained in this document has been prepared from the inputs contained in the National Status Quo Report as well as the outcomes of consultations with National Government key stakeholders in the form of interviews and written feedback.

The starting point for the strategy is the recommendations of the Johannesburg Plan of Implementation for Sustainable Consumption and Production. The UNEP describes Cleaner Production and Sustainable Consumption as two sides of one coin. The focus for this strategy is on the Cleaner Production perspective because it provides more options for implementation in the 3 to 5 year period which is envisaged for the strategy.

The strategy has been prepared with a framework of identifying the main constraints to the implementation of Cleaner Production in South Africa as has been experienced over the past 10 years. Moreover, particular attention has been given a number of programmes which have included awareness building campaigns, demonstration projects and pilot schemes on cleaner production.

In order to overcome these constraints, four goals have been identified for the following strategic areas:

- Enforcement of appropriate regulatory standards
- Harmonization of Government policies and strategies
- Development of incentive and support schemes
- Availability of Information

These goals are supported by various objectives that must be completed. The objectives highlighted are believed to be measurable; time bound and identifies responsibilities for implementation where applicable. These objectives are discussed in greater in Section 7 of this document. Furthermore, optional activities to reach these goals are identified and are presented in Tabular form in Section 8.

The purpose of this version of the strategy document is to enable the wider stakeholder grouping within SA to provide comments and guidance for issues that are to be included in the in the next draft for the 2<sup>nd</sup> National Workshop which will be held in early 2005. A number of supporting documents and references are provided as background information and these contained in the appendices.

## **1 INTRODUCTION**

The Department of Environmental Affairs and Tourism's Branch for Environmental Quality Protection is embarking on developing a National Strategy for Cleaner Production and sustainable consumption. The strategy is being prepared by DEAT through the implementation of the Johannesburg Plan of Implementation (JPOI), with particular reference to the implementation of recommendations as contained in Chapter 3 on sustainable consumption and production. The key emphasis of the strategy is on the cleaner production aspect.

The UNEP describes cleaner production (CP) and sustainable consumption (SC) as being two sides of one coin and it is for this reason a strategy for CP cannot be separated from a strategy for SC. Within the implementation mandate at DEAT, i.e., Regulatory Services and Pollution and Waste Management, the immediate opportunities for strategic planning lie with Cleaner Production.

Based on the above the CSIR has been appointed by the DEAT to draft the National Strategy for CP and SC. The strategy as contained in this document has been primarily based on the findings of the national base line study<sup>1</sup> which was completed in August 2004 and consultations between the DEAT and other national government departments responsible for components of Cleaner Production. Based on these two major information sources a list of the policies and Acts that are believed to be the responsibilities of these various departments is provided as Appendix A.

This strategy document is being developed over 4 stages:

- Stage 1: Draft 1 of the strategy has been prepared for a steering committee composed of Government and Industry representatives. (Completed).
- Stage 2: Draft 2 of the strategy is revised version based on the inputs from the Steering Committee and submitted to a broader stakeholder base which includes a Reference Group of CP practitioners and civil society through conducting a series of workshops. (This document).
- Stage 3: Draft 3 of the strategy will be revised based on the input from stakeholder engagement, reviews and comments from the Steering Committee, and Reference Group and submissions for a final National workshop.
- Stage 4: The Strategy will be finalized and submitted to a parliamentary forum for approval.

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<sup>1</sup> Assessment of the Status Quo of Cleaner Production in SA, DEAT August 2004

## 2 VISION STATEMENT

A vision statement essentially explains what a strategy is about with a proposed long term perspective (more than 5 years) to achieve the implementation of the strategy. The vision statement for the National Cleaner Production Strategy is proposed as follows:

**The vision of the SA Government is:**

**To enable SA society and industry to develop to its long term full potential, by adopting the recommendations of Chapter 3 of the JPOI on sustainable consumption and production, by:**

- 1: Adopting the principles of Cleaner Production, i.e., continuous application of an integrated and preventative strategy applied to products, processes, and services so as to increase eco-efficiency and reduce risks to humans and the environment, by using a full life-cycle approach, and
- 2: Promoting the practices of sustainable consumption, ie, use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well emissions of waste and pollutants over the life-cycle so as not to jeopardize the needs of future generations.

**A Cleaner Production and Sustainable Consumption programme involves decisions which impact on outcomes in the social, economic as well as environmental domains. DEAT as the custodian for implementation of JPOI and responsible for protection of the environment will be the lead agent and will work to harmonize national strategies and policies so as to achieve this vision.**

## 3 CONTEXT OF CP IN SOUTH AFRICA (ADAPTED FROM – CP STATUS QUO REPORT)

Cleaner Production describes a preventive environmental approach, aimed at increasing resource efficiency and reducing the generation of pollution and waste at source, rather than addressing and mitigating just the symptoms by only technically “treating” an existing waste/pollution problem. In essence, Cleaner Production is about:

- Preventing waste and pollution at source
- Minimising the use of hazardous raw materials
- Improving water and energy efficiency
- Reducing risks to human health
- Saving money

- Improving efficient management practices
- Promoting sustainable development

Cleaner Production includes measures to conserve raw materials, water and energy and measures to reduce at source the quantity and toxicity of all emissions and wastes being emitted to air, land and water. Furthermore, this approach embraces the '*cradle-to-grave*' principle, the '*precautionary principle*' and the '*preventive principle*'. Because Cleaner Production addresses the problem at several levels at once, it is a holistic integrated preventive approach to environmental protection.

Cleaner Production is a subsidiary element of South Africa's commitment to sustainable development. The World Summit on Sustainable Development, held in South Africa during 2002, placed Sustainable Development high on international, regional and local agendas. The world and South Africa's commitment to sustainable development was cemented in the Summit Declaration, entitled the '*The Johannesburg Plan of Action*'<sup>2</sup>, which South Africa is in the process of implementing.

One of the outcomes of the Summit was the formation of the UNIDO National Cleaner Production Centre (NCPC), formed by an agreement between the dti, the CSIR, UNIDO and the donor countries of Austria and Switzerland. The objective of this Centre has been to stimulate wider use of Cleaner Production in South Africa in partnership between Government and other major role players, e.g. industry manufacturing, processing, and mining, agriculture, and the consumer.

However, prior to the establishment of the NCPC, a number of (not necessarily coordinated) CP initiatives – by Government, industry bodies, universities, research organisations, and donor agencies (most notably DANIDA and NORAD) – have taken place, mainly in the form of research and demonstration projects.

Overall, there has been a growing trend of CP related activities within the national economic development arena. Whereas the private sector is more focussed on the practical industry based implementation of CP projects, the public sector has been actively involved in an array of activities including research, policy formulation, project financing and implementation. Moreover, local academic, research institutions and privately owned consulting firms are also actively conducting CP related research, creating awareness and documentation of local and international best practices regarding the emerging CP phenomenon and its potential benefits to the participating industries.

Some of the earliest CP-related initiatives were funded by the Water Research Commission (WRC). The work of the WRC on waste minimization and water management goes back a

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<sup>2</sup> WSSD (2002) The Johannesburg Plan of Action, September 2002.



long way and with perhaps a more sustainable impact than the more recent and well-known DANIDA initiatives. The majority of these initiatives have been aimed at promoting Cleaner Production practices in South Africa through research and demonstration projects. While the focus thus far for the WRC has been on the food and beverage, leather, textile, pharmaceutical, and metal finishing sectors.

Recent successes have been well publicized in the fisheries, metal finishing and textiles industries (largely as a result of the DANIDA intervention) other industrial sectors (automotive, chemical). Local Govt are also increasingly implementing Cleaner Production through initiatives such as the Waste Minimisation Clubs.

There are a number of significant milestones regarding the introduction of Cleaner Production in South Africa in recent years. These include:

- The WRC funded research projects into water management and waste minimisation starting which included the first Waste Minimisation Clubs in South Africa
- The Southern African Regional Conference on Cleaner Production, held in May 1997 with over 300 delegates from 12 African countries; this was hosted by DEAT and the Industrial Environmental Forum of Southern Africa (IEF) with core funding provided by DANCED
- The inclusion of CP-related aspects into national policy and legislation on waste management, pollution control, water management & energy
- DANCED's demonstration projects in the fisheries, metal finishing (electroplating and hot-dip galvanising), and textiles sectors<sup>3</sup>
- The establishment of Waste Minimisation Clubs in the Durban, Gauteng and Cape Town region and development of a WMC facilitator guideline document in 2002 (the latter was initiated by the Water Research Commission (WRC)<sup>4</sup>
- Development of CSIR (Green Buildings for Africa): Waste Minimisation Guideline document for Facility Management, and Minimization and recycling in the construction industry.
- Development of the DWAF water resources management strategy as an example of government's move towards cleaner production (See the Draft of Water Conservation and Water Demand Management)
- 1997-2000 UCT Chemical Engineering: Detailed CP assessments in 12 companies (textile and metal finishing sectors) in Cape Town and Durban as part of the Industrial Symbiosis Project;
- The publication of a waste minimisation guide for the textiles industry initiated by the WRC<sup>5</sup>
- The creation of a dedicated Cleaner Production unit in DEAT

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<sup>3</sup> <http://www.nu.ac.za/cleanerproduction/>; <http://www.enviropating.co.za/home/enviropating.html>

<sup>4</sup> <http://www.nu.ac.za/wasteminclubs/>

<sup>5</sup> <http://www.nu.ac.za/wasteminclubs/>

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- Adoption of Cleaner Production as a cross cutting technology in the DST Advanced Manufacturing Technology Strategy in 2002
- The establishment of the National Cleaner Production Centre (NCPC) in 2003 and the initiation of training activities by the Centre
- The establishment of the Cleaner Textiles Environmental Linkage Centre (CTELC) by Danida in 2003 at the CSIR branch in Cape Town.
- The DANIDA Evaluation of CP activities in South Africa<sup>6</sup> and the publication of the Business Guide on Cleaner Production in South Africa<sup>7</sup>
- “Embracing Sustainability Makes Good Business Cents”, a conference held in Durban in March 2004, organized by the Durban Chamber of Commerce and Industry, in conjunction with the National and Provincial Government, the NCPC and the dti
- Publishing of cleaner production catalogue and client education poster (for wider industrial application) from the Electroplating industry
- Specific training of local authorities on Cleaner Production supported by the DANIDA CTPP as well as the publication of a Generic Guide for regulators on CP<sup>8</sup> as well as a sector-specific Guide for regulators on CP in the Textile Industry<sup>9</sup>
- The initiation of the WRC-funded research & implementation project on Cleaner Production in the Mining Industry in April 2004

The majority of these initiatives have been promotion, research and/or demonstration projects and there remains significant scope for the wider adoption of profitable CP practices within South African business and industry sectors. Although there have been a number of detailed assessments<sup>10</sup> of the adoption of CP within Europe and the North America, until recently there have been few comprehensive reviews of the implementation of CP in South Africa.

The most recent major investigation into the state of Cleaner Production in South Africa was undertaken in 2003 for DANIDA<sup>11</sup>. Although the focus of this report was on the DANIDA CP projects, it also included an overview of other CP projects in South Africa.

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<sup>6</sup> Hanks, J and Janisch, C: *Evaluation of Cleaner Production Activities in South Africa (with a particular focus on DANIDA supported initiatives)*, Evaluation Mission Report, DANIDA, Danish Embassy Pretoria, July 2003

<sup>7</sup> Heatherington A, DANIDA, 2003, *Cleaner Production in South Africa-Lessons learnt in environmental assistance*

<sup>8</sup> Hanks, J. and Janisch, C. (May 2004): *GENERIC GUIDELINE, Promoting Cleaner Production Practices in South African Businesses*, for the DANIDA Cleaner Textile Production Project, Pretoria, South Africa

<sup>9</sup> Hanks, J. and Janisch, C. (May 2004): *Regulator’s Guide on Cleaner Production – Sector-specific guide for the Wet-textile Processing industry*, for the DANIDA Cleaner Textile Production Project, Pretoria, South Africa.

<sup>10</sup> See e.g. Clayton, A, Spinardi, G & Williams, R, 1999. *Policies for Cleaner Technology: A New Agenda for Government and Industry*. London: Earthscan; OECD, 1997. *The Promotion and Diffusion of Clean Technologies in Industry*. Environmental Monograph No 9. Paris;

<sup>11</sup> Hanks, J and Janisch, C: *Evaluation of Cleaner Production Activities in South Africa (with a particular focus on DANIDA supported initiatives)*, Evaluation Mission Report, DANIDA, Danish Embassy Pretoria, July 2003

## 4 RATIONALE FOR A STRATEGY ON CLEANER PRODUCTION

Problem statement:

CP has been shown to be a good tool, but has not yet been well implemented nationally.

### 4.1 Benefits of adopting Cleaner Production to the South African Context

Cleaner Production has been shown internationally to be essential if South Africa is to remain competitive in external markets as well as internal markets in the face of increasing pressures of globalisation. Implementation of cleaner production will result in products and product processes being more cost effective and less harmful to the environment. There are a number of benefits that can be achieved if South Africa adopts cleaner production principles and methods. Some of these benefits are listed below.

- **Reducing Environmental Degradation**

Cleaner production is a positive and proactive approach for the improvement of the environment. CP promotes the prevention of the generation of pollution and brings about more efficient use of resources. The European Environment Agency<sup>12</sup> strongly contends that the CP is aimed at meeting human needs without endangering the health of people or the integrity of the eco-systems on which they depend. The approach also places emphasis on the need for individual actions and the desirability of encouraging all companies to participate in environmental schemes. CP is, therefore, seen as an important small economic step to achieving the global targets of avoidance of environmental damage and the depletion of resources.

- **Economic benefits**

Environmental degradation produces serious impacts on human health and results in a substantial drain on the national economy of any country. There are direct economic savings related to the implementation of cleaner production within an industrial context in South Africa. Benefits that can be achieved if South Africa adopts cleaner production principles have been obtained from the industry CP projects (textiles project).

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<sup>12</sup> European Environment Agency (2002)

**Example of potential benefits 1: Textile sector data at facility level**

A post project survey of participants in the Danida Cleaner Textiles Production Project showed by October 2003 that on average, the 16 production facilities reported annual savings of R 1.2 m pa each, as the result of reduced water, energy, chemicals and effluent charges. For the eight facilities that reported on water savings annual average savings were 100 000 kl each.

**Example of potential benefits 2: Textile sector data at industry sector level.**

Estimated potential savings for the textile industry can be made using the results of the facilities that have adopted the principles most strongly. These indicate that savings of the order of 1.5% pa of turnover can be targeted. For continuous improvement over 3 years this presents a net potential saving of 4.5% of turnover pa. Sales from domestic production in 2002 were approximately R 6b. This yields a target of R 270 m pa in savings in 2002 Rands.

Another component of economic benefits includes the savings from the cost of environmental degradation by industries in South Africa if cleaner production measures are not adopted. In essence, a monetary estimate is placed on impacts on the economy that would be ascribed to environmental degradation. This value does not correspond to any intrinsic of value but rather estimates costs related to economic losses like health, utility or productivity losses due to poor quality of water, poor water management, air pollution, accumulated waste soil erosion and endangered species.

- **Improving the quality of life**

The implementation of CP can result in an improved economy due to increased efficiency products and processes, a reduction in waste and emissions streams and a reduction in environmental degradation. The overall result will be an improvement in quality of life for the people of South Africa.

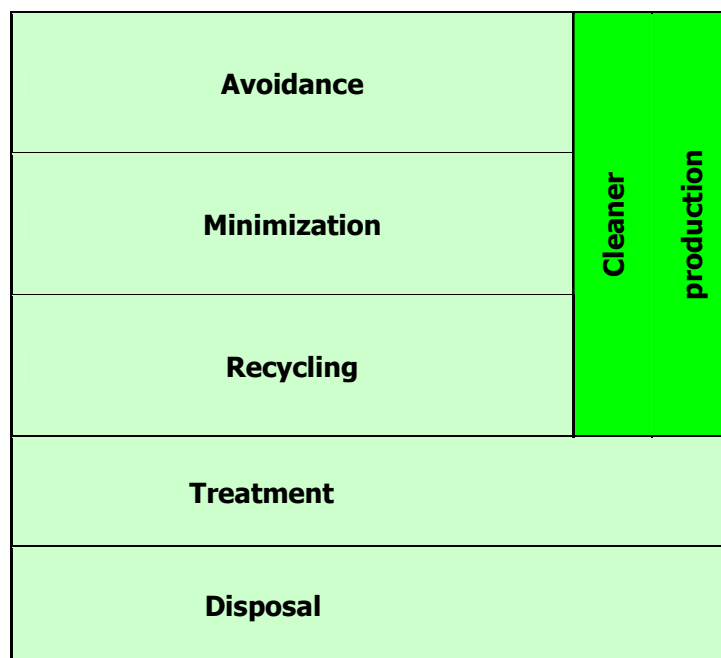
Cleaner production in essence can result in a sustainable production scenario in the South African context. CP aims to combine all aspects on sustainability, since it is promotes non-polluting; conserving of energy and natural resources; increased efficiency; safe and healthy conditions for workers, communities and consumers.

- **Other benefits**

Other benefits arising from adopting cleaner production principles encapsulates aspects such as increased productivity, achieving cost effectiveness, and improved competitiveness in global markets.

## 5 BACKGROUND TO WASTE MINIMIZATION, CLEANER PRODUCTION AND THE HIERARCHY OF WASTE MANAGEMENT

The National Waste Management Strategy<sup>13</sup> has identified a hierarchy of approaches to the effective management of waste which is illustrated in the following below.



**Figure 1: Hierarchy of waste management**

The hierarchy identifies the priorities for waste management and is a paradigm shift away from focussing on improved methods for treating and disposing of the waste, towards efforts at reducing the amounts of waste produced.

Cleaner production encompasses the first three strategies i.e. avoiding the production of waste, minimizing the amounts of waste, and recycling or reusing the waste. Cleaner production and waste minimization are often used interchangeably. The main difference is the additional focus of cleaner production on improved productivity and reduced impact as the result of design over the life of products, processes and services. For SA Industry and Govt this means minimizing waste by improved efficiency of existing operations, introduction of recycling activities to recover value from waste, and redesigning the products and services so as to avoid waste over the consumption life cycle.

<sup>13</sup> National Waste Management Strategies and Action Plans for SA: National Waste Management Strategy, 15 October 1999, ref: 4.1.19

### **5.1 Avoidance Strategy**

The avoidance strategy avoids producing the waste by changing the way that. New technologies or ways of providing services may not be proven and therefore are only adopted after pilot trials.

### **5.2 Minimization or Prevention Strategy**

This strategy minimizes waste production using the same basic technology but a new procedure, e.g. non-toxic chemical materials, or lower temperature production procedures that save energy.

There can be additional benefits, such as simpler stock control for cold chain management<sup>14</sup>. The benefits and disadvantages of these changes are being continually researched in Cleaner Production programmes and industrial development.

### **5.3 Recycling Strategy**

The recycling strategy identifies ways in which disposable items can be used for other applications without posing additional safety risks to waste handlers and the public.

In some cases the costs and health risks for recycling may show that recycling is not viable in South Africa, e.g., recycling of mercury. Better opportunities therefore will exist for minimizing or avoiding the waste, e.g., stock control, or use of alternative technologies for temperature measurement.

The main success of the cleaner production approach is the self funding nature of improvements in efficiency. The cost savings realised through implementing change can be used to fund the work required to identify the changes, and the training and equipment that are required to implement the changes. Cost savings can be as follows:

- Reduced material cost;
- Reduced waste disposal and treatment cost;
- Reduced labour cost due to elimination of rework, and simplification and streamlining of activities.

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<sup>14</sup> “cold chain” is the description given to the physical equipment and logistical operations which ensure that temperature sensitive medicines are maintained below the upper temperature limit over the time from manufacture to injection in the patient.

## 6 KEY CONSTRAINTS TOWARDS OBTAINING CLEANER PRODUCTION IN SOUTH AFRICA

The key constraints provided below have been developed from the following sources of information:

- 1) DANIDA<sup>15</sup>/UNIDO/NCPC CP Sector study assessments (i.e., chemical<sup>16</sup>, food<sup>17</sup>, textile<sup>18</sup>, and health care sector<sup>19</sup> studies);
- 2) DEAT Report – Assessment of Status Quo of Cleaner Production In South Africa; and
- 3) Interviews with relevant national government departments.

**Constraint 1:** Inconsistent enforcement of regulations to protect the environment.

- There is an absence of a working policy on integrated pollution control and pollution prevention. Permits for release (air, water, solid waste) of hazardous substances from an enterprise or institution are not coordinated.
- Due to changes in demarcation of municipal boundaries and the change in workforce, as well as limited staff complements, the standards of inspection and testing of waste releases to sewer, air and land are not uniformly and consistently applied.
- For this reason some industries are confused as to what standards can be acceptable for waste release and see possible enforcement of existing regulations and new standards as a threat to current levels of profitability.
- Some government authorities see enforcement of effluent standards as a source of income to finance expenditure on loss making activities in the municipality. This situation does not provide for incentives of waste minimization of hazardous wastes as charges and penalties are not used to discourage the release to sewer, air and landfill.
- This problem is experienced in the small to medium enterprises and inexperienced municipalities as well as larger enterprises and municipalities when decisions relating to waste disposal are based on cost alone.

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<sup>15</sup> Evaluation of cleaner production activities in SA (with specific focus on Danida supported initiatives) Evaluation mission report, Danida July 2003

<sup>16</sup> Development of national sector specific cleaner production action plans: Chemical Sector Analysis, Draft Final, CSIR report HT411 for UNIDO July 2004

<sup>17</sup> Development of national sector specific cleaner production action plans: Food Sector Analysis, Draft Final, CSIR report HT411 for UNIDO August 2004

<sup>18</sup> Development of national sector specific cleaner production action plans: Textile Sector Analysis, Draft Final, CSIR report HT411 for UNIDO July 2004

<sup>19</sup> Generic waste minimization principles and initiatives in health care institutions and facilities in the Western Cape, CSIR and Basel Convention Centre report HT408 for DEA&DP June 2004

**Constraint 2:** The fragmented approach in Government departments to the triple bottom line for sustainable development.

- There is a lack of holistic approaches to the entire production and consumption cycles so as to improve productivity, improve resource efficiency, improve access to basic needs, and quality and competitiveness of technologies used in SA industries.
- Some job and technology promotion programmes see regulations to protect the environment by permits and charges as a threat to viability of SME programmes.
- Some government departments have procedures which discourage maintenance, and capital investment in efficient technologies that will provide savings through improved resource efficiency.
- Charges for resource usage and waste disposal are seen as incentives for international investment in SA. Consumption charges of natural resources are relatively low compared to other production costs. Programmes to minimize wastage are, therefore, seen by industry to have low ROI's. For example, low energy costs intended to encourage industrial development, discourage efficiency.
- South Africa is universally agreed as being a water deficient country. However, water charges and effluent disposal charges are significantly lower than international trading partners and competitors. These encourage higher consumption rates in SA industry.
- Eco-labelling has not been adopted as a policy in SA.
- There are limited policies to adopt industry sector approaches to CP in waste management and industrial development schemes. This results in an absence of technical guidelines and limited numbers of government personnel with knowledge (also due to low R&D levels) on industrial waste management, as well as unfocussed incentives for development.

**Constraint 3:** Although Cleaner Production is almost universally accepted as a worthwhile concept by those aware of it in Government circles in SA, there is a lack of incentive programmes (including training, R&D, access to loans, venture capital, and technical assistance) that can be used to assist SA industry and Government services to adopt international practices and develop appropriate local solutions to local problems.

- A lot of industrial production is based on old equipment and old technologies. This is in part due to the historically high cost of capital (interest rates), and the perception that new, and imported equipment is expensive. Also there is a perception that new technologies may not yield new market opportunities, and changes to production equipment may not meet the ROI required by shareholders.
- Current government incentive schemes are not focussed on Cleaner Production.



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- Banks and financial institutions have not recognized the status of Cleaner Production in an enterprise as an indicator to potential profitability and reduced environmental liabilities.
- Access to capital for SME's to implement CP improvements is not readily available in SA.
- A regulatory framework and legal framework for supporting CP is in place but not enforced.

**Constraint 4:** Lack of information, knowledge and awareness in SA Government, industry, and consumers on the costs and benefits of implementing Cleaner Production.

- Industries, in particular small and medium sized, are not in the position to assess the business risk associated with investment and returns that can be achieved through use of cleaner production and eco-efficiency. Information on success stories is available in some sectors but Government support and institutional anchorage are still developing.
- Benchmarks on productivity and resource efficiency are not widely available to SA industry sectors. As a result there is ignorance of the potential for waste reduction and cost savings.
- The importance of use of environmentally sound technologies for export markets is not fully understood by SME industries.
- Government awareness is growing on the potential for CP but a limited number of personnel have the knowledge to link pollution enforcement activities with the promotion of EST's and the use of economic instruments, while maintaining jobs and economic competitiveness.
- Consumer awareness is growing, but the information on how to identify more eco-efficient products is not available.

## **7 STRATEGIC GOALS AND OBJECTIVES**

Based on the key constraints highlighted above, four strategic goals have been identified to overcome the constraints. Each goal is defined to encapsulate the following key characteristics:

- Must be completed so as to enable the vision statement to be reached (i.e., not nice-to-have),
- necessary to the mission,
- attainable in the mid-term, i.e., 3-5 years,
- measurable so that they can be planned, and resourced
- formulated at situations that will occur in the future
- supported by actions that provide the "how's" for the achievement of the objective by the responsible resources within the target time period

In line with the goals identified above a number of strategic objectives are also proposed to implement the goals and to give effect to the CP strategy. The objectives (with identified responsibilities) are listed according to the convention of the four goals highlighted.

### **GOAL 1: Enforcement of appropriate regulatory standards**

It is anticipated that this goal will be achieved by Government setting strategic objectives that define pollution<sup>20</sup> and set standards to control pollution within the developmental objectives for South Africa. This can be achieved by setting appropriate standards for release of waste to the environment, and enforcement of regulations for measuring acceptable environmental quality and for protection of the environment.

Enforcement requires an efficient compliance monitoring system and an efficient system for handling of offences. It is expected that efficient enforcement will make use of waste information systems at facility level, e.g., part of ISO 14000, and at regional level, e.g., components of the National Waste Information system and the legislative framework defined by NEMA.

The strategic objectives identified for this goal is the protection of natural resources that are feasible for completion within the 3-5 year time horizon.

#### **Strategic objective 1.1: Protection of water resources (DWAF)**

- National regulations and standards will be enforced by DATE for all sectors identified in the DWAF strategic plan, i.e., municipalities, mining, etc.

#### **Strategic objective 1.2: Protection of air quality (DEAT)**

- National regulations and standards will be enforced by DATE for all controlled and listed emitters.

#### **Strategic objective 1.3: Protection of soil and land (DWAF/DEAT)**

- National regulations and standards for the disposal of hazardous wastes on land will be enforced by DATE .

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<sup>20</sup> Pollution definition as per Draft NIWMB March 2004.

**Strategic objective 1.4: Mining industry environmental protection and resource use efficiency (DME)**

- Regulations and standards for the release of waste to the environment from the mining sector will be enforced by DATE.

**Strategic objective 1.5: Waste information systems**

- Mandatory reporting/information disclosure requirements for hazardous 21 waste inventories (DEAT, DWAF, DME) by DATE.

**Strategic objective 1.5: Product Stewardship**

- Regulations and guidelines for extended product responsibility (dti, DEAT, DWAF, DME, National Treasury) by DATE.

**GOAL 2: Harmonization of Government policies and strategies**

It is expected that this strategic goal will need to be achieved by DEAT as ultimately they would be responsible for waste management in all forms of media<sup>22</sup>. Other National government departments who share responsibility for waste management will also need to jointly set strategic objectives in line with each department's national mandates. This will assist SA to meet the triple bottom line of social, economic and environmental sustainability, and support the achievement of the other 3 goals. The strategic objectives proposed for this goal include:

**Strategic objective 2.1: Coordination of policy and regulation development with the following current themes.**

- Natural resource usage (DST, DME, DWAF, DEAT, Treasury with consultation to responsible State Enterprises, e.g., ESKOM).
- Waste management systems that support recycling and reuse and encourage income generation, and environmentally sound disposal systems (DEAT, DoH, with consultation to DBSA, appropriate structures that involve Provincial and Local Governments).

<sup>21</sup> Reporting on general waste inventories is considered a lower priority and not feasible within the next 5 years within the current conditions in SA.

<sup>22</sup> Draft NIWM Bill March 2004

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- Economic and industrial development policies (R&D, economic investment, infrastructural development) relating to environmental change (DEAT, dti, Treasury)
- Social development policies related to resource usage (basic needs, and employment) (DEAT, Housing, Local Government, Education). Coordination of job creation and poverty alleviation programmes (DEAT, Treasury)
- Re-usable consumer goods, guidelines for production and labelling and developing infrastructure (DEAT, dti, DST)
- DATES as per themes

**Strategic objective 2.2: Incorporation of the UNEP recommended policy principles in evaluation of national government policies for waste management.**

These include the following:

- Continuous improvement
- Transparency
- Eco-efficiency
- Precaution
- Life cycle thinking
- Polluter pays principle
- Common but differentiated responsibilities
- DATE to incorporated as above

**Strategic Objective 2.3: Use of a national technical institution such as the National Cleaner Production Centre to provide co-ordinated national studies that provide the information required by governments CP coordination forum and ensure common understanding of implications of policy decisions over the full life cycle.**

This will provide technical information for decisions based on scientific methods such as Life Cycle Assessments (e.g., environmental with cost) , National Base Line studies, Mass Flow Analyses, Environmental Impact Assessments. (DTI, DEAT, DWAF, DME, DST) (DATE).

**GOAL 3: Development of incentive and support schemes**

It is expected that this goal will be achieved by Government setting strategic objectives that provide financial and support measures that facilitate the adoption of cleaner production and sustainable consumption. To be effective, the incentives and support measures should be targeted at industries and their technologies which produce high levels of pollution and which provide services and products which consume unacceptable quantities of resources which create ultimately results in unacceptable quantities of waste streams. The strategic objectives identified for this goal include:

**Strategic Goal 3.1** Establishment of sector improvement programmes incorporating incentives for adoption of production efficiency techniques and EST's that are based on the practices of CP and Eco-efficiency. Specific attention should be given to SME's. (dti, Treasury, DEAT, DWAF, DME) by DATE.

**Strategic Goal 3.2** Development of guidelines for the calculation of environmental costs and the assessment of economic instruments for existing and proposed resource charge systems, e.g., water, effluent, energy charges to industry and municipalities. In principle, the polluter should pay for the costs of pollution with due regard for public interest without distorting trade or investment<sup>23</sup> (DEAT, Treasury, DWAF, DME) by DATE.

**Strategic Goal 3.3** Creation of level playing field between incentives and subsidy/levies amongst renewable energy, energy efficiency, advanced energy technologies, and centralized, decentralized, and distributed energy systems.<sup>24</sup> (DME, Treasury, DEAT, DWAF) by DATE.

**GOAL 4: Availability of information**

It is expected that this goal will be achieved by government and industry through accomplishing the strategic objectives for information accessibility to support investment, and regulatory enforcement on wastage, efficiency, and competitiveness for:

- technologies for production; and
- products and services.

The key strategic objectives that have been identified for this goal are:

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<sup>23</sup> Referred to in JPOI 18-b

<sup>24</sup> Referred to in JPOI 19-j

**Strategic objective 4.1:** An operating network of cleaner production and sustainable production information centres (e.g., based on the UNEP/UNIDO model), at national, industry, and regional level, with focus on the needs of consumers, government/municipalities, SME's, NGO's, schools, and industry sectors. (dti, DEAT, DWAF, DME, DST) by DATE

**Strategic objective 4.2:** A S&T programme focussed on CP and SC which develops capacity and develops contextually relevant information for SA at schools, tertiary institutions, S&T institutions, and industry research bodies. This information is then being used to improve quality of life, industrial competitiveness, and employment opportunities by SA Govt, industry and the community.

## 8 OPTIONS FOR ACTIVITIES TO MEET EACH STRATEGIC OBJECTIVE

A number of problems have been identified in the Status Quo Report <sup>25</sup> and are identified in the DEAT consultation document<sup>26</sup>. Optional activities have been identified in order to provide solutions to the specific problems. The options are listed within the framework of the strategic goals.

Other options to meet the objectives may be identified during the consultation process being followed to develop the strategy. The acceptability of these options should be assessed for acceptability by DEAT and the stakeholders.

### 8.1 Optional activities to meet objectives in goal 1: Enforcement of appropriate regulatory standards

No	Optional activities to meet Objectives	Responsibility	
		DEAT	other
1	CP audit requirements incorporated into permits for air, water, solid waste/pollution release to the environment for 1: industrial, 2: Government entities. This will include the requirement for targets to reduce wastage. The example being used by EThekwini for Hammarsdale is used as a pilot.	DEAT	DWAF, provinces, district/metro councils
2	Monetary evaluation of pollution and waste is included in permits for waste/pollution release to environment for 1; industry, 2. Government entities	DEAT	DWAF, provinces, district/metro councils

<sup>26</sup> Introduction document DEAT stakeholder consultation, Oct 2004

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3	Assessment of Industrial Ecology waste management options is included as an impact mitigation item is included in Sect 24-5 NEMA regulations out for comment 25 June 2004, and ECA amendment R 1182 Sept 1997	DEAT	
4	NAQMB and NIWMB incorporate provisions that accommodate CP	DEAT	
5	New regulations are developed under NEMA for a framework to handle specific industry waste problems, (check progress on e.g. motor vehicle tyres DEAT and industry cooperation agreement)	DEAT	

### 8.2 Optional activities for objectives in goal 2: Harmonization of Government policies and strategies

No	Optional activities to meet Objectives	Responsibility	
		DEAT	other
1	Operation of an inter-departmental standing committee that addresses the needs of cleaner production and sustainable consumption with respect to pollution control. This should be managed by DEAT and could be an existing successful committee, e.g., NEMA. This committee will ensure that the conflicting demands between economic, social and environmental development are understood and addressed in policy and regulations.	DEAT	DWAF, DME, dti, Treasury and other departments as needed
2	Long term agreements are developed between government, the private sector and Nedlac, on voluntary agreements for the implementation of CP in industries to allow for capital investments on cleaner technologies see 3.6 DEAT participant in Nedlac	DEAT	Nedlac, dti, BUSA, relevant Depts
3	Industry sector agreements are developed by CP demonstration projects that address key pollution abatement problems, e.g., the car tyre recycling project	DEAT	dti, industry associations, relevant Depts
4	Agreement is reached on voluntary and regulatory standards that affect the ability of SA Government and industry to sell carbon credits, e.g., waste regulations relating to the release of global warming gases from landfills.	DEAT	DME, DWAF, Treasury

### 8.3 Optional activities for objectives in goal 3: Development of incentive and support schemes

No	Optional activities to meet Objectives	Responsibility	
		DEAT	other
1	Where feasible inclusion of CP and EI into current incentive schemes. Introduction of support schemes for the promotion of CP	DEAT	dti, DME, DST, DWAF, Nat Treasury
2	National strategies for resource use include internalization of costs as part of SD policy in line with national imperatives (e.g., jobs, and poverty), and policy on JPOI	DEAT	dti, DME, DST, DWAF, DLA, National Treasury
3	DEAT successfully promotes the inclusion of BAT in National strategic resource policies. This will include promotion of EST's, efficient technologies, and innovation for competitiveness, job creation, and productivity in line with national imperatives and JPOI	DEAT	dti, DME, DST, DWAF, DLA, Nat Treasury
4	DEAT develops guidelines for management accounting systems to incorporate environmental costs	DEAT	Nat Treasury
5	DEAT develops a cost effective Government procurement guideline that promotes CP and meets the needs of other departments for SD (triple bottom line)	DEAT	Nat Treasury, cabinet
6	Promotion of CP investments is specified in Growth and Development Summit Agreements (Nedlac: 7 June 2003 and subsequent summits). DEAT is a participant in CP and SC agreements reached at Nedlac.	DEAT	dti, National Treasury



#### 8.4 Optional activities for objectives in goal 4: Availability of information

No	Optional activities to meet Objectives	Responsibility	
		DEAT	other
1	DEAT builds capacity in government on enforcement and understanding of CP. This can be carried out using SA expertise and institutions. R&D projects can be used to build capacity.	DEAT	DST, DWAF, DME
2	Capacity of consumers to pressurize suppliers of CP goods and services is built by implementing an Eco-labelling system,		dti has the mandate
3	The perception that CP is a cost factor rather than an opportunity for savings is overcome by way of promotion of case studies, and information generated and promoted by Govt supported institutions, e.g., NCPC, WRC, ESKOM	DEAT	dti, DME, DWAD
4	Information systems on CP are developed and focussed at industry sectors, government, and consumer level.	DEAT	dti, DME, DWAD
5	Reward, recognition and promotion of industries that achieve high environmental performance through the application of CP is achieved by way of a national competition for sustainable industries (like the ESKOM awards).	DEAT	DWAF, dti, DME, DST
6	CP and SCP principles and practices are included in curricula at schools, professional courses, and SETAs	DEAT	DST, Dept of Education, dti, BUSA, Dept of Labour
7	DEAT in partnership with the Consumer Council of SA provides assistance to consumers (organizations and individuals) to make environmentally responsible choices by the establishment of a programme for awareness of goods and services.	DEAT	dti, BUSA, DST, DWAF, DME
8	Baseline of CP practice, by which industry can measure its own performance and improvement (see 3.3) is developed for technologies that pollute, e.g., NAQMB listed and controlled emitters, proposed schedule for NEMA, and other technical regulations. These are compared with international trade requirements, and best international practices	DEAT	dti, BUSA, DST, DWAF, DME

**PART 2: BACKGROUND INFORMATION DOCUMENTS**

**APPENDIX A: POLICIES AND ACTS OF KEY NATIONAL STAKEHOLDERS**

The policies and applicable Acts that summarize the National Department responsibilities are as follows:

- DEAT:
  - NEMA (1998)
  - National Air Quality Bill (in progress)
  - National Integrated Waste Management Bill (in progress)
  - White Paper for Integrated Waste Management for SA, 2000
  
- DST:
  - National R&D strategy
  - National Manufacturing strategy
  - Technology for resource based industries (not documented)
  
- DME
  - National Energy Bill
  - National Alternative Energies Policy
  - Integrated Energy plan for SA, March 2003
  
- DTI
  - Integrated Manufacturing Strategy
  - Micro-Economic Reform Strategy
  - Medium Term Strategic Plan 2004/5 – 2006/7
  - Establishment of the National Cleaner Production Centre with UNIDO
  
- DWAF
  - Water Quality Management Framework Document (in progress)
  - Waste minimization hierarchy approach to water use (policy)
  
- National Treasury
  - Development of a framework for levy-based instruments for environmental policy in SA (in progress)
  - Framework for supply chain management (tender rules for supply of services, sales of goods etc). Regulations in terms of PFMA 1999.

The policy documents that summarize the agreed commitments and positions of business and labour are:

- NEDLAC Growth and Development Summit
- NEDLAC Chemical Sector Summit with the policy on Cleaner Production

**APPENDIX B: JPOI – CHANGING UNSUSTAINABLE PATTERNS OF CONSUMPTION AND PRODUCTION****III. Changing unsustainable patterns of consumption and production**

13. Fundamental changes in the way societies produce and consume are indispensable for achieving global sustainable development. All countries should promote sustainable consumption and production patterns, with the developed countries taking the lead and with all countries benefiting from the process, taking into account the Rio principles, including, inter alia, the principle of common but differentiated responsibilities as set out in principle 7 of the Rio Declaration on Environment and Development. Governments, relevant international organizations, the private sector and all major groups should play an active role in changing unsustainable consumption and production patterns. This would include the actions at all levels set out below.

14. Encourage and promote the development of a 10-year framework of programmes in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production to promote social and economic development within the carrying capacity of ecosystems by addressing and, where appropriate, delinking economic growth and environmental degradation through improving efficiency and sustainability in the use of resources and production processes, and reducing resource degradation, pollution and waste. All countries should take action, with developed countries taking the lead, taking into account the development needs and capabilities of developing countries through mobilization, from all sources, of financial and technical assistance and capacity-building for developing countries. This would require actions at all levels to:

(a) Identify specific activities, tools, policies, measures and monitoring and assessment mechanisms, including, where appropriate, life-cycle analysis and national indicators for measuring progress, bearing in mind that standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries;

(b) Adopt and implement policies and measures aimed at promoting sustainable patterns of production and consumption, applying, inter alia, the polluter-pays principle described in principle 16 of the Rio Declaration on Environment and Development;

(c) Develop production and consumption policies to improve the products and services provided, while reducing environmental and health impacts, using, where appropriate, science-based approaches, such as life-cycle analysis;

(d) Develop awareness-raising programmes on the importance of sustainable production and consumption patterns, particularly among youth and the relevant segments in all countries, especially in developed countries, through, inter alia, education, public and

consumer information, advertising and other media, taking into account local, national and regional cultural values;

(e) Develop and adopt, where appropriate, on a voluntary basis, effective, transparent, verifiable, non-misleading and non-discriminatory consumer information tools to provide information relating to sustainable consumption and production, including human health and safety aspects. These tools should not be used as disguised trade barriers;

(f) Increase eco-efficiency, with financial support from all sources, where mutually agreed, for capacity-building, technology transfer and exchange of technology with developing countries and countries with economies in transition, in cooperation with relevant international organizations.

15. Increase investment in cleaner production and eco-efficiency in all countries through, inter alia, incentives and support schemes and policies directed at establishing appropriate regulatory, financial and legal frameworks. This would include actions at all levels to:

(a) Establish and support cleaner production programmes and centres and more efficient production methods by providing, inter alia, incentives and capacity-building to assist enterprises, especially small and medium-sized enterprises and particularly in developing countries, in improving productivity and sustainable development;

(b) Provide incentives for investment in cleaner production and eco-efficiency in all countries, such as state-financed loans, venture capital, technical assistance and training programmes for small and medium-sized companies while avoiding trade-distorting measures inconsistent with WTO rules;

(c) Collect and disseminate information on cost-effective examples in cleaner production, eco-efficiency and environmental management, and promote the exchange of best practices and know-how on environmentally sound technologies between public and private institutions;

(d) Provide training programmes to small and medium-sized enterprises on the use of information and communication technologies.

16. Integrate the issue of production and consumption patterns into sustainable development policies, programmes and strategies, including, where applicable, into poverty reduction strategies.

17. Enhance corporate environmental and social responsibility and accountability. This would include actions at all levels to:

(a) Encourage industry to improve social and environmental performance through voluntary initiatives, including environmental management systems, codes of conduct, certification and public reporting on environmental and social issues, taking into account such initiatives as the International Organization for Standardization (ISO) standards and Global Reporting Initiative guidelines on sustainability reporting, bearing in mind principle 11 of the Rio Declaration on Environment and Development;

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(b) Encourage dialogue between enterprises and the communities in which they operate and other stakeholders;

(c) Encourage financial institutions to incorporate sustainable development considerations into their decision-making processes;

(d) Develop workplace-based partnerships and programmes, including training and education programmes.

18. Encourage relevant authorities at all levels to take sustainable development considerations into account in decision-making, including on national and local development planning, investment in infrastructure, business development and public procurement. This would include actions at all levels to:

(a) Provide support for the development of sustainable development strategies and programmes, including in decision-making on investment in infrastructure and business development;

(b) Continue to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the costs of pollution, with due regard to the public interest and without distorting international trade and investment;

(c) Promote public procurement policies that encourage development and diffusion of environmentally sound goods and services;

(d) Provide capacity-building and training to assist relevant authorities with regard to the implementation of the initiatives listed in the present paragraph;

(e) Use environmental impact assessment procedures.

\* \* \*

19. Call upon Governments, as well as relevant regional and international organizations and other relevant stakeholders, to implement, taking into account national and regional specificities and circumstances, the recommendations and conclusions of the Commission on Sustainable Development concerning energy for sustainable development adopted at its ninth session, including the issues and options set out below, bearing in mind that in view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. This would include actions at all levels to:

(a) Take further action to mobilize the provision of financial resources, technology transfer, capacity-building and the diffusion of environmentally sound technologies according to the recommendations and conclusions of the Commission on Sustainable Development as contained in section A, paragraph 3, and section D, paragraph 30, of its decision 9/1 on energy for sustainable development;

(b) Integrate energy considerations, including energy efficiency, affordability and accessibility, into socio-economic programmes, especially into policies of major energy-consuming sectors, and into the planning, operation and maintenance of long-lived energy

consuming infrastructures, such as the public sector, transport, industry, agriculture, urban land use, tourism and construction sectors;

(c) Develop and disseminate alternative energy technologies with the aim of giving a greater share of the energy mix to renewable energies, improving energy efficiency and greater reliance on advanced energy technologies, including cleaner fossil fuel technologies;

(d) Combine, as appropriate, the increased use of renewable energy resources, more efficient use of energy, greater reliance on advanced energy technologies, including advanced and cleaner fossil fuel technologies, and the sustainable use of traditional energy resources, which could meet the growing need for energy services in the longer term to achieve sustainable development;

(e) Diversify energy supply by developing advanced, cleaner, more efficient, affordable and cost-effective energy technologies, including fossil fuel technologies and renewable energy technologies, hydro included, and their transfer to developing countries on concessional terms as mutually agreed. With a sense of urgency, substantially increase the global share of renewable energy sources with the objective of increasing its contribution to total energy supply, recognizing the role of national and voluntary regional targets as well as initiatives, where they exist, and ensuring that energy policies are supportive to developing countries' efforts to eradicate poverty, and regularly evaluate available data to review progress to this end;

(f) Support efforts, including through provision of financial and technical assistance to developing countries, with the involvement of the private sector, to reduce flaring and venting of gas associated with crude oil production;

(g) Develop and utilize indigenous energy sources and infrastructures for various local uses and promote rural community participation, including local Agenda 21 groups, with the support of the international community, in developing and utilizing renewable energy technologies to meet their daily energy needs to find simple and local solutions;

(h) Establish domestic programmes for energy efficiency, including, as appropriate, by accelerating the deployment of energy efficiency technologies, with the necessary support of the international community;

(i) Accelerate the development, dissemination and deployment of affordable and cleaner energy efficiency and energy conservation technologies, as well as the transfer of such technologies, in particular to developing countries, on favourable terms, including on concessional and preferential terms, as mutually agreed;

(j) Recommend that international financial institutions and other agencies' policies support developing countries, as well as countries with economies in transition, in their own efforts to establish policy and regulatory frameworks which create a level playing field between the following: renewable energy, energy efficiency, advanced energy technologies, including advanced and cleaner fossil fuel technologies, and centralized, distributed and decentralized energy systems;

(k) Promote increased research and development in the field of various energy technologies, including renewable energy, energy efficiency and advanced energy technologies, including advanced and cleaner fossil fuel technologies, both nationally and through international collaboration; strengthen national and regional research and development institutions/centres on reliable, affordable, economically viable, socially acceptable and environmentally sound energy for sustainable development;

(l) Promote networking between centres of excellence on energy for sustainable development, including regional networks, by linking competent centres on energy technologies for sustainable development that could support and promote efforts at capacity-building and technology transfer activities, particularly of developing countries, as well as serve as information clearing houses;

(m) Promote education to provide information for both men and women about available energy sources and technologies;

(n) Utilize financial instruments and mechanisms, in particular the Global Environment Facility (GEF), within its mandate, to provide financial resources to developing countries, in particular least developed countries and small island developing States, to meet their capacity needs for training, technical know-how and strengthening national institutions in reliable, affordable, economically viable, socially acceptable and environmentally sound energy, including promoting energy efficiency and conservation, renewable energy and advanced energy technologies, including advanced and cleaner fossil fuel technologies;

(o) Support efforts to improve the functioning, transparency and information about energy markets with respect to both supply and demand, with the aim of achieving greater stability and predictability and to ensure consumer access to reliable, affordable, economically viable, socially acceptable and environmentally sound energy services;

(p) Policies to reduce market distortions would promote energy systems compatible with sustainable development through the use of improved market signals and by removing market distortions, including restructuring taxation and phasing out harmful subsidies, where they exist, to reflect their environmental impacts, with such policies taking fully into account the specific needs and conditions of developing countries with the aim of minimizing the possible adverse impacts on their development;

(q) Take action, where appropriate, to phase out subsidies in this area that inhibit sustainable development, taking fully into account the specific conditions and different levels of development of individual countries and considering their adverse effect, particularly on developing countries;

(r) Governments are encouraged to improve the functioning of national energy markets in such a way that they support sustainable development, overcome market barriers and improve accessibility, taking fully into account that such policies should be decided by each country, and that its own characteristics and capabilities and level of development should be considered, especially as reflected in national sustainable development strategies, where they exist;



(s) Strengthen national and regional energy institutions or arrangements for enhancing regional and international cooperation on energy for sustainable development, in particular to assist developing countries in their domestic efforts to provide reliable, affordable, economically viable, socially acceptable and environmentally sound energy services to all sections of their populations;

(t) Countries are urged to develop and implement actions within the framework of the ninth session of the Commission on Sustainable Development, including through public-private partnerships, taking into account the different circumstances of countries, based on lessons learned by Governments, international institutions and stakeholders and including business and industry, in the field of access to energy, including renewable energy and energy-efficiency and advanced energy technologies, including advanced and cleaner fossil fuel technologies;

(u) Promote cooperation between international and regional institutions and bodies dealing with different aspects of energy for sustainable development within their existing mandate, bearing in mind paragraph 46 (h) of the Programme of Action for the Further Implementation of Agenda 21, strengthening, as appropriate, regional and national activities for the promotion of education and capacity-building regarding energy for sustainable development;

(v) Strengthen and facilitate, as appropriate, regional cooperation arrangements for promoting cross-border energy trade, including the interconnection of electricity grids and oil and natural gas pipelines;

(w) Strengthen and, where appropriate, facilitate dialogue forums among regional, national and international producers and consumers of energy.

\* \* \*

20. Promote an integrated approach to policy-making at the national, regional and local levels for transport services and systems to promote sustainable development, including policies and planning for land use, infrastructure, public transport systems and goods delivery networks, with a view to providing safe, affordable and efficient transportation, increasing energy efficiency, reducing pollution, reducing congestion, reducing adverse health effects and limiting urban sprawl, taking into account national priorities and circumstances. This would include actions at all levels to:

(a) Implement transport strategies for sustainable development, reflecting specific regional, national and local conditions, so as to improve the affordability, efficiency and convenience of transportation, as well as improving urban air quality and health, and reduce greenhouse gas emissions, including through the development of better vehicle technologies that are more environmentally sound, affordable and socially acceptable;

(b) Promote investment and partnerships for the development of sustainable, energy efficient multi-modal transportation systems, including public mass transportation systems

and better transportation systems in rural areas, with technical and financial assistance for developing countries and countries with economies in transition.

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21. Prevent and minimize waste and maximize reuse, recycling and use of environmentally friendly alternative materials, with the participation of government authorities and all stakeholders, in order to minimize adverse effects on the environment and improve resource efficiency, with financial, technical and other assistance for developing countries. This would include actions at all levels to:

(a) Develop waste management systems, with highest priorities placed on waste prevention and minimization, reuse and recycling, and environmentally sound disposal facilities, including technology to recapture the energy contained in waste, and encourage small-scale waste-recycling initiatives that support urban and rural waste management and provide income-generating opportunities, with international support for developing countries;

(b) Promote waste prevention and minimization by encouraging production of reusable consumer goods and biodegradable products and developing the infrastructure required.

\* \* \*

22. Renew the commitment, as advanced in Agenda 21, to sound management of chemicals throughout their life cycle and of hazardous wastes for sustainable development and for the protection of human health and the environment, inter alia, aiming to achieve by 2020 that chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment, using transparent science-based risk assessment procedures and science-based risk management procedures, taking into account the precautionary approach, as set out in principle 15 of the Rio Declaration on Environment and Development, and support developing countries in strengthening their capacity for the sound management of chemicals and hazardous wastes by providing technical and financial assistance. This would include actions at all levels to:

(a) Promote the ratification and implementation of relevant international instruments on chemicals and hazardous waste, including the Rotterdam Convention on Prior Informed Consent Procedures for Certain Hazardous Chemicals and Pesticides in International Trade so that it can enter into force by 2003 and the Stockholm Convention on Persistent Organic Pollutants so that it can enter into force by 2004, and encourage and improve coordination as well as supporting developing countries in their implementation;

(b) Further develop a strategic approach to international chemicals management based on the Bahia Declaration and Priorities for Action beyond 2000 of the Intergovernmental Forum on Chemical Safety (IFCS) by 2005, and urge that the United Nations Environment Programme (UNEP), IFCS, other international organizations dealing

with chemical management, and other relevant international organizations and actors closely cooperate in this regard, as appropriate;

(c) Encourage countries to implement the new globally harmonized system for the classification and labelling of chemicals as soon as possible with a view to having the system fully operational by 2008;

(d) Encourage partnerships to promote activities aimed at enhancing environmentally sound management of chemicals and hazardous wastes, implementing multilateral environmental agreements, raising awareness of issues relating to chemicals and hazardous waste, and encouraging the collection and use of additional scientific data;

(e) Promote efforts to prevent international illegal trafficking of hazardous chemicals and hazardous wastes and to prevent damage resulting from the transboundary movement and disposal of hazardous wastes in a manner consistent with obligations under relevant international instruments, such as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal;

(f) Encourage development of coherent and integrated information on chemicals, such as through national pollutant release and transfer registers;

(g) Promote reduction of the risks posed by heavy metals that are harmful to human health and the environment, including through a review of relevant studies, such as the UNEP global assessment of mercury and its compounds.

### **APPENDIX C: THREE STAGES OF CLEANER PRODUCTION**

From the perspective of investment in cleaner production there are primarily three stages. These include the following:

1. First stage:

During this stage the “house keeping” or “low hanging fruit” activities are identified by way of a “quick scan”<sup>27</sup> or “walk through” audit. As a result of this audit carried out by a trained assessor, low cost changes are identified which can have pay back periods on the investment, i.e., from 1 day to 1 month. The changes required might be simple settings on a processing plant, or changes in the way that staff operate equipment. The main cost for this is usually the cost of having the audit executed. The opportunities for quick returns on investment are usually in industries that produce a lot of visible waste either in effluent or solid waste.

2. Second stage:

During this stage changes are identified as the result of a more detailed assessment in which opportunities for changes to the process are assessed by way of monitoring performance and operations over an extended period. As a result of gaining better understanding of the operating principles ways are identified to reduce the quantity and hazard rating of the waste. Implementing these options may involve training of personnel, modifications to equipment or operating procedures, and a pilot study to assess the impact of the changes on other quality objectives of the operation. The cost of these changes include the cost of the assessment, training, equipment modifications and purchases. Costs can range from R 100 000 up to millions of Rands depending upon capital costs. In practice pay back periods on the investment can range from weeks to a year or two. In addition to pay back periods additional factors affect the willingness of enterprises to invest in cleaner production improvements. These include factors such as industry targets for ROI, cost of capital for that sector (Government departments can have lower cost of capital but do not look at ROI as critically as commercial industry), improved product quality, improved image in the market place, understanding of technical and commercial risk, industry business cycles, Government incentives and taxes, and reduction of environmental liabilities.

3. Stage 3

During this stage the enterprise or government entity evaluates the way in which it achieves its mission, by looking strategically at its operations. The evaluation might look at the life time impact and costs of the products and services it offers. Based on an assessment which will use tools such as environmental and cost life cycle assessments, the product design and offerings will be modified to bring those more in line with sustainable consumption patterns, and resource usage.

**APPENDIX D: ENVIRONMENTALLY SOUND TECHNOLOGIES AND NATIONAL STRATEGY**

The following is an extract from the UNEP website on “environmentally sound technologies” (EST). The term “environmentally sustainable technologies” is discussed in the UNEP document “Environmentally Sound Technologies and Sustainable Development” (IETC, 2003)<sup>28</sup>.

Agenda 21 and Environmentally Sound Technologies  
(Extract from UNEP web site)

REPORT OF THE UNITED NATIONS CONFERENCE ON  
ENVIRONMENT AND DEVELOPMENT

(Rio de Janeiro, 3-14 June 1992)

Chapter 34

**TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGY, COOPERATION  
AND CAPACITY-BUILDING****INTRODUCTION**

34.1. Environmentally sound technologies protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they were substitutes.

34.2. Environmentally sound technologies in the context of pollution are "process and product technologies" that generate low or no waste, for the prevention of pollution. They also cover "end of the pipe" technologies for treatment of pollution after it has been generated.

34.3. Environmentally sound technologies are not just individual technologies, but total systems which include know-how, procedures, goods and services, and equipment as well as organizational and managerial procedures. This implies that when discussing transfer of technologies, the human resource development and local capacity-building aspects of

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<sup>28</sup> <http://www.unep.or.jp/ietc/knowledge>

technology choices, including gender-relevant aspects, should also be addressed. Environmentally sound technologies should be compatible with nationally determined socio-economic, cultural and environmental priorities.

34.4. There is a need for favourable access to and transfer of environmentally sound technologies, in particular to developing countries, through supportive measures that promote technology cooperation and that should enable transfer of necessary technological know-how as well as building up of economic, technical, and managerial capabilities for the efficient use and further development of transferred technology. Technology cooperation involves joint efforts by enterprises and Governments, both suppliers of technology and its recipients. Therefore, such cooperation entails an iterative process involving government, the private sector, and research and development facilities to ensure the best possible results from transfer of technology. Successful long-term partnerships in technology cooperation necessarily require continuing systematic training and capacity-building at all levels over an extended period of time.

34.5. The activities proposed in this chapter aim at improving conditions and processes on information, access to and transfer of technology (including the state-of-the-art technology and related know-how), in particular to developing countries, as well as on capacity-building and cooperative arrangements and partnerships in the field of technology, in order to promote sustainable development. New and efficient technologies will be essential to increase the capabilities, in particular of developing countries, to achieve sustainable development, sustain the world's economy, protect the environment, and alleviate poverty and human suffering. Inherent in these activities is the need to address the improvement of technology currently used and its replacement, when appropriate, with more accessible and more environmentally sound technology.

### **Use of Environmentally Sound Technologies (ESTs)**

In order to determine whether the techniques and technologies could qualify as EST's, the following criteria can be used:

- In comparison to the technologies they replace, ESTs are
  - a. Less polluting
  - b. Use all resources in a sustainable manner (people, economics as well as natural resources)
  - c. Recycle more and handle residual wastes in a more acceptable manner
- In the context of pollution, ESTs are
  - a. processing and product technologies
  - b. Generating no or low waste

- c. Also including end-of-pipe treatment (which extends beyond CP techniques)
- In the context of the implementation of ESTs, the total system is implemented this includes
  - a. Know how in the organization
  - b. Procedures in use in the organization
  - c. Goods and service providers
  - d. Equipment and local support
  - e. Organizational and managerial procedures with trained managers and workers
  - f. Compatibility with nationally determined socio-economic, cultural and environmental priorities

**APPENDIX E: EXPLANATION OF TERMS**

Most of the terms used in this strategy can be found in several public domain documents (e.g. NEMA, UNEP web site).

**Cleaner production – Source** -[http://www.unepie.org/pc/cp/understanding\\_cp/home.htm](http://www.unepie.org/pc/cp/understanding_cp/home.htm)

The continuous application of an integrated preventive environmental strategy to processes, products, and services, to increase overall efficiency, and reduce risks to humans and the environment. Cleaner Production can be applied to the processes used in any industry, to products themselves and to various services provided in society. Specifically for:

**Production processes:** Cleaner Production results from one or a combination of conserving raw materials, water and energy; eliminating toxic and dangerous raw materials; and reducing the quantity and toxicity of all emissions and wastes at source during the production process;

**Products:** Cleaner Production aims to reduce the environmental, health and safety impacts of products over their entire life cycles, from raw materials extraction, through manufacturing and use, to the 'ultimate' disposal of the product; and

**Services:** Cleaner Production implies incorporating environmental concerns into designing and delivering services”.

**Precautionary principle - Source**

[http://glossary.eea.eu.int/EEAGlossary/P/precautionary\\_principle](http://glossary.eea.eu.int/EEAGlossary/P/precautionary_principle)

(1) Principle adopted by the UN Conference on the Environment and Development (1992) that in order to protect the environment, a precautionary approach should be widely applied, meaning that where there are threats of serious or irreversible damage to the environment, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation. (2) The precautionary principle permits a lower level of proof of harm to be used in policy-making whenever the consequences of waiting for higher levels of proof may be very costly and/or irreversible

**Eco-efficiency**

[http://www.unepie.org/pc/cp/understanding\\_cp/related\\_concepts.htm#1](http://www.unepie.org/pc/cp/understanding_cp/related_concepts.htm#1)

Eco-Efficiency was coined by the World Business Council for Sustainable Development (WBCSD) in 1992 and defined as the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life cycle, to a level at least in line with the earth's estimated carrying capacity. The concepts of eco-efficiency and Cleaner Production are almost synonymous. The slight difference between them is that eco-efficiency starts from



issues of economic efficiency which have positive environmental benefits, while Cleaner Production starts from issues of environmental efficiency which have positive economic benefits.

**Sustainable consumption and production – Source -**

<http://www.iisd.org/susprod/principles.htm>

Sustainable production and consumption involves business, government, communities and households contributing to environmental quality through the efficient production and use of natural resources, the minimization of wastes, and the optimization of products and services."

Sustainable consumption implies that the consumption of current generations as well as future generations improves in quality. Such a concept of consumption requires the optimization of consumption subject to maintaining services and quality of resources and the environment over time.

**Waste minimization – Source**

[http://www.unepie.org/pc/cp/understanding\\_cp/related\\_concepts.htm#4](http://www.unepie.org/pc/cp/understanding_cp/related_concepts.htm#4)

The concept of waste minimisation was introduced by the U.S. Environmental Protection Agency in 1988. In this concept, waste prevention approach and its techniques are defined as on-site reduction source reduction of waste by changes of input raw materials, technology changes, good operating practices and product changes. Off-site recycling by direct reuse after reclamation are also considered to be waste minimisation techniques, but have a distinctly lower priority compared to on-site prevention or minimisation of waste.

Currently, waste minimisation and pollution prevention terms are often used interchangeably. Pollution prevention means not generating waste in the first place by reducing it at the source. Waste minimisation is a broader term that also includes recycling and other means to reduce the amount of waste which must be treated/disposed of.

**Polokwane Declaration -Source**

[http://www.environment.gov.za/ProjProg/WasteMgmt/Polokwane\\_declare.htm](http://www.environment.gov.za/ProjProg/WasteMgmt/Polokwane_declare.htm)

To implement a waste management system which contributes to sustainable development and a measurable improvement in the quality of life, by harnessing the energy and commitment of all South Africans for the effective reduction of waste. Reduce waste generation and disposal by 50% and 25% respectively by 2012 and develop a plan for ZERO WASTE by 2022.

**Incentives**

Something, such as the fear of punishment or the expectation of reward, that induces action or motivates effort.

**Penalties**

A punishment established by law or authority for a crime or offence.

**Sustainable Development –**

**Brundtland Commission definition:**

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.