



Toolkit for Eco-industrial Parks: **ENERGY**

The eco-industrial park (EIP) concept is about creating more resource efficient and cost-effective industrial parks that are more competitive, attractive for investment, and risk resilient. The uptake of EIPs is rapidly increasing internationally and in South Africa.

The Global Eco-Industrial Parks Programme (GEIPP) demonstrates the viability and benefits of greening industrial parks by improving resource productivity and economic, environmental, and social performance of businesses.



ADDRESSING ENERGY CHALLENGES THROUGH EIP APPROACHES

Addressing South Africa's energy challenges through business-driven opportunities is very much part of the eco-industrial park approach, e.g. companies saving energy through resource efficient and cleaner production (RECP), and industrial and infrastructure synergies.

ENERGY CHALLENGES IN SOUTH AFRICA

Direct causes of inadequate energy supply as identified from the Department of Minerals and Energy (DMRE) Strategic Plan (2020-2025) include:

- Lack of investment, and infrastructure breakdown;
- Fiscal crisis and global financial crisis;
- Lack of transformation in the energy sector;
- Unsustainable sources of energy;
- High energy prices;
- Ineffective institutional arrangements within the sector;
- Growth and financial stability of state-owned enterprises;
- Leadership and governance.

South Africa is experiencing a shortage in electricity supply mainly due to lack of investment and maintenance of power plants. Load shedding started late in 2007 and has been continuing ever since.

The solution statement in the DMRE Strategic Plan reads: "Ensure the availability of resources for energy consumption and the rapid deployment of alternative energy; energy

efficiency; and the technological diversification of energy sources that would result in significant energy security and economic development."

ENERGY RESOURCES IN SOUTH AFRICA

Coal dominates the South African resource base and therefore, makes the country one of the largest emitters of carbon dioxide (CO₂) in the world. Coal is used to produce electricity and liquid fuels.

Liquid fuels are also produced from natural gas and imported crude oil. Most of the natural gas is imported via pipeline from Mozambique. Large underwater gas deposits have been discovered off the shore of Mossel Bay.

The bulk of electricity is produced by Eskom, mainly from coal. Eskom also has a nuclear power plant at Koeberg in the Western Cape.

The Integrated Resource Plan (IRP) 2019, aims to secure 42% of energy needs from renewable energy by 2030.

The Renewable Energy Independent Power Producer Programme (REIPPP) has increased investments in photovoltaic (PV) solar systems, concentrated solar plants and wind turbines.

In March 2021, the South African Government also announced eight bidders selected as part of the 2 000-Megawatt (MW) Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP).

The IRP 2019 outlines several steps that Government will take to improve the deteriorating energy sector, while increasing the focus on social inclusion and a “just” transition to renewable energy.

ECO-INDUSTRIAL PARK APPROACHES IN ENERGY MANAGEMENT

Industrial parks can address some of the energy challenges identified by implementing eco-industrial park approaches, such as:

- Operating an energy management system in line with internationally certified standards, monitoring park performance, and supporting resident firms with their own firm-level management systems.
- Having supporting programs to improve the energy efficiency of resident firms;
- Investigating an industrial heat recovery strategy for heat and energy recovery at the major energy-consuming firms in the park (where applicable);
- Having a program to monitor, mitigate and/or minimize greenhouse gas (GHG) emissions;
- Investigating renewable energy opportunities;
- Working towards setting maximum carbon and energy intensity targets for the park and its residents; and
- Promoting energy assessments for tenant companies.

More details of the **International Eco-industrial Park Framework** can be found here

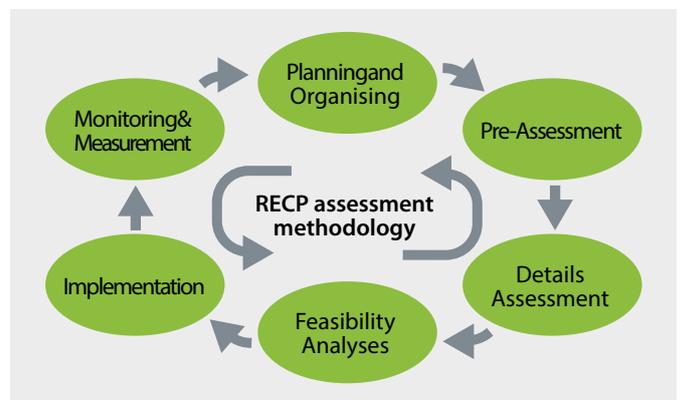


ENERGY ASSESSMENT METHODOLOGY

A typical energy assessment at company level, incorporating RECP methodology as developed by the NCPC-SA will include the following, amongst others:

- Initial environmental assessment, rating the operation's energy management procedures and identifying gaps;

- Process description and flow chart to show major areas and amounts of energy consumed;
- Pre-assessment to identify areas of energy consumption that are most important to the operation for improvement and savings opportunities;
- Billing systems and costs for purchasing energy;
- Identification of significant energy uses by area of an operation (e.g. offices) and process (i.e. lighting);
- Detailed assessment including energy consumption data analysis against identified relevant variables that influence consumption volumes using regression analysis methodology to evaluate the environmental performance and operating efficiency at the operation;
- Identified energy savings opportunities, including estimated energy consumption savings, estimated cost savings, investment costs, and simple payback periods; and
- Implementation plan.

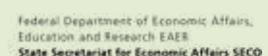
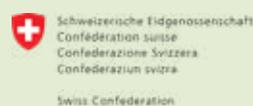


SOUTH AFRICAN GOOD PRACTICE EXAMPLES

The Industrial Energy Efficiency (IEE) Project of the NCPC-SA, implemented since 2010 in partnership with UNIDO, aims to support the implementation of energy management systems and energy systems optimization in South Africa.

Savings from the IEE project amounts to 6 524 gigawatt-hours or 6.4 million tons of carbon dioxide equivalents, with monetary saving of R5.3 billion. The IEE Project is an international award-winning project – Energy Project of the Year, International 2020.

Several industrial parks are planning renewable energy rollouts in the future, e.g. North West Development Corporation that manages Bodirelo Industrial Park, East London Industrial Development Zone (ELIDZ), Dube Tradeport, Atlantis SEZ, and Coega.



The Global Eco-industrial Parks Programme (GEIPP) South Africa is being implemented from 2021 to 2023 through a collaboration between UNIDO, the Department of Trade, Industry and Competition (**the dtic**) and the National Cleaner Production Centre, South Africa (NCPC-SA). The GEIPP is made possible by funding from the Swiss State Secretariat for Economic Affairs (SECO).

