



# Industrial Symbiosis Programme & Progress

Circular Economy and Industrial Development Dialogue  
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- **What is Industrial Symbiosis**
- **Industrial symbiosis benefits and savings realised**
- **Industrial Symbiosis Economic contributions**





The National Cleaner Production Centre South Africa (NCPC-SA) supports South African industry to **improve competitiveness** and reduce **environmental footprint** through the implementation of **resource efficient and cleaner production (RECP)** methodologies.

*A programme of **the dti** hosted by the **CSIR***



**the dti**

Department of  
Trade and Industry  
REPUBLIC OF SOUTH AFRICA



# Other partners and donors



## environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA



## energy

Department:  
Energy  
REPUBLIC OF SOUTH AFRICA



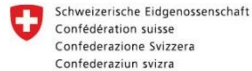
## water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA



## tourism

Department:  
Tourism  
REPUBLIC OF SOUTH AFRICA



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Confederation

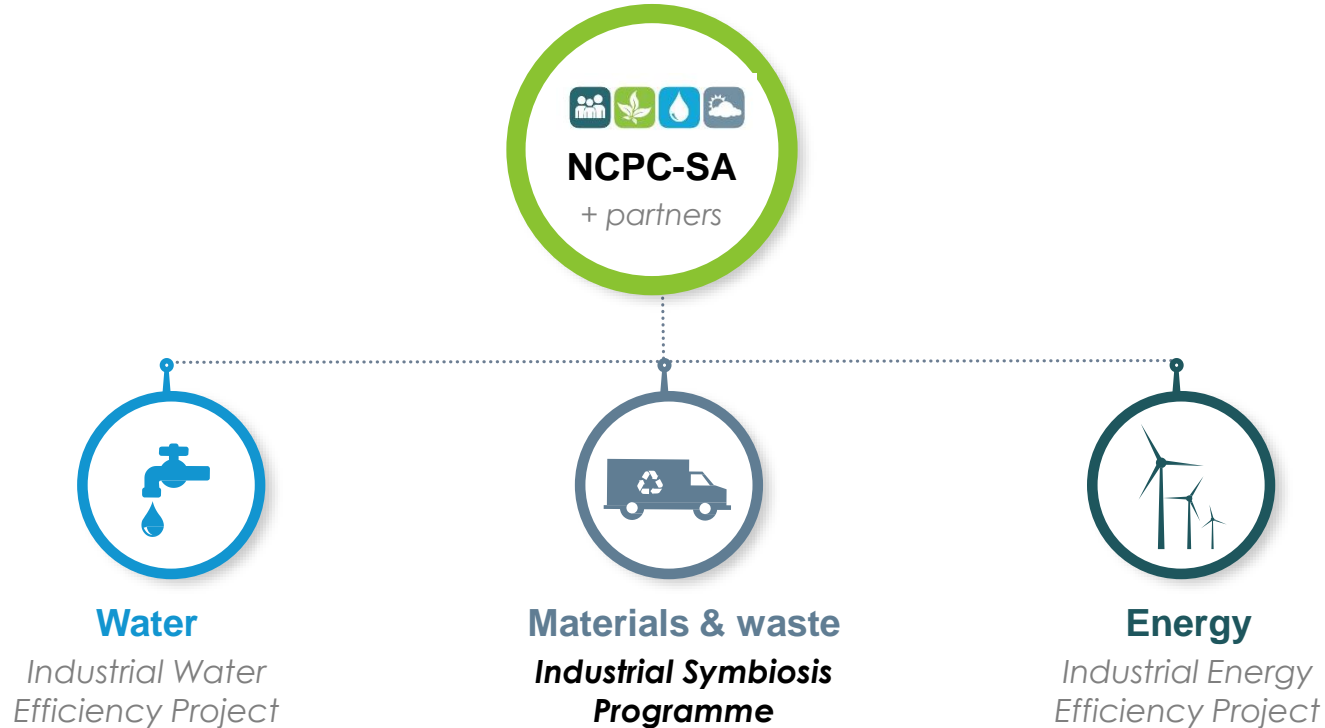
Federal Department of Economic Affairs FDEA  
State Secretariat for Economic Affairs SECO



# Thematic approach – flagship projects



- The NCPC-SA applies RECP in three main thematic areas. Each of these is driven through a flagship project or programme:





The NCPC-SA services are highly subsidised, and are aimed at stimulating and supporting the uptake of RECP by industry:



## Assessments & Implementation

*Energy, water, materials, waste efficiency*



## Skills development

*Training courses  
Internship programme*



## RECP Tools

*Online tools and sector guides*



## Advocacy

*Workshops, awareness & policy advice*



# RECP Tools

Throughout its various projects, the NCPC-SA applies the tools of RECP to assist companies:

- In-plant **RECP assessments** (energy, water, waste, materials)
- Industrial systems optimisation
- Energy and water management
- **Industrial symbiosis**
- Life-cycle management
- Eco-innovation



# What is Symbiosis?

**In biology:** 'An interaction between two different organisms living in close physical association to the advantage of both'  
*Concise Dictionary, 8<sup>th</sup> Edition*





# What is Industrial Symbiosis (IS)?



# What is Industrial Symbiosis

- [7.What is Industrial Symbiosis.mp4](#)

# In a nutshell, Industrial Symbiosis (IS).....



**Industrial symbiosis** is a resource efficiency approach where unused or residual resources of one company are used by another.



## Materials

wood, plastics, food waste, WEEE, metals



## Expertise

ISO 9000, ISO 14000, OSHAS 18001, best practice



## Capacity

under-utilised equipment, lab facilities



## Logistics

transport, warehouse facilities, land



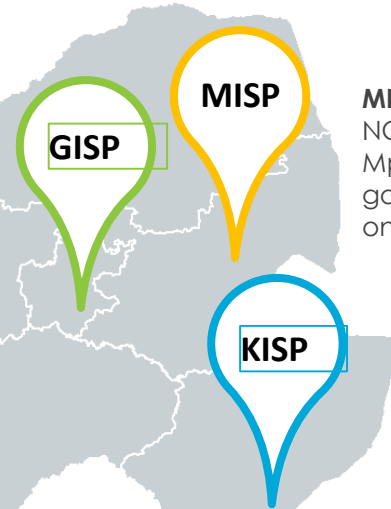
## Water and energy

waste heat, steam, borehole, process

# Industrial Symbiosis in South Africa



**GISP** - Funded by and delivered by the NCPC-SA, in collaboration with Gauteng Department of Agriculture and Rural Development (GDARD) and Gauteng Department of Economic Development (GDED)



**MISP** - Launched by the NCPC-SA and the Mpumalanga Provincial government in August 2018 on a 12-month pilot



**WISP** - Funded by the Western Cape Department of Economic Development and Tourism. Delivered by GreenCape.



**KISP** - Jointly funded and delivered by the NCPC-SA, Trade and Investment KZN and the KZN Department of Economic Development, Tourism and Environmental Affairs.



# Our Partners

**Funded by the**



**the dti**

Department:  
Trade and Industry  
REPUBLIC OF SOUTH AFRICA

**Delivered through**



**In collaboration with**

**GDARD-GDED, City of Ekurhuleni & THE INNOVATIONHUB**





# ISP benefits & savings in last 3 years



Waste to Land  
Fill Diversion

111,502 tonnes



GHG Reduction  
(CO<sub>2</sub>e)

57,435 tonnes



Virgin Resource  
use reduction

107,000 tonnes



Industrial Water  
Saved

1,030,500 m<sup>3</sup>



Cost Savings

R 17 610 428



# ISP benefits & savings in last 3 years



Value of airspace savings (ZAR per annum)

R 45 881 696



Resource value contributed back to SA Economy (2015-2018)

R 27 027 005



Direct benefit to South Africa (ZAR per annum)

R 72 908 701

Total benefit to SA (incl. externalities) per annum

R 89 539 912



## In a nutshell ....

ISP has generated a total economic value of R94.8 million between April 2015 and March 2018; based on:

- landfill airspace savings,
- value of recovered resources, and
- avoided externalities.

Based on the tonnages diverted in 2017/18 alone, the economic impact is estimated at

- R89.5 million per annum

# Total GISP economic contribution to GDP and Gauteng GDPR

Benefit	Annual economic value (Rands per annum, 2017/18)	% of national GDP (2017: R4.7 trillion)	% of Gauteng GDPR (2017: R1.6 trillion)
Airspace savings	R 45 881 696	0.0010	0.0029
Recovered resources	R 27 027 005	0.0006	0.0017
Avoided externalities	R 16 631 211	0.0004	0.0010
<b>Total</b>	<b>R 89 539 912</b>	<b>0.0019</b>	<b>0.0056</b>

South Africa's nominal GDP was R4.7 trillion for 2017 (Stat SA, 2018b)

- R89.5 million represents 0.0019% of South Africa's GDP.

Gauteng contributes approximately 34% to South African GDP - GDPR approx R1.6 trillion.

- Annual economic impact of R89.5 million represents 0.0056% of Gauteng's GDPR.

# Case Study: From Plastic Waste to Refuse Bins and Pallets

- [Esiltuli Dustbin HD.mp4](#)



# Case Study 1: Recycling Concrete

- [Eco-Match final update HD revisions 8 May 2018.mp4](#)



**@NCPC\_SA**



**Thank you for Listening**

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## Enviroserv Waste Management (Pty) Ltd

Company with material waste

## AJ Polycyling (Pty) Ltd

Company that needs waste material

Year of Interventions: 2015

### Summary of intervention

Enviroserv Waste Management (Pty) Ltd, a waste management company, mitigates risk to the environment and surrounding communities by developing and implementing processes and also collects Polystyrene (PET) waste from clients.

## Case Study

### Savings



Intervention implemented:

**Recycling**



Monetary savings ZAR (Want company):

**R172 800**



Industrial Water Saved (m<sup>3</sup>):

**28 050m<sup>3</sup>**



Waste diverted from landfill:

**150 tonnes**



GHG emission reduction (tonnes):

**1917 tonnes**



Virgin resource use reduction:

**150 tonnes**

**Ekurhuleni Metropolitan Municipality – Simmer and Jack Landfill Site**  
Company with material waste

**Eco-Match (Pty) Ltd**  
Company that needs waste material

**IS Programme year of intervention: 2017**  
**Waste stream:** Construction and demolition waste

## Summary of intervention

The Ekurhuleni Metropolitan Municipality partnered with Eco-Match (Pty) Ltd to recycle the construction and demolition waste from the Simmer and Jack Landfill Site in Germiston, after the Gauteng Industrial Symbiosis Workshops.

Simmer and Jack Landfill Site falls under the Ekurhuleni Metropolitan Municipality. The waste recycled by Eco-Match is converted into fill material, road application and concrete stone.

## Case Study

### Savings



Waste diverted from landfill: **20 000 tonnes**



GHG emission reduction (ton CO<sub>2</sub>):



Jobs created:  
**3 permanent jobs**  
**3 temporary jobs**



Landfill air space:  
**20 000m<sup>3</sup>**

# The foundry example



Slag and dust



**Foundry**



**Slag Pile**



**Road construction aggregate**



**Quartz and Stone Flooring**



**Granite, brick and masonry**



- Industrial Symbiosis (IS) Programme is a free facilitation service which uses internationally proven industrial symbiosis approach to enhance business profitability and sustainability.
- **Industrial symbiosis** is a resource efficiency approach where unused or residual resources of one company are used by another.

