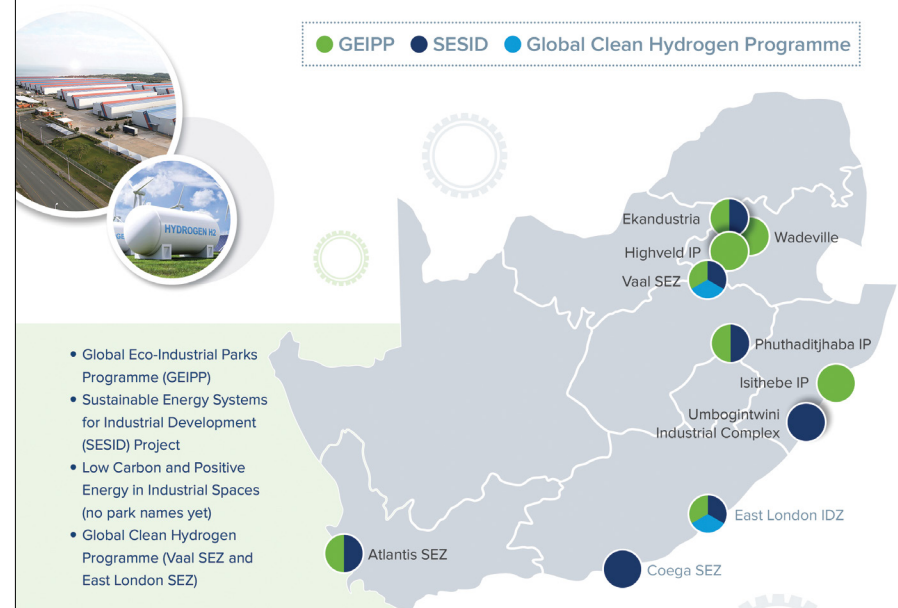


NCPC-SA's critical role in decarbonising SA

MCA talks to the director of the CSIR's National Cleaner Production Centre South Africa (NCPC-SA) about the role it plays in supporting industrial production facilities in mitigating climate change.

Sustainable Industrial Spaces Programme

Enabling the advancement of greener, low-carbon spaces in SA participating hubs map



Industrial spaces have significant potential to produce energy for their own consumption and to serve nearby communities, as well as to provide greener infrastructure for industrial companies of all sizes.

With a mission to facilitate the transition of South African industry to a low-carbon, climate-resilient economy, the National Cleaner Production Centre South Africa (NCPC-SA) undertakes projects to help industrial facilities adapt and mitigate against climate change: by adopting circular economy principles; establishing sustainable industrial parks with tenants that are energy-efficient, resource-efficient and competitive; developing the skills and resources needed to implement renewable energy and green hydrogen projects; helping production facilities with the development of viable business cases for off-grid and local renewable energy plants; and encouraging industrial symbiosis, where companies identify and exchange each other's waste as alternative and circular raw-material resources.

"While I think people in industry are exhausted by the complex set of decisions they are being asked to make to comply with environmental legislation and global developments such as trade tariffs and carbon taxes, the uncertainty also presents opportunities to make a positive impact for the future. We exist to help companies

navigate compliance and take advantage of greener opportunities," begins Ndivhuho Raphulu, the Director of the NCPC-SA.

"The US tariffs, for example, have made industry realise we have a market at our back door, as well as significant unexploited opportunities in the Asian and the South American markets. Our industry and manufacturing clusters are now reaching out to these communities to foster stronger ties," he tells MCA.

Ndivhuho Raphulu has been involved with the NCPC-SA since 2006, having initially been brought in following an enquiry during Thabo Mbeki's time as President into the challenges to industrial growth in South Africa. "The key issues that emerged were industrial efficiency, competitiveness and environmental challenges. This programme was established at the Council for Scientific and Industrial Research (CSIR) to enable industry to address these challenges, with an initial mandate to raise awareness of regulations and opportunities that lie in cleaner production, introducing international best practices in South Africa.

"We quickly realised there was a critical skills and capacity problem, so we started

introducing what we now call green skills. Then, from an efficiency perspective, we began to do significant work in industrial energy efficiency, initially driven by constrained energy supplies and load shedding. Today, we have divided our efficiency offering into three specific thematic areas: energy efficiency, water efficiency and resource efficiency," he explains.

Carbon Border Adjustment Mechanisms (CBAM)

"CBAM is a policy tool, currently in place in the European Union (EU), that puts a carbon price on imported goods from countries with lower carbon pricing policies. It is designed to prevent 'carbon leakage', which occurs when companies move production out of their home country to avoid paying carbon emissions-related costs. CBAM ensures that imported carbon-intensive products have similar carbon costs to domestically produced ones," Raphulu explains.

"This policy is influencing industry to adopt and use production methods and mechanisms that foster urgency in mitigating carbon emissions and the adoption of climate adaptation technologies," he explains. "It also supports localisation, research and development, innovation, skills development and capacity building in our country," he adds.

In addition to this EU mechanism, the UK will introduce a CBAM from January 2027, and other importing countries are likely to follow suit. "Following COP 30, I believe several more countries will be committing to a CBAM policy," he predicts.

Identifying and reporting on carbon emissions to comply with schemes such as CBAM can highlight the most effective ways to systematically reduce emissions associated with specific production paths, thereby leading to cleaner production, improved energy and resource efficiency, and increased productivity.

South Africa's decarbonisation mandate

"South Africa has committed and is facilitating industry to comply with global decarbonisation goals in several ways, including the funding and support of NCPC-SA projects to help industry with resource efficiency and the use of clean production methodologies and tools. We have the Carbon Tax, the Climate Change Act, and



Left: The NCPC-SA recently hosted a two-day hybrid event to advance the drive for sustainability and competitiveness in industrial spaces. **Right:** NCPC-SA Sustainable Industrial Spaces delegates highlighted the success of two flagship initiatives: the Sustainable Energy Systems for Urban-Industrial Development (SESID), to accelerate the uptake of renewable energy; and the Global Eco Industrial Parks Programme (GEIPP), which fosters efficient resource use, industrial symbiosis and cleaner production.



the Air Quality Act, which all incentivise industry while encouraging industrial compliance and investment in technologies that lower carbon emissions," Ndivhuho Raphulu points out.

"There is notable progress with regards to national awareness, capacity, skills and investment in climate resilience projects by industry, including independent power producer (IPP) industry development. We have developed basic and strategic regulations, and we are now well placed to accelerate our path to decarbonisation through facilities that encourage industry to invest in green and climate-resilient technology and business development," he notes.

He adds that while some saw these regulations as making South African industry less competitive, many now see the long-term advantages. "If a company in the UK, a company in Kenya, and a company in South Africa are all making a similar product, the competitive nature of that product would traditionally be related only to the direct cost of production and the selling price. Today, quality and the impact of that product on people's health and the environment are additional factors to consider. The traceability of the additional quality, health and environmental factors is now a key aspect to competitiveness, particularly in international markets," he argues.

Achieving decarbonisation

Any production facility or industry that consumes energy, uses water and material resources, and produces waste can benefit from decarbonisation and a focus on how a plant performs against specific measures to determine and report the sources and levels of emissions. "A decarbonisation path requires a strategic and focused national capacity, skills development and investment initiatives, which all contribute to strong and sustainable economic growth.

"Improving access and reducing the costs of greener technologies is a long-term process, though. The hydrogen economy is set to play a positive role in our future decarbonisation strategy, supporting renewable energy and sustainability. Now, the costs

of green hydrogen and the technology and infrastructure required to support projects are limiting factors for project implementation and viability.

"Still, our government's approach is to attract private investment, leverage international partnerships, and identify strategic applications for green hydrogen as a catalyst for re-industrialisation and economic transformation. This is not just a response to the climate crisis," he notes, adding that tax deductions on investments in electric and hydrogen-powered vehicle production are likely sometime after 2026.

Hard-to-abate sectors, such as steel, fertiliser, cement and heavy-duty mobility, can all benefit from adopting green hydrogen. "Our national target is to produce one million tonnes of green hydrogen annually by 2030, and seven million tonnes by 2050, which would boost the economy significantly and create jobs," he says.

The NCPC-SA's extended offering

The NCPC-SA support is one way the government provides tangible assistance to industry in navigating the challenges of decarbonisation. The NCPC-SA makes use of its funding from the Department of Trade, Industry and Competition (DTIC) to assign specialists to collaborate with a production facility's technical and maintenance teams, identifying opportunities to reduce emissions through energy management and waste reduction.

"In addition, when we have identified an opportunity that requires investment, we can help develop bankable proposals on how to implement some of the recommendations and how to manage the transition to cleaner production. This approach helps to remove uncertainty and ensures that the interventions deliver all the compliance and productivity results identified," assures Raphulu.

The Sustainable Industrial Spaces Conference 2025

Industrial spaces, such as industrial development zones (IDZs), special economic zones (SEZs) and industrial parks, offer strategic opportunities for decarbonisation and energy

security due to their integrated infrastructure and key locations. The NCPC-SA is currently implementing four multi-year projects with the United Nations Industrial Development Organization (UNIDO) to drive sustainability, particularly in the area of sustainable energy.

The Sustainable Energy Systems for Industrial Development (SESID) project is accelerating the uptake of renewable energy in industrial spaces through integrated planning and pilot projects. At the same time, the Low Carbon and Positive Energy Project promotes the optimisation of energy consumption and the generation of distributed renewable energy in industrial spaces. The Global Eco-Industrial Parks Programme (GEIPP), which has been operational for five years, promotes efficient resource utilisation, industrial symbiosis, and cleaner production. Additionally, the Global Clean Hydrogen Programme is set to launch in South Africa in early 2026.

Industrial spaces have significant potential to produce energy for their own consumption and to serve nearby communities, as well as to provide greener infrastructure for industrial companies of all sizes. Together with the DTIC and international project funders, these initiatives are collaborating with selected industrial sectors, all of which are at varying levels of readiness and adoption of sustainable industrial development models.

The NCPC-SA recently hosted a two-day hybrid event to advance this drive for sustainability and competitiveness in industrial spaces, bringing together key stakeholders at the CSIR ICC in Pretoria and online.

"We make these opportunities and the tools we produce freely available to industry to support their journey, and we have been encouraged to see how many of South Africa's large emitters are taking up the challenge and partnering with us and others towards a low-carbon and resource-efficient future," concludes Raphulu.

The NCPC-SA conference content, including presentations of green hydrogen and future energy models, can be viewed on the NCPC conference website, along with content from their 2024 and 2022 events.

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