

South Africa: SAGEN-CET

Building Capacities to support the South African Energy Transition



South Africa has experienced many years of a severe energy crisis. Unreliable power supply has resulted in drastic economic losses, above costing jobs and increasing social injustice. The energy crisis has proven to be a significant millstone around South Africa's neck. The country's power plant fleet is ageing and relies heavily on coal, which is the top carbon emitter among different energy sources and thus a main driver for global warming. The notable consequences of this climate crisis have already been experienced by South Africans, for instance through catastrophic floods killing people and destroying livelihoods and infrastructure. As a result, South Africa needs to tackle the energy, economic, social and climate challenges simultaneously.

Project name	South African-German Energy Programme – Capacities for the Energy Transition (SAGEN-CET)
Commissioned by	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ)
Project region	South Africa
Partners	Department of Mineral Resources and Energy (DMRE), National Energy Regulator of South Africa (NERSA), National Transmission Company South Africa (NTCSA), South African Local Government Association (SALGA)
Duration	01.01.2024 – 31.12.2026
Financial volume	EUR 4.5 million

The challenge

Due to the ageing of the power plant fleet, old coal-fired power plants with an installed capacity of approx. 11 GW will be decommissioned by 2030. This will result in a significant need for new generation capacity, which will be provided largely from renewable energies. By 2030 alone, 24 GW of solar and wind capacity will be installed. In addition to this energy transition, South Africa is facing a power sector reform that will fundamentally change the structures of the power sector and the roles of the actors involved. The vertically integrated state-owned utility Eskom will be split into three state entities: Generation, Transmission and Distribution. A transition process towards a competitive market is envisaged.

Our approach

The Capacities for the Energy Transition project under the South African-German Energy Programme (SAGEN-CET) collaborates with South African partners to manage this change and the transition to a reliable, affordable and clean energy future.

SAGEN-CET empowers decision-makers in public organizations, enhancing their skills for prompt, informed decisions, bolstering contributions to the power sector reform. Tailored services include expert talks, peer exchanges, training programmes, collaborations with educational institutions, and targeted capacity building at different government levels. The project provides international know-how for policy makers and utilities on the future power market design and energy transition. The project also focuses on implementing existing policies and legal provisions, offering structured training at entities like the National Energy Regulator of South Africa (NERSA) and the National Transmission Company South Africa (NTCSA) on market design, regulations, and technical aspects. Additionally, SAGEN-CET addresses gender inequality within the power sector by supporting strategies, gender-specific data capture, organizational development measures, and creating gender-responsive working conditions. This includes prioritizing actions, performance assessment, and empowering women in senior positions through mutual agreements on gender-responsive goals.



Photo left: Technician working at a PV (photovoltaic) plant

Photo middle: Group of people attending a course

Photo right: Transmission Grid



Contact person

Ms Anna-Maria Heisig
Head of Project
anna-maria.heisig@giz.de

Photo left: Wind farm and PV panels

Photo right: Solar water heater

Our results

During its first phase (2019-2023), SAGEN-CET assisted the establishment of two multi-stakeholder working groups in the power sector with the participation of the DMRE, NT, NERSA, SALGA, Cooperative Governance and Traditional Affairs (CoGTA), the Association of Municipal Electricity Utilities (AMEU) and Eskom, among others, and has facilitated a multitude of multi-stakeholder dialogue formats.

In collaboration with prominent South African universities, including the Centre for Renewable and Sustainable Energy Studies (CRSES) led by Stellenbosch University, Power Futures Lab (PFL) at the University of Cape Town's Graduate School of Business and the African Energy Leadership Center (AELC) at Wits Business school, SAGEN-CET supported the strengthening of capabilities in critical areas such as power system planning and operations, energy policy and regulation, as well as green hydrogen.

Together with its partners, SAGEN-CET spearheaded the development and rollout of 22 new or adapted modular continuing education courses, in which more than 860 people have participated to date. These courses are designed to equip industry experts with the knowledge necessary for navigating the transition towards a future energy landscape characterised by a higher proportion of renewable energy sources, a restructured sector, and the emergence of a green hydrogen economy.

SAGEN-CET extends its support to pilot innovative technologies from the private sector, specifically geared towards facilitating the energy transition. Two innovations, incl. smart geyser controls in cooperation with the City of Cape Town and smart electric vehicles controls in cooperation with GridCars, are currently being piloted and are undergoing testing. The results will be widely shared with stakeholders within the electricity sector.

The SAGEN-CET project places a special emphasis on promoting the Just Energy Transition in the province of Mpumalanga as it is the centre of South Africa's coal production. Through collaboration with Green Cape, SAGEN-CET supports the Mpumalanga provincial government in the establishment of a Green Economy Cluster Agency. The goal is to bolster the growth of the green economy in Mpumalanga and to create fresh opportunities within sustainable industries. In line with the established training courses supported by SAGEN-CET, the knowledge acquired through these platforms will be disseminated to a wide array of stakeholders within the electricity industry.

Furthermore, SAGEN-CET actively facilitates knowledge exchange among stakeholders within the electricity industry and lends expertise to critical power sector reform endeavours. This includes direct assistance to Eskom in establishing an independent transmission system and market operator (ITSMO) and providing guidance on the creation of a certification scheme for renewable energy, including recommendations on guarantees of origin for renewable energy and green hydrogen. Together with DMRE, NT, SALGA, AMEU and NERSA a dialogue forum was created for the establishment of a national wheeling framework. At the distribution system level, the project's support is focused on enabling sustainable and resilient distribution utilities. To this end, a working group comprising SALGA, NERSA, NT, CoGTA, DMRE, AMEU, and Eskom has been established to oversee the regulatory review of the electricity distribution pricing framework and the practical implementation of the cost of-supply framework in multiple municipal distributors, including metropolitan and local ones.



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University Collaborations



22

(Short) Courses



860

Course Participants



4

Technology Innovations piloted

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South African-German Energy Programme (SAGEN)
P.O. Box 28102, Sunnyside, 0002
Hatfield Gardens, Block C, 333 Grosvenor Street
Pretoria, South Africa

sagen@giz.de
www.giz.de/southafrica | www.sagen.org.za

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