

SOUTH AFRICA AND THE 21ST CENTURY POWER PARTNERSHIP

Paving the Way to a Cleaner, Smarter, and More Resilient Power System

Mission and Objectives

Power systems are a foundational element of inclusive economic growth and social development. Integrating these objectives into viable power system policy frameworks is the central challenge of policymakers in the 21st century. The 21st Century Power Partnership (21CPP) serves as an open, collaborative platform for sharing policy and regulatory best practices in the service of power system transformation.

Established in 2012, the 21CPP South Africa programme is a global initiative that connects South African stakeholders with an international community of expertise. The overall goal of this program is to support South Africa's power system transformation by accelerating the transition to a reliable, financially robust, and low-carbon power system. 21CPP activities focus on achieving positive outcomes for all participants, especially addressing critical questions and challenges facing system planners, regulators, and operators. In support of this goal, 21CPP taps into deep networks of expertise among leading industry practitioners.

The 21CPP South Africa programme's primary objectives are to:

- **Accelerate next-generation power system planning** by supporting South Africa's Integrated Resource Plan (IRP), identifying policy approaches to distributed generation and grid codes for large-scale generators, and undertaking a comparison of power system planning tools.
- **Promote various power system modernization efforts** through operational and policy support for grid integration of distributed and bulk power renewable energy, in combination with energy efficiency and smart grid deployment measures.
- **Assist the government of South Africa to build a workforce of power system experts** through dedicated workshops and trainings, staff exchanges, consultations and peer engagements.

About the 21st Century Power Partnership

The 21st Century Power Partnership is a multilateral effort of the Clean Energy Ministerial and serves as a platform for public-private collaboration to advance integrated policy, regulatory, financial, and technical solutions for the large-scale deployment of clean energy generation in combination with deep energy efficiency and smart grid solutions.

2017–2018 Program Highlights

- 21CPP and Eskom launched the joint South African Grid Integration Study (SAGIS). Phase I of this grid study began in February 2017 with an overhaul of Eskom’s long- and short-term planning capabilities by Eskom and National Renewable Energy Laboratory (NREL) experts. These improved modelling capabilities have provided the foundation for a detailed analysis of South Africa’s grid and its ability to reliably and cost-effectively incorporate high penetrations of variable renewable energy.
- In March 2017, 21CPP joined with the USAID EC-LEDS program, the South Africa Low Emission Development (SA-LED) program, GIZ and the South Africa Local Government Association (SALGA) to provide training for South African municipal utilities on solar photovoltaics financial and socio-economic impact analysis. The training included the International Jobs and Economic Development Impacts (I-JEDI) tool—a freely available economic model developed by NREL that estimates gross economic impacts and job potential from wind, solar, biomass, and geothermal energy projects.
- In April 2017, 21CPP hosted two Fellows from the Council for Scientific and Industrial Research (CSIR) at NREL. Fellows used the I-JEDI tool to investigate the potential economic impacts of implementing the IRP in South Africa. With the expertise gained from this Fellowship, 21CPP Fellows will help further adapt the I-JEDI tool for South African applications and support broader training and dissemination for other South African stakeholders.
- 21CPP partnered with the CSIR to develop first-of-its-kind, high-resolution geospatial wind and solar resource supply curves for South Africa. NREL hosted two staff from the CSIR in May 2017 as part of this collaboration, the results of which will inform future analyses of the potential for variable renewable energy across South Africa.
- NREL presented initial results of the South Africa Grid Integration Study at the WindAc conference in Cape Town in November 2017. Early results of the study indicated that tandem long-term and short-term modelling can yield more cost-effective build-plans that better consider both capital and operational expenses. A new interactive visualization tool to understand these results was also presented and will be finalized soon.

2018–2019 Anticipated Activities

South African Grid Integration Study Expansion

Continue and strengthen technical partnerships with Eskom and the CSIR to expand the South Africa Grid Integration Study, aiming to build upon the initial results by addressing new factors such as stability and load flow considerations, improved understanding of integration costs, enhanced resource data, and implications of distributed generation and improved load management. This effort will hopefully include new techniques for co-optimization of generation and transmission decisions and enhanced visualizations

Partners: Eskom, CSIR

Support for Enhanced Local and Regional Coordination

Provide renewed support for multi-lateral and peer-to-peer discussions within South Africa and the broader Southern Africa region to build consensus and strengthen partnerships to advance regional planning efforts and build a coalition ready to address the next generation of power system questions, such as regional integration, electric vehicles, demand response and the energy-water nexus.

Partners: SAPP, SADOE, CSIR, Eskom, National Treasury, USAID, GIZ, SALGA, and others

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www.21stcenturypower.org

15013 Denver West Parkway
Golden, CO 80401
303-275-3000 | www.nrel.gov

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