

Executive Summary

Future skills and job creation through renewable energy in South Africa

Assessing the co-benefits of decarbonising the power sector



South Africa has an abundance of renewable energy resources. This, combined with the recent drop in technology costs and the need for new power generation as coal power plants reach retirement, provides an opportunity for the country to decarbonise its electricity sector. Managing this process will allow for a just transition in coal-dependent sectors and regions, thus opening new opportunities for current coal sector employees and other job seekers.

This study analyses the employment impacts of different plans for expanding electricity generation in South Africa's power sector; this was carried out in the context of the COBENEFITS' project with the aim of assessing the co-benefits of a low-carbon energy transition in the country. Four scenarios for the future development of the electricity sector in South Africa were analysed: Council for Scientific and Industrial Research Least Cost planning scenario (CSIR_LC); Department of Environmental Affairs Rapid Decarbonisation scenario (DEA_RD); Integrated Resource Plan 2016 (IRP 2016); and Integrated Resource Plan Policy Adjusted scenario 2018 (IRP 2018).

This report presents the resulting employment effects within the electricity sector, primarily focusing on coal and renewable energy sources. It also provides an initial assessment of the skill attainment levels required for South Africa's energy transition, and the potential for workers to transfer from the coal sector to the emerging renewable energy sector.

The four scenarios considered two timelines consistent with the DOEs reporting of the draft IRP 2018: The short-term timeline up to the year 2030 which is based on the expected electricity generation mix to meet the rising demand in the country and which is aligned with the National Development Plan 2030. The long-term timeline considers the timeframe up to 2050, based on the electricity generation mix predicted to meet the projected growth in energy demand in the country within this timeframe. It also considers the predicted decommissioning timeline of coal power plants in the country by 2050. "Test case variables input parameters" stated in the draft IRP 2018 (for public comments) such as the RE annual limits were applied for the reference IRP 2018 scenario stated in this study.

- **Key policy message 1:** South Africa can significantly boost gross employment by increasing the share of renewables. With its decision to scale up renewables by moving from IRP 2016 to IRP 2018, employment (measured in job years) can be expected to increase by an additional 40% in the next 10 years. But there is room for more: by following CSIR's least cost pathway, this number could even be doubled.
- **Key policy message 2:** The renewable energy sector is fostering the high-skill labour market, with 70% of positions in renewable power generation being created in the highly skilled group (> Grade 12). Growth in high-skilled jobs is most distinct in DEA's rapid decarbonisation pathway and CSIR's least cost pathway, both reaching a share of 76% in 2050.
- **Key policy message 3:** Coal-sector-based employment is expected to decline regardless of a shift in power generation towards renewable energy sources, with 35–40% decline in employment between 2020 and 2050. However, the transition process should be managed politically, to mitigate negative impacts on affected workers and communities.

KEY FIGURES:

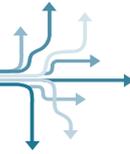
- By 2050, the shift from IRP 2016 to IRP 2018 will have contributed to a 17% job increase. By this horizon more than 150,000 jobs will have been created in the power sector in net terms, i.e., including job losses in the coal sector.



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⁵ The term "co-benefits" refers to simultaneously meeting several interests or objectives resulting from a political intervention, private sector investment or a mix thereof (Helgenberger et al., 2019). It is thus essential that the co-benefits of climate change mitigation are mobilised strategically to accelerate the low-carbon energy transition (Helgenberger et al., 2017).



- Up to 1.6 million additional jobs can be created economy-wide through the power sector transformation by 2050.
- Across all scenarios, around 70% of new power-sector jobs associated with renewable energy are categorised as highly skilled.
- Jobs in the coal sector will decline by 35–40% between 2020 and 2050, with expected reductions in global demand and exports being the main driver behind this transformation.

KEY FINDINGS:

- **South Africa can significantly boost employment by increasing the share of renewables.** With this decision, employment can be expected to increase by an additional 40% in the period 2018 to 2030, accounting for 580,000 job years. By following CSIR's least cost pathway this number can be more than doubled to more than 1.2 million job years, created along the renewable energy value chain.
- **Jobs in renewable power generation are concentrated in the services, construction and manufacturing sectors.** However, employment opportunities are created in almost all sectors – including the mining sector, which experiences a net increase in employment despite job losses in coal mining.
- **With the shift from IRP 2016 to IRP 2018 an additional 1.3 million jobs are created economy-wide by 2050.** DEA's rapid decarbonisation pathway would have an equivalent impact. However, following the CSIR's least cost pathway would create an additional 300,000 economy-wide jobs.
- **With the shift from IRP 2016 to IRP 2018, new jobs created in the power sector increase by an additional 17% by 2050,** adding up to more than 150,000 jobs (net).
- In terms of total net employment in the electricity sector, solar PV and wind together account for more than 80% of total net employment in the CSIR_LC and DEA_RD scenarios. Scenarios with higher shares of renewables also lead to the highest net employment figures.
- **By the 2030 horizon, CSIR's least cost pathway will result in the highest number of jobs in the power sector, accounting for 94,000 jobs (net),** and the highest number of economy-wide jobs with almost 300,000 additional jobs in comparison to IRP 2018. In general, CSIR's least cost pathway performs best in terms of economy-wide jobs at both the 2030 and 2050 horizons.
- **The bulk of job creation in renewable power generation is within the high-skilled labour group,** defined as workers with an educational attainment level above Grade-12, although employment is also created in other skill groups. Across all scenarios, around 70% of new jobs created in the power sector by renewable energy are in fact high-skilled jobs (> Grade 12). Growth in high-skilled jobs is most distinct in DEA's rapid decarbonisation pathway and CSIR's least cost pathway, both reaching 76% in 2050.
- **The Renewable Energy Independent Power Producer Procurement Programme (REIPPP) has demonstrated the potential for localised job creation through renewable energy deployment in South Africa.** The localisation requirements of the REIPPP resulted in the development of renewable manufacturing industries and capacity in South Africa. However, growth in the manufacture of essential renewable energy (RE) technologies (and the associated components) is highly dependent on commitment by government to continuous and long-term deployment of renewable energy.
- **Continued job losses are likely in the coal sector: declining global demand for coal is the largest impact factor for coal mining employment;** a decline in demand for South African coal can be observed across all scenarios. Bloomberg New Energy Finance (2018) estimates that by 2050 global coal power generation will decrease to 5% of the global power mix (from 30% in 2017). Across the employment scenarios, jobs in the coal sector (including the mining and power sectors) are predicted to decline by 35–40% between 2020 and 2050. For IRP 2018, this decline corresponds to 19,000 jobs in total.