COBENEFITS STUDY

October 2019

Economic prosperity for marginalised communities through renewable energy in South Africa

Assessing the co-benefits of decarbonising the power sector

Executive report

CSIR our future through science

IASS POTSDAM

IET International Energy Transition

COBENEFITS

This COBENEFITS study has been realised in the context of the project "Mobilising the Co-Benefits of Climate Change Mitigation through Capacity Building among Public Policy Institutions" (COBENEFITS). This print version has been shortened and does not include annexes. The full version of this report is available on www.cobenefits.info.

This study is part of a 2019 series of four studies assessing the co-benefits of decarbonising the power sector in South Africa, edited by IASS and CSIR. All reports are available on www.cobenefits.info.

- Improving health and reducing costs through renewable energy in South Africa
- Consumer savings through solar PV self-consumption in South Africa
- Economic prosperity for marginalised communities through renewable energy in South Africa
- Future skills and job creation through renewable energy in South Africa

---

COBENEFITS is part of the International Climate Initiative (IKI). The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag. The project is coordinated by the Institute for Advanced Sustainability Studies (IASS, Lead) in partnership with the Renewables Academy (RENAC), Independent Institute for Environmental Issues (UfU), IET – International Energy Transition GmbH and the Council for Scientific and Industrial Research (CSIR).

Revised edition October 2019. First published March 2019.

Editors: Ayodeji Okunlola, David Jacobs, Ntombifuthi Ntuli, Ruan Fourie, Sylvia Borbonus, Laura Nagel and Sebastian Helgenberger – IASS Potsdam, CSIR and IET

Technical implementation: Fumani Mthembi, Anthony Dane, Holle Wlokas, Louise Tait, Lauren Hermanus, Nolwazi Sokhulu, Mbali Mabaso, Tlhologelo Relela – Knowledge Pele, University of Stellenbosch – Centre for Complex Systems in Transition, and Change Pathways

Supported by:
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
based on a decision of the German Bundestag

INTERNATIONAL CLIMATE INITIATIVE (IKI)

COBENEFITS of the new energy world of renewables for the people in South Africa

South Africa is in the midst of an energy transition, with important social and economic implications, depending on the pathways that are chosen. Economic prosperity, business and employment opportunities as well as health impacts, issues related to the water–energy–food nexus and global warming impacts: through its energy pathway, South Africa will define the basis for its future development. Political decisions on South Africa's energy future link the missions and mandates of many government departments beyond energy, such as environment, industry development, science and technological innovation.

Importantly, the whole debate boils down to a single question: **How can renewables improve the lives of the people in South Africa?** Substantiated by scientific rigor and key technical data, the study at hand contributes to answering this question. It also provides guidance to government departments and agencies on further shaping an enabling environment to maximize the social and economic co-benefits of the new energy world of renewables for the people of South Africa.

Under their shared responsibility, the CSIR Energy Centre (as the COBENEFITS South Africa Focal Point) and IASS Potsdam invited the Department of Environmental Affairs (DEA) and Department of Energy (DoE), together with the Independent Power Producers (IPP) Office, the Department of Trade and Industry (DTI), Department of Science and Technology (DST) and the South African National Energy Development Institute (SANEDI) to constitute to the COBENEFITS Council South Africa in May 2017 and to guide the COBENEFITS Assessment studies along with the COBENEFITS Training programme and political roundtables.

We particularly highlight and acknowledge the strong dedication and strategic guidance of the COBENEFITS Council members: Olga Chauke (DEA); Nomawethu Qase (DoE); Gerhard Fourie (DTI); and Lolette Kritzinger-van Niekerk, Frisky Domingues, Thulisile Dlamini and Lazarus Mahlangu (IPP Office). Their contributions during the COBENEFITS Council sessions guided the project team to frame the topics of the COBENEFITS Assessment for South Africa and to ensure their direct connection to the current political deliberations and policy frameworks of their respective departments. We are also indebted to our highly valued research and knowledge partners, for their unwavering commitment and dedicated work on the technical implementation of this study. The COBENEFITS study at hand has been facilitated through financial support from the International Climate Initiative of Germany.

South Africa, among 185 parties to date, has ratified the Paris Agreement, to combat climate change and provide current and future generations with opportunities to flourish. Under the guidance of the National Planning Commission, municipalities, entrepreneurs, citizens and policymakers are debating pathways to achieve a just transition to a low-carbon, climate-resilient economy and society in South Africa. With this study, we seek to contribute to these important deliberations by offering a scientific basis for harnessing the social and economic co-benefits of building a low-carbon, renewable energy system while facilitating a just transition, thereby **making the Paris Agreement a success for the planet and the people of South Africa**.

We wish the reader inspiration for the important debate on a just and sustainable energy future for South Africa!

Ntombifuthi Ntuli
COBENEFITS Focal Point
South Africa
CSIR Energy Centre

Sebastian Helgenberger
COBENEFITS
Project Director
IASS Potsdam

Executive Summary

COBENEFITS

Economic prosperity for marginalised communities through renewable energy in South Africa

Assessing the co-benefits of decarbonising the power sector

South Africa's renewable energy (RE) procurement policy is unique globally in its emphasis on providing benefits for communities in the vicinity of projects participating in the RE Independent Power Producer Procurement Programme (REIPPPP). RE projects are primarily located in rural communities, frequently categorised as "marginalised communities".[1] The REIPPPP has created a legal framework to incentivise IPPs to channel benefits to communities near RE project sites through a range of means, including local employment quotas, community ownership in RE projects, as well as contributing a proportion of their revenue towards development spending, known as socio-economic development (SED) and enterprise development (ED) spend.

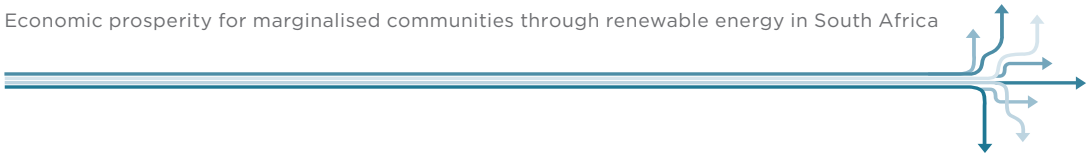
This study assesses the SED and ED impacts of renewable energy deployment in marginalised communities in South Africa; this was carried out in the context of the COBENEFITS project with the aim of assessing the range of additional benefits[2] resulting from a low-carbon energy transition in the country. It entails the assessment of selected socio-economic impacts, realised to date, in three REIPPPP project areas, along with projections and modelling the assessed impacts (up to 2030 for the medium term, and 2050 for the long term) across a range of power sector decarbonisation scenarios.

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). The COBENEFITS study also sought to provide insights on further improving the various benefits that should accrue to

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.

[1] In this report, the term 'marginalised communities' refers strictly to a "previously disadvantaged community" as applicable. These communities represent typical areas with underdeveloped and disenfranchised populations targeted by the South African Government for accelerated development.

[2] 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).



- **Key policy message 1:** By the year 2050, IRP 2018 will have created almost 5,000 jobs through socio-economic and enterprise development (SED and ED) and enabled 19,000 individuals to benefit from access to education-related programmes. These socio-economic benefits for marginalised communities could even be increased by an additional 100 % and 50 % respectively, by scaling up the adoption of renewable energy (RE) in line with the more ambitious low-carbon energy pathways.
- **Key policy message 2:** Without stronger guidance, large-scale REIPPPP[3] projects may not deliver the anticipated level of significant benefits for marginalised communities: The IPP Office should be better positioned to lead engagement with the local and district municipalities that host independent power producers (IPP), to ensure a detailed understanding of the REIPPPP mechanisms and the intended role of power producers within the communities.
- **Key policy message 3:** Prior engagement of IPPs with the various community stakeholders, in pre- and post-project commissioning, forms the basis for renewable energy projects to deliver on their socio-economic promises. Codifying these requirements by means of a REIPPPP Practice Guide would strengthen the delivery of more direct and measurable socio-economic and enterprise-related benefits to the host and marginalised communities.

KEY FIGURES:

- Up to 30 000 individuals in marginalised communities can benefit from access to education-related programmes through REIPPPP by the year 2050.
- More than 3 000 local enterprises in marginalised communities can be supported through REIPPPP until the year 2050.
- Up to 10 000 local jobs can be created in marginalised communities through REIPPPP SED and ED spend until the year 2050.
- Local communities own an average of 11% of active IPP projects.

COBENEFITS South Africa (2019): Economic prosperity for marginalised communities through renewable energy in South Africa. Assessing the co-benefits of decarbonising the power sector

available on www.cobenefits.info

[3] REIPPPP: Renewable Energy Independent Power Producer Procurement Programme of South Africa

KEY FINDINGS:

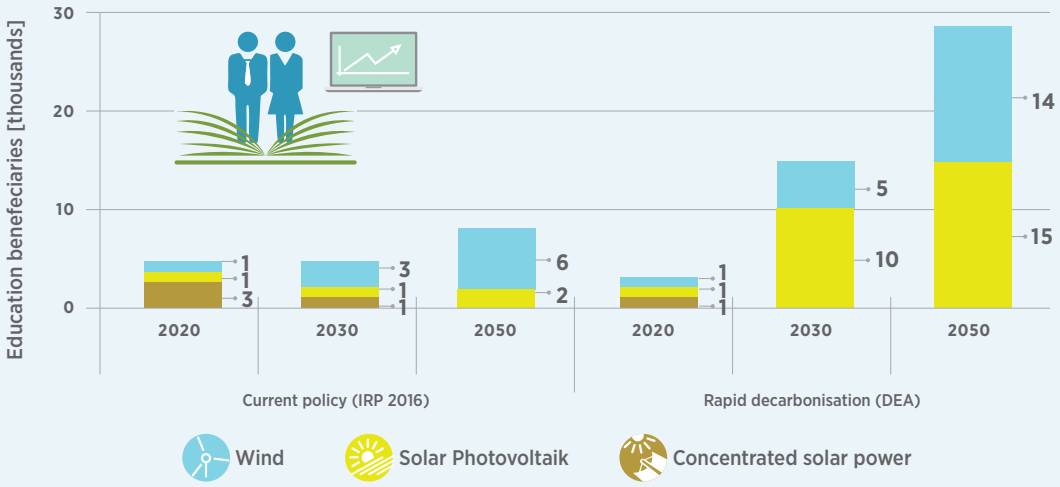
The employment benefits of RE deployment are distributed nationwide – which is not the case for fossil-fuel power plants. Jobs associated with the solar PV value chain mostly occur in inland areas of the country, while marginalised communities in coastal regions of the country benefit more from jobs created in the wind value chain.

Ambitious renewable energy pathways generate the largest impacts for beneficiaries in marginalised communities.

- In terms of literacy access in marginalised communities: By the year 2050, IRP 2018 will enable 19 000 individuals to benefit from access to education-related programmes. This benefit could be further increased by 34 % by following the CSIR Least Cost pathway, and by more than 50% through the DEA's rapid decarbonisation pathway.
- In terms of enterprise support: IRP 2018 will support more than 2200 local enterprises in the year 2050. This benefit could be further increased by 17% by following DEA's rapid decarbonisation pathway and by more than one-third by following the CSIR Least Cost pathway.
- In terms of local job benefits through SED and ED spend: By the year 2050, IRP 2018 will enable almost 5000 additional jobs in local enterprises. This benefit could be further increased by more than 60% by following CSIR Least Cost pathway; and even doubled – to a total of almost 10 000 jobs in local enterprises – by following the DEA's rapid decarbonisation pathway.
- Within the context of the sites assessed, the types of jobs created locally through SED and ED spend include non-core services offered to projects, such as cleaning and catering services. In communities with other significant opportunities for economic activity, job creation may not necessarily support renewable power generation. For example, supported enterprises may create retail jobs or service jobs for other industries, including the mining industry.

With its socio-economic co-benefits the REIPPP programme makes important contributions to meeting the objectives of the UN 2030 Sustainable Development agenda. While the REIPPP programme is most directly associated with SDG 7 (Sustainable Energy for All), through its socio-economic co-benefits it also makes important contributions to meeting other objectives, such as SDG 1 (No Poverty), SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth) and SDG 10 (Reduced Inequality).

By 2050, 30.000 people in rural South Africa can benefit from access to education programmes by following an ambitious decarbonisation pathway



Educational beneficiaries of SED and ED spending

Contents

List of Tables

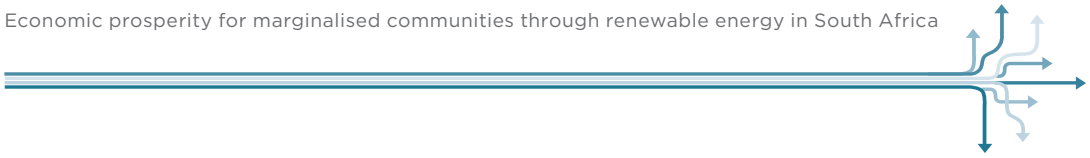
List of Figures

1. Understanding the context of renewables and marginalised communities

Since 2011, South Africa has experienced significant growth in utility-scale renewable energy through the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP). As of March 2018, 64 projects were in operation, delivering 3 801 MW of electricity to the national electricity grid (IPP Office, 2018). Whilst the growth of this sector is already stimulating important economic impacts nationally (Bischof-Niemz, 2015), there is also considerable interest in the benefits that renewable energy will engender for remote, low-income and marginalised communities. South Africa's renewable energy procurement policy is unique in its emphasis on stimulating socio-economic benefits at the local level for communities in the vicinity of renewable energy (RE) projects. In addition to potential indirect benefits for communities, deriving from procurement and construction, government policy places specific requirements on independent power producers (IPPs) to foster community ownership in the form of shareholding in RE projects, local employment, as well as annual monetary contributions to stimulate local development.

Economic opportunities for rural and marginalised communities (termed previously 'disadvantaged communities') are especially important within the South African context, as such communities are characterised by some of the most severe economic inequality in the world (Odusola et al., 2017). Many of the gains from South Africa's post-apartheid economic growth have not been shared by the poorest and most vulnerable of its citizens. This inequality is also experienced spatially, with remote and rural communities experiencing some of the poorest developmental outcomes in the country, reflecting the structural design of pre-1994 apartheid South Africa (David et al., 2018). Inequality is one of the biggest challenges to the achievement of South Africa's developmental objectives. For the purposes of this study, marginalised communities are understood as those that have experienced social and economic exclusion both historically and currently, as evidenced by a range of socio-economic indicators such as high poverty and unemployment rates. The REIPPPP has created a legal framework to incentivise IPPs to target communities within 50km of RE project sites to drive expected direct local value creation and socio-economic benefits.

Given that IPPs will be making substantial financial investments in marginalised communities in South Africa over the next 20–30 years, it is important to establish and develop appropriate assessment frameworks to better understand the impacts thereof. It is imperative to point out that it is presently very early in the implementation of these projects, with the first projects only having begun operating in 2014. Thus, significant impacts at this stage are limited, given that developmental outcomes are typically long-term in nature. This study, therefore, aims to contribute towards unravelling the socio-economic benefits created in marginalised communities through renewable energy till date. This is achieved through an exploration of the emerging experiences, activities and development investments of IPPs, which jointly present a view of the prospects for achieving long-term impacts. It is understood that these development activities are nascent; therefore, approaches and assessment mechanisms to propose a lens through which potential impacts over the longer term can be viewed and measured are assessed. It is important to note that the REIPPPP has delivered, and will continue to deliver significant economic benefits to the economy of South Africa at large (e.g., Bischof-Niemz, 2015). This study focuses on the socio-economic and enterprise development benefits accrue to marginalised communities within the vicinity of RE projects-communities targeted as 'beneficiary' communities by the RE power producers. The assessment drew on three case study sites from the Northern Cape, Eastern Cape and Western Cape provinces of South Africa.



2. Methodology

2.1 Site selection and data collection

The study draws on implementation experience and data collected from three REIPPPP locations. This comprises two wind farms and one solar photovoltaic (PV) power project. Due to confidentiality agreements and the competitiveness of the REIPPP programme, securing access to project-specific information for research purposes is a sensitive issue. Consequently, only very limited research on project performance and impacts exists and is accessible to the public. The selection of project sites was thus primarily guided by the quality of existing relationships with the project company, followed by the locations of the projects across provinces in South Africa, the duration of their commercial operation and also the expected level of community investment.

The assessment is based on both primary and secondary data. Primary data are obtained from structured focus-group interviews with SED and ED beneficiaries, local municipality leaders, power plant managers and employees, local business owners and employees, as well as with educational and health service providers within the community. Secondary data are obtained from company documentation obtained from the respective ED managers and also from publicly available reports of the South Africa Independent Power Producer office (IPP Office). The surveys and questionnaires issued sought to understand the communities' understanding of the role and impact of the nearby large-scale RE project as well as to gather data on the expected outcomes of the IPP's SED/ED investments in the area. The participatory focus group method applied at the various locations was qualitative in nature, combining the use of focus group discussions and practical exercises that allowed participants to orally represent their perspectives on the socio-economic impact areas (indicators) measured in the study.

2.2 Methods for assessing the socio-economic impact

This assessment focused on two key 'impact areas' as shown in table 1 below. They are selected from broad key stakeholder engagement on the COBENEFITS Council, as well as from the results of existing literature indicating the "impact areas" with the highest potential to deliver on socio-economic development and enterprise development generated though renewables for marginalised communities in South Africa.

	Impact Area	Description
1	SED and ED spend	Socio-economic development and Enterprise development spending directly into projects and activities in the communities as required as part of the REIPPPP. This represents the area that directly delivers the most significant socio-economic benefits for marginalised communities. It includes three quantitative impact indicators: ■ Direct employment ■ Enterprise support and development ■ Education access and support ■ Improvement in the standard of living (this quantitative metric was not developed for this study)
2	Renewable energy investment	Socio-economic impacts associated with the investment in renewable energy that indirectly impact on the marginalised communities (i.e., associated with selected stages of the RE project development). Key quantifying indicators include: ■ Construction and operation and maintenance jobs ■ Local ownership of RE projects

Table 1: Renewable energy impact areas directly linked to marginalised communities

Source: own

Analytical framework

The analytical framework allowed for an overarching assessment that draws on both qualitative information and quantitative indices of varying degrees of completeness and accuracy. It builds on research concerning 'Theory of Change'[4] to contribute toward building a broadly applicable methodology that, while accommodating local contexts explicitly, attempts to create comparability across different project sites in different geographies. The key data sources and procedure for conducting the impact analysis are shown in figure 1. An 'ecosystem' of relevant data sources was developed and drawn upon (figure 1); the diversity of sources contributed to a richer understanding of the activities, outputs, outcomes (or effects), intermediate states (or impact proxies), and ultimately the impacts at each analysis stage.

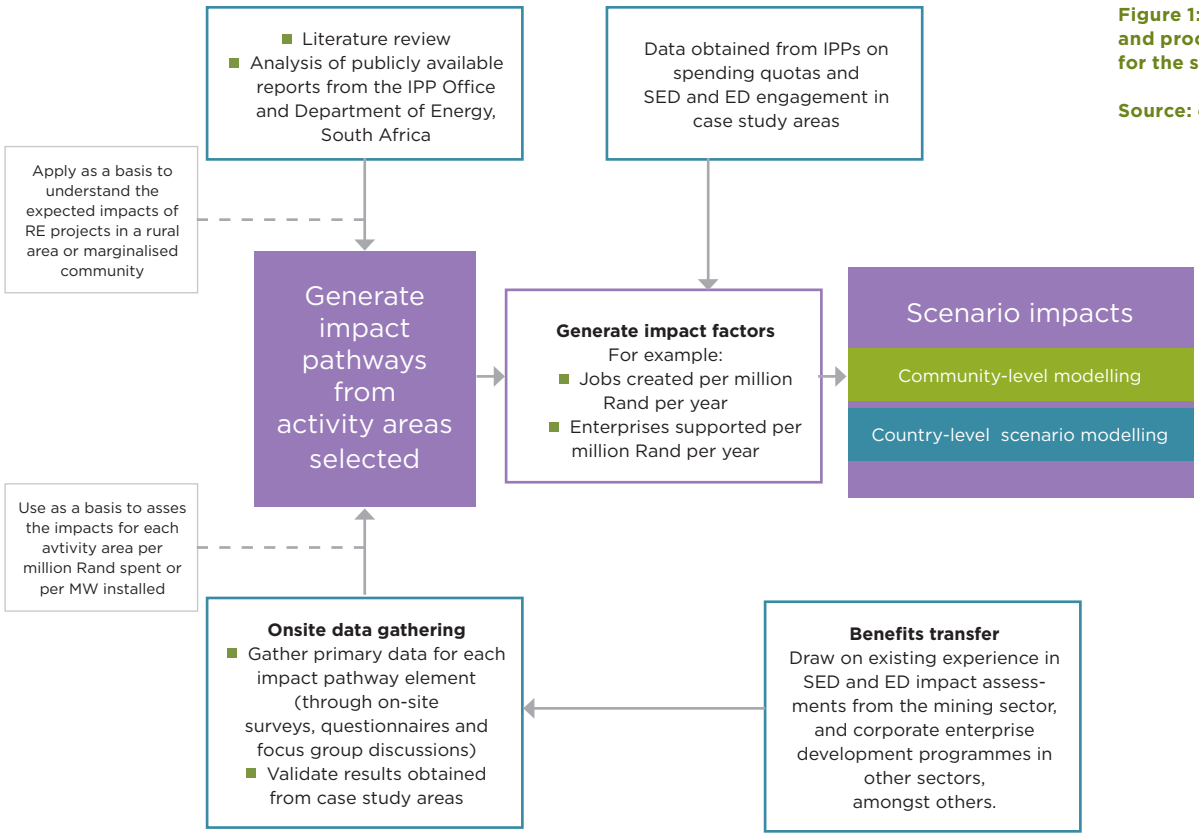


Figure 1: Sources of data and process flow applied for the study

Source: own

[4] This theory was popularised by Carol Weiss in 1995 as a way to describe the set of assumptions that explain the steps that lead to long-term goal and the connections between programmes, activities and outcomes (Andrea, 2004).

Impact pathways and impact factors

A series of 'impact pathways' was developed for each site associated with SED and ED spent and also at an aggregate level for RE 'investment'. This represents the rationale for how activities that deliver outputs will lead to outcomes and finally to impacts (or to intermediates proxies for impacts). This step drew on the scales that were constructed in order to organise qualitative information obtained through interviews and focus groups into quantitative metrics (see figure 2). In the case of employment, this involved an attempt to estimate the number of jobs that would be sustained over time, as well as accounting for employment redundancies. For education, this was informed by the extent to which beneficiaries felt empowered, as well as evidence that an intervention led to improved educational results or enrolment in further education. For enterprises, this was informed by the proven sustainability of the supported businesses (to date) as well as by perceptions regarding the role of the project support in contributing to beneficiaries' business sustainability. Impact factors were obtained by averaging the metrics across the three study areas, as well as accounting for. The factors are not tailored according to specific RE technologies or geographies.

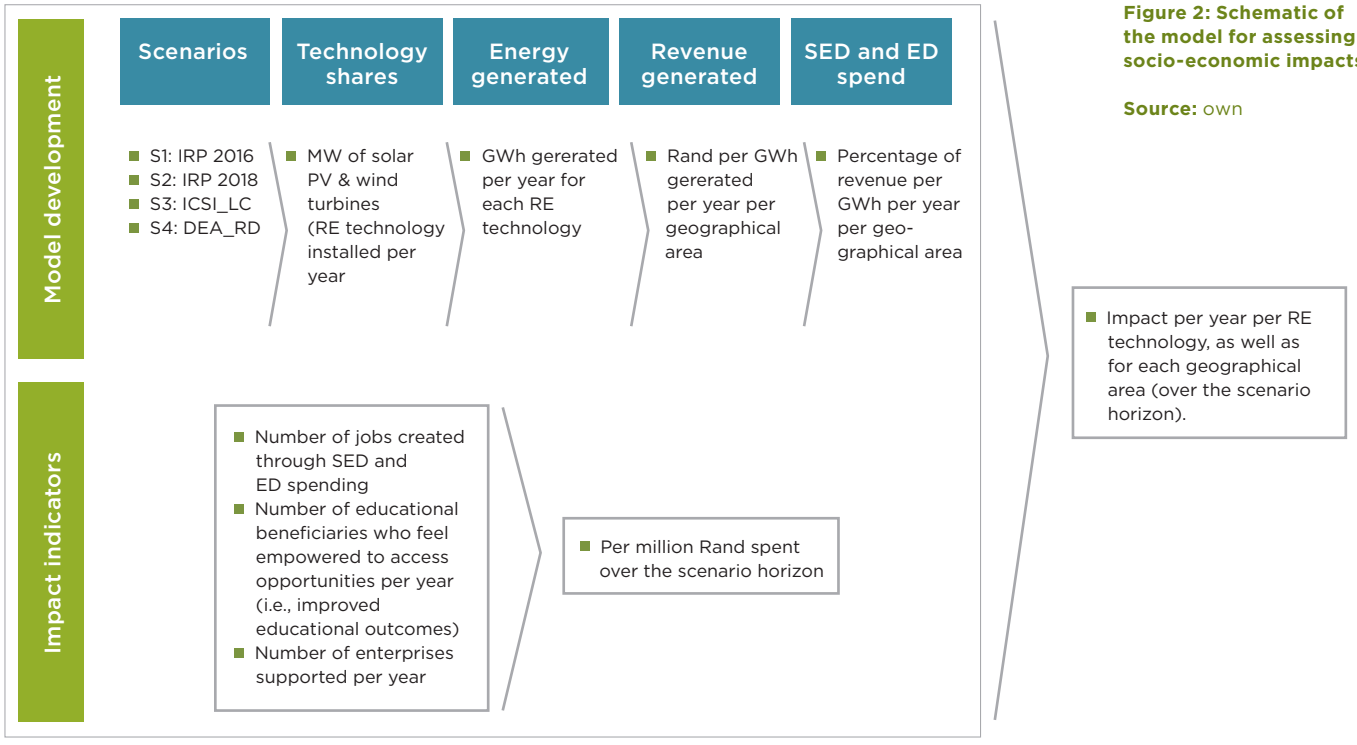


Figure 2: Schematic of the model for assessing socio-economic impacts

Source: own

Based on the available data, the following impact factors were generated:

- Number of jobs created (per million Rand spent per year) through SED and ED spend (cumulative, assuming all jobs are sustained over the life of the project).
- Number of education beneficiaries (per million Rand spent per year) who feel empowered to access opportunities (i.e., improved educational outcomes).
- Number of supported enterprises (per million Rand spent per year) that perceive positive impact on their sustainability.

Scenario analysis

The data on technology shares, energy generated and the Levelised Costs of Electricity (LCOE) per technology per year for each scenario were obtained from Energy Research Centre (ERC)[5] at the University of Cape Town, for all scenarios except for IRP 2018 where tariffs (including a margin) for solar PV and wind power were based on REIPPPP bid window 4b. Revenues for each technology per year were determined from the LCOE, with a 20% profit margin[6] multiplied by the energy generated (equations 1–3). The spending quota is assumed to 1.25% and 0.6% of revenue generated per year for SED and ED respectively. The CSIR provided information that informed the spatial component of the analysis (Bofinger et al., 2016).

For the purposes of this study the Renewable Energy Development Zones (REDZ)[7] were used as the basis for assessing the spatial dimensions of the socio-economic impacts of SED and ED spend over time (DEA, 2018). The spatial assessment focused strictly on solar PV and wind.

$$Rev_t = LCOE * 20\% * MWh \quad (eqn\ 1)$$
$$SEDspend_t = 1.25\% * Rev_t \quad (eqn\ 2)$$
$$EDspend_t = 0.6\% * Rev_t \quad (eqn\ 3)$$

where:

Rev_t = *Project revenue per technology*
LCOE = Levelised cost of electricity
20% = Margin sufficent to deliver a sustainable internal rate of return (IRR)
MWh = Energy generated
$SEDspend_t$ = *IPP socioeconomic development spend*
$EDspend_t$ = *IPP enterprise development spend*

2.3 Study limitations

Common with assessment studies of this nature, challenges owing to the lack of baseline data and attribution of impacts for renewables in South Africa were encountered. Larger indirect and induced local value creation of RE in rural areas and multiplier effects in communities with clustered RE projects are not considered. Broader analyses of the impacts of off-grid projects in marginalised communities are not included in this study, but should be considered for future studies on this topic.

The study applied a case study assessment (bottom-up) approach and not a general equilibrium (top-down) approach to estimate the impacts of solar and wind projects. This was necessary due to the paucity of critical baseline data (due to data sensitivity) along the renewable energy value chain, together with the timing and scope of the study.

[5]The data obtained were generated from ERC's South African TIMES general equilibrium model for the energy sector, a model applied in the study "Future skills and job creation through renewable energy in South Africa". It is one of four COBENEFITS studies assessing the co-benefits of decarbonising the power sector in South Africa. Researchers from ERC and CSIR were part of the technical implementation team of the study.

[6]It is assumed that for a large infrastructure project, a 20% margin would be sufficient to deliver an IRR high enough to attract private investors.

[7]The Renewable Energy Development Zones (REDZ) in South Africa represent areas in the country identified as being of strategic importance for large-scale wind and solar photovoltaic energy developments, including the rollout of its supporting transmission and distribution infrastructure.

3. Positive impacts on jobs, education and community ownership

3.1 Socio-economic impacts associated with SED and ED spend

The assessment focused on three main impact indicators related to employment, literacy rates and education access, and creation and growth of small, medium and micro enterprises (SMMEs). Impact pathways were developed for each case study area, which are based on both primary and secondary data generated. These indicators formed the basis of the site-level analysis and the resulting impact factors.

KEY FINDINGS:

- Women are the highest beneficiaries of both SED and ED initiatives across the case study sites. SED beneficiaries have ranged from infants to adults but limited benefits accrued to elderly and disabled groups.
- Early childhood development (ECD) and educational support for learners and students emerged as common SED initiatives, alongside infrastructure investments aimed at improving public goods and the standard of living in the commune.

Educational impacts: Cumulatively, 4,956 individuals were direct beneficiaries of educational support programmes implemented by the operating IPPs over the past 2 years across the three case study marginalised communities since inception. The case study areas assessed differed significantly in terms of their spending approaches and the amount invested per beneficiary as illustrated in table 2, While robust evidence is scarce, anecdotal comparative evidence from the site visits suggests that case study area 1's spending was more impactful (as measured by the amount spent per beneficiary) – the extent to which the impact per beneficiary justifies the higher spend per beneficiary remained unclear and could not be ascertained from the survey.

Projects and programmes within the category of education varied widely in their scope, duration, approach and focus. They included bursary schemes, investments in infrastructure, provision of resources (from equipment to sustaining an additional teacher), etc., and various types of support to teachers, children and scholars at various levels.

	Total beneficiaries to date	Education spend per beneficiary*
Case study area 1	63	R 55 010
Case study area 2	4 265	R 1 805
Case study area 3	628	R 7 323

Table 2: Education-related support per study area

Source: own

** Spend on projects that target educational benefits*

Employment impacts: SED and ED spend created 82 jobs (over 60 % of jobs created) that are to be sustained over the project lifetime of 25 years (table 3). Most of these are jobs associated with the supply of services for the construction, operation and maintenance of the project and the IPP. There is also a significant difference in the effectiveness of spending in terms of job creation across the 3 case study areas. Acknowledging that different focus areas and local contexts played a significant role, the spending at case study area 1 (evidenced by fewer projects/programmes) showed more significant in-vestment in planning/ research to inform decisions on the approach to SED spending within the marginalised community. Within the context of the sites assessed, the types of jobs created locally through SED and ED spend also include non-core services offered to the project such as cleaning and catering services. In communities with significant other opportunities for economic activity, Jobs created may not necessarily support renewable power generation. For example, supported enterprises may create retail jobs or service jobs for other industries, including the mining industry.

	Total jobs reported	Estimated jobs created and sustained*	Spend per job created**
Case study area 1	36	23	R 59 055
Case study area 2	36	15	R 521 774
Case study area 3	62	44	R 209 449

** Estimation based on site visit data (focus groups and interviews). This evidence suggests that reported job creation exceeds the levels that are likely to be sustained over time.*

***Spend on projects aiming to create and sustain jobs*

Table 3: Employment-generating support per study area

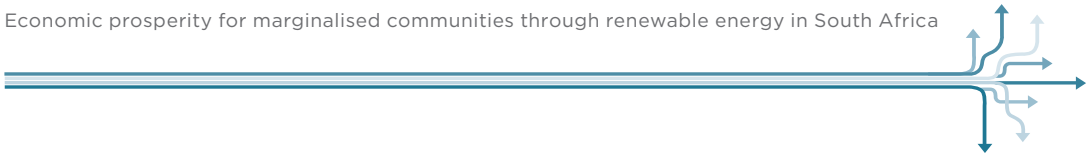
Source: own

	Enterprises supported	Spend per enterprise supported (perceiving benefit)
Case study area 1	10	R 111 182
Case study area 2	13	R 868 421
Case study area 3	11	R 208 171

Table 4: Enterprises supported per study area

Source: own

This survey results, although limited to a concise assessment of three case study of marginalised communities in South Africa, suggest that SED and ED impacts have been relatively moderate to date. This can be attributed to a number of reasons. Firstly, implementation has, on average, only been on-going for two years whereas socio-economic development is a comprehensive and long-term process. Secondly, there is evidence of considerable learning and evolution in the approach to development implementation, with a number of programmes halted or refined and new strategic partnerships being established. Thirdly, the actual magnitude of spending is low relative to the scale of need. These budgets are further stretched because IPPs distribute funds over a range of programmes in an attempt to drive a range of programmes and SED engagements in the communities rather than focus on a limited number.



3.2 Impact pathways and impact factors

This section assesses the level of direct job creation through the construction, operation and maintenance of the RE projects (the 'investment'), distinct from jobs created through SED and ED spend. The focus here is on a granular, bottom-up assessment of jobs created, particularly for local, marginalised communities. In order to determine how many of the total jobs went to marginalised communities, it is assumed that all 'local' employment would go to persons within the defined marginalised beneficiary communities the jobs.

The jobs created in the marginalised community during construction, operation and maintenance for the three IPP case study projects are summarised in . . From review of the data, the result obtained shows that within the marginalised communities within the proximity of RE project site, jobs created are rather additional (i.e., it is not merely a matter of people moving between jobs or projects) and most of the semi-skilled site-related O&M jobs benefit those within the marginalised communities. It is important to note that jobs created through the SED and ED impact area are not added to O&M jobs created through the investment; enterprises and skills development beneficiaries have been included with the SED and ED impact area.

	Construction		Operations & maintenance	
	Total*	Local – MC**	Total*	Local – MC**
Case study area 1	219	135	37	31
Case study area 2	420	164	23	11
Case study area 3	1000	uncertain	43	30

*Total includes direct and indirect jobs
**MC (Marginalised communities)

Table 5: Jobs created through RE investments during construction, operations & maintenance

Source: own

3.3 Local community ownership as a key driver for value creation

Renewable energy IPPs are required to include a proportion of 'local' ownership by communities in their projects. This will see the community earn dividends from their shareholding. The way in which these dividends will be spent is subject to the terms and conditions associated with the Community Trusts that are generally established to govern their spending. However, due to the debt structuring of this shareholding, these dividends are only realised on a substantial scale later in the project lifecycle. Rather than assessing impacts, this section instead provides an overview of the nature and scale of these equity shareholdings within the sector to date, and therefore discusses the potential benefits and challenges arising. The obligations attached to the ownership bid are assessed via four main indicators. The bid obligation targets and shareholding quotas associated with ownership for bid windows (BW) 1 to 4 of the REIPPP programme are shown in table 6 below.

Ownership	BW 1		BW 2		BW 3, 3.5 & 4	
	Min %	Target %	Min %	Target %	Min %	Target %
Shareholding by local communities in the seller	2.5	5	2.5	5	2.5	5
Shareholding by black people and/or black enterprises in the seller	12	30	12	30	12	30
Shareholding by black people and/or black enterprises in the construction contractor	8	20	8	20	8	20
Shareholding by black people and/or black enterprises in the operations contractor	8	20	8	20	8	30

Table 6: REIPPPP ownership obligations

Source: adapted from IPP Office (2018)

Within the REIPPPP, local community ownership commonly takes the form of a Community Trust. However, such structures are beset with implementation challenges, and it remains unclear whether they are the most appropriate structure for community ownership (Tshikululu, 2010). This also results in varying dividend flows to communities. Several sources (IPP Office, 2018; Tshikululu Social Investments, 2010; Wlokas, 2015) agree that the lag in Community Trust cashflows reaching communities remains a challenge for fostering investment in development projects. The IPP Office (2018) reports that local communities own an average of 11% of the IPP projects that have reached financial closure between REIPPPP bid windows 1 and 3.5 (as shown in figure 3).

Shareholding is, therefore, not fundamentally problematic for communities, but this study suggests levels of complications evidenced by two key issues: the reformulation of a community, historically defined through geography and shared history, into a juristic entity, without sufficient consultation with the community itself; and the attendant terms of funding advanced to such vehicles. As a consequence, community ownership has been widely criticised as a complicating feature of projects, given that communities are not sufficiently empowered to manage them. The structuring of the debt advanced to communities to participate in IPP projects compounds this problem, since sizable benefits typically only occur during the final 5–7 years of project operations; this creates the risk of a 'gold-rush' in the final years of the project which may be inadvertently characterised by political in-fighting. Currently, community trusts are permitted to form part of the equity structure of a project with only a promise to appoint community trustees at a future date. Community Trusts are not currently treated as broad investment vehicles, hence limiting their ability and intent to invest in other revenue-generating investments; restructuring this situation would ensure that Community Trusts are able to serve as longer-term community wealth funds that are not solely dependent on the IPP for revenue.

Figure 3: Local community ownership

Source: adapted from IPP Office (2018)

4. Nationwide distribution of employment and education benefits

This analysis shows how impacts would be distributed in the country (across the Renewable Energy Development Zones) by considering the expected deployment patterns for the two primary RE technologies: wind and solar PV for reference power sector planning scenarios. In order to model and forecast impacts into the future, impact factors (IFs) are derived based on the findings and indices generated from the surveys conducted in marginalised communities assessed, as well as from a meta-analyses of literature. The obtained IFs are presented in table 7 .

Table 7: Impact factors generated

Source: own

	Indicator	Impact Factor	Description
IF 1	Direct & Indirect Jobs	0.06	Number of jobs created per million Rand SED and ED spending per year (cumulative over the project lifespan)
IF 2	Literacy & Education Access	5.73	Number of beneficiaries (per million Rand spent per year) that feel empowered to access opportunities (i.e., improved education outcomes)
IF 3	Creation & Growth of SMMEs	0.67	Number of supported enterprises (per million Rand spent per year) that perceive positive impact on their sustainability

For impact factor 1 (IF 1) jobs created were assumed to be largely attributable to the project and sustainable over time, based on supporting evidence gathered through the site visits. The following key baselines for modelling were assumed:

- IF1 assumes that jobs supporting the IPP are created at the beginning of the RE project: Many of the jobs created (but not all) are associated with businesses that support the IPP (i.e., indirect employment as part of the IPP's supply chain). During operations, barring core IPP jobs, the new jobs per million Rand spent will be derived from SED and ED in particular.
- IF1 assumes jobs created through SED (such as education/bursary programmes) or ED (where enterprises do not rely on the IPP for their revenue) increase over time as the ratio of investment of SED and ED funds in planning/general administration versus implementation decreases over time.
- IF3 is based on the heuristic that 75% of small businesses fail within the first year or operation (Business Tech, 2018)

4.1 Cumulative spread of jobs created through SED and ED spend (only)

The spatial distribution of jobs generated through SED and ED spending matters from a policy perspective, as there is an intention to target those areas most in need of job creation. For simplicity, the analysis of the spatial distribution of jobs created assumed that all jobs created through SED and ED spend are local. Up to 10,000 local jobs can be created in marginalised communities through SED and ED spend through REIPPPP until the year 2050 (see figure 4). With the shift from IRP 2016 to IRP 2018 an additional 45% of new jobs are created strictly in the marginalised communities across within the REDZ in the country by 2050. Local job benefits through SED and ED spending enabled through RE project development, the IRP 2018 by the year 2050 will have enabled almost additional 5,000 jobs in local enterprises. This benefit could be additionally increased by more than 60% following CSIR Least Cost pathway and even doubled by following DEA's rapid decarbonisation pathway to a total of almost 10,000 jobs in local enterprises (see figure 5). Scenarios with higher shares of renewables also lead to the highest employment benefits in the marginalised communities despite observed cost declines indicated with drop in the LCOE for solar and wind technologies.

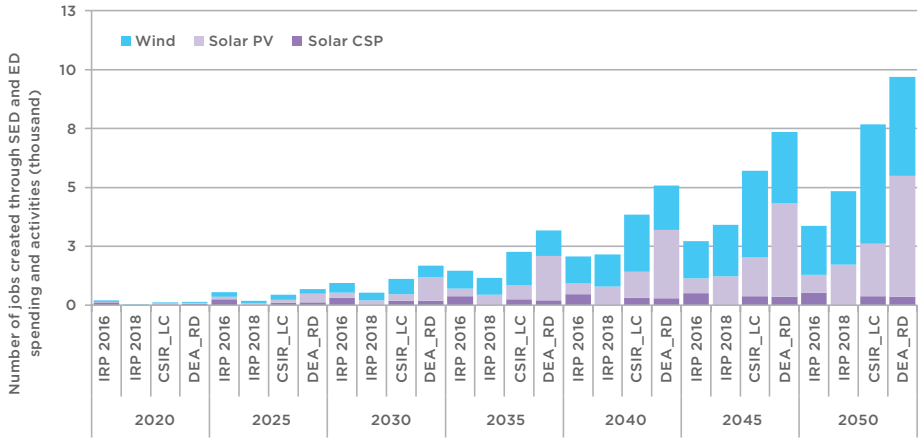


Figure 4: Evolution of aggregate number of jobs created in marginalised communities through SED and ED activities and spending by 2050

Source: own

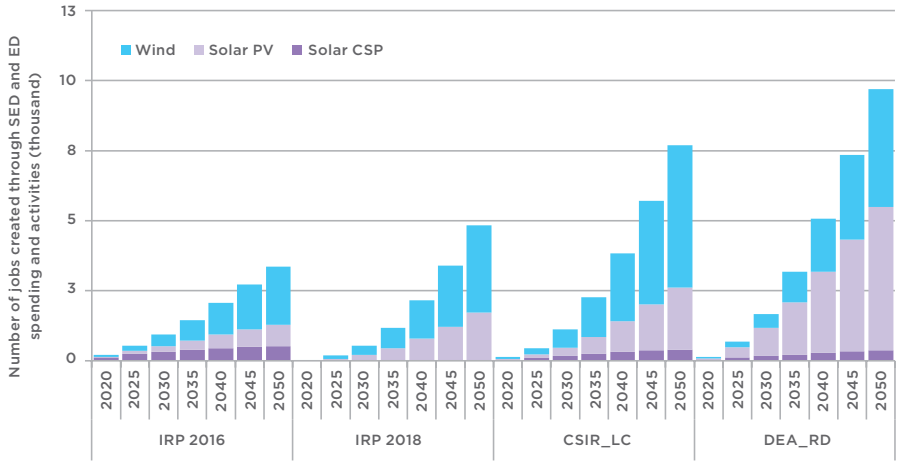


Figure 5: Evolution of aggregate number of jobs created in marginalised communities through SED and ED activities and spending across the different renewable energy pathways

Source: own

The employment benefits of RE deployment are distributed nationwide for marginalised communities – which doesn't apply for fossil fuel power plants, especially coal. Jobs associated with the solar PV value chain mostly occur in inland areas of the country, while marginalised communities in coastal regions of the country are greater beneficiaries of jobs created in the wind value chain. Highlighted in figure 6, the various scenarios show different estimates of the numbers and spatial distributions of jobs created. The CSIR LC scenario favours wind, and shows significantly more jobs created in the Eastern Cape than a policy scenario that favours solar PV. The DEA RD scenario, which favours solar PV, creates comparatively more jobs inland, in the Northern Cape, the Free State and the North West. The IRP scenarios are expected to create comparatively few jobs associated with SED and ED spend, given their lower shares of renewables in these scenarios relative to other generation technologies.

4.2 Spread of educational and literacy beneficiaries from SED and ED spending

According to data assessed from IPPs, education spending is the most significant non-ED spending category, on average. The key intended outcome for this impact area is that beneficiaries are prepared to access opportunities within other sectors in the broader South African economy, beyond the renewable energy value chain. Increased deployment of renewable energy in South Africa and the associated effects of fostering SED spending leads to net increases in educational gains for marginalised communities over the assessed time horizon – The difference in magnitude across each scenario stems from the growth in the percentage share of each RE technology capacity in the reference pathway. In the short and medium term however, DEA's rapid decarbonisation scenario will result in the highest

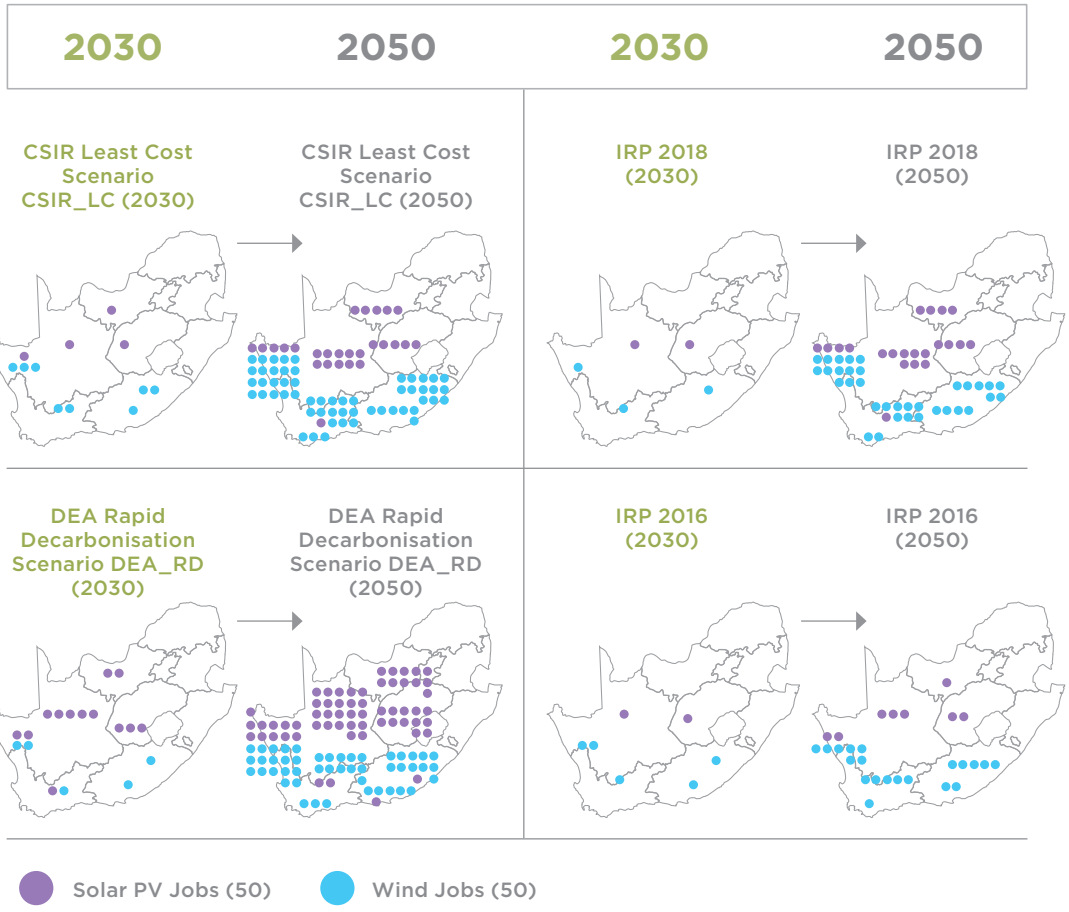


Figure 6: Geographical spread of cumulative jobs created through SED and ED spending in marginalised communities across South Africa

Source: own

number of additional educational and literacy benefits through REs in the marginalise communities, accounting for about 15,000 beneficiaries solely by the year 2030. Over the long term, in view of literacy access in marginalised communities the IRP 2018 by the year 2050 will have enabled 19,000 individuals to benefit from access to education-related programmes. This benefit could be additionally increased by 34% (25,000 beneficiaries) following CSIR Least Cost pathway and by more than 50% (25,000 beneficiaries) following DEA's rapid decarbonisation pathway (see figure 7). The IRP 2018 shows a slow pace of driving educational gains for marginalised communities in the short term, but has a gradual multiplier effect over the long term (by the year 2050) as result of faster increase in the shares of RE in the power sector post-2030 (see figure 7) – this could however be corrected with early and continued pace of adding REs to the energy mix from the year 2020 upwards.

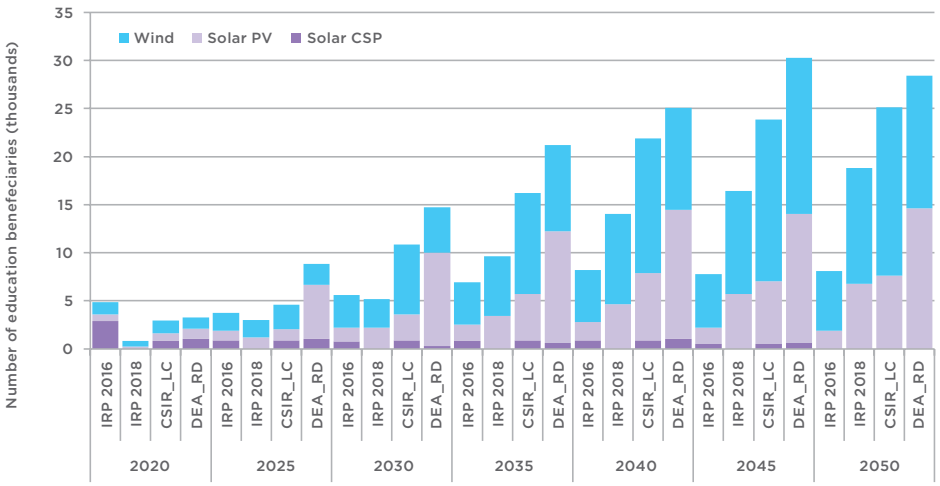


Figure 7: Quinquennial evolution of educational beneficiaries of SED and ED spending in marginalised communities by 2050

Source: own

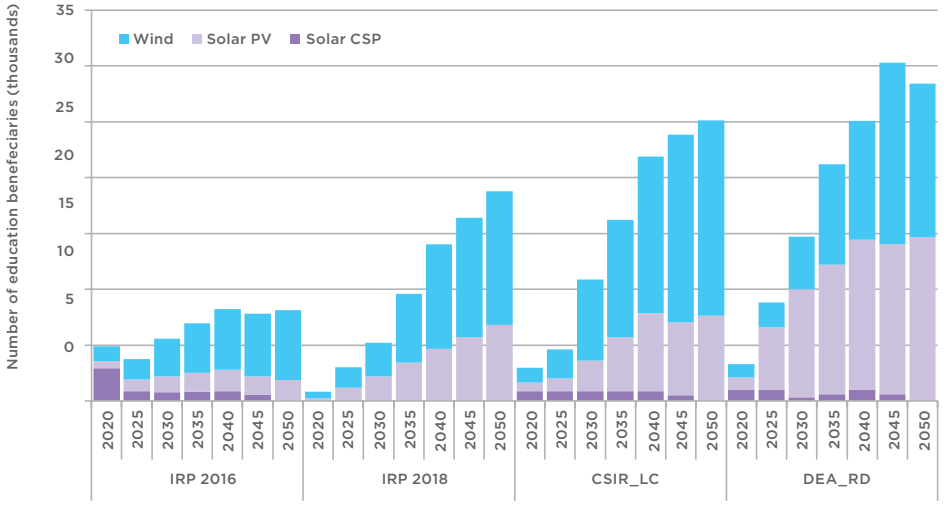


Figure 8: Quinquennial evolution of educational beneficiaries of SED and ED spending in marginalised communities across the different renewable energy pathways

Source: own

[8]It is important to note that some of the beneficiaries could be the same individuals year-on-year.

Figure 9 illustrates locational spread of educational beneficiaries of SED spending in South Africa for the short term (year 2030) and long term (year 2050). As obtained with jobs created through SED and ED spend, the significant differentiator, beyond the obvious extent of generation per technology type (and therefore revenue generated), is the difference between the distributions that favour either coastal or inland areas. The more large scale solar PV projects are developed and commissioned, the greater the proportion of educational beneficiaries in the inland areas of the country, i.e., the Northern Cape, Free State and North West Provinces (Solar PV) – the DEA_RD scenario represents this phenomenon. Marginalised communities in coastal regions of the country are greater beneficiaries of educational gains form SED activities in the wind power plant development.

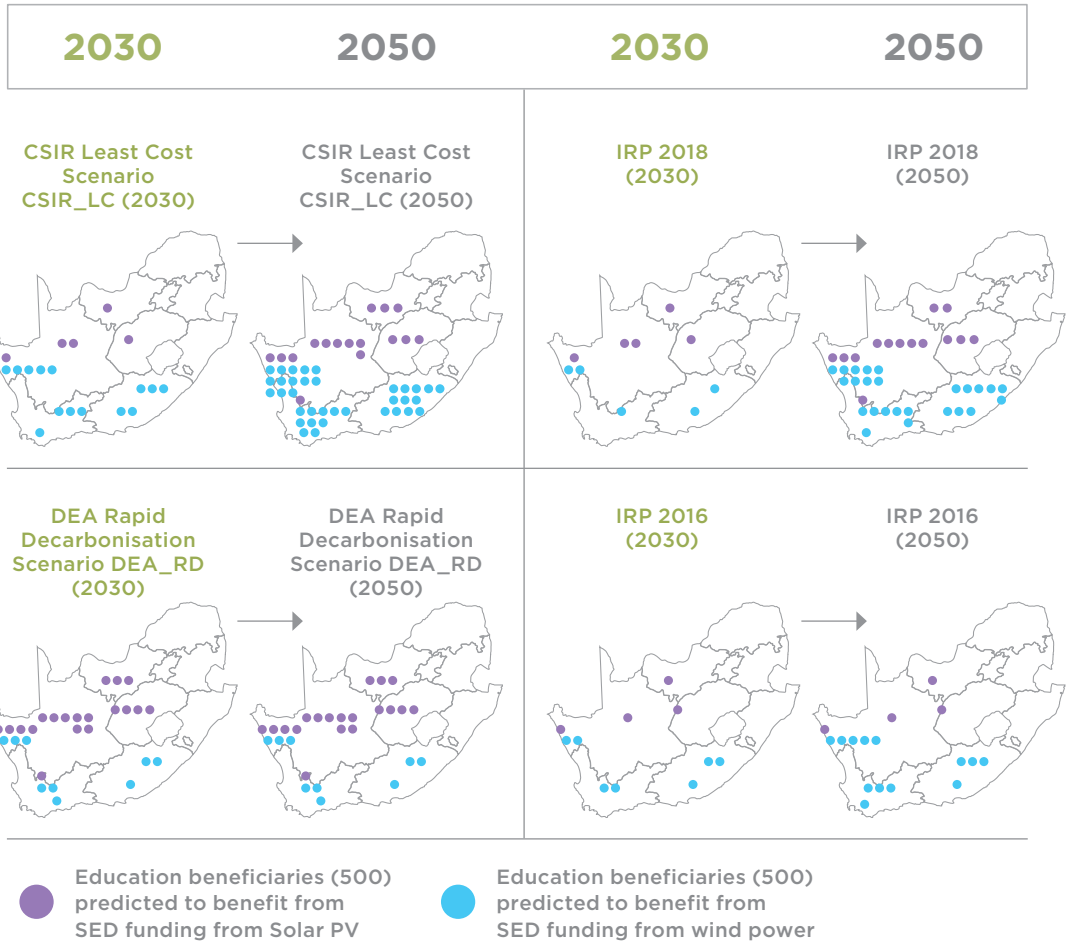


Figure 9: Geographical spread of educational beneficiaries in marginalised communities across South Africa

Source: own

4.3 Enterprise benefits created through ED spending

The success of enterprise development initiatives is measured through the longer-term viability of a business. Given the short period of intervention for existing IPP ED investments, no empirical failure rate was available for this analysis, however, as stated earlier an heuristic of 25% failure rate after the first 3 years of operations for new businesses supported though ED spending- thus, the impact shown in Figure is based on this assumption.

The IRP 2018 is estimated to have supported more than 2,200 local enterprises in the year 2050 (considering the 25% failure rate heuristic). Within the same horizon, this benefit could be further increased by 17% by following DEA's rapid decarbonisation pathway – the DEA_RD scenario would have supported over 3,300 local enterprises, and by more than one-third by following the CSIR Least Cost pathway – over 2,900 businesses would have been supported under CSIR_LC scenario (see figure 10). With the shift from IRP 2016 to IRP 2018, over 1,200 more enterprises with a 75% success rate are estimated to be created or supported under the IRP 2018 scenario in the year 2050, while the DEA_RD scenario is estimated to create or support over 2,300 enterprises more than the IRP 2016 in the year 2050. Despite the continuous growth in enterprises supported or created under the IRP 2018, this can still be enhanced further is further higher ambition is shown to increase the share of renewable energy in the power sector, as exemplified under the DEA_RD scenario and the CSIR_LC scenario (see Figure 10).

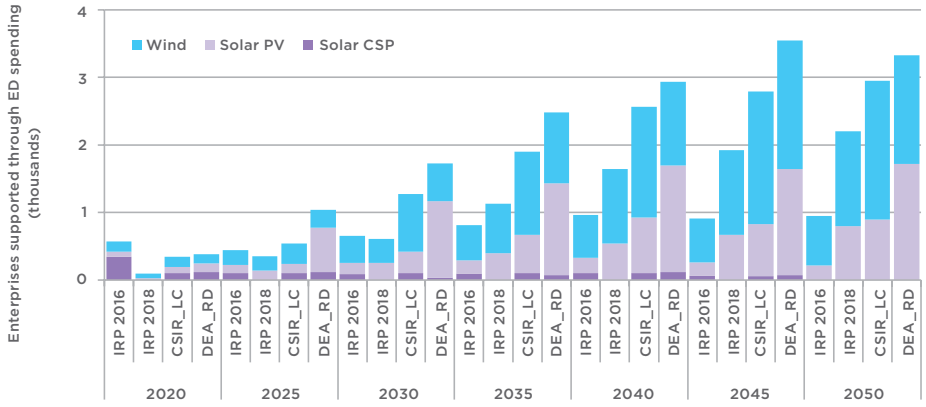


Figure 10: Number of enterprises supported quinquennial in marginalised communities through ED spending by 2050

Source: own

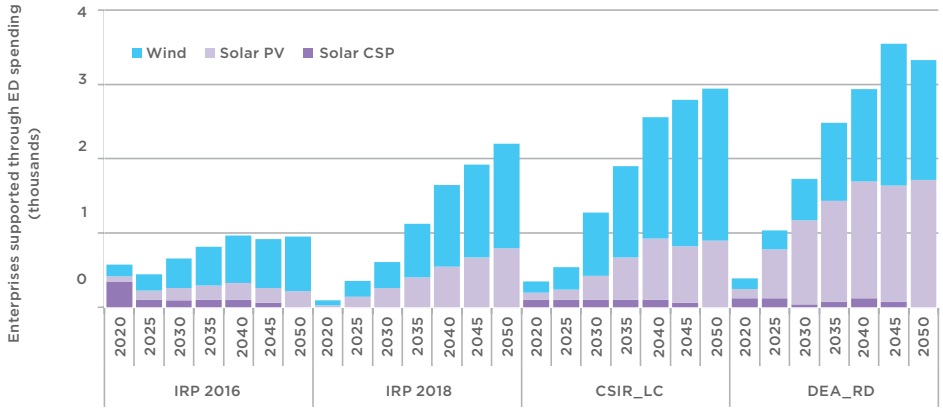


Figure 11: Number of enterprises supported quinquennial in marginalised communities through ED spending by 2050

Source: own

The distribution of enterprises supported marginalised communities across the country enabled and driven through REs ED spending and activities the similar with the distribution of impacts obtained for job creation and education gains in earlier sections – enterprises support through ED spending in the solar PV value chain mostly occur in inland areas of the country (Northern Cape, Free State and North West Provinces), especially under the CSIR_LC scenario while marginalised communities in coastal regions of the country are higher beneficiaries of enterprise development spending in the wind energy value chain, under the DEA_RD scenario. The IRP 2018 shows an even distribution of enterprise development beneficiaries across the country for marginalised communities.

5. Creating an enabling environment to generate economic prosperity in marginalised communities

Impulses for furthering the debate

The COBENEFITS study shows that investment in large-scale REIPPPP can translate into significant socio-economic co-benefits for marginalised communities in South Africa. Up to 30 000 individuals in marginalised communities can benefit from access to education-related programmes through REIPPPP by the year 2050. More than 3000 local enterprises in marginalised communities can be supported through REIPPPP and up to 10 000 local jobs can be created in marginalised communities until the year 2050 through REIPPPP SED and ED spend.

What can government agencies and political decision makers do to create a suitable enabling environment to maximise socio-economic benefits for South Africa's marginalised communities?

How can other stakeholders harness the social and economic co-benefits of building a low-carbon renewable energy system while facilitating a just energy transition?

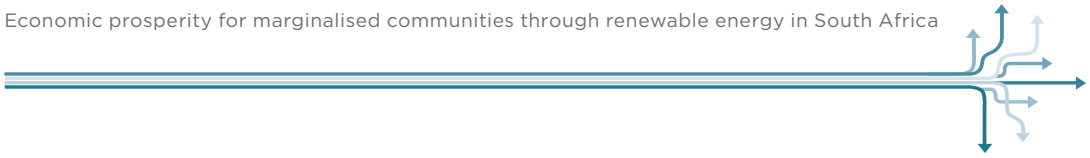
Building on the study results and the surrounding discussions with political partners and knowledge partners, we propose to direct the debate in three areas where policy and regulations could be put in place or enforced in order to generate prosperity in marginalised communities via RE deployment:

- Improve data availability and data transparency
- Foster community engagement and establish practice guides for IPPs
- Connect the REIPPP programme's socio-economic contributions to the Sustainable Development Goals (SDGs)

Improve data availability and data transparency

The study identified numerous lessons learned related to the practices of IPPs. Those with better access to data on the marginalised communities around their project site and a better working relationship with the local community delivered higher levels of SED and ED benefits to these areas.

- **Transparency and availability of data:** It is recommended that the government should make detailed data on the social investments of IPPs publicly available, even if the IPPs are anonymised. There is currently a dearth of data, which results in the erroneous perception that IPPs offer little to no social value. Specifically, there is a requirement for data that meaningfully represent the nature and quality of social investments engendered by RE.
- **Consistency and coordination in reporting:** An effort should be made to ensure the consistent application of the SED and ED spend categories, and to provide guidelines to IPPs in this regard. It is important that there is greater clarity around the classification of investments, to enable a deeper understanding which programmes deliver the greatest impacts. This will also aid in improving the overall monitoring and evaluation of project implementation and further enable coordination and collaboration across the sector.
- **Collaboration within the research and implementation communities to better understand and measure the broader socio-economic impacts:** The development and application of impact factors and methodologies for assessing socio-economic impacts across a range of fields is gaining momentum amongst consulting and academic researchers. Practitioners involved in the implementation and measurement of SED and ED should participate in structured information-sharing sessions; and, where possible, collaborate



(where issues of confidentiality and commercial interest allow) to share and learn from best practice.

Foster community engagement and establish practice guides for IPPs

The rules of the REIPPPP serve as a good basis for providing community benefits, given that they obligate IPPs to make minimum, direct contributions towards their host communities. Nevertheless, there exists an opportunity to strengthen these rules by codifying their implementation into a set of 'practice guides'. In essence, it is necessary to guide IPPs on topics such as when and how to engage local stakeholders and the community at large; to specifically outline the types of studies that must be undertaken at project inception and on an ongoing basis; to suggest ways to collaborate with local government; and on how to create long-term strategic social investment plans, amongst others. What follows are recommendations for strengthening existing rules through codified guidelines for IPPs.

- **Job Creation (in conjunction with enterprise development):** As part of the community engagement process preceding bid-submission, project developers are required to ascertain the skills development requirements of communities with a view to providing training for more substantive participation in the projects. Previous bidding rounds were executed at a rapid pace, making it difficult for projects to prepare communities for opportunities such as skilled employment and service provision. As a consequence, beneficiary communities have assumed the least skilled roles and provided low-value services to projects, most notably catering and grass-cutting. A crucial driver of the under-investment in communities is also the funding structure of projects. Because social investments only flow during the operational phase, project developers have typically waited for this phase to then distribute funds towards skills and enterprise development. Project developers should prioritise investments that are intended to provide permanent jobs, and should set long-term service-level agreements for local community members and companies. This can take the form of a multiplier for every Rand spent, and could be integrated into the procurement rules. Furthermore, targets could be set for a defined percentage of the plant operations contract, defined in terms of service provision not equity ownership, to be in the hands of the local community by a certain date (e.g., five years post-commencement of operations).

- **Community Ownership (Equity):** Instruments for community ownership should be fully constituted and given access to professional services prior to the establishment of IPP projects. Currently, Community Trusts are established by IPPs and permitted to form part of the equity structure of a project without any community participation. It is recommended that community trusts be treated as broad investment vehicles with the ability and intent to invest in other revenue-generating investments. In so doing, the trusts can serve a longer-term objective as community wealth funds that are not solely dependent on the IPP for revenue. This structure may be funded through development financiers, who could be empowered to appoint legal and financial advisors to negotiate their own funding terms. The REIPPPP could also incentivise active participation of Community Trusts, by allocating additional points to those that also own the land on which the project is built, and that participate in core value-chain activities. It is suggested that, in future renewable energy procurement rounds, host communities should receive necessary support to ensure they have more effective organisational skills, and be encouraged to seek out co-development partnerships with IPPs, using forms of capital such as land or collective savings. In conclusion, measures should be instituted for monitoring and evaluating Community Trusts and any other community ownership vehicle. Currently, trusts are not required to report to the IPP Office on their composition, activities and impact. Instead, community ownership vehicles should be subject to standardised, statutory quarterly reporting requirements that include governance, financial management and development impact obligations.

- **SED and ED Spend**: While there is nothing wrong, in principle, with the development role that the private sector takes on in the REIPPPP, it is important to keep in focus that SED and ED spend are a function of the state-sanctioned licence to operate. It is thus recommended that the state reorient its approach in the following key ways:

- **Municipal alignment:** The state should also determine key focus areas for development in each municipality and impose such a focus on IPPs, in collaboration with proven community priorities (as expressed in the Participatory Rural Appraisal, PRAs). Investing in these areas does not have to occur through the municipality, but should be collaborative, ensuring that the IPP's budget augments a larger funding pool within the local municipality, towards a key programme.

Collaboration should be governed by a public social contract or memoranda of understanding.

- **Elective deference:** IPPs should be given the option to delegate the management of their SED/ED spends rather than managing this themselves. Many IPPs lack the capacity, interest and understanding to devise workable social investment strategies. Indeed, despite a genuine interest, many IPPs fail to implement their plans as a consequence of the complexities inherent in community development work. It is thus recommended that IPPs should be permitted to defer to the state in executing their duties; and that the state may, in turn, contract third-party service providers to execute the IPPs' mandates on their behalf.

- **Programme-based logic for scale:** Given financial constraints, IPPs should not be permitted to invest in more than three or four SED programmes and two to three ED programmes. Assuming an annual budget of circa R5 million, this allows for at least R500,000 to be spent annually on each programme that delivers on the spread of employment and enterprise development in the marginalised communities.

Connect REIPPP programme's socio-economic contributions to the Sustainable Development Goals (SDGs)

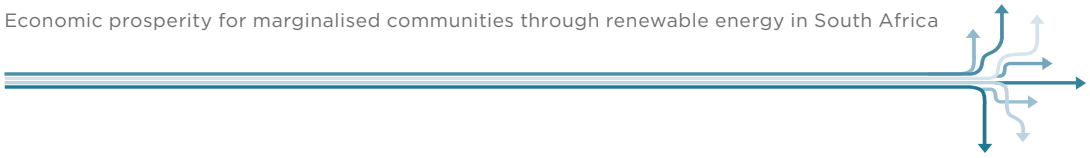
Finally, it is recommended to connect and align the socio-economic objectives of the REIPPP programme in South Africa with the global Sustainable Development Goals (SDGs). South Africa is among the 193 member states of the United Nations to have ratified the Sustainable Development Goals (SDGs), and 179 parties to have ratified the Paris Agreement (United Nations 2018; IRENA et al. 2018). Moreover, prior to the ratification of these international goals and commitments, South Africa's National Planning Commission had already developed the National Development Plan (NDP) with similar objectives. While the NDP is broadly aligned to the SDGs, it includes transformation requirements, specific to the history of institutionalised racism and deep persistent inequality in South Africa (NBI 2016).

The objectives of the REIPPP programme help to reach the SDG 7, which aims to "[e]nsure access to affordable, reliable, sustainable and modern energy for all" (IRENA et al. 2018). However, the co-benefits that this study has identified also support both SDGs as well as NDP commitments, as shown in the table below.

Project phase	COBENEFITS study Sub Categories	Most Relevant SDG	Relevant NDP Chapters
Jobs resulting from SED/ED spend	■ Direct jobs (employed in businesses funded through SED/ED spend, employed to deliver SED/ED services) ■ Indirect jobs (induced by SED/ED investment)	SDG 8: Decent work and economic growth	NDP Chapter 3: Economy and employment
Diversification of household income	■ Changes in reliance on municipal/national grants ■ Additional employed persons in households	SDG 10: Reduced inequalities	NDP Chapter 3: Economy and employment
Creation & growth of SMMEs	■ SMMEs directly funded or otherwise supported (in kind) ■ Types of businesses	SDG 8: Decent work and economic growth	NDP Chapter 3: Economy and employment
Community-level Income Inequality	■ Changes in income inequality resulting from SED/ED spending ■ Changes in access to basic services (energy, waste water) over time	SDG 1: No poverty SDG 10: Reduced inequalities	NDP Chapter 11: Social protection
Literacy Rates & Education Access	■ Adult literacy ■ School enrolment (and level of completion) ■ Access to tertiary education	SDG 4: Quality education	NDP Chapter 3: Economy and employment NDP Chapter 9: Improving education, training and innovation

Table 8: Alignment of REIPPPP co-benefits to SDGs and NDP

Source: own classification, building on NBI (2016)



References

Anderson, Andrea A. (2004): Theory of change as a tool for strategic planning: A report on early experiences. Aspen Institute Roundtable on Community Change (2004): 1–32. http://www.theoryofchange.org/pdf/tocII_final4.pdf

Anglo American (2015): Socio-Economic Assessment Toolbox (SEAT) 3. http://www.angloamerican.com/-/media/Files/A/Anglo-American-PLC-V2/documents/communities/seat-v3-jan-15-2.pdf

Bainton, Nicholas; Vivoda, Vlado; Kemp, Deanna; Owen, John; and Keenan, Julia (2017): Project-induced in-migration and large-scale mining: A scoping study, Centre for Social Responsibility in Mining (CSRM), The University of Queensland: Brisbane. St Lucia: University of Queensland, Centre for Social Responsibility in Mining

Bischof-Niemz, Tobias (2015): Financial benefits of solar and wind power in South Africa in 2015. Presentation at the 5th CSIR Conference, 8–9 October 2015.

Bofinger, Stephan; Zimmermann, Britta; Gerlach, Ann-Katrin; Bischof-Niemz, Tobias; Mushwana, Crescent (2016): Wind and Solar PV Resource Aggregation Study for South Africa.

Borbonus, Sylvia (2017): Generating socio-economic values from renewable energies. An overview of questions and assessment methods. IASS Working Paper, July 2017. DOI: 10.2312/iass.2017.016

Business Tech (2018): The alarming truth about the number of small businesses in South Africa. https://businesstech.co.za/news/business/260797/the-alarming-truth-about-the-number-of-small-businesses-in-south-africa/ (27.09.2018)

David, Anda; Guilbert, Nathalie; Hamaguchi, Nobuaki; Higashi, Yudai; Hino, Hiroyuki; Leibrandt, Murray; and Shifa, Muna (2018): Spatial Poverty and Inequality in South Africa: A municipality level analysis. Discussion Paper Series Kobe University. http://www.rieb.kobe-u.ac.jp/academic/ra/dp/English/DP2018-02.pdf

DEA, Department of Environmental Affairs (2018): Renewable Energy Development Zones. https://egis.environment.gov.za/redz (05.07.2018)

GreenCape (2017): Utility-scale renewable energy: 2017 Market Intelligence Report. Cape Town. www.greencape.co.za (20.08.2018)

Helgenberger, Sebastian; Gürtler, Konrad; Borbonus, Sylvia; Okunlola, Ayodeji; Jänicke, Martin (2017): Mobilizing the co-benefits of climate change mitigation: Building New Alliances – Seizing Opportunities – Raising Climate Ambitions in the new energy world of renewables. – COBENEFITS Impulse (Policy Paper), November 2017. DOI: 10.2312/iass.2017.021

Helgenberger, Sebastian; Jänicke, Martin (2017): Mobilizing the co-benefits of climate change mitigation: Connecting opportunities with interests in the new energy world of renewables. – IASS Working Paper, July 2017. DOI: 10.2312/iass.2017.015.

Helgenberger, Sebastian; Jänicke, Martin; Gürtler, Konrad (2019): Co-benefits of Climate Change Mitigation. In: Filho, Walter L.; Azul, Anabela M.; Brandli, Luciana; Özuyar, Pinar G.; Wall, Tony (eds) Climate Action. Encyclopedia of the UN Sustainable Development Goals. Springer, Cham. DOI: 10.1007/978-3-319-71063-1

IPP, Independent Power Producer Office (2018): Independent Power Producers Procurement Programme (IPPPP) https://www.ipp-projects.co.za/Home/About (20.08.2018)

IRENA, International Renewable Energy Agency; CEM, Clean Energy Ministerial (2014): The socio-economic benefits of large-scale solar and wind energy: an econValue report. Abu Dhabi. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2016/Socioeconomic_benefits_solar_wind.pdf?la=en&hash=FCFA4C1C1CDA1E2E2B8BE7E71D8BDB55113DE81A

Kumba Iron Ore (2014): Kolomela Mine SEAT Report 2014. https://www.kumba.co.za/-/media/Files/A/Anglo-American-Kumba/documents/kumba-socio-economic-assesment-tool-report.pdf

Lochner, Marais; Holle, Wlokas; de Groot, Jiska; Dube, Noleen; and Scheba, Andreas (2017): Renewable energy and local development: Seven lessons from the mining industry, Development Southern Africa, DOI: 10.1080/0376835X.2017.1389260.

Misago, Jean Pierre (2017): Politics by Other Means? The Political Economy of Xenophobic Violence in Post-Apartheid South Africa. The Black Scholar, 47:2, 40 – 53,

Moultrie, Tom (2017): What do we really know about international migration to & from South Africa? Article in Africa Check. https://africacheck.org/2017/01/08/analysis-really-know-international-migration-sa/ (11.03.2019)

Odusola, Ayodele; Cornia, Giovanni, Andrea; Bhorat, Haroon; and Conceicao, Pedro (2017): Income inequality trends in sub-Saharan Africa. United Nations Development Programme. Determinants and Consequences: Introduction, Motivation and Overview. No. 2063-2018-609. NBI, National Business Initiative (2016): Mapping the SDG targets and NDP objectives. Available online: http://piv.nbi.org.za/Documents/SFU/NDP%20Infographics/NBI%20NDP%20Infographic%202%20-%20The%20NDP%20&%20SDGs%20052016.pdf

Phillip, Kate (2012): How structural inequality limits employment and self-employment in poor areas (or: Why South Africa's informal sector is so small). Law, Democracy and Development, Volume 14. www.ldd.org.za

Smyth, Eddie; and Vanclay, Frank (2017): The Social Framework for Projects: a conceptual but practical model to assist in assessing, planning and managing the social impacts of projects. Impact Assessment and Project Appraisal 35(1):65-80

StatsSA Statistics South Africa (2018): Quarterly Labour Force Survey – QLFS Q1:2018. http://www.statssa.gov.za/?p=11139

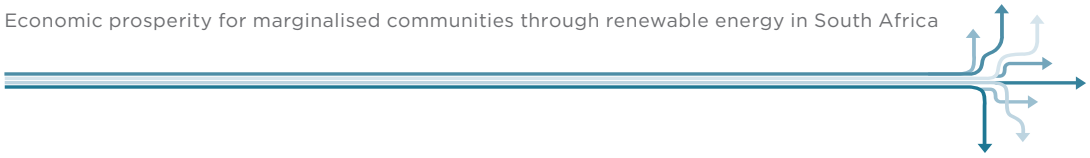
Tassell, Lindsay (2018): Opportunities in the Renewable Energy Sector : EDF Renewables Perspective. Johannesburg. http://www.energy.gov.za/files/PPMO/2018/EDF-Renewables-Perspective.pdf (20.08.2018)

Tshikululu Social Investments (2010): An Analysis of the Risks and Opportunities Inherent in PDI Beneficiary Trusts as Vehicles of Broad Based Black Economic Empowerment. Johannesburg. http://www.tshikululu.org.za/uploads/%0Afiles/TSI_research_PDI-community-trusts_2010.pdf

Vanclay, Frank; Esteves, Ana Maria; Aucamp, Ilse; Franks, Daniel M. (2015): Social Impact Assessments: Guidance for Assessing and Managing the Social Impacts of Projects. International Association for Impact Assessment (IAIA).

Walker, Gordon (2008): What are the barriers and incentives for community-owned means of energy production and use? Energy Policy. 36(12):4401 – 4405.

Western Cape Government, (2013): Growth Potential Study (GPS3), Department of Environmental Affairs and Development Planning.



Wlokas, Holle Linnea (2015): A review of the local community development requirements in South Africa's renewable energy procurement programme. World Wildlife Foundation Technical report, South Africa. Cape Town. awsassets.wwf.org.za/downloads/local_community_development_report_20150618.pdf

Wlokas, Holle Linnea; Soal, Sue (2016): Roundtable Conversation Series – Economic Development in REIPPPP. Johannesburg. https://sawea.org.za/wp-content/uploads/2016/05/Roundtable-Conversation-Series_Managing-Community-Unrest_Report_May-2016.pdf

Wright, Jarrad G.; Bischof-Niemz, Tobias; Calitz, Joanne; Mushwana, Crescent; van Heerden, Robbie; Senatla, Mamahloko (2017): Formal comments on the Integrated Resource Plan (IRP) update assumptions, base case and observations. Pretoria, South Africa: Council for Scientific and Industrial Research. https://www.csir.co.za/sites/default/files/Documents/20170331CSIR_EC_DOE.pdf

List of abbreviations

BW	Bid Windows
CSIR	Council for Scientific and Industrial Research
CSIR	Council for Scientific & Industrial Research
CSIR_LC	Council for Scientific & Industrial Research: Least Cost Scenario
CSP	Concentrated solar power
DEA	Department of Environmental Affairs, South Africa
DEA_RD	the Department of Environmental Affairs Rapid Decarbonisation scenario
DEA's	Department of Environmental Affairs
DoE	Department of Energy
DST	Department of Science and Technology
DTI	Department of Trade and Industry
ECD	Early Childhood Development
ED	Enterprise Development
ERC	Energy Research Centre
IASS	Institute for Advanced Sustainability Studies, Potsdam, Germany
IF´s	Impact Factors
IPPs	Independent Power Producers
IRENA	International Renewable Energy Agency
LCOE	Levelised Costs of Electricity
NBI	National Business Initiative
NDP	National Development Plan
O&M jobs	Operations & Maintenance Jobs
PRAs	Participatory Rural Appraisal
PV	Solar Photovoltaic
RE	Renewable Energy
REDZ	Renewable Energy Development Zones
REIPPPP	Renewable Energy Independent Power Producers Procurement Programme
SANEDI	South African National Energy Development Institute
SDGs	Sustainable Development Goals
SED	Socio-Economic Development
SMMEs	Small, Medium and Micro Enterprises

COBENEFITS

COBENEFITS
Connecting the social and economic opportunities of renewable energies to climate change mitigation strategies

COBENEFITS cooperates with national authorities and knowledge partners in countries across the globe such as Germany, India, South Africa, Vietnam, and Turkey to help them mobilise the co-benefits of early climate action in their countries. The project supports efforts to develop enhanced NDCs with the ambition to deliver on the Paris Agreement and the 2030 Agenda on Sustainable Development (SDGs) and to enable a just transition. COBENEFITS facilitates international mutual learning and capacity building among policymakers, knowledge partners, and multipliers through a range of connected measures: country-specific co-benefits assessments, online and face-to-face trainings, and policy dialogue sessions on enabling political environments and overcoming barriers to seize the co-benefits.

Contact

COBENEFITS focal point South Africa
Ruan Fourie, RFourie@csir.co.za

COBENEFITS project director
Sebastian Helgenberger, Institute for Advanced Sustainability Studies (IASS)
sebastian.helgenberger@iass-potsdam.de

DOI: 10.2312/iass.2019.010

www.cobenefits.info

@IKI_COBENEFITS

Supported by:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

based on a decision of the German Bundestag

INTERNATIONAL CLIMATE INITIATIVE (IKI)