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Key messages

- At COP17, the South African Government launched the South Africa Renewables Initiative (SARi) and the SARi International Partnership. They aim to develop financing arrangements that enable development of a critical mass of renewable energy sources in South Africa.
- Addressing the incremental cost of renewables (cost compared with coal-fired plants) is a core challenge that will be taken up by SARi and the Partnership.
- As subsidies on coal-fired generation are withdrawn, electricity prices in South Africa are rising. It is considered socially and politically untenable to raise them further to cover the higher cost of renewables.
- The incremental cost of the first renewable energy projects under the South Africa Integrated Resource Plan has primarily been met by the South African public purse. But this is not a viable model for the remaining projects.
- SARi needs a range of domestic public policies, supported by domestic and international public sector finance mechanisms, that will leverage sufficient private sector investment and bring down the costs of renewables.

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Making renewable energy affordable: the South African Renewables Initiative

South Africa is a country with a predominantly coal-fired electricity system and ever-growing energy needs. Use of renewable energy resources for electricity generation is currently almost non-existent, but the potential is great. Through its new Integrated Resource Plan (2010) calling for 19 gigawatts (GW) of renewable electricity by 2030, its newly launched South Africa Renewables Initiative (SARi), and the announcement of the first tranche of accepted tenders of over 1,000 megawatts (MW) of renewable energy from independent power producers (IPPs), South Africa is heralding a commitment to meet both its future energy needs and its climate change objectives. But the country is also clearly signalling its need for help from the international community to achieve these twin objectives.

On 7 December 2011 in Durban, the South African Ministers of Energy and of Trade and Industry, joined by ministers from Denmark, Germany, Norway and the UK, and a Vice President of the European Investment Bank, launched SARi.

As explained in the press release, 'SARi is a South African Government initiative. Its objective is to design and establish the financing arrangements needed to enable a critical mass of renewables to be developed, without incurring

unacceptable cost burdens on South Africa'.

The agencies present at the launch signed up to a new SARi International Partnership. This involves national governments, development finance institutions (DFIs) and international finance institutions (IFIs) that have committed to work with the South African Government in its efforts to scale up renewables, secure economic benefits and reduce the incremental cost burden to South Africa.

Details of the SARI International Partnership

Individual Memoranda of Understanding (MOUs) will now be established between the South African Government and each of its SARI partners. Specific commitments of the international partners may include, inter alia:

- engaging with the Government of South Africa to support the development of financial mechanisms and to contribute funding and/or investment into such mechanisms by mutual agreement, subject to demonstration of value for money, and monitoring, reporting and verification of results
- exchanging learning experience and information with respect to: (i) large-scale rollouts of renewables; (ii) benchmarking against international best practice; (iii) industrial development approaches; and (iv) different designs of financing solutions for low-carbon developments
- providing technical assistance for strengthening the regulatory and financial environment needed to scale up renewable energy deployment
- assisting the Government of South Africa in engaging additional partners to support scaled-up renewables deployment in South Africa
- facilitating engagement with other stakeholders internationally by mutual agreement.

On its side, the Government of South Africa commits to:

- chair the process to achieve the aim of SARI
- develop a collective work plan and annual report on progress against the aims and objectives of the Partnership, in collaboration with relevant ministries and international partners
- involve all relevant government departments and agencies in the development of SARI, securing their active contribution and ensuring the initiative is aligned to relevant policy frameworks
- engage with partners to develop a mutually agreed set of mechanisms to support the development of renewable energy and the growth of the renewable energy sector in South Africa, in such a way that industrial and job creation benefits are maximised
- advance the implementation of domestic policies needed to implement these mechanisms and to build upon existing commitments to carbon mitigation and renewables growth
- share experience and information regarding the ongoing development of South Africa's renewables procurement processes and industrial strategy on renewables
- seek out and engage additional partners to support the scaling up of renewables deployment in South Africa
- ensure ongoing engagement with relevant stakeholders and sources of expertise in renewables deployment in South Africa, including civil society, the private sector, investors and technical expert communities.

Results of the first renewables tender process

At the launch of SARI, the results of the first major renewables tender process in South Africa for IPPs were also publicly announced. In this round, 1,416 MW of renewable projects were selected, broken down as approximately 632 MW of solar photovoltaics (PV), 150 MW of concentrating solar power (CSP) and 634 MW of wind power.¹ The next round of bids set for 2012 aims to add another 2,209 MW and complete the total allocation of 3,625 MW in the 'first window' of South Africa's procurement of renewable power from IPPs.

History of SARI's evolution

South Africa is the world's 25th most populous country, the 20th highest emitter of CO₂ (not including land-use emissions) and ranks 45th on per capita CO₂ emissions. The country is described as being very energy inefficient, with a commodity export-driven economy that relies on domestically mined, low-quality coal used in ageing coal-fired power stations. Electricity tariffs are set significantly lower than the full financial cost of coal-fired power generation, and the social costs, including environmental degradation, are not included in this accounting.

The South Africa Department of Energy has two visions of the country's energy sector to guide its strategic planning. The sector will:

- by 2014, be transformed and sustainable, with universal access to modern energy carriers for all
- by 2025, have an energy mix that includes 30% clean energy.²

SARi aims to unlock the environmental, industrial and economic benefits that large-scale renewable energy offer to South Africa, without imposing an unacceptable burden on our economy, public finances or citizens.

Dr. Rob Davies
Minister of Trade and Industry
South Africa

In addition, under the 2010 Cancun Agreement, the South African Government committed to undertaking nationally appropriate mitigation actions to enable a 34% deviation below the business-as-usual emissions trajectory by 2020, and 42% deviation by 2025. The extent to which this action can be implemented depends on financial resources, capacity building support and technology transfer.

Behind these visions and commitments are some difficult realities. South Africa experienced an energy crisis in 2008, when years of inadequate investment in new electricity supply, combined with surging demand, resulted in blackouts and cutbacks in industrial production. Energy is critical to every part of South Africa's economy, and the inevitable economic and social disruptions linked to inadequate electricity supply were only delayed by the recent economic recession.

Today, the economy is growing rapidly again, on the back of increased commodity exports and prices. As a result, energy security remains a major short-term concern. By 2030, South Africa needs to develop approximately 52 GW of new energy generation capacity to support its industrial and broader economic development objectives. There also is an electrification backlog that threatens the achievement

of the Millennium Development Goals by 2015. At the end of 2009, there were still 12.5 million people (25% of the population) without electricity.³

The current Integrated Resource Plan (IRP 2010) agreed by Cabinet includes up to 19 GW of renewables to be added to the grid by 2030. Like the Cancun Agreement commitments, achieving this level of renewables development depends on the availability of funding. Financing partnerships need to be at a sufficient scale to deliver a critical mass of renewable energy. SARi can be a means to attain this support, leveraging it with private investment and domestic resources.

An ambitious renewables plan

In light of South Africa's current energy challenges, an ambitious plan for renewables makes sense. In addition



As subsidies on coal-fired generation are withdrawn, electricity prices in South Africa are rising. Photo: Panos Pictures.

to its coal reserves, South Africa has at least two other world-class energy resources: solar and wind. It has some of the highest solar irradiance rates in the world and strong onshore wind potential. The 19 GW of renewables called for in the IRP would contribute nearly 9% of the country's total electricity demand by 2030. It would result in the abatement of 138 megatonnes (Mt) of CO₂ between 2012 and 2025 and contribute 7% of the overall emissions cuts needed for South Africa to meet its Cancun Agreement commitment by 2025.

However, producing 19 GW of renewable energy requires a large number of power stations. Thus far, South Africa has limited experience with renewable energy, with only three small wind farms operating in 2011, totalling less than 10 MW. Taking a project-by-project approach to reach 19 GW is a long and difficult road. Instead, SARI envisions a large-scale effort from the outset. The SARI modelling team, which includes international analysts, has raised evidence pointing to the need to develop a critical mass of renewables in order to achieve maximum economic benefit.

The core challenge is the higher financial cost of renewables compared to coal

For many decades South Africa has provided electricity at prices lower than its full financial cost. This makes investing in new electricity generation problematic, for both coal and renewables. With the re-emergence of concerns over energy security, this problem is being addressed by a planned rapid increase in electricity tariffs – about 25% per year from 2010 to 2012 – so that they cover the full financial cost of new coal. This measure is being undertaken despite significant

domestic concern about affordability and competitiveness. The government is faced with a double challenge: to finance renewables while at the same time limiting further price increases for electricity.

For the first 3.6 GW in renewables procurement, net costs are being covered by the South African 'fiscus' (the public purse). But this model is not viable for the full rollout of the 19 GW renewables envisaged in the IRP. SARI, and in particular the work of the SARI International Partnership, will address this specific challenge.

Scale of investment needed

Based on its analysis, the SARI modelling team estimates that achieving the IRP's goal for renewables will require an investment of \$35.6 billion in renewables capacity by 2030. Low-cost loans and other financial instruments can be used to overcome financing bottlenecks and reduce the cost of capital for new projects until commercial funding can take over. This would require approximately \$11.3 billion of low-cost loans and additional financial risk mitigation products to leverage \$24.3 billion of commercial finance into the sector.

Lowering the cost of capital by addressing risks

Renewable energy cost structures are particularly sensitive to the cost of capital, and the risks (real and perceived) of large-scale deployment in developing countries means that these costs are high. This issue has been a particular focus of early SARI analysis, undertaken through commissioned research and extensive consultation with government officials, industry and technology experts, and public and

private finance providers, both in South Africa and internationally. The key finding is that an optimal mix of concessional loans, political risk insurance against policy-related risks, currency hedges to reduce the exchange-rate risks, and loan guarantees applied against the whole build – all made available through a one-stop-shop mechanism – could reduce the annual funding gap to manageable levels.

It's not just about finance

An ambitious 19 GW renewables programme requires many other elements to work. This is especially true since the model assumes that development will be undertaken mostly by IPPs. They require grid access as well as transmission and distribution line certainty, including access pricing. Therefore, regulatory utility reform may be needed. In fact, the idea of reform is raised in the South African government's role in the MOU: 'Advance implementation of domestic policies is needed to enable these mechanisms to be implemented.'

Building a large number of power stations in South Africa, as in any country, requires a solid regulatory process, including proper stakeholder engagement. Failures on this front (including through rushed, or unduly slow, processes) can add significantly to the risks faced by

We see SARI as a visionary model for other big emerging economies in the process of introducing renewable energy.

Martin Lidegaard
Minister for Climate, Energy and Building
Denmark

developers and undermine the model's fundamental focus on lowering the cost of capital.

SARi is not just about building renewable power stations. It also entails a full industrial strategy for a renewables sector, with a strong emphasis on building local capacity to serve domestic and regional markets. This brings with it the need for a major business development and technical training programme.

SARi and climate compatible development

By its very nature, a large-scale renewable energy programme fits well with any notion of a 'green growth' development strategy. South Africa needs increased electricity to meet its economic growth objectives, but using its current low-grade coal fuel source is incompatible with its commitment to reduce greenhouse gas emissions. The use of renewables also avoids other environmental impacts of coal on air and water resources.

SARi will also create jobs. The SARi model estimates direct and indirect job creation on the basis of the renewables plan in the IRP. The vast majority of jobs will be created in construction, manufacturing and installation; therefore, the number of jobs per year will depend on the capacity being installed. Estimates for the period 2012–2030 foresee the creation of an average of 20,000–23,000 jobs per year in this sector. These will help address poverty alleviation objectives, as unemployment rates in South Africa are currently at about 25%.

Another issue facing South Africa is that it could, in the future, be faced with carbon penalties in its export markets. It already has one of the most carbon-intensive gross domestic product (GDP) rankings in the world. Analysis done for SARi suggests that \$11.2 billion in annual exports face increasingly carbon-sensitive international markets, so are at risk of potential trade measures. An aggressive and successful national renewables programme can lower this risk.

Implications

SARi's Phase 1 (in 2010) was about establishing a vision for how renewables could be rolled out on a very large scale in South Africa. The lessons learned during this design phase and during its consolidation in 2011 provide the following insights into how other fossil fuel-dependent economies can gear up for large-scale renewable energy investments:

- **A multi-agency process also involving core private and community stakeholders is crucial to the likelihood for success**

SARi's design phase involved the detailed technical and economic analysis and consultation with experts needed to underpin a strong financial model and build a coalition of ministerial supporters. This was led and championed by the South Africa Department for Trade and Industry and Department for Public Enterprises. The significant progress made in 2011 has been the forging of the now close connection of the SARi analysis and process with the

Department of Energy-led IRP process, as well as the adoption of a more 'whole-of-government' approach. In particular, it is critical that SARi is now led jointly by the Department of Energy and the Department for Trade and Industry.

- **A joined-up and coordinated government approach is needed to attract and channel foreign funding**

The SARi International Partnership is a critical development for attracting foreign investment (public and private). In particular, the foreign partners all have deep experience with programmes for the large-scale rollout of renewables and therefore understand the finance and investment challenges. The South African Government now needs to maintain the momentum and ensure all elements of the MOUs are delivered by all partners.

- **The form and method of initial support for investments in renewable power is a critical, and potentially contentious, issue for governments to get right**

The 'feed-in tariff versus tendering' debate remains an active one for governments worldwide. In 2011, based on concerns about consistency with national laws in South Africa, a switch was made from a planned feed-in tariff procurement model to a tender model to set the initial support subsidy. The first tender process for over 1.4 GW has now been completed. (CDKN's case study on scaling up solar power in India encountered similar growing pains during the initial private sector tendering process.⁴)



Key measures of success going forward will be the successful construction and launch of the 1.4 GW of projects in the first tender round, completion of the full 3.6 GW initial procurement window under the IRP, and the development and agreement of finance mechanisms (and the underpinning policies and industrial development strategy) for the full 19 GW in the IRP.

Moreover, South Africa's ambition for renewables may not end there. The SARi team have also modelled a more ambitious 'bold' scenario: 24 GW by 2025, creating an average of 36,000 jobs per year in 2012–2024, reducing the emissions associated with energy-intensive exports by 30%, and contributing 12% of the emission reductions needed for South Africa to meet its international

climate mitigation commitment for 2025. A further increase in ambition of this scale would require \$12–14 billion of additional funding beyond what is already needed. Whether it follows the current plans under the IRP or this even more ambitious scenario, South Africa's nascent energy transition is clearly one to watch.

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The Climate and Development Knowledge Network (CDKN) aims to help decision-makers in developing countries design and deliver climate compatible development. We do this by providing demand-led research and technical assistance, and channelling the best available knowledge on climate change and development to support policy processes at the country level.

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