THE SOUTH AFRICAN RENEWABLES INITIATIVE

Partnering for green growth

South Africa • December 2011

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Acronyms

AFD – Agence Française de Développement

CDM – Clean Development Mechanism

CO2 – Carbon Dioxide

CSP – Concentrated Solar Power

CTF – Clean Technology Fund (World Bank)

DBSA – Development Bank of Southern Africa

DFI – Development Finance Institution

DFID – Department for International Development (UK)

DTI – Department of Trade and Industry

EIB – European Investment Bank

GEF – Global Environment Facility

GHG – Greenhouse Gases

IPAP – Industrial Policy Action Plan

IPP – Independent Power Producer

IRP – Integrated Resource Plan

ISMO – Independent Systems and Market Operator

KfW – KfW Entwicklungsbank (German development bank)

kWh – Kilowatt hour

LTMS – Long Term Mitigation Scenarios

MW – Megawatts

MYPD – Multi-year Price Determination

NAMA – Nationally Appropriate Mitigation Action

NERSA – National Energy Regulator of South Africa

PPA – Power Purchase Agreement

PV – Photo Voltaic or Present Value

REEEP – Renewable Energy and Energy Efficiency Partnership

REFIT – Renewable Energy Feed-In Tariff

REMT – The Renewable Energy Market Transformation Project

SARi – South African Renewables Initiative

SAWEP – South African Wind Energy Programme

UNEP – United Nations Environment Programme

Contents

Summary

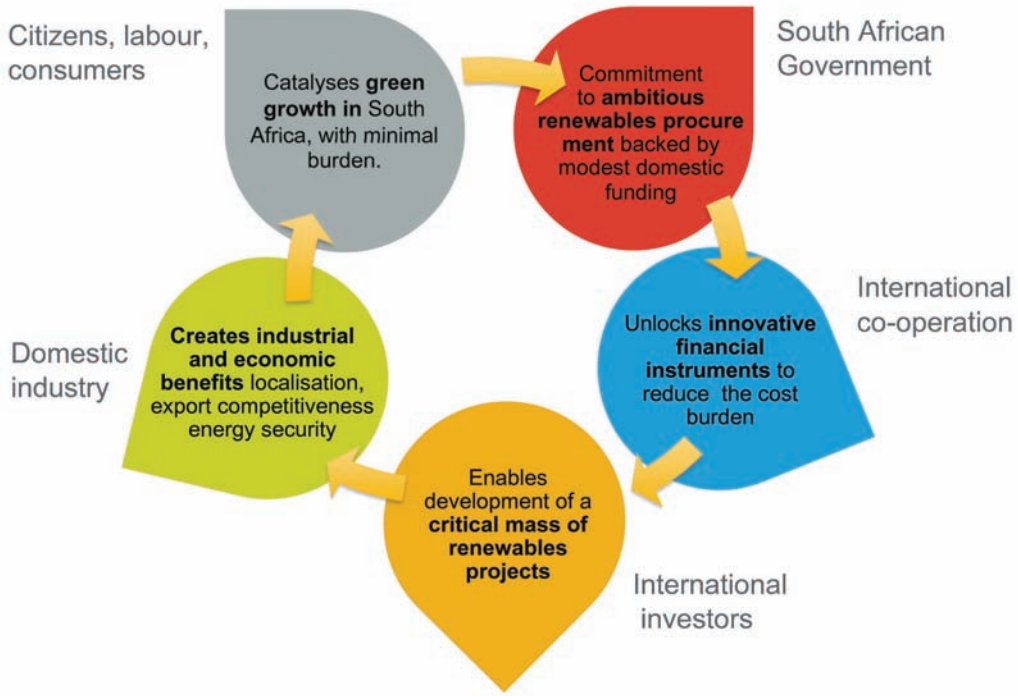
Unlocking green growth

The South African Renewables initiative (SARi) has been established by the Government of South Africa to support the rapid and ambitious scaling-up of renewables in South Africa in a manner that will deliver economic, social and environmental benefits, without imposing unacceptable costs on the nation's citizens and economy.

The initiative provides a means for mobilising and channelling international public finance into the development of renewables capacity and the delivery of green energy. The overall vision is for a strategic, large-scale, and competitive procurement of renewable energy, enabled by domestic institutional de-risking, and the provision of low cost loans and risk guarantee instruments from international sources, to be combined with modest amounts of domestic funds and international public grants, to cover the remaining incremental costs.

This approach was first proposed in the founding SARi report 'Unlocking Green Growth', released by the South African Government at the Cancun Climate Change Summit in 2010.[1]

The Vision: Unlocking South Africa's Green Growth Potential



A National Initiative

SARi has been confirmed by Cabinet and forms part of South Africa's **Industrial Policy Action Plan** and the recent White Paper on the National Climate Change Response.[2] Support for the initiative has also been developed among international partners to the point where an International Partnership is now ready to be launched.

The work of SARi is guided by a Project Steering Committee co-chaired by the Department of Trade and Industry and the Department of Energy.

Analysis and design of the initiative has been refined and validated, and has also benefited from the exchange of learning with others working to catalyse and support ambitious national action for climate and green growth.[3-4]

This briefing paper gives a summary of the design work underpinning the initiative; the relationship with national policy and institutions; the scale of the ambition and the direction of the partnership going forward. It also highlights the challenges that SARi must tackle, in common with other ambitious national initiatives, in designing new mechanisms to catalyse green growth.

Energy, environment and economic benefits

The initiative seeks to optimise the potential economic benefits to South Africa from an ambitious scaling up of renewables:

- Economic benefits from the localisation of parts of the global value chain of renewables, notably manufacturing, construction, operations and servicing, but also research and product development.

- Energy security benefits from the additional reserve provided through the provision of renewables generation capacity that could help to meet demand, prior to other major new generation capacity.

- Greening of South Africa's exports as international markets become more carbon-sensitive.

In addition, it is anticipated that the healthy growth of the renewables industry will encourage awareness by business and policy-makers of the potential of the green economy, helping to catalyse green investments in other areas of the economy.

The envisaged approach supports the effective alignment of energy, industrial and economic, climate, and public finance policies and practices. This would optimise positive economic benefits for South Africa in its transition towards a green growth pathway.

Securing and applying sufficient financing would enable South Africa to realise the renewables component currently included in its Integrated Resource Plan (IRP2010). Such a financing mechanism would lay the foundations to enable increased levels of renewables to be included in future revisions of the plan.

International partnership

The South African Renewables Initiative will be supported by an international public partnership, including national and regional governments, international bodies and development finance institutions.

Whilst businesses are not involved as direct partners in the initiative, the intention is to leverage a stronger and more mutually beneficial engagement of the private sector as technology providers, financiers and operators. Technology choice and its cost of acquisition, localisation with long term investment potential and the development of South Africa as an export and service hub are all key to renewables playing a strong role in the wider development of South Africa.

Supporting coordination

South Africa already benefits from many bilateral agreements with international public partners in the energy field. Bringing together many of these existing partners, as well as new partners into an integrated and ambitious approach, is crucial to coordinating, scaling up and applying support effectively to enable the development of a critical mass of renewables.

SARi is one of many developments in the South African policy agenda. Energy regulation, system management and oversight, pricing and tariffs and the creation of national public funds and facilities are but a few of the energy-specific measures, with many others in place, or in progress to ensure their integration with economic and fiscal policy. It is these developments that will ensure that finance mobilised through the initiative and other sources will be deployed effectively.

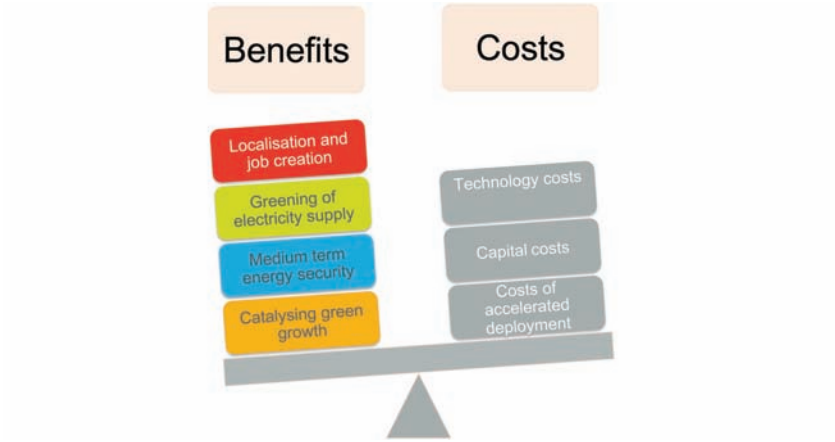
Shared learning

The South African Renewables Initiative is a work-in-progress. Effective integration of renewables into the nation’s broader policy framework, particularly with respect to economic development, is a challenge in itself. Progressing this with the international co-operation of diverse partners with widely varying perspectives, competencies and interests, increases complexity, as well as opportunity, with consequent potential benefits.

Through SARi the Government of South Africa is seeking not only to establish a means of mobilising collaboration to meet its goals, but also to provide a source of inspiration and shared learning with other ambitious national initiatives seeking to progress through international co-operation.

1. The South African Renewables initiative

The South African Renewables Initiative (SARi) has been established by the Government of South Africa to support the rapid and ambitious scaling up of renewables in South Africa in a manner that will deliver economic, social and environmental benefits without imposing unacceptable costs on the nation's citizens and economy.



Enabling strategic development of renewables

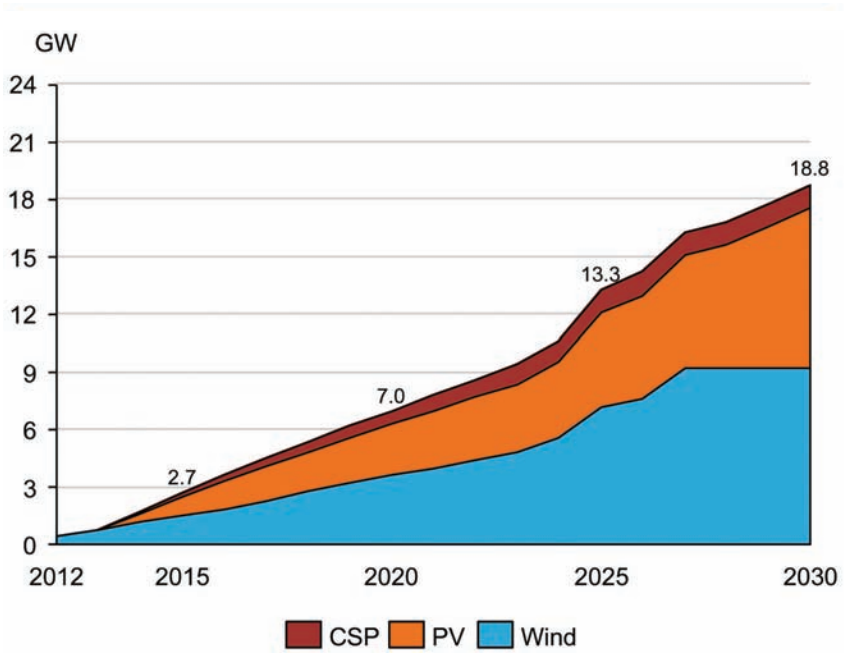
The initiative aims to support the scaling-up of renewable energy, based on the **Integrated Resource Plan** for Electricity.[5] The IRP is the strategic planning framework for South Africa's energy sector, and reflects the need to balance economic and industrial benefits, supply adequacy, greenhouse gas emission reduction, and cost. In particular it reflects the need for a clear, long-term, ramp-up, and a strategic approach to procurement and technology choices, to enable South Africa to pursue the opportunity to become a producer, rather than solely a consumer, of green technology.

The current plan (IRP 2010) includes almost 19 Gigawatts (GW) of renewable energy capacity made up largely of Wind, Solar Photovoltaic (PV) and Concentrated Solar Power (CSP) to be added to the grid by 2030.[6]

Exhibit 1. The current plan for renewables in the IRP

This includes 17.8 GW of new and additional renewables capacity, as well as 1 GW already committed.

[Source: based on Integrated Resource Plan (IRP 2010) and the Renewables Flagship Program (RFP)]



Overcoming the incremental cost challenge

Implementing the IRP scenario will mean that almost 9% of electricity supplied to the grid will come from renewables by 2030. Such a rapid and ambitious scale-up of renewables would make a significant contribution towards domestic goals for clean energy, carbon emission reduction and green job creation.

However, while the cost of renewable energy has been falling, it remains higher than the alternatives, particularly coal. Currently 90% of the country's electricity is generated from abundant supplies of cheap coal. The incremental cost between renewables, and the rest of the energy mix, is a major challenge to the successful implementation of clean energy technologies.

Based on current estimates, the additional cost of realising the renewables targets, over and above the full financial cost of non-renewable sources, would be of the order of US$ 8.0 – 8.9 billion over the lifetime of the power procurement contracts which would be signed between 21012 and 2030.* These costs would have to be passed on to energy consumers, if they are not offset in other ways.

SARi has been developed to provide a means for mobilising and channelling international public finance into the development of renewable generation capacity, and its delivery of green energy, to reduce the domestic burden of this incremental cost.

Supporting coordination

The envisaged approach supports the effective alignment of energy, industrial and economic, climate, and public finance policies and practices, thereby optimising economic benefits to South Africa in its transition towards a green growth pathway.

Such an integrative approach is indicated in the **Industrial Policy Action Plan** and the **National Climate Change Response** White Paper, which specifically reference an innovative financing initiative.[7]

Enabling greater ambition

The IRP is a living plan, which will be revised and updated as necessitated by changing circumstances. In particular, if the domestic burden of incremental costs can be brought down, the plan for renewables could be accelerated beyond what is currently envisaged. Equally, if the incremental costs prove too high, the plan is likely to become limited by funding constraints.[8]

Therefore, securing and applying the required international public finance would enable South Africa to realise the renewables component of its Integrated Resource Plan.

*Present value (at 6% discount rate) of total US$ gap above baseline energy cost [Source: IRP] until 2049, assuming 100% commercial financing and not including the positive effect of mature technologies with LCOEs below the price of electricity. Based on SARi Model v3.5

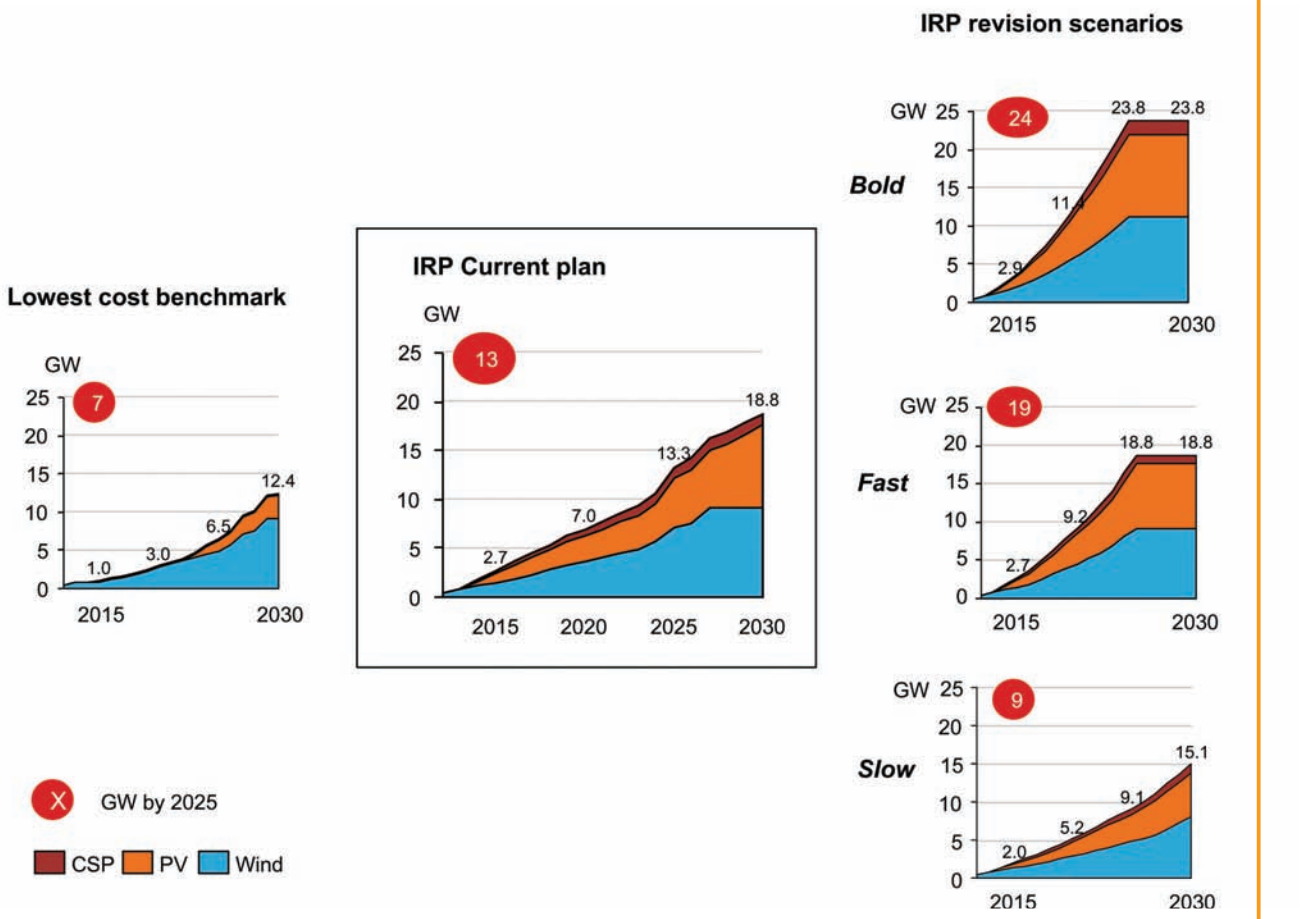
Exhibit 2. IRP revision scenarios

In addition to estimating the costs and benefits of implementing the current IRP plan, which ramps up to nearly 19GW of renewables by 2030, this briefing presents three additional scenarios, reflecting the potential for roll-out of renewables to be accelerated, or decelerated, in future revisions of the IRP. These illustrative scenarios have been developed to explore the impact of these directional changes on the balance of costs and benefits from the renewables programme:

A) **Bold** – IRP roll-out accelerated and made more ambitious to achieve 24 GW by 2025.
B) **Fast** – IRP roll-out profile accelerated by five years
C) **Slow** – IRP roll-out profile delayed by five years.

In addition a fourth scenario has been calculated as a benchmark for assessing costs and benefits. This is the 'lowest cost scenario' which represents the volume of renewables that would be developed if each technology is only commissioned after it becomes cost-competitive with non-renewables. This scenario eliminates incremental cost, but results in a much slower build-up of solar PV and no CSP.

This is not, however, a 'business as usual' scenario, since developing renewables even at this lower level still depends on policy measures to overcome non-financial barriers. Nevertheless, in terms of the direct results of incremental costs incurred, the climate, economic and energy security benefits of achieving the IRP scenario for renewables (or the variations illustrated) can be considered additional to the the lowest cost benchmark.



2. The potential for green growth

Economic benefits from renewables

There are four key potential economic benefits to South Africa from an ambitious scaling up of renewables as envisaged in the IRP.

- **Industrial development:** Attracting investment not only in renewables generation, but also in the industrial value chain supplying the industry. Direct benefits from localising parts of the global value chain of renewables - notably manufacturing, construction, operations and servicing , but also research and product development, would include the creation of jobs and skills, and the associated tax revenues from economic growth. Technical studies, and the experience of other countries, indicate that there is significant potential for creating and sustaining employment in renewables.[9]

- **Medium-term energy security:** Unreliable power supply in South Africa adversely affects competitiveness and employment, and imposes significant costs on consumers, businesses and municipalities. Renewables, if developed in the next ten years, could add several percentage points to energy reserves, helping to address the medium-term risk of economic and social dislocation as a result of reduced availability.[10]

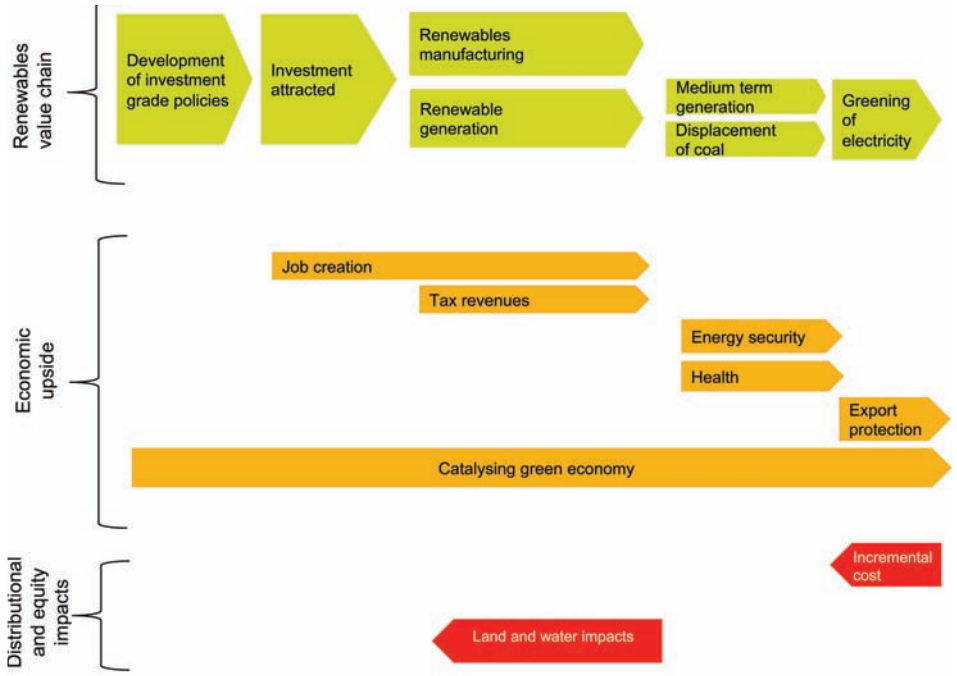
- **Export competitiveness**: 60% of South Africa's electricity supply is used by industry. Industry, while concerned about controlling costs, is also increasingly vulnerable to international measures which may be taken to control the trade of products associated with high carbon emissions.[11] Greening South Africa's energy supplies would be a sound move to help secure the on-going competitiveness of energy-intensive exports.

- **Catalysing green growth:** A burgeoning renewables industry will help to increase awareness in the business sector, and among policy-makers, of the potential of the green economy. This could help to catalyse green investments in other areas of the economy.

There are likely to be positive health affects associated with the displacement of coal by renewables. There may also be potentially negative localised economic impacts owing to competition for land and water resources with farmers, householders and amenity users. These will need to be addressed, not only through local planning policies and safeguards, but also through measures to ensure that local communities benefit economically from the rollout of renewables projects.

Exhibit 3. Economic impacts of the renewables value chain in South Africa

While a full economic analysis has not been undertaken, a number of key elements have been assessed. Based on this modelling, if the incremental cost of renewables is passed on entirely to consumers it is likely that this would have a **moderate negative impact** on industrial competitiveness and consumer welfare. This could result in a significant negative impact on the ability to develop the business and political will to support renewables.



There are significant difficulties in accurately assessing the jobs and economic development impacts of alternative energy policies.[12] Nevertheless, key indicators illustrate the scale of the economic benefits which could be achieve by the scaling up of renewables in South Africa. Based on current estimates, achieving the IRP for renewables could result in:

- **Approximately 37,000 jobs created in 2023, the peak year**, including 20,000 direct jobs.* South Africa's economic development strategy, the New Growth Path, identifies the green economy as one of the six key opportunity areas for creating high quality, high skill, manufacturing jobs. With a target of 80,000 new clean technology manufacturing jobs, delivering the IRP as planned would contribute 18% of this target.[13] The pattern of direct job creation will shift between predominantly up-front jobs in manufacturing and construction in the early years, towards a growing proportion of on-going jobs in operations and maintenance, as capacity is built up.[14]
- **Up to 40,000 GWhs/ year of electricity would be contributed to medium-term energy supply**, by 2030.** This provides a level rising to 9% of electricity demand, during a period when demand is likely to outpace the development of new major generation capacity from coal, gas or nuclear.[15]

*Source: Energy Sector jobs to 2030: A global analysis; Jay Rutovitz, Alison Atherton; Institute for Sustainable Futures, 2009; Putting Renewables and Energy Efficiency To Work: How Many Jobs Can The Clean Energy Industry Generate in the U.S.?, Max Wei,Shana Patadia,Daniel M. Kammen,University of Berkeley; Agama Energy, "Employment potential of renewable energy in South Africa", 2003; Department of Labour, "Job opportunities and employment in the South African Labour Market", 2010; team analysis; SARI model v3.5

**Capacity factors considered: 25-30% for wind energy; 18.7% for Photovoltaic Crystalline; 41% for CSP Tower with Storage; 37% for CSP Trough with storage. Source: averages of diverse international sources among investment banks and industry experts for each technology

- **138 Mt of CO^2 would have been abated** between 2012 and 2025, or around 26 Mt/ year at peak, providing the opportunity to reduce the emission intensity of energy intensive exporters by 20%, if all green GWhs were allocated to these sectors.*

However, there is not simply a linear relationship between the scale of renewables and the jobs and economic development benefits generated. While some elements, such as construction work and manufacture of low-value heavy components (such as wind towers) are easy to localise and increase with gradual scale, this alone will only provide a temporary uplift, and will not serve as the basis for the development of a long-term sustainable industry.

A large, steady, and clearly signalled ramp-up is needed to provide a basis for industrialisation. This offers developers and manufacturers the security of assured long-term demand to make investments in the plant, technology and skills required to move up the industrial value chain. A clear and ambitious long-term ramp up technology also allows integration with industrial policy to encourage skill and enterprise development all along the supply chain, as well as creating the basis for an export industry to be established.

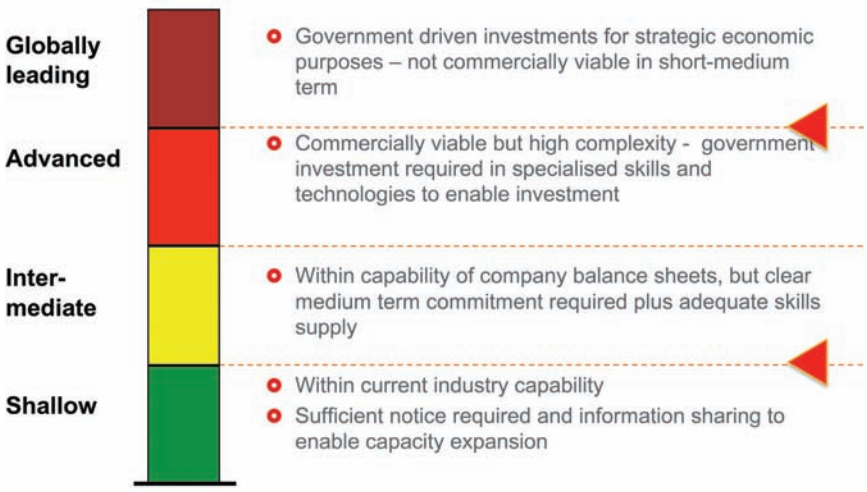
Over the medium-term, the competitiveness of renewables will rely on both economies of scale and continuous innovation.[16] A successful localisation strategy should therefore use the first critical mass of renewables as a springboard for creating the specialised capacities needed to deliver more advanced component manufacture. The extent that these jobs, and additional construction jobs, could be sustained, will depend on whether the initial build-up of renewables has been successfully used to establish a commercially competitive industry, able to serve an expanding national and regional market.

In addition, a planned and steady growth in renewables is likely to be more effective at displacing fossil fuels, than a stop-go approach, as it enables integrated planning.

Exhibit 4. Levels of localisation

Technology research and consultations with developers and manufacturers indicate that localisation up to the level of advanced manufacturing could be achieved with an ambitious and well-funded procurement programme for renewables supported by a coordinated industrial policy, strategic technology partnerships and investment in skills and training.

This could secure localisation up to the level of gearbox, blades and bearings for wind technology, and controls, valves and drives for CSP.

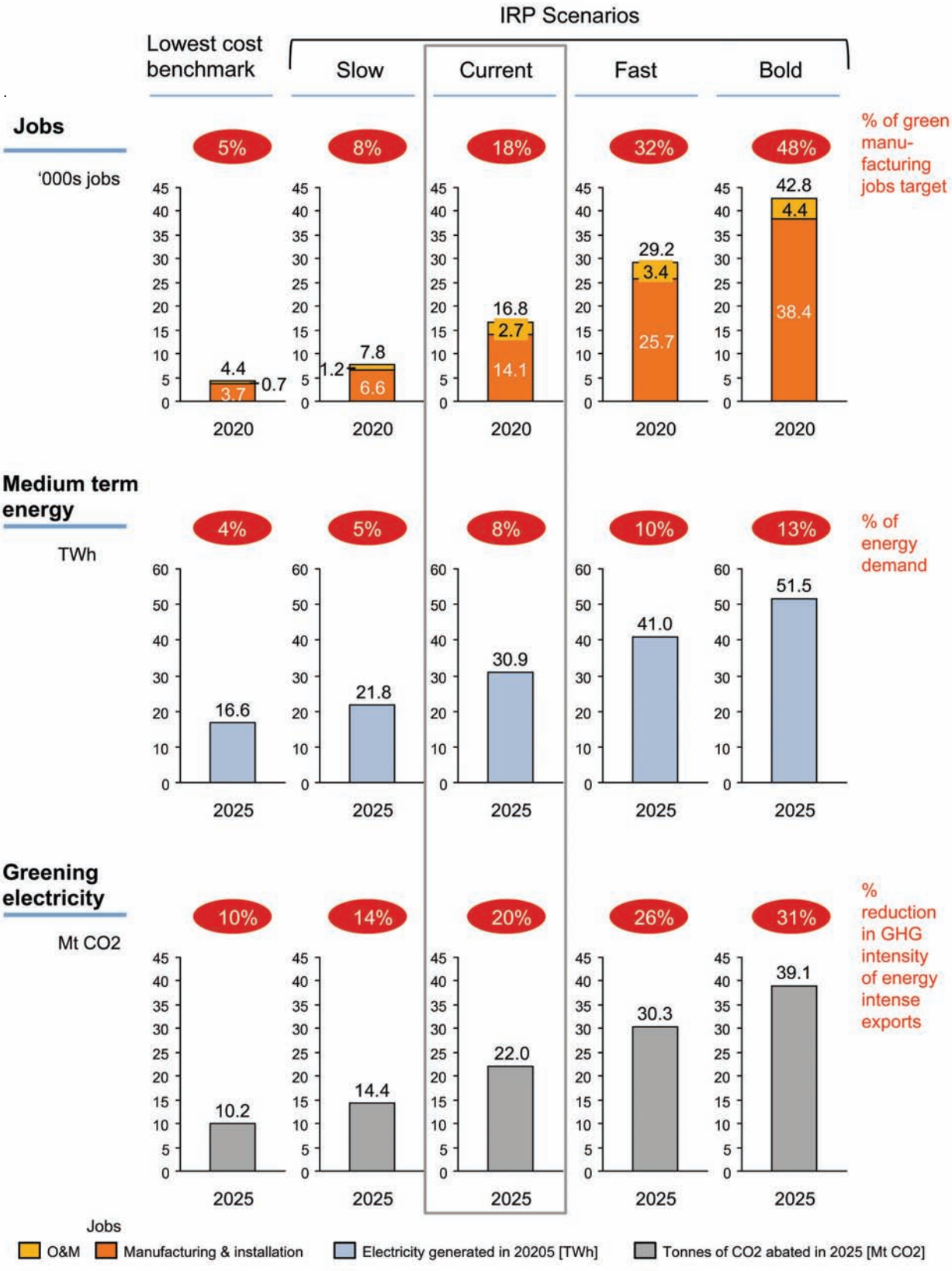


[Source: based on framework developed by the "The South Africa Power Project (TSAPRO)"]

*CO2 emission abatement assumptions: 2010 grid emissions factor of 0.98 tCO2e/MWh in SA, evolving according to new commission and decommission of different technologies according to IRP plan. Exports assumed to be 40% of total 2010 demand, and maintained constant at that level along the years.

Exhibit 5. Economic benefits of renewables at different scales

If future revisions of the IRP resulted in a faster, and more ambitious, development of renewables, this would mean a greater number of jobs would be created, as well as a larger contribution to medium-term energy security and climate change mitigation goals. This includes both the linear and non-linear relationships of these economic benefits to scale.



Learning from international experience: Localising economic value from renewables

South Africa is developing an industrial strategy for the wind and solar sector. As in many other countries, the challenge is to develop policies and programmes to enable the development of a competitive local industry, integrated into global value chains.

Clean energy technology is already an established industry. Wind turbine manufacturing is concentrated in China, Germany, Denmark, Spain, the USA, Brazil, India and South Korea. Solar PV modules are produced worldwide by companies with headquarters in China, followed by the Americas, Europe and Japan.[17]

Globally, large renewable projects are often highly international in terms of the parties involved. The 212MW Olkaria geothermal complex in Kenya, for example, has Israeli and Kenyan plant operators, drilling equipment from Chinese companies and finance from Chinese and French development banks. It also has a loan from Japan to pay for a transmission line, and from the German government for the expansion of the project.[18]

Large-scale procurement with a long and steady ramp-up in capacity is a key driver for developers and manufacturers to invest in developing local industry and supply chains.

However, local content rules have also become a popular device in the last few years in order to ensure that domestic economies benefit from natural resource exploitation, in both renewables and other key natural resource industries, such as oil and gas. China, for example, included a requirement for up to 70% of the value added of wind turbines procured under the national wind programme to originate locally. In Brazil, the Proinfa wind feed-in tariff programme also stipulated 70% at first. In 2009, the Canadian province of Ontario introduced a generous feed-in tariff for solar PV projects, if developers used modules with at least 50% of their cost based on local goods and services. India's Solar Mission required local assembly of modules in its first phase, and will require local production of cells and modules in its main phase.[19] South Africa's first phase of Independent Power Production tendering also includes a local economic development requirement.

There are tensions around local content targets, as to whether they are a rational public policy for time-limited support of nascent industries, or, on occasions, an unjustified form of protectionism. It is increasingly argued and demonstrated that carefully designed local content measures can be applied in a way that does not entrench protectionism, but that does lead to a more skilled, capable, and competitive local industrial base.[20] The Technical Report on the UN High Level Panel on the Financing for Development for example, agrees that limited time-bound protection of certain industries by countries in the early stages of industrialisation is warranted, notes that "however misguided the old model of blanket protection intended to nurture import substitute industries, it would be a mistake to go to the other extreme and deny developing countries the opportunity of actively nurturing the development of an industrial sector".[21]

Unless carefully constructed, local content requirements can conflict with the procurement requirements of development finance institutions. For example the European Investment Bank's guidelines on procurement stress the principles of open international competition, non-discrimination of tenderers, fairness and transparency of the process, and selection of the economically most advantageous offer. Borrowers may grant a 15% margin of preference for goods manufactured, or produced, in the country but the Bank does not allow for preference to be given to works (even if they include the supply of goods) or services originating in the beneficiary country.[22]

Contributing to climate change mitigation

Reducing carbon emissions is a key national and international policy goal in developing clean energy.

In 2009, at the Copenhagen Climate Conference, President Jacob Zuma pledged that South Africa would carry out Nationally Appropriate Mitigation Actions (NAMAs) to enable a 34% deviation below the 'business as usual' emissions growth trajectory by 2020 and a 42% deviation by 2025.[23]

These international climate commitments are consistent with South Africa's benchmark National GHG Emissions Trajectory benchmark, to achieve a peak, plateau, and decline in emissions by 2050. This is the pathway against which the efficacy of mitigation action will be measured.[24]

Clean energy technology comprises four streams: renewable energy, non-renewable low-carbon, cogeneration processes and energy-efficiency technologies. Renewable energy technologies may be grid-connected electricity or off-grid solutions (household, micro-grids and industrial self generation), as well as gaseous and liquid fuels, heat, or a combination of these energy types. Non-renewable low-carbon technologies also include clean coal technologies and hydrogen and fuel cells.[25] While renewable grid-based energy, which is the initial focus of SARi is only one part of this clean energy mix, South Africa's Climate Change Policy makes clear that shifting to lower-carbon electricity generation is one of the areas with the greatest potential for mitigation in the medium term, and should be aggressively pursued and combined with actions in these other sectors.[26]

Modelling carried out as part of the SARi development process compared the IRP roll-out of renewables with the least-cost scenario (waiting until incremental costs reduced to zero). The IRP scenario would result in 50% greater emission reductions than the least cost scenario over the lifetime of the wind and solar projects commissioned (up to 2044), but crucially would deliver 150% greater emission reductions in the period up to 2025, and 260% greater in the period up to 2020. International research finds that early emission reductions will be crucial to maintaining climate change below the 2 degrees mark.[27]

Estimates developed through SARi show that, all in all achieving the current IRP plan for renewables would contribute around 7% of the overall emission reductions needed for South Africa to achieve its target for reducing emissions below the BAU trajectory by 2025. This confirms the conclusion of the Long Term Mitigation Scenarios and other assessments of mitigation potential in South Africa, that renewables while not a magic bullet, can contribute a significant wedge of emission reductions.[28]

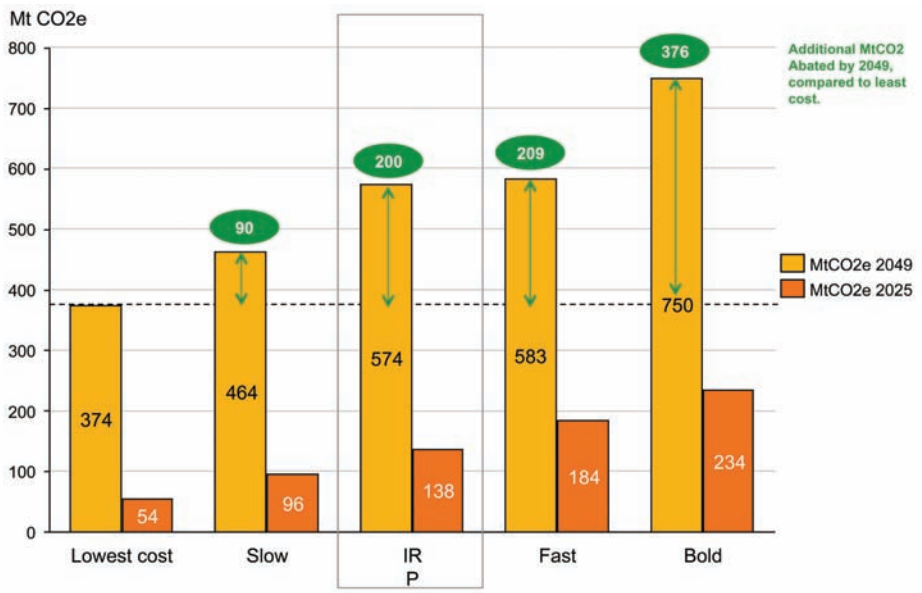
This significant wedge could be made larger with a greater volume of renewables. For example, the bold scenario of 24GW by 2025 would deliver 12% of overall emission reductions needed by 2025, providing over 400% greater emission reductions than the least cost scenario in the short term period up to 2020.

Exhibit 6. Emission reduction potential

As the exhibit highlights implementing the current IRP plan for renewables, would result in significant emission reductions, contributing 7% of the emission reductions needed to meet South Africa's 2025 target.

Developing renewables also prevents the lock-in of high carbon infrastructure.

Emission reductions to 2049 and 2025



3. Solving the funding and financing challenge

The three major challenges to up-scaling renewables have long been identified as economic and financial viability for IPPs, electricity supply industry re-structuring, and the institutional and legislative framework.[29]

There has been significant progress on the institutional developments and energy sector reforms needed to develop renewables in South Africa. The first renewables IPP process is already underway. However, the financial challenge of bringing down and covering the incremental costs of renewables at scale remains a significant barrier to building up from these foundations and delivering on the significant economic, climate and energy security potential of the industry.

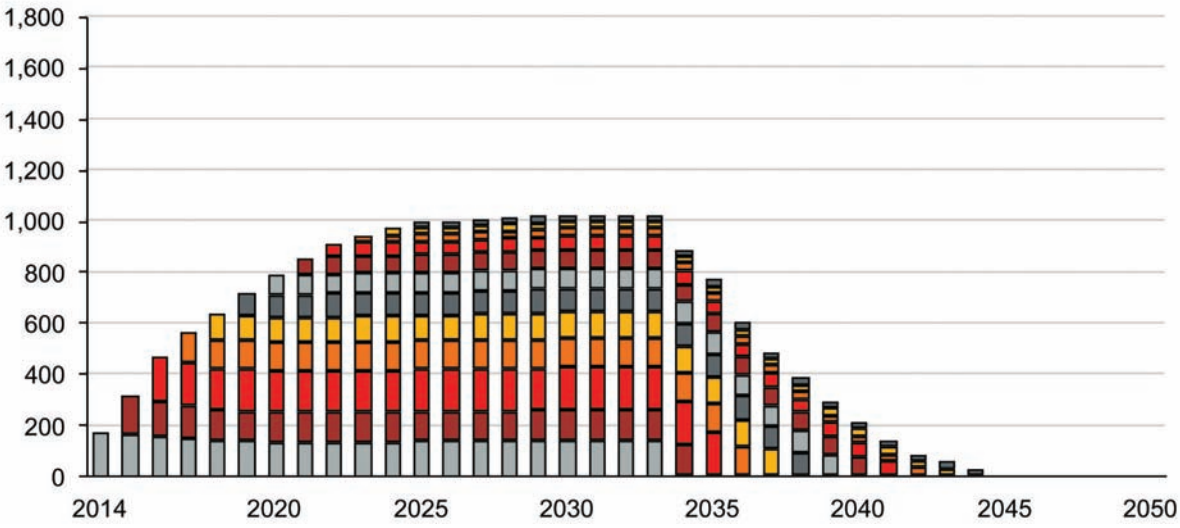
The incremental cost problem

Current estimates are that delivering the IRP scenario for renewables would entail an overall incremental cost, above the underlying cost of other electricity options, with an estimated present value of US$ 8.0 – 8.9 billion up to 2044, assuming that all projects were financed at commercial rates. This is largely made up of the incremental costs of solar energy, since once the first pioneering wind projects address risks and risk perceptions, the costs are likely to come down to the point where new contracts will not carry an incremental cost compared to the rest of the energy mix.

Exhibit 7. Incremental cost

Each vintage of renewable energy procured has an incremental cost profile which relates to the technology, the maturity of the technology, the length of the contract, and the change in the underlying baseline cost of other electricity sources over that time.

Total Funding gap associated with each vintage - Commercial funding, $m
IRP scenario vs. Lowest cost scenario



[Source: IRP] until 2049, assuming 100% commercial financing and not including the positive effect of mature technologies with LCOEs below the price of electricity. Based on SARi Model v2.3.5]

The investment challenge

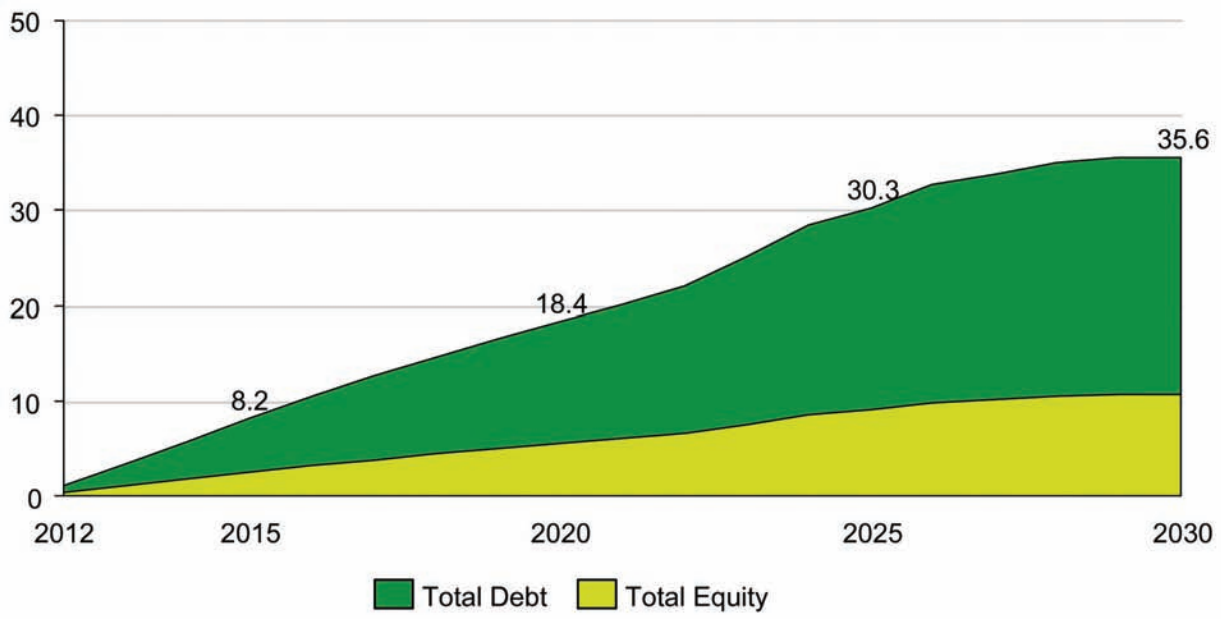
The incremental costs while significant are much smaller than the overall amount of investment needed to achieve an ambitious programme of renewables development.

Renewable energy projects are, by their nature, capital intensive, since they are long-term infrastructure investments with fuel costs that are low to zero.[30] Pioneering renewable energy projects in developing countries face particularly high capital costs due to a combination of technology and country risk.[31]

Overall, it is estimated that US$36 billion investment is needed by 2030 to achieve IRP targets for renewables, made up of US$11 billion of equity and US$25 billion of debt.

Exhibit 8. Investment requirement

Cumulative financing requirements, Commercial funding, $bn



[Source: Industry interviews, SARi Model v2.3.5]

The two challenges of incremental cost and investment are linked, as predictable funding flows for incremental costs are needed to provide the revenues required to attract private sector investment. At the same time reducing or mitigating real and perceived risk would lower the effective cost of capital, reducing these incremental costs, while still offering attractive risk-adjusted returns to investors.[32] Low cost loans and other financial instruments can therefore play a key role in bringing down the incremental cost if these two mechanisms are coordinated, and scaled up together.

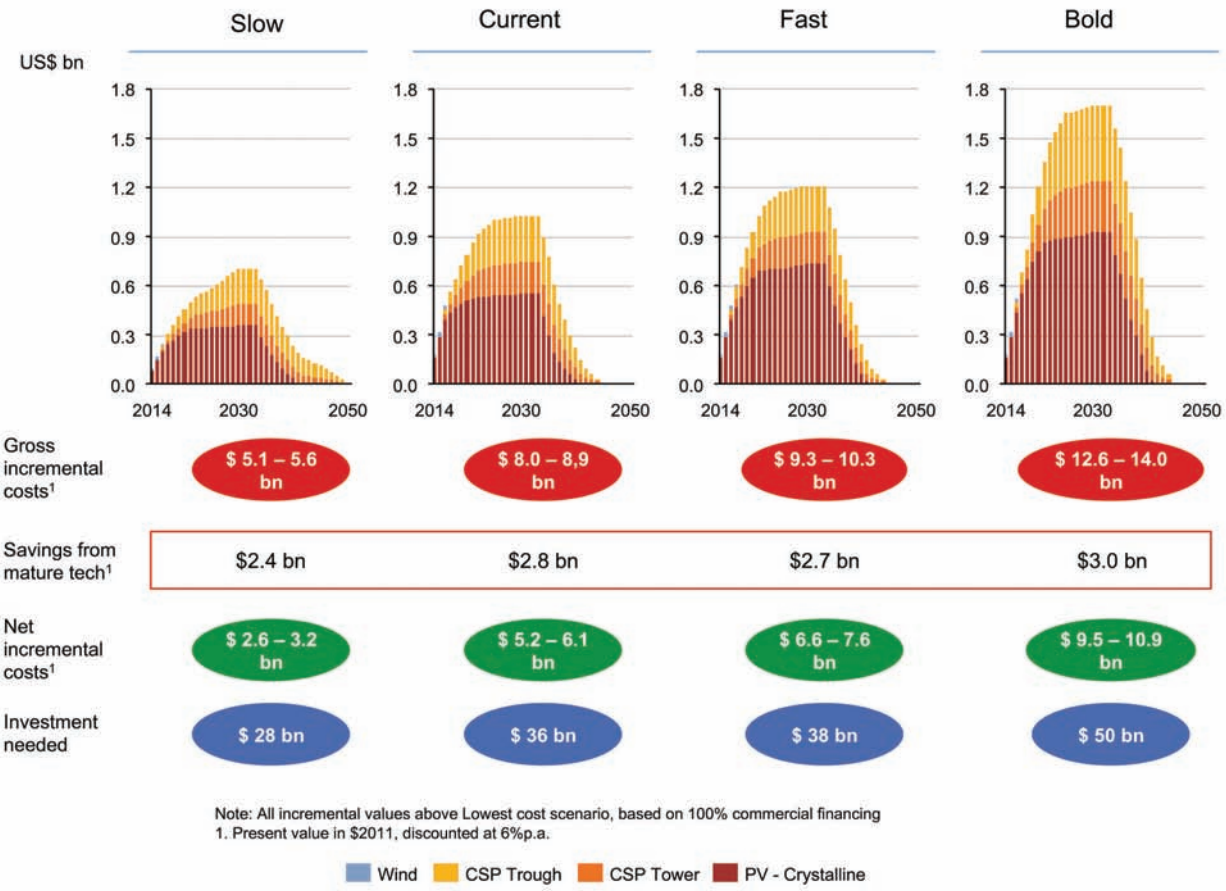
Given the scale of investment needed, and the overall incremental costs involved, it is clear that the IRP targets are highly ambitious and all the more challenging to realise in the context of turbulent global economic conditions. They will require international partnerships to achieve or to further accelerate.

Exhibit 9. Scaling incremental funding and investment to meet ambition

The incremental funding gap identified is essentially the cost of going faster in developing renewables than the least cost benchmark would allow.

The graphic below shows the incremental costs, and the investment needs for the IRP and for the three variations modelled.

In each scenario, there is also a saving, once the cost of generating wind energy falls below the underlying grid price. If these savings are captured by the energy purchaser through a competitive procurement process, they could help to offset the premium to give a lower net incremental cost for the overall programme.



Mobilising and coordinating financial resources

There is increasing attention being paid to how public sector finance and financial instruments can ‘crowd in’ private capital to the sector.[33] This has been emphasised most recently by the UN Secretary-General’s Advisory Group on Climate Financing.[34]

Learning from international experience: Using public funding to leverage private investment

Examples of climate mitigation-focused public financing mechanisms which aim to leverage private investment include:[35]

- **Partial risk guarantees** enable Development Finance Institutions to offer low-cost loans. Partial loan guarantees underwritten by governments and other public finance institutions protect private investors against defaults and enable development finance institutions to raise capital on the market. This tool transfers risk from the lender onto the loan guarantor, enabling DFIs to raise finance more cheaply, make more loans, at a lower rate, and for longer terms. Such credit lines may be provided directly to projects, or to intermediaries including domestic DFIs and commercial banks.
- **Policy insurance and guarantees** that cover private lenders, or investors against the risk of a government (or government-owned entity) failing to perform its contractual obligations with respect to a private project, or changing the basis of a specific public policy needed for project viability.
- **Carbon finance facilities** monetize the advanced sale of emissions reductions to finance project investment costs.
- **Grants and contingent grants** share project development costs, reducing risk and investment needed at the early stage of project development.
- **Loan softening programmes** use aid funding to offset the cost of credit and offer loans at concessional rates, significantly below low cost market rates.
- **Foreign exchange liquidity facilities** help to reduce the risks associated with local currency fluctuations where projects need to repay loans on borrowed debt in foreign currency.
- **Export credit guarantees** offer credit to technology exporters, reducing the cost of enhancing access to key technology inputs.
- **Pay-for-performance grants** offer direct payment of incremental costs to support low carbon policies, for example, by funding feed-in tariffs for strategic renewables procurement.[36]
- **Equity capital 'pledge' funds, and subordinated equity** use public equity to take a 'first loss' position to encourage much larger investment by private investors, such as sovereign wealth funds, large private equity firms and pension funds.[37]
- **Green bonds have been proposed as mechanisms** guaranteed by OECD member governments to be issued to private sector investors to generate funds for climate change activities.[38]

A number of sources of policy-enabled financing are already in place in South Africa:

- **MDB (Multilateral Development Bank)** low cost loans – US$83 million from the World Bank's Clean Technology Fund (CTF) is being provided to South Africa as flexible loans to fund the South African Sustainable Energy Acceleration Program focused on the first Gigawatt of green energy procurement. The CTF also approved a $350 million loan to Eskom to develop a CSP plant and a wind power plant. The European Investment Bank (EIB) has provided half the funding towards a US$140 million funding facility for small and medium scale investment in renewables, managed by Investec. The EIB has also invested US$55 million in a PV module manufacturing plant in South Africa.

- **Domestic DFI low cost loans** – The South African Industrial Development Corporation reports that it already has renewable energy projects to the value of US1.7 billion over the next five years in the pipeline.

- **State-owned enterprise investment** – Eskom is seeking to develop its own renewables projects. In addition, the Department of Energy controlled Central Energy Fund (CEF) has established a renewable energy division to pursue commercially viable investments in the sector. The CEF channels grants and loans from international development partners including the USA, Norway, Germany and Denmark. To date, projects include a mini-hydro scheme, a solar water heater scheme and the Darling Wind Farm.

- **Bilateral low cost loans** – US$62 million is being lent through the Green Energy Efficiency Fund launched in October 2011 by the IDC and KfW, the German Development Bank. The fund will encourage and promote investments in both energy efficiency and renewable energy in South Africa. There is also a French loan support mechanism of US$165 million for an Environmental Credit Line to ABSA and Nedbank private banks, via the Industrial Development Corporation.

- **Domestic economic support** – Starting in 2012, a US$ 3 billion (R25 billion) economic support package is being developed by the South African government to boost industrial development, accelerate job creation, support the transition to a greener economy, and leverage infrastructure investment and risk-sharing partnerships with the private sector. While it is not yet determined as to how much of this funding will be directed towards renewables, it is likely that there may be a significant contribution to catalyse investment in the sector. The National Treasury also intends to establish a Renewables Fund to support the renewable energy programme in South Africa. R800 million was set aside for green economy initiatives in the 2011/2012 budget, which may also be used to support the renewables programme.

- **Non annex I investors** – A South African Energy company recently signed a US$15 billion renewable energy deal to produce wind and water power in Lesotho's Maluti Mountains, for use by both Lesotho and South Africa, The Government of Lesotho and a private equity investor will provide equity finance, however 80% of the finance is being provided by investors from China.

- **Private Sector Risk Capital Facility** (the Evolution One Fund). The fund is a 10-year late-stage venture and expansion capital fund with approximately US$90 million in committed capital from third party investors including the IFC, Castleway Properties (owned by the Tchenguiz Family Trust), the Swiss Investment fund for Emerging Markets (Sifem) and the Finnish Fund for Industrial Cooperation (Finnfund).[39]

- **Clean Development Mechanism** (CDM). The number of registered projects has expanded to 17 since 2006, with a further 125 submitted as of July this year, 96 at project information note stage, 29 at project design document stage.

- **Technology Transfer Guarantee Fund** (TTGF), initiated in 2007 and monitored by the Department of Energy. The TTGF guarantees 90% of the technology transfer transaction expenses to a maximum of R1 million.

This combination of funding mechanisms is illustrated in the case of the Darling Wind Farm opened in 2008. The farm is an independent power producer, with four wind turbines that can supply 5.2 MW of electricity, which it is selling to the City of Cape Town. Financing was provided by private investors, the Development Bank of Southern Africa (DBSA), the Central Energy Fund (CEF) and through a grant from the Danish government. The wind farm also qualifies for funding from the Technology Transfer Guarantee Fund, managed by the Department of Energy.[40]

The Department of Energy has a Renewable Energy Finance and Subsidy Office (REFSO), whose mandate includes the management of renewable energy subsidies and advice to developers on renewable energy finance and subsidies. However, to date developers have only been invited to apply for a subsidy after their project reaches maturity, with an "off-take agreement", a positive environmental impact assessment (EIA) record of decision, and the release of funds by lead financing institutions imminent.[41] To date, six projects with a total installed capacity of 23.9 MW have been subsidised. These include three small-scale hydro projects and individual biogas, wind and landfill gas projects.

To reach or to supersede its IRP goals, these sources of finance and funding will not only need to be scaled up, but also to be coordinated development.

A key challenge recognised by Government is the coordination of the provision of low cost loans and other capital subsidies, with demand-side contributions towards incremental costs. This needs to be sequenced correctly so that low cost loans are translated into lower energy prices rather than inflated profits.

Towards a funding solution

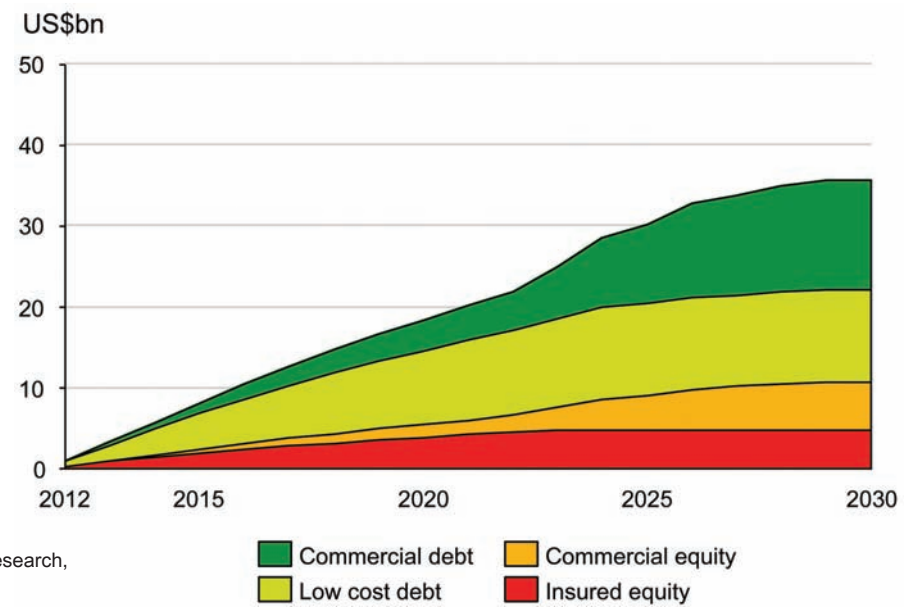
SARi seeks to develop a means for mobilising and channelling international public finance into the development of renewables generation capacity and its delivery of green energy in a way that will deliver economic, social and environmental benefits.

If low cost loans, insurance products and other financial instruments which lower the cost of capital can be mobilised at scale, this will reduce the incremental cost of renewables, and crowd-in private finance. One scenario for this, drawing on low-cost loans and equity insurance and thereby reducing incremental costs by 35%, is illustrated below.

Exhibit 10. Blended finance scenario

In this scenario, low cost loans are used to overcome financing bottle-necks at the early stage of the programme, but phased out for new projects after 2025 (2016 for wind projects).
It is estimated that this would require US$11 billion of low cost loans, plus insurance, and would leverage US$24 billion of commercial finance (including insured equity) into the sector.

[Source: industry interviews and research, SARi model v 2.3.5]



Best estimates are that applying these instruments optimally across the whole build programme would reduce the overall incremental cost of achieving the IRP plan for renewables by around 35% to a present value in the region of US$5.1 – 5.9 billion, or US$2.3 – 3.1 billion, if the domestic cost savings from wind were also used to offset against the impact on consumers of higher cost solar.

The South African electricity tariff set by the regulator, NERSA, aims towards being cost reflective. This means that eventually, the cost of renewables will be combined with other energy sources and passed on through the electricity tariff to consumers, replacing the need for international funding.

The costs would not directly impact on the poorest energy users who receive concessional tariffs, but would increase the overall cost of energy generation. Developing renewables at scale funded through ongoing tariff rises is therefore likely to lead to pressure to slow down the programme. This is due to other high priority public policy aims in the tariff-setting process, such as the need to cross-subsidise tariffs for the poor, and to maintain economic competitiveness for industrial energy users.

A number of potential sources can be explored for funding the reduced incremental costs, until the domestic tariff rises to meet them. One key possibility to contribute towards these incremental costs is international pay-for performance grants.

Pay for performance

As the previous chapter highlights, even with significant low cost loans and other financial instruments, there will remain an incremental cost challenge for scaling up renewables in South Africa in the order of US$ 2.3 – 3.1 billion to achieve the IRP plan for renewables to 2049. Funding for the incremental costs of renewables lends itself to a pay-for-performance mechanism.

Learning from international experience: designing results-based funding mechanisms for climate funding.

Results-based funding is a concept that is gaining currency in international development assistance and is starting to be explored in relation to climate funding.[42] Payment by results systems promise to strengthen the accountability of recipient governments to their citizens, funders to recipient governments, and recipient governments to funders, by making financing contingent upon transparent, and measurable progress on specific shared goals. Key principles of results-based systems are payments for outcomes, hands-off implementation, independent verification of progress, transparency through public dissemination, and complementarity with other aid programs.[43]

The benefits of this type of mechanism are that it enables demonstration of measurable results, while allowing recipient countries to combine international resources from different sources with domestic resources to achieve low carbon development goals.

Results-based funding mechanisms for climate change mitigation are most often associated with carbon markets. However, the sale of carbon credits raises funds by allowing businesses in carbon regulated industries and regions to count emission reductions achieved elsewhere against their own obligation to reduce emissions. Therefore, while current CDM rules allow carbon credits to be claimed even where there are policy drivers for emission reductions, it is difficult to see how projects funded through carbon credits would be able to contribute to South Africa meeting its own targets for emission reductions.

Pay-for performance mechanisms are also being developed for non-market public funding where this offsetting problem is avoided. For example the Amazon Fund developed a results-based mechanism for donor funding for avoided deforestation.[44] The Forest Carbon Partnership Facility is also piloting results-based payments for emission reductions in selected developing forest nations. The UK Government is exploring results-based finance for renewables with the Government of Rwanda. The World Bank's Scaling-up Renewable Energy Program (SREP) is also investigating the potential for results-based financing approaches to help countries deliver renewable energy investment plans. In October 2011, The Government of Norway launched Energy Plus; a partnership seeking to develop, and fund, results-based mechanisms for green energy involving a number of governments, development agencies, and development banks.

A number of different pay-for-performance mechanisms could be applied to clean energy and energy access goals.[45]

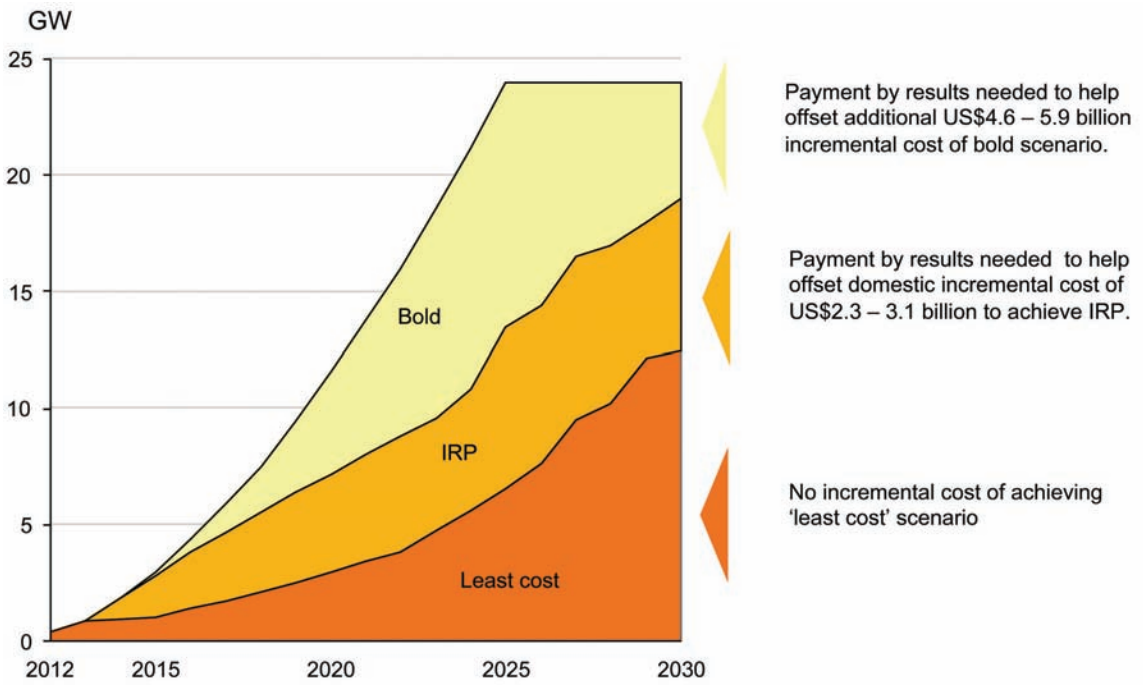
Mechanism	Explanation	Example	Pros and cons	Suitability for grid power?
Output-based aid	A cash-back payment is made for installation or delivery of service.	Payment per solar water heater or domestic biogas system installed.	Incentivises installation - not long term performance.	Low
Advance market commitment	Short term revenue for delivery of a service.	Payment per mini - grid live connection per quarter for four years.	Incentivises short-term performance - fits with donor funding window.	Medium
Performance-based payment	Long term pledge for payment against performance.	Payment per green GWh delivered.	Tailored funding to subsidise need - long timeframes for donor funding.	High

The experience of the Amazon Fund, the CDM and other early results-based climate funding mechanisms shows that a clear link is needed between the funding mechanism and the achievement of additional emission reductions in order to demonstrate value-for-money to public funders.[46]

A performance-based funding mechanism could be designed so that it targets the gap between South Africa's ambition for renewables and green growth, and the level of renewables that could be achieved without additional revenues.

Exhibit 11. Designing a performance-based mechanism for renewables in South Africa

One option that will require further development is that international public funds may be pledged and delivered against green gigawatt-hours above a least-cost scenario level.



The cost per-tonne could be standardised at a rate that is mutually agreed to provide value-for-money for funders and sufficient support for South Africa, across the overall program. Although funders would only be paying to support emissions reductions above the least cost scenario directly, their contributions would also be having a catalytic effect on the overall programme, as it is the overall level of ambition and economic benefit that is crucial in generating economic benefits and helping to build support to overcome both financial and non-financial barriers to renewables growth.

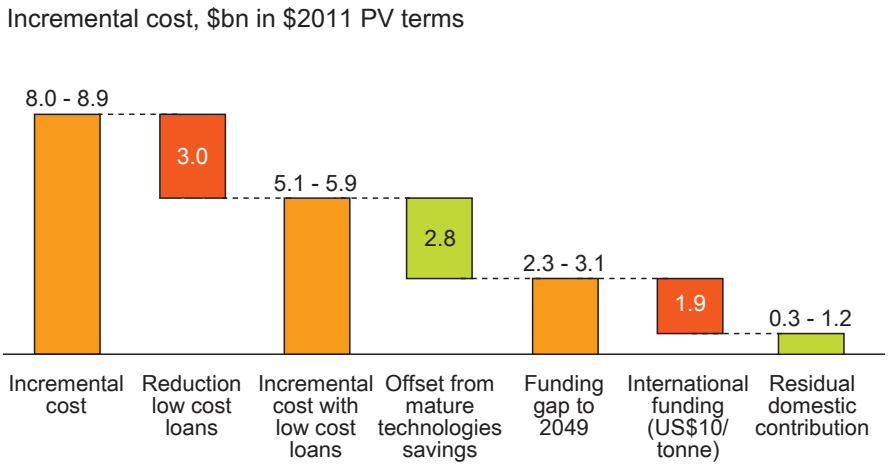
Further work needs to be done in developing a working pay-for-performance mechanism, which provides a standardised, monitorable, value-for-money proposition for international public funders. This would provide a clear incentive and enabler for South Africa to deliver on its ambition, and if backed by significant conditional funding pledges from international partners, would give a signal of confidence to developers and manufacturers of the long-term funding envelope for renewables.

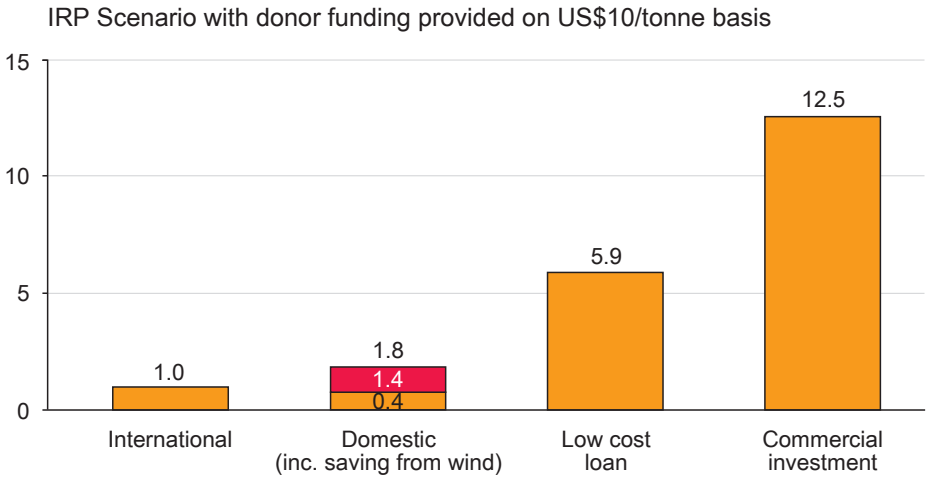
As an illustration, the graph below applies an international contribution of US$10 per tonne for the additional tonnes of carbon abated by the IRP, compared to the least cost scenario.

Exhibit 12. Illustrative funding blends

If international public funders pledged and delivered funding on a US$10/tonne basis for emission reductions associated with green gigawatt hours above the least-cost level, this would amount to a contribution with a present value in the region of US$1.9 billion towards the incremental cost of the current IRP leveraging a residual domestic contribution of US$0.3 – 1.2 (in addition to savings from low cost wind) and private investment of US$ 24 bn (including insured equity).

In this way 1 USD of international public funding would leverage almost 13 USD of investment.





4. Partnership for green growth

International partnerships

International partnerships will underpin the success of the South African Renewables Initiative.

South Africa already benefits from many joint activities with international public partners in the energy field:

- **Multilateral and bilateral loans** for renewables, provided by the World Bank's Clean Technology Fund (CTF), France's AFD, Germany's KfW, and the European Investment Bank.

- **Capacity building support for green economy projects and clean energy related departments.** Since 2004 when development partners began to support climate projects in South Africa, the country has received around US$ 0.4 billion in grants, and around US$1.2 billion in loans for climate related activities, concentrated on renewables and energy efficiency. The ten largest grant funders are Germany, the Global Environment Facility (GEF), the Gates/Buffet Foundations, Switzerland, the UK's Department for International Development (DfID), the French Development Bank (AFD), Denmark, Norway, the Development Bank of Southern Africa, Finland and the United Nations Environment Programme (UNEP- through its role in the Clean Development Mechanism - CDM in South Africa and Africa). Donor mapping shows there were at least 33 different development agencies implementing or preparing around 125 projects related to 'the green economy'.[47]

- **Catalytic programmes** seek to overcome barriers to renewables development, without investing in projects themselves. For example, The Renewable Energy Market Transformation Project (REMT) is a joint initiative of the Department of Energy and the World Bank (which has provided US$6 million funding over four years from 2009).Through the Development Bank of South Africa, there is grant funding to support renewables developers in the feasibility and pre-feasibility phase of project development. The South African Wind Energy Programme (SAWEP), run by the Department of Energy with funding from the GEF has been operational since 2003, working to overcome barriers to wind energy deployment. The Vienna-based Renewable Energy and Energy Efficiency Partnership (REEEP) also offers funding for projects to overcome barriers to clean energy development in South Africa.

To date, however, these activities have been largely bilateral, and while there have been some efforts at coordination within departments through the catalytic programmes, they have not been integrative of energy, industrial and economic and climate policies. Neither have these partnerships been of a scale that can deliver a critical mass of renewables with the associated benefits.

The design analysis undertaken under the South African Renewables Initiative indicates that South Africa could initiate an ambitious ramp-up of renewables at an acceptable cost to all parties. This requires coordination and scaled-up funding.

Exhibit 13. Potential benefits from international collaboration to support the IRP plan for renewables

- **Employment:** 35,000 – 40,000 new jobs created at peak.
- **Decarbonization of South African exports:** green house gas intensity of exports reduced by 20% by 2025.

- **Investment:** directly in the region of $36 bn investment in renewables capacity by 2030.
- **Public sources:** a blend of low cost loans (up to US$11 bn), plus insurance products and pay-for-performance grants to cover incremental costs (contributing towards US$2.3 – 3.1 billion incremental costs, together with South African domestic and consumer funding)

- **Renewables generation:** 19GW by 2030, providing 9% of electricity supply.
- **Carbon mitigated:** 575 Mt by 2049 or 27Mt per annum at full ramp-up.
- **Reduction from Business as Usual:** by 2025 would contribute 7% of South Africa's Cancun agreement target.

[Source: Integrated resource plan, team analysis, expert interviews, SARi model]

The South African Renewables initiative therefore brings together many of South Africa's existing partners into a systematic and more ambitious partnership to drive renewables development in South Africa.

The role of the partnership will be to enable international collaboration between the Government of South Africa, other governments and regional and international public bodies in order to:

a) Design, establish and secure appropriate funding to catalyse renewable energy development, as well as associated industrial development.
b) Increase implementation of industrial, energy, climate-change and economic development policies domestically.
c) Demonstrate and share learning from an innovative large-scale collaboration to mobilise investment into renewable energy technology and clean technology infrastructure to promote green growth.
d) Permit public partnerships to leverage funding, including private investment, in a manner that supports South Africa's efforts to move towards a greener economy that offers sustainable social development and upliftment.

Mobilising and coordinating resources at scale will also depend on drawing in additional partners, beyond the initial founders, to contribute and invest. National and regional governments and development finance institutions (DFIs), that are committed to working with the South African Government in its efforts to scale up renewables and catalyse green growth, are invited to join the partnership.

The South African Government will involve all relevant ministries and institutions in the partnership, as the delivery of clean energy, industrial development and climate change benefits from renewables is a cross-cutting objective. Key departments include the Department of Trade and Industry, the Department of Energy, the National Treasury, the Department of Public Enterprises, the Department of Environmental Affairs, the Department of Economic Development, the Department of Science and Industry, and The Presidency, as well as the Development Bank of South Africa and the Industrial Development Corporation.

The South African Government will engage with the international partners to seek to develop an appropriate set of mechanisms, supported by domestic policies, to enable the development of renewable energy, and growth of the renewable sector in South Africa, in such a way that industrial and job creation benefits are maximised.

The role of the private sector

The South African Renewables Initiative will be a public partnership, including national and regional governments, international bodies and development finance institutions. While the private sector is not directly involved in the international partnership, the intention is to support more mutually beneficial engagement of business as technology providers, financiers and operators.

There is already increasing private sector interest in the renewables sector in South Africa. For example:

- There has been a high level of interest in the first 3,725 GW of renewables open for bidding under the Renewables flagship Independent Power Producers (IPP) programme. Over 300 potential bidders paid the US$1,900 fee to receive bid documentation, and a total of 53 bids, representing some 2,100 MW of potential capacity, were received by the Department of Energy during the first bidding 'window'.[48] Winners of the first round of bidding are intended to be announced at COP 17 in December 2011.

- India's Suzlon Energy and leading CSP developers such as Abengoa, Solar Reserve and Solar Millennium have established offices in South Africa.

- Isivunguvungu Wind Energy Converter's (I-WEC) is developing South Africa's first large-scale wind turbine manufacturing plant in Cape Town. The company has invested US$12.8 million and plans to supply turbines to independent wind energy producers in South Africa. While some of the components will be imported, a large percentage will be produced in South Africa and the company hopes to employ up to 300 people at full capacity.

- Chinese solar firm, Suntech, is supplying panels for a 50-megawatt solar plant at Droogfontein.

- Cape Town-based Mulilo Renewable Energy has partnered with a consortium of Chinese companies led by Long Yuan Corporation to develop six wind farm projects capable of producing an output of 1,500 megawatts. Long Yuan's parent company, the state owned Guodian Corporation states that it plans to build a turbine assembly plant as well as a blade manufacturing facility in the Western Cape.

- The French Company Tenesol has set up a solar panel production plant in Cape Town.

- China's Goldwind, Denmark's LM Wind and India's Suzlon Energy have indicated they would consider setting up manufacturing plants in South Africa.[49]

The increasing business interest in South African renewables from around the world is warmly welcomed. However, there is a need to ensure that South Africa's prospective, large-scale procurement of renewables over the coming decades is both cost-optimised, and delivers the potential economic and social benefits. Technology choice, and its cost of acquisition, localisation with long term investments in mind, and the development of South Africa as a regional ,if not continental, export and service hub are all key to renewables playing their role in the wider development of South Africa. The private sector is a critical stakeholder in this respect.

Creating an enabling environment

South Africa's success in implementing its renewable and broader energy and green growth plans requires investment but also crucially, the development of policies and institutions able to support the scale up of renewables and realisation of associated economic benefits.

The private sector is generally well developed in South Africa but its participation in the energy sector, and in particular in power generation, has been cautious and limited to date. The primary requirement to attract private sector capital into low carbon investment is an appropriate policy framework. Almost all renewables investment is considered highly policy-dependent, not only to overcome incremental cost barriers, but also because institutional and infrastructural challenges require policy driven solutions.

The government has taken significant steps to identify and address the factors which have slowed the development of clean energy markets in South Africa. These include addressing issues related to institutional complexity and challenges to coordination, imperfect capital markets, dominance of generation and distribution by Eskom; financing risks and uncertainties, in particular related to the bankability of power purchase agreements, and bottle-necks in obtaining approvals and licenses.[50]

Learning from international experience: Investment Grade Policy

There is increasing attention to the overall package of policies needed to crowd-in investment to renewables. As research by Chatham House noted: "A target, a fiscal incentive, or availability of public finance alone will not be sufficient if there are cumulative high risks associated with other factors, as risk-adjusted returns must be commercially attractive."[51]

The term 'investment grade' is increasingly used to define the package of policies and institutions that ensure the clarity, stability, predictability and long-term visibility needed to attract finance. International institutions including the OECD, development banks and the International Energy Agency (IEA), offer advice on the frameworks and principles for such investment grade policies in the clean energy sector.[52] Key elements of investment grade policy identified by their experience include:

1. **Macroeconomic stability and general investment environment.**

2. **Long-term commitment to provide policy stability across the duration of investment lifetime** through an explicit commitment to a national strategy, mission or policy on renewables ramp-up.

3. **Carefully designed, transparent and predictable incentives** for cleaner options, including phasing out of subsidies for fossil fuel and, eventually, establishing a price on CO^2 emissions.

4. **Removal of non-economic barriers** by streamlining policy and regulation across all factors within the boundary of the deal, simplifying and reducing risk at every stage from planning approval to delivery.

5. **Integrated planning and provision of physical infrastructure** supporting integration of technologies.

6. **Co-ordinated, predictable policies to accelerate technology development.**

Overall, delivering against these six requirements depends on the political will and coordination of relevant institutions and their ability to mobilise and effectively apply sustained funding. This, in turn, depends on **economic alignment.** As the IEA points out: Crucial to the success of countries that have achieved dramatic changes in their energy markets has been "a strategic, comprehensive approach that communicates to the public the energy security, economic growth and environmental benefits of clean energy investment."[53]

Beginning in 2003 with the White Paper on Renewable Energy Policy which set an initial target for 10,000 GWh of electricity from renewable resources by 2013, the Government has taken a number of steps to overcome key obstacles and integrate renewables into its coal dominated electricity supply.[54] This has also been supported in recent years by the Renewable Energy Market Transformation project and the South African Wind Energy Project:

- **Integrated energy planning**. In 2009, under the Electricity Regulation Act, it was determined that energy planning should not be negotiated between Eskom and NERSA but should be developed though a consultative Integrated Resource Planning (IRP) process, coordinated with national economic, environmental and social considerations. The Department of Energy released the first IRP in December 2009.

- **Developing a framework for independent power producers.** The Electricity Regulations on New Generation Capacity in August 2009 aim to regulate procurement processes and set out criteria for the selection of preferred

independent power producers (IPPs). The criteria include: the compliance with the IRP; the acceptance of a standardized power purchase agreement; a preference for a plant location that contributes to grid stabilisation, and mitigates against transmission losses; and a preference for a plant technology and location that contributes to local economic development.

- **Setting an ambitious target**. While the first IRP maintained the initial 10,000 GWh short term target for renewables, in March 2011 Cabinet approved an updated IRP (IRP2010) which established an ambitious medium-term target for renewables to contribute 42% of all new and additional generation capacity developed up to 2030.

- **Developing a strategy for affordability.** Initially the plan for procuring renewables was to be a relatively generous fixed price feed-in tariff (REFIT). However, this could not be sustained for the ambitious volumes of renewables included in the IRP. Therefore, the procurement process was revised to a bidding process designed to deliver competitive pricing and local economic development benefits. Prices have also been capped per each technology at levels below those promulgated in the 2009 Refit approved by the national regulator, NERSA.

- **Grid infrastructure development.** To accommodate renewables at scale it is likely that the grid network will need to be strengthened in regions such as the Northern and Western Cape. In consultation with Eskom, a DoE/Treasury team mapped investor plans against existing Eskom infrastructure and grid planning late in 2010. The analysis indicates that there is sufficient connection capacity for REFIT IPPs until 2016. In the longer term, there are plans for an intensive network rehabilitation programme (to be funded by a combination of fiscal and tariff allocations), together with a regulatory plan to provide for maintenance and rehabilitation of the electricity transmission and distribution sectors. A Grid Access Unit has been set up within Eskom to provide a one-stop shop for IPPs requiring information on where connections were available and what the costs would be.

- **Ensuring viable procurement agreements and terms.** In 2010, The Department of Energy, National Treasury and the Development Bank of Southern Africa (DBSA) developed the renewable energy PPA and other procurement documents. The collaboration aimed to ensure a consistent legal and policy framework and bankable PPA documents. The first 3,725 MW of generation capacity to be commissioned through the Renewables Flagship Programme, which opened in 2011, will be the demonstration of the viability of these arrangements. The Department of Environmental Affairs has also promised to dedicate capacity to fast-track the process of planning approvals, without breaching the "letter and spirit of the law".

- **Increasing the historically low electricity tariff.** For many years the South African electricity price was subsidised and maintained at a rate that did not fully cover the cost of generation. However, with the electricity supply shortage experienced in 2008, the need to radically revise the tariff so as to enable new capital investment, and diversify the energy mix beyond the dependence on coal, became evident. In 2009 a multi-year price determination (MYPD) was agreed by NERSA to bring the South African electricity tariff up sharply to cover the full financial cost of coal-fired generation. While the tariff does not yet cover the full volume of renewables planned, it does bring up the basic tariff, so that incremental cost funding would not be in danger of subsidising coal energy.

- **Ensuring a fair market, given the historic dominance by Eskom.** Eskom has traditionally had the status of the "single buyer in the South African market" and therefore the off-taker in a power purchase arrangement. Although the New Generation Regulations explicitly indicate that the Minister of Energy will determine which capacity Eskom will build, and what would be allocated to the private sector, Eskom's position as being responsible for some renewable generation, system operations and transmission does create the perception that Eskom is conflicted. In mid-March 2011 a cabinet decision was made to proceed with the promulgation of a bill establishing the Independent Systems and Market Operator (ISMO) including a separate buyers office.

Resolving outstanding issues, demonstrating a first round of bankable PPAs and successful tenders, and completing the policy development processes adequately is crucial to creating investment grade policies. **Developing a financial mechanism that bridges industrial, economic and energy security goals, while contributing to South Africa's carbon reduction commitment, will support coordination, and catalyse support and momentum for the institutional developments needed for renewables, and for other policy measures needed for development of the broader green economy.**

5. Leadership for low carbon transformation

The South African Renewables initiative is a work-in-progress.

The effective integration of renewables into the nation's broader policy framework is a challenge in itself. Trade, energy, industrial and environment, policies need to be aligned to support the transition towards a green economy. Progressing this with international co-operation of diverse partners with widely varying perspectives, competencies and interests whilst increasing the opportunity and potential benefits increases complexity.

The challenge of sequencing, planning and integrating policies, financing and development of infrastructure is by no means unique to South Africa. Other countries are also facing the challenge of leading and coordinating change across multiple domains.

The International Energy Agency estimates that US$5.7 trillion must be invested in renewables by 2035 to avoid catastrophic climate change by 2035. Key potential sources of investment are the under-utilized domestic savings and pension funds of developing countries, as well existing investment flows which need to be diverted away from yesterday's businesses towards low carbon technologies that serve tomorrows markets.

Carbon emissions reduction cannot wait for a broad-based international agreement. International action is required now.

Concrete initiatives mobilising finance to meet ambitious near-term targets are crucial to build the confidence that developed countries are willing to back ambitious green growth plans, and that developing countries can use this money to catalyse domestic growth strategies and policy frameworks that show that the effective delivery of climate measures is possible. Such experiences, in practice, create the mutual trust required to quickly move forward on the next stage of scaling-up climate.[55]

It is hoped that SARi will not only provide a means of supporting action in South Africa, but will act as an innovative initiative that serves to inspire other ambitious national iniatives to progress through international cooperation.

This international challenge, and the need for practical, ambitious, national action, and international collaboration, is recognised not only in the ongoing processes of the UNFCCC, but also in broader debates and developments. 2012 has been designated the UN International Year for Sustainable Energy for All, while the agenda of the Rio +20 process also underscores the inextricable link between energy, environment and development, and the need to catalyse green economic growth. The South African Government and its partners will continue to engage in these processes and offer SARi as an opportunity for learning.

Learning through international collaboration: Partnerships to Scale up Renewables

International initiatives are working to develop mechanisms to mobilise and deploy public money in order to leverage greater private investment into clean energy. These global initiatives include:

- **The UNFCCC Green Fund** – In 2010 in Cancun, the UNFCCC parties proposed the establishment of a Green Climate Fund to function under the guidance and accountability of the UNFCCC Conference of the Parties. A Transitional Committee was established, with South African Minister in the Presidency and former Minister of Finance, Trevor Manuel as one of the co-chairs, to design the details of the fund.

- **Clean energy programmes of public development banks** – Development banks have been a mainstay of renewable energy investment. The three leading development banks in the sector are the European Investment Bank, with $5.4 billion, Brazil's BNDES with $3.1 billion and Germany's KfW with $1.5 billion (all 2010 figures). The African Development Bank's private sector window has a U.S.$0.9 billion budget for renewable energy projects while The World Bank's Climate Technology Fund has made investments of over US$1 billion in clean energy projects.[56] The China Development Bank also last year announced some $36 billion in credit lines to Chinese clean energy manufacturers in 2011, but, to date, has only confirmed itself as lender of US$0.6 billion to renewable energy projects. UNEP and Bloomberg New Energy finance believe that the full contribution of CDB to clean energy projects is probably much greater.[57]

- **International Energy and Climate Initiative** – Energy+ was launched in October 2011. The partnership seeks to build up a results-based funding mechanism for green energy. The following countries and organizations have formally declared the intention of becoming partners: Kenya, Bhutan, Liberia, Ethiopia, Maldives, United Kingdom, Switzerland, France, the World Bank Group, Asian Development Bank, African Development Bank, United Nations Industrial Development Organisation (UNIDO), United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), International Energy Agency, World Business Council on Sustainable Development (WBCSD), Global Village Energy Partnership, United Nations Foundation.

Other initiatives do not have direct finance to invest, but seek to advance international coordination and to engage financiers in the development of emerging public climate funding strategies, to ensure they are able to mobilise private investment towards the clean energy sector:

- **Clean Energy Ministerial** (CEM) is a high-level global forum to promote policies and programmes that advance clean energy technology, to share lessons learned and best practices, and to encourage the transition to a global clean energy economy. Meetings offer ministers, business leaders, non-governmental organisations and others the opportunity to evaluate progress towards announced clean energy goals and new commitments.

- **The Conference of Energy Ministers in Africa** (CEMA) was established to provide political leadership, policy direction and advocacy on energy issues. It has identified as priorities: clean energy access, energy security, clean energy, localisation of supply chains and securing financial resources.[58]

- **The Nairobi-Paris Climate Initiative** is a French-led initiative to promote the uptake of renewable energy and clean technologies, particularly in Africa. It focuses on creating an enabling environment for investments, co-operating in the development of Nationally Appropriate Mitigation Actions (NAMAs) and developing new and flexible financing mechanisms to catalyse and scale-up private sector investments.[59]

- **Institutional Investors Group on Climate Change (IIGCC)** is a forum for collaboration on climate change for European investors. There are currently over 70 members, including some of the largest pension funds and asset managers in Europe, representing around €6 trillion.[60]

- **Chatham House Renewable Energy Project** - This project directly engages with leading mainstream renewable energy financiers on the policy conditions required for accelerating investment into renewable energy.[61]

- **Carbon Markets Capital Initiative** is an initiative led by the UK's Department for Environment and Climate Change which brings together key players from the City with international financiers and policy makers. The initiative aimed at driving green economic investment in emerging economies and identifying how the current barriers to new investment can be dismantled.

- **Sustainable Energy Finance Intitiative** - SEFI is a UNEP programme which aims to provide sustainable energy financiers with the tools, support, and networks to drive the cycle of financial innovation focused on a greening of the energy mix.[62]

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