The South African Renewable Energy Master Plan: Emerging Actions Discussion Document

The second step in the validation of draft levers and workstreams for the South African Renewable Energy Master Plan

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Author
GreenCape

Prepared for
IRG, EOC

Contact
sarem@green-cape.co.za

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Executive Summary

Context for the opportunity of the Renewable Energy Masterplan

With the published IRP2019, the DMRE has signalled the technologies that will form the South African energy mix. Renewables is a key part of this as a peg in the ground for the potential market for components and services, adding 14,400 MW of wind and 6,400 MW of solar PV, including some additional 4000 MW of embedded generation and 2000 MW of storage.

There is a trade-off in the near term between maximising objectives upstream (local manufacturing and industrialisation) and downstream (achieving reliable electricity supply for an industrial economy). With this in mind, it is important to address how one achieves industrialisation of the renewable energy value chain in our electricity sector.

South Africa's power sector procurement model is evolving. Year-on-year growth of small-scale embedded capacity is growing in hundreds of MW per year and the recent lifting of the cap on new generation capacity requirement for a generation licence to 100MW signalled a further shift. Major corporates as Sasol[1] and the Minerals Council members indicating interest in greater than 3000 MW of private procurement alone. This must be taken into account in the possible paths to industrialisation.

To implement IRP2019 would require over 14 million solar panels and 3,600 wind turbines alone. This represents a significant opportunity in employment and GDP contribution through annual production across the value chain – a potential of up to R182 billion/year and 39,000 people employed in bringing 2600 MW of new capacity online each year in 2030.

Vision of the renewable energy masterplan

The vision is to see industrialisation of the renewable energy value chain to enable inclusive participation in the energy transition, serving the needs of society and contributing to economic revival.

There are five primary objectives and targets to these objectives are to be agreed by social compact partners. The table below presents a starting point toward such target-setting, premised on the actions herein.

Table 0-1: Vision and objectives: targets

Objective	2025 target	2030 target
Grow the economy (annual GDP contribution)	R100-123 bn/year	**R141-164bn/year**
Create and sustain employment (new jobs)	26,000-29,000	**32,500-35,000**
Grow capacity in the value chain (% localised)	40-60% of key components, 80% of BoP	**70-90% of key components, 90% of BoP**
Build a transformed industry (ownership and management of local manufacturing capacity by Black persons, women, youth and disabled persons)	40% (R12 bn/year production value)	**51% (R21 bn/year production value)**
Contribute to a Just Energy Transition (integrate into hotspot economies)	Geographic competitiveness initiatives in place in SEZs, EIPs, repurposing	**10% of national production value (R15bn/year), 1 major component manufacturer in a hotspot**
	Skills programme operational	**3,500 Hotspot youth and former coal sector employees trained and employed**

[1] https://www.news24.com/fin24/companies/sasol-eyes-900-mw-of-renewable-energy-from-independent-sources-20210413

Emerging priority actions

Market certainty was identified as the most important aspect to build a local manufacturing industry. In the long term as momentum builds on a competitive manufacturing base, the future growth path is indicated through the trajectory of capacity growth required by aspirations to carbon neutrality and the growth of hydrogen, electric vehicles and shifting of thermal loads to electric. In the short-to-medium term, these actions are priority (see Table 0-2):

1. **For short-term market certainty and to encourage components to be localised on the basis of their competitiveness** and value-add, the procurement criteria in the implementation of IRP through the REIPPPP would be adjusted to a 70/20/10 adjudication weighting with a local content points scoring system implemented. This would be the mandate area of the DMRE, implemented through IPPO and would need to provide sufficient years' consistency to kick-start industrialisation.
2. **For medium term market certainty and support for establishing a manufacturing base that can compete internationally**: the suite of DTIC levers in trade and industrial policy are brought to bear to support competitiveness, with an incentive framework for export and rationalising of import duty exemptions on certain input materials. A system of export credits and decision path to a similar set of incentives as support the automotive manufacturing industry are explored.
3. **A demand-led skills development programme**, building on proactive foundational skills development requires coordination of multiple stakeholders and initiatives. The effectiveness of this intervention lies in its ability to ensure that technical training institutions' offering is always kept up date with the needs of the industry. The initial step is to set up and resource such a platform with voluntary participation from industry, labour and government institutions. This would also enable connecting available workforce with placements. Through this, organised labour to come to the fore on championing a workforce with growing skills competitiveness.
4. **Transformation via private sector procurement through capital and corporate objectives**: commitments to supply chain transformation requirements embedded in ESG / finance terms from capital providers. With the scale of renewable energy procurements announced by major players in the economy amounting to several thousand MW in the medium terms, this presents a suite of opportunities outside of public procurement programmes. Together these include supply chain requirements in procurement of energy by corporates, voluntary supplier commitment, employee shareholder schemes and requirements by funds and lenders with ESG and impact imperatives

Transformation was defined by stakeholders on the principle of inclusivity - to enable active participation by Black persons, gender-inclusive, youth, persons with disabilities and rural communities. Meeting the objectives of Transformation and contributing to a Just Transition, rather than being seen as distinct blocks of work in isolation, requires embedding an intent in each of the active workstreams, targeting their levers to inclusivity and to finding ways to co-locate industrial opportunities in Just Transition hotspots. In Mpumalanga and other hotspots, institutional assets such as those in Eskom and mines are leveraged to train the workforce and youth in transferrable skills.

There are reinforcing secondary actions. These include: employee share schemes have been a path to transformation and empowerment applied in other masterplans, to be explored further with labour and industry, and blended finance innovations for warranties guarantees and provision of competitive capital, involving DFIs and finance industry players.

The suite of DTIC directorates' existing tools and mechanisms to boost competitiveness and promote investment may be targeted to renewable energy manufacturing and arranged to maximise their accessibility to potential investors e.g., through a one-stop shop kind of packaging. For example:

- The Black Industrialists Programme to be targeted to renewable energy manufacturing
- SEZs and eco-industrial parks can be established in Just Transition hotspots to boost their competitiveness for locating there. Proactively establishing top structures and flexible lease terms will reduce lead time and mitigate market certainty risk

The next step is for task teams to complete outstanding actions to ensure concurrence by decision makers and social compact partners on plan elements. Potential investors from industry and other implementers are to underpin the commitment with proposed catalytic projects and investments. Across the set of actions, there is opportunity for collaborative contributions from each of industry, government and labour on multiple fronts to make this implementation plan a championable reality.

Table 0-2: High priority implementation plan elements

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Implementer	Additional steps to articulate in implementable form
1.	Provide confidence in the implementation of sufficient years' worth of REIPPPP with consistent competitive adjudication framework	Announce dates of procurement rounds for sufficient future rounds of REIPPPP	6 mo	DMRE	IPPO	Concurrence from decision makers
		Application to National Treasury for REIPPPP adjudication weighting of 70/20/10. Aligned with legislation 10 points toward transformation, 20 points to local content, 70 on price.	3 mo	National Treasury	DMRE, IPPO	Concurrence from decision makers
		Add points-based scoring table for components in the RFP.	3 mo	DTIC	IPPO	DTIC and SAREM Project Team review data and models to propose scoring table.
2.	Export promotion incentive framework managing trade-offs on import protection on input materials	Support local manufacturing competitiveness through incentive structure and export promotion embedded in trade and industrial policy. Institute system of export credits for renewable energy components	(TBC)	National Treasury, DTIC	DTIC	DTIC explore parameters for decision-making for emulating auto's AIS & APDP. Global Value Chain leaders and DTIC reach concurrence for conditional investment commitments.
		Analyse trade-offs on key materials that are protected locally and resolve on exemption or other mitigations where supply constraints reduce competitiveness of components. Apply import duty exemptions to strategic materials.	3 mo	DTIC	ITAC	Additional data from manufacturers on critical inputs. Further interface with Steel Masterplan. Concurrence from decision makers
3.	RE sector skills platform that iteratively links demand-led skills development with industry needs.	Set up steering committee, identify a host, secure funding. Appoint implementer and roll out programme as described in scope: connect industry and TVETs, maintain platform for placements, ongoing audit and assessment.	1. 3 mo 2. 6 mo 3. 4 y	Labour, Industry, DHET	(TBC)	Articulate possible structure, through further engagement with High Gear and Labour. Task team review, refine proposed steps
4.	Transformation via private sector procurement through capital and corporate objectives	Supply chain requirements of local content and transformation	6 mo	Major corporates	Corporates, OEMs / suppliers	Identify commitments c/o follow ups with major procurers including Sasol, Minerals Council. Engage with major OEMs/suppliers regarding transformation objectives
		Requirements embedded in ESG / finance terms from capital providers	6 mo	Individual capital providers	Individual capital providers	Identify commitments c/o DFIs, banks and funds. (Follow up with IDC, DBSA, BASA, Labour)

All actions under consideration

The full set of actions under consideration by task teams is summarised in this table. This document's sections put them each into context and show how they integrate with each other.

Table 0-3: Collated actions toward implementable plan elements

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Implementer	Additional steps to articulate in implementable form
1.	Market certainty					
1.1.	Provide confidence in the implementation of sufficient years' worth of REIPPPP	Announce dates of procurement rounds for sufficient future rounds of REIPPPP	6 mo	DMRE	IPPO	Concurrence from decision makers
1.2.	Establish a consistent set of local content policy criteria	Set bid RFP criteria for the same period	6 mo	DTIC	IPPO	Concurrence from decision makers
1.3.	Develop consistent trade and industrial policy that builds a competitive environment beyond public procurement mechanisms.	This suite of policy actions is cross-referenced in the 1. Local content policy levers; and 2. Trade and export promotion levers	3 y	DTIC	DTIC	Concurrence from decision makers
1.4.	Enable power-to-x market	Establish interface with the Hydrogen Society Roadmap and Green Hydrogen Strategy, to enable implementation and ensure manufacturing sector capacity trajectory to suit demand trajectory	3-10 y	DSI, IDC, DTIC, DMRE	DSI, IDC, DTIC, DMRE	
1.5.	Cross-reference *system readiness* for enabling offtake diversity in the medium term					
2.	Local content policy					
2.1.	Institute 70/20/10 adjudication weighting with points-based scoring table for components in REIPPPP.	Application to National Treasury for REIPPPP adjudication weighting of 70/20/10. Aligned with legislation 10 points toward transformation, 20 points to local content and 70 on price.	3 mo	National Treasury	DMRE, IPPO	Concurrence from decision makers
2.2.		Add points-based scoring table for components in the RFP.	3 mo	DTIC	IPPO	DTIC and SAREM Project Team review data and models to propose scoring table. Task team explore optimisation within qualification criteria and minimum threshold to maximise use of existing local manufacturing capability.
2.3.	Target existing suite of investment support to renewable energy competitiveness and make accessible	Build accessibility and knowledge of suite of incentives – e.g., through 1 stop shop. Target suite of incentives to renewable energy manufacturing (12i, CPFP, CIP, SEZs, CCA, export promotion)	1 y	DTIC	DTIC	Concurrence from decision makers and refine
3.	Input materials					
3.1.	Import duty exemption on strategic inputs	Analyse trade-offs on key materials that are protected locally and resolve on exemption or other mitigations where supply constraints reduce competitiveness of priority components. Apply import duty exemptions to strategic input materials.	3 mo	DTIC	ITAC	Additional data from manufacturers on critical inputs. Further interface with Steel Masterplan. Concurrence between DTIC and manufacturers on applicable qualifying inputs
3.2.	Improve competitiveness of local materials	TBC	TBC	TBC	TBC	Other Masterplans, such as Steel. Build platforms for interface between OEMS, developers, and input material providers – neutral ground.
4.	New entrant support					
4.1.	Develop solution to warrantees and guarantees	TBC	TBC	TBC	TBC	Follow up with task team members who offered to champion warranty models with 3rd party
4.2.	Blended finance instrument for guarantees and factory investment	Craft blended finance instruments that a) assists smaller suppliers to put up guarantees in bids and b) provides capital for factory investment to enable commitment pre-financial close	TBC	IDC, DBSA	TBC	Follow up with DBSA, IDC, banks through BASA on opportunities.
4.3.	Mentoring of emerging suppliers by OEMs	Identify and on-board emerging suppliers	TBC	Industry	Industry	Identify existing mentoring programmes and voluntary commitments by OEMs
4.4.	Target existing business incubation and capacity building support to emerging suppliers	TBC	TBC	TBC	TBC	Identify host for generic business development support in existing programmes
4.5.	Target the above to Transformation					
4.6.	Target the above to Just Transition hotspots					
5.	Trade/export support to access regional opportunities					
5.1.	Export promotion, incentive framework	Support local manufacturing competitiveness through incentive structure and export promotion embedded in trade and industrial policy. Institute system of export credits for renewable energy components	TBC	National Treasury, DTIC	DTIC	DTIC explore the parameters for decision-making for emulating the Auto Investment Scheme (AIS) & Auto Production and Development Programme (APDP). Global Value Chain leaders and DTIC reach concurrence for conditional investment commitments.
5.2.	Bilateral arrangements with other countries	To be explored, in particular in Africa	TBC	TBC	TBC	To be explored. Include engagement with ITAC on strategic designation of components under AfCFTA
6.	Transformation					
6.1.	Establish a platform for oversight of effective implementation of transformation strategies	Host to establish multi-stakeholder steering committee and resource an implementing agent to support the scope as described.	6 mo	TBC	TBC	Task team to identify possible host programme or department, propose structure and scope

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Implementer	Additional steps to articulate in implementable form
6.2.	Scope and adopt employee share scheme model	TBC	TBC	TBC	TBC	Further input from Labour and interested industrialists
6.3.	Include transformation criteria in public procurement	10 points of REIPPPP adjudication weighting to transformation.	3mo	DMRE, National Treasury	IPPO	Concurrence from decision makers
6.4.	Transformation via private sector procurement through capital and corporate objectives	Supply chain requirements of local content and transformation	6 mo	Major corporates,	Corporates (procurement manager), OEMs / suppliers	Task team to explore further, identify voluntary commitments c/o follow ups with major procurers including Sasol, Minerals Council. Engage with major OEMs/suppliers regarding transformation objectives
6.5.		Requirements embedded in ESG / finance terms from capital providers	6 mo	Individual capital providers	Individual capital providers	Task team to explore further, identify voluntary commitments c/o DFIs, banks and funds. (Follow up with IDC, DBSA, BASA, Labour)
6.6.	Competitive rates for factory investment capital	Develop finance offering at competitive rates for factory investment / expansion by transformed industrialists	6 mo	Individual capital providers	Individual capital providers	Follow up with IDC, DBSA, BASA
6.7.	Cross reference other workstreams' focus (new entrant support, skills, local content policy)					
7.	Integration with Just Transition hotspots					
7.1.	Improve competitiveness in Just Transition hotspots	Establish SEZs and eco-industrial parks in hotspot areas	3 y	DTIC	DTIC	DTIC explore in principle, via steps to motivate for such new zones.
7.2.		Target suite of incentive programmes to JT hotspots	3 y	DTIC	DTIC	DTIC explore in principle, considering e.g., 12i, CPFP, CIP.
7.3.	Direct investment	TBC. (Investments to be brought forward)	TBC	Industry, Eskom	Industry, Eskom	Eskom, potential investors, to contribute defined plans. Identify who can scope the manufacturers positioned to pivot. Minerals Council supplier database?
7.4.	Incentivise through public procurement / Eskom	TBC	3mo – 3y	DMRE	IPPO, Eskom	DMRE, IPPO, NT evaluate merit to geographically focussed procurement round and/or procurement criteria to support JT objectives.
7.5.	Incentivise through non-REIPPPP procurement	Voluntary procurement requirements to incentivise local manufacturing	TBC	Private sector, Eskom, munics	Private sector, Eskom, munics	Explore with Minerals Council, SASOL, Eskom, other major corporates, municipalities.
7.6.	Stimulate regional demand	Voluntary and incentivised development of RE generation capacity in hotspots	TBC	DMRE	IPPO	Test assumption that it leads to local supply chain simulation. Bring forward voluntary developments. Explore concessional finance
7.7.	Incentivise private sector procurement through capital and corporate objectives: Cross-reference same action for Transformation, targeted to hotspots					
7.8.	Competitive rates for factory investment capital: Cross-reference same action for Transformation, targeted to hotspots					
7.9.	Cross reference other workstreams' focus (new entrant support, skills, local content policy)					
8.	Skills					
8.1.	RE sector skills platform that iteratively links demand-led skills development with industry needs.	1. Set up steering committee 2. Identify a host, secure funding, 3. Appoint implementer and roll out programme as described in scope: connect industry and TVETs, maintain platform for placements, ongoing audit and assessment.	1. 3 mo 2. 6 mo 3. 4 y	Labour, Industry, DHET	(TBC)	Articulate possible structure, through further engagement with High Gear and Labour Unions. Task team review and refine proposed steps and champions.
8.2.	Proactive training of foundational skills	(1. Identify relevant foundation skills as communicated through DHET Masterplan support process (DHET forms) and further engagement with industry if required. 2. DHET to further define actions required for implementation)	2 y	DHET	DHET	Obtain better understanding of DHET / TVET funding and intake models to determine mechanisms. Identify relevant foundation skills (in progress through SANEDI DSI skills project). Communicate need to DHET via DHET Masterplan support process (DHET forms) and direct engagement.
8.3.	Demand-led training	Industry to introduce/scale up internal training programs partnering with government training providers and including bursaries, internships, apprenticeships and mapping clear skills development and employment pathways for trainees	1-2 y	Industry, National Treasury	Industry	1. Clarify whether there are any tax benefits or incentives for industry to set up / scale these programmes. (National Treasury?) 2. Obtain commitment from industry to scale current programmes / introduce new programmes.
8.4.	Pivot existing skills in transition areas	1. Identify priority skills to pivot, design and implement programme 2. Existing industries and institutions assess their current offerings, adapt as needed and actively contribute to the reskilling	1. 1 yr 2. 1 yr	TVET, Eskom, Minerals Council, Labour unions.	TBC	Engage Minerals Council and Eskom. 2. Linking implementers to existing initiatives to determine (supporting) role required from SAREM. (Existing include CSIR/Res4Africa; TIPS/GIZ, IKI, others?) Engage with TVET colleges in transition zones to gauge status of own initiatives aimed at reskilling.
8.5.	Target the above to for inclusivity					
9.	System readiness					
9.1.	Build capacity of distribution licensees (e.g., Municipal distribution entities) to accommodate smaller-scale distributed generation projects).	TBC	TBC	DMRE,	NERSA , Municipalities	Explore further with DMRE, NERSA
9.2.	National wheeling and trading frameworks, including for local municipalities	TBC	TBC	DMRE	NERSA, Municipalities, Eskom	Explore further with Eskom, NERSA
9.3.	Invest in transmission and distribution infrastructure to enable best wind and solar resource deployment	Build-out new transmission and distribution infrastructure, leveraging access to concessional finance to enable.	15 y	Eskom	Eskom	

Contents

Acronyms and abbreviations

AfCFTA	African Continental Free Trade Agreement
AIS	Auto Investment Scheme
AMCU	Association of Mineworkers and Construction Union
APDP	Auto Production and Development Programme
ASCCI	Automotive Supply Chain Competitiveness Initiative
BASA	Banking Association of South Africa
BBBEE	Broad-based Black Economic Empowerment
BEPA	Black Energy Professionals Association
BoP	Balance of Plant
CEPPWAWU	Chemical, Energy, Paper, Printing, Wood and Allied Workers' Union
CIP	Critical Infrastructure Programme
COSATU	Congress of South African Trade Unions
CPFP	Capital Projects Feasibility Programme
CSIR	Council for Scientific and Industrial Research
DBSA	Development Bank of Southern Africa
DHET	Department of Higher Education and Training
DMRE	Department of Mineral Resources and Energy
DSI	Department of Science and Innovation
DTIC	Department of Trade, Industry and Competition
EIB	European Investment Bank
EIP	Eco-industrial park
EWSETA	Energy and Water Sector Education and Training Authority
FEDUSA	Federation of Unions of South Africa
IDC	Industrial Development Corporation
IEP	Integrated Energy Plan
IPP	Independent Power Producer
IPPO	Independent Power Producer Office
IRP	Integrated Resource Plan
ITAC	International Trade Administration Commission
JT	Just Transition
LCR	Local Content Requirements
MERSETA	Manufacturing Engineering Related Services Sector Education and Training Authority
NAACAM	National Association of Automotive Component and Allied Manufacturers
NERSA	National Energy Regulator of South Africa
NIPP	National Industrial Participation Programme
NT	National Treasury
NUM	National Union of Mineworkers
NUMSA	National Union of Metalworkers of South Africa
P2X	Power-to-X
PPPFA	Preferential Procurement Policy Framework Act
RE	Renewable Energy
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
RFP	Request for Proposal
SAESA	South African Energy Storage Association
SANEDI	South African National Energy Development Institute
SAPVIA	South African Photovoltaic Industry Association
SAREC	South African Renewable Energy Council
SAREM	South African Renewable Energy Masterplan
SARETEC	South African Renewable Energy Technology Centre
SAWEA	South African Wind Energy Association

SAWEP	South African Wind Energy Programme
SEZ	Special Economic Zone
SSEG	Small Scale Embedded Generation
TBC	To be confirmed
TIPS	Trade & Industrial Policy Strategies
TVET	Tertiary Vocational Educational and Training

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1. The South African Renewable Energy Master Plan

1.1. What is the South African Renewable Energy Masterplan?

SAREM is one of over 14 industry-specific masterplans in progress since July 2019. The master plan development approach collaborates between industry, labour and government to develop an industrialisation implementation plan for the renewable energy sector. SAREM is an action-oriented implementation plan that focuses on leveraging investment in the renewable energy value chain to deliver jobs and support economic recovery. These objectives seek to have an impact on transformation and support a just energy transition.

The national masterplan process falls under the reimagined Industrial Strategy of the Department of Trade, Industry and Competition (the dtic). It builds upon the approach taken by the automotive sector and the sector plan process developed between private- and public sectors, led by the Public-Private Growth Initiative (PPGI) in conjunction with the Presidency. The master plan development approach is a collaboration between industry, labour and government. Oversight of the plan's development is chaired by the relevant Minister in an Executive Oversight Committee (EOC).

GreenCape is the secretariat of the SAREM development process, managing the project, the research and consultation and formulating the Masterplan. A project committee, which includes representatives from the dtic, DMRE, labour, industry and PPGI, ensures that the process is on track and unblocks obstacles that may arise along the way. There are engagements with stakeholders through the industry working group (IWG) in cycles of scheduled sessions through the planning process. The project team also draws on a pool of expertise – an industry reference group (IRG) – for sense-checking and input as it goes through the research and plan formulation process.

Process includes setting out a vision for an industry in South Africa, identifying blockages and constraints, and proposing a set of key actions that need to be taken forward over the short, medium and long term. The planning process is to conclude with a social compact between industry, labour and government. The Masterplan identifies opportunities for industrialisation and the mechanisms and public sector levers to enable them. The process facilitates the industry to invest within this framework and government and labour undertaking to remove these plans' implementation impediments in the future.

1.2. Purpose of this document

This document provides a breakdown of the current progress of the South African Renewable Energy Master Plan formulation. It provides a consolidated view of stakeholder and research inputs toward implementable plan actions/levers. This is an important step in ensuring that the SAREM and its recommended actions are pragmatic, sensible and will lead to the desired outcomes. This record of emerging workstreams and potential levers forms a reference for discussion to prioritise focus and refine and validate implementation plan elements.

This document should not be taken in isolation, but rather as a step in the process following the prior phases of plan formulation in which earlier discussion documents were drafted, these include:

1. Interim research summary December 2020
2. Workstream and levers discussion document, August 2021
3. Emerging actions discussion document, September 2021 (this one).

It serves as a record of progress wherein task teams refine the set of actions into implementable form. Not all proposed actions have been adopted and championed by those stakeholders within whose mandate they fall. The status of their consideration by such decision makers and implementers is highlighted and where further steps are required to articulate the actions in implementable form, these are indicated.

This document is for review by task teams, Industry Reference Group members and the Executive Oversight Committee. This review will enable a steer to task teams and project team to ensure it is aligned toward the Executive Oversight Committee's objectives and to enable go-ahead to pursue final definition of actions in task teams for incorporation into a draft Implementation Plan document for adoption.

2. Background and context

2.1. South Africa's electricity market

South Africa's electricity demand is currently dominated by coal-fired power generation stations, primarily owned and operated by Eskom, the national power utility. Eskom generates ~95% of South Africa's total electricity production. The remaining 5% of demand is met through municipalities, imports and independent power producers (IPP). Energy demand has distinctly flattened since 2010, resulting in reduced demand for coal-based electricity (87% in 2010 versus 79% in 2019). A historic imbalance of supply and demand in South Africa's single buyer energy model over more than ten years resulted in intensive load shedding experienced country-wide during 2019 and the first half of 2020. An estimated 1.3 TWh was load shed during these periods.

The Integrated Resource Plan (IRP) was adopted as the official long-term government plan for new electricity generation capacity, including project timelines. It estimated planned generation capacities contributing to the overall energy mix. The IRP2019 aims to double the electricity capacity through a diversified energy mix, mainly coal, gas, nuclear and renewable energy. The IRP2019 includes a strong reliance on renewable energy as 42% of the total added capacity should be from renewable energy by 2030, equating to a generation capacity of 17 800 MW. The primary mechanism by which renewable energy has been brought onto the grid previously is by the government is by an auction process, i.e., opening several bidding rounds to procure renewable energy under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP). This growth presents an opportunity for increased local industrialisation through increased energy availability and price security and increased demand for renewable energy components to meet this new demand.

2.2. The need for economic growth and job creation through industrialisation

The South African economy is characterised by multiple factors that underscore the need for revitalisation from new and emerging sector opportunities. These include high levels of unemployment (above 25%), extreme inequality and insufficient levels of job creation to respond to the need. The currency is weak and weakening. A weakening Rand does aid the competitiveness of South African exports in the short term. Still, it also reduces buying power and hurts consumers and results in imported products, including oil and petrol is more expensive. Aspirations to uplift the populace through education are lagging aspirations. We face a budget deficit (South Africa's government revised its budget deficit forecast to 15.7% of GDP in 2020/21 fiscal year from an earlier estimate of 14.6% in June and compared to 6.4% in 2019). State-Owned Enterprises are facing challenges across the board, characterised by poor performance in many of them constituting a structural drain on the economy. Internationally, the demand for the resource-based sector is in a global decline. The country's credit rating has taken further hits from unrest and other factors.

Establishing a vibrant manufacturing sector is a powerful engine of growth and development. Industrialisation, which the industrial revolution has placed at the heart of structural changes, has consistently raised the levels of production and employment, which has led to unprecedented income growth. Promoting the development of the industrial sector can be a key to achieving sustainable development. It is now well established in the growth and development literature that there is a strong correlation between the growth of manufacturing output and the growth of GDP. Sustainable industrialisation creates quality and better-paying jobs, income in manufacturing is higher and relatively stable, and a strong industrialisation sector can create significant capital accumulation, enhancing economic productivity.

Increased domestic spending has a multiplier effect, an economic factor that, when increased or changed, causes increases or changes in many other related economic variables. In terms of gross domestic product, the multiplier effect causes gains in total output to be greater than the change in

spending that caused it. The manufacturing sector has a relatively high multiplier effect. These contributions are applied to historical and projected renewable energy rollout to articulate the employment and economic value-add.

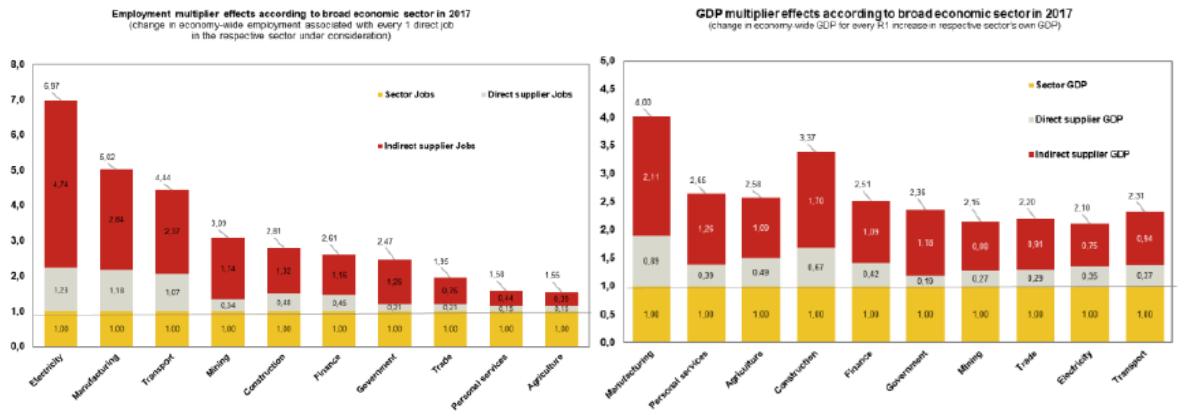


Figure 2-1: Employment and GDP multipliers

2.3. Macro-trends in renewable energy

The potential for increasing renewable energy demand, despite COVID-19 demand reductions, combined with the electrification of transportation and industrials and oil and gas companies' increased participation in the electricity value chain, is accelerating industry convergence.

2.3.1. Global markets mature into renewable energy investment

The COVID-19 pandemic caused dramatic shifts in the energy sector, from sharply decreased oil demand to drastic increases in residential energy usage. Many renewable energy projects postponed due to COVID-19 regulations will come online in 2021, leading to a rebound in renewable energy capacity. As a result, the expectation is that the market will maintain a similar growth path to 2019. Globally, renewable energy continued its blistering growth pace in 2019, increasing by 12.2% over 2018. Over the past decade, renewable energy consumption has grown at an average annual rate of 13.7%[2].

"In 2020, even while economies bent under the weight of Covid-19 lockdowns, renewable sources of energy such as wind and solar PV continued to grow rapidly, and electric vehicles set new sales records. The new energy economy will be more electrified, efficient, interconnected and clean. Its emergence is the product of a virtuous circle of policy action and technology innovation, and its momentum is now sustained by lower costs. In most markets, solar PV or wind now represents the cheapest available source of new electricity generation. Clean energy technology is becoming a major new area for investment and employment – and a dynamic arena for international collaboration and competition." – IEA World Energy Outlook 2021

[2] IEA (2020), Renewable energy market update, IEA, Paris https://www.iea.org/reports/renewable-energy-market-update

2.3.2. Remaining globally relevant for export markets requires reduced carbon intensity

A global transition to sustainable development is underway. From a trade and industrial perspective, remaining globally competitive will require a shift in developing new, green industries and greening existing, traditional industries.

South Africa is an energy- and carbon-intensive economy vulnerable to climate change and underprepared for a low-carbon transition. The energy sector contributes around 80% of total greenhouse gas emissions, 50% of which are from electricity generation and liquid fuel production alone. The country's carbon intensity is 599 t of CO_2 per million dollars of GDP, more than double the global average of 286 t of CO_2 per million dollars. Carbon intensity in South Africa increased by 1.4% in 2018 and 2019, while real gross domestic product (GDP) growth was a modest 0.2%. While South Africa's renewable energy generation is set to increase, the adequacy of the pace of decarbonisation is widely questioned.

A 2021 TIPS policy note[3] indicates that a failure to move to green energy could see South Africa's export products shunned globally. For example, Neal Froneman, CEO of Sibanye-Stillwater, says, "South Africa's future potential to export mining products is threatened without a transition to green energy. If produced with carbon-intensive electricity, platinum-group metals, iron ore, and gold will lose interest to international buyers." In an era of accelerating change, the imperative to limit climate change and achieve sustainable growth is strengthening the momentum of the global energy transformation; this is particularly true for South Africa's economy.

2.3.3. Availability of capital favours low-carbon investment

Availability of capital is an important consideration in infrastructure planning. Global pressures from several quarters put downward pressure on carbon-intensive investments and increased attractiveness in renewable energy investments. Investment decisions are taken with growing cognisance of ESG principles, and the carbon intensity of the supply chain is a key parameter. As the energy sector is disrupted year on year by the rapid downward trends in the cost of maturing renewable energy generation technologies, coupled with storage options that are increasingly competitive with conventional peaking power sources, the long-term outlook for megaprojects comes with a material risk of them becoming stranded assets[4]. The result is increasing cost of capital and greater challenges in securing capital and bringing such projects to financial close[5]

2.3.4. Renewable energy cost trajectory

Globally, capital costs of solar photovoltaic (PV) and wind power have dropped significantly over the past several years. Average costs of wind turbines (3MW+) fell by around 25% between 2012 and 2019. Average solar PV module prices fell by around 70% during the same period. The 2020 pandemic saw this downward price trajectory slow.

[3] TIPS. 2020. “The Global Climate Change Regime And Its Impacts On South Africa’s Trade And Competitiveness: A Data Note On South Africa’s Exports” Pretoria: Trade & Industrial Policy Strategies.
[4] Stranded Assets a Long-Term Risk for Major Fossil Fuel https://www.fitchratings.com/research/sovereigns/stranded-assets-long-term-risk-for-major-fossil-fuel-exporters-15-02-2021
[5] Commercial funders withdraw from coal IPPs in South Africa (Standard Bank) (Nedbank)

The REIPPPP has been lauded globally for its clear mandate, growth path and independence in its procurement approach. This is clearly illustrated through a tariff decline of more than 150% over six years, with the levelised cost of electricity for wind and solar in the expedited round coming in at less than R0.62/kWh. Globally, the average global weighted-average levelised cost of energy (LCOE) of utility-scale solar PV and onshore wind is potentially set to fall to USD 0.039/kWh and USD 0.043/kWh 2021. The global price decline trends indicate the potential for further price drops in South Africa. Battery energy storage costs are on a trajectory even more impressive than that of solar, to the extent that the market is seeing utility scale hybrid solar and energy storage facilities are coming in tariffs competitive to other forms of new dispatchable capacity in some regions and battery storage competing with gas on ancillary grid services.

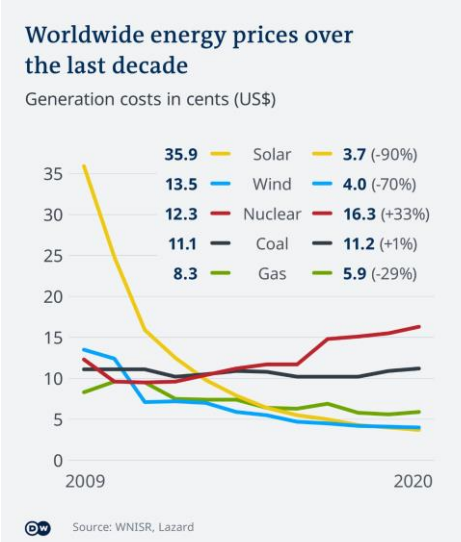


Figure 2-2: Worldwide energy price trajectory

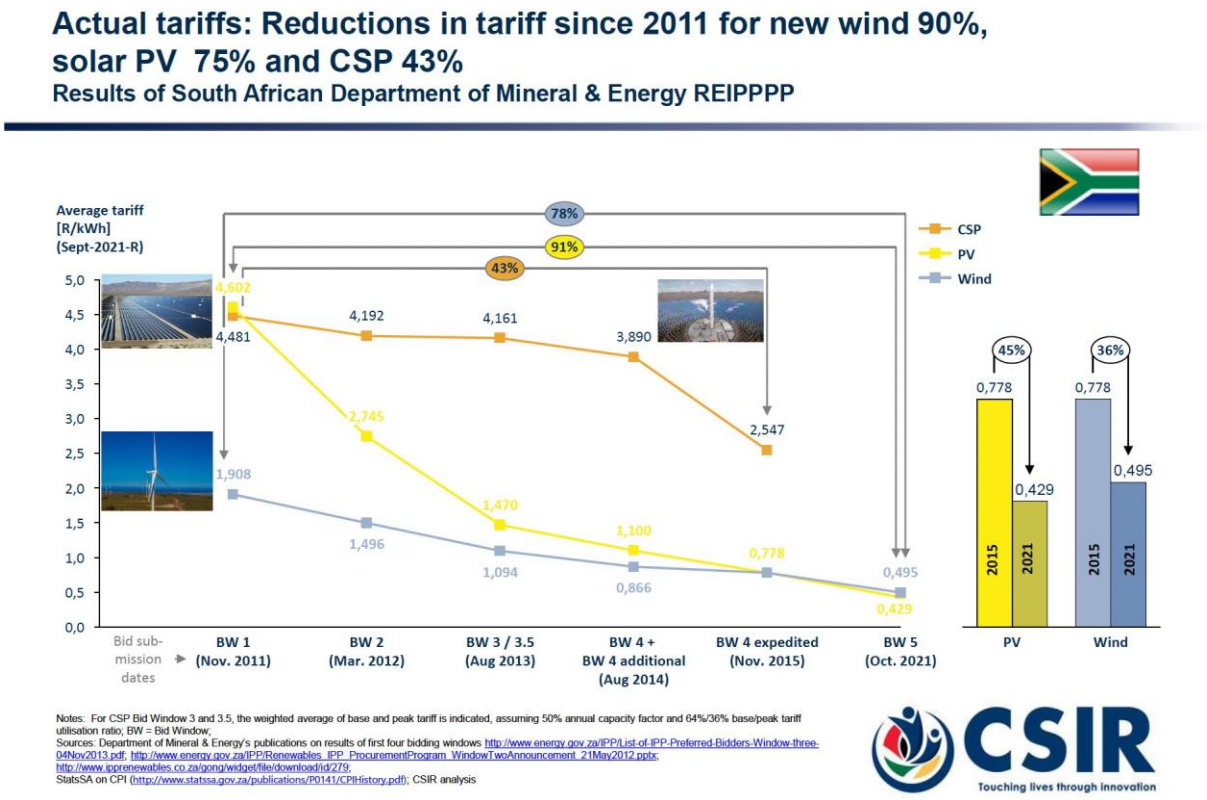


Figure 2-3: Energy cost trajectory in South Africa

In South Africa, the blended cost model of the IRP considers the utilisation factor of all technologies in the model and provides an outcome that delivers a mix of generators that matches projected demand with requisite consideration of how the load is balanced in cost. The IRP2019's outcome, using baseline inputs at the time, indicated that the combination of growing penetration of renewable energy, combined with other technologies at their requisite utilisation factor, is aligned with the cost-competitiveness of a growing contribution of renewable energy.

The rapidly falling technology prices and competitiveness of renewables are dramatic in percentage and real terms. These plummeting costs will serve to dampen any potential premiums from locally manufactured components. Ultimately, excellent wind and solar resources will continue to drive the industry's cost competitiveness.

The most relevant drivers of the cost competitiveness of renewables across South Africa are solar and wind resources, land and grid capacity availability. The most relevant drivers of cost competitiveness between projects in South Africa is the cost of capital and grid availability.

2.3.5. Sector coupling and electrification

A trend that is forecasted to impact significantly on the energy mix of the future and increase the demand for renewable electricity is the migration of energy carriers to electricity from other means. This is discussed in some detail in the literature on sector coupling and the major areas of focus with relevance for South Africa is in three areas: transfer of thermal loads to electricity, electrification of transport and growth of “power-to-x” products such as ammonia and hydrogen. Electric vehicle uptake would be a driver of the electrification of transport. In the case of production of hydrogen for export, the international requirement for “green hydrogen” would explicitly require that such electricity input is sourced from renewable energy.

2.4. Support for a Just Transition

2.4.1. South Africa's Just Transition

South Africa has initiated a transition to a more sustainable development pathway. This notably involves moving towards a low-carbon economy. In a highly unequal society like South Africa, the need for a Just Transition, which would empower vulnerable stakeholders, has emerged as an imperative. Vulnerable stakeholders (such as workers, small businesses and low-income communities) should not be negatively impacted by the transition and those who have been disadvantaged should emerge better off through it. A Just Transition can be defined as a framework to foster inclusive and empowering social dialogue and decision-making; mitigate negative impacts associated with the transition and effect positive solutions and rectify or ameliorate situations of harmed or disenfranchised communities.

While the Just Transition agenda has an economy- and society-wide relevance, discussions in South Africa (and globally) have primarily focused on the coal value chain, particularly coal-fired power generation and associated coal mining. In South Africa, the bulk of coal-related operations is concentrated in (but not limited to) the Mpumalanga province, especially in eMalahleni and Steve Tshwete municipalities.

The mix of measures required to foster a Just Transition in South Africa is far and wide. It would encompass social dialogue, labour market policies, industrial policy, social protection and regulatory reform and enforcement. In the case of Just Transition hotspots, i.e., communities impacted by the coal transition, this calls for social engagement and upliftment, material support for vulnerable stakeholders (workers, small businesses and communities as a whole) and an economic rejuvenation and diversification of communities (considering all possible economic activities in and outside of the energy sector).

2.4.2. Renewable energy and Just Transition

As part of an overall, broad strategy and mix of measures, the renewable energy sector can make a positive contribution towards a Just Transition on at least three key levels:

- The rollout of renewable energy-based electricity generation can provide a source of economic activity and employment through the deployment (ownership, project planning and design,

procurement, construction/installation, operation and maintenance) of large-scale power plants and small-scale systems.

- Renewable energy technologies provide a platform to enhance the access to modern energy services by all, including through increased new ownership models; and
- The development of the renewable energy value chain, from mining and beneficiation of minerals to manufacturing parts, components and systems, to recycling components, can generate economic activity and employment.

Such channels are mutually supportive but largely independent from each other. In all cases, locating such activities in such a way as to integrate with the economies of communities directly impacted by the coal transition (Just Transition hotspots) would support a Just Transition.

2.4.3. SAREM and Just Transition

The South African Renewable Energy Masterplan (SAREM) is one of a series of sector Masterplans led by the Department of Trade, Industry and Competition (the dtic) and the respective sector departments – in this case, the Department of Mineral Resources and Energy (DMRE) – in collaboration with industry and labour. SAREM exclusively focuses on the development of the value chain. Indeed, the SAREM aims to foster South Africa's industrial development on the back of a rollout of renewable energy technologies (as mandated by the Department of Mineral Resources and Energy) and does not directly address issues related to the penetration of renewable energy generation technologies in the country.

Within this framework, the SAREM aims to maximise the contribution of the renewable energy value chain to South Africa's Just Transition by, where possible, locating economic activities in regions negatively impacted by the coal transition.

3. The opportunity

Energy technologies are rapidly evolving, driving power sectors to become more decentralised with higher levels of market competition and more diverse finance options. As a result, policymakers now have to navigate new markets for products and services in the power sector. This trend is becoming clear in the South African energy market. While the general trend is clear, the most efficient way of providing adequate electricity services in terms of cost, emissions, job creation, growing the economy, etc., is an ongoing process embedded in the framework of energy planning.

Given the macro-trends discussed in 2.3, above, over the next 20-30 years, the influence of such changes may see the South African economy be fundamentally reorganised. If the focus is on a Just Transition, many social ills can be addressed – especially in long-term infrastructure projects with lasting economic, environmental and socio-economic impacts.

South Africa is currently in the process of reforming its electricity sector. This ongoing process poses a methodological challenge for developing the SAREM. Ideally, a policy framework for the electricity sector which: (1) is aligned to public interest objectives of reliable supply at the lowest cost, (2) mitigates stranded power sector asset risks[6] and (3) indicates sufficient demand for technologies to be conducive to industrialisation pathways, would have already been established and therefore could guide the industrial policy required by SAREM. While the modelling framework for IRP satisfices on point (1), the combination of this with (2) and (3) is not established in a policy framework. This ideal chronology would support alignment between supporting an economy with reliable electricity and developing an upstream economy for the renewable energy sector.

There is a trade-off in the near term between maximising objectives upstream (local manufacturing and industrialisation) and downstream (achieving reliable electricity supply for an industrial economy). Where this trade-off hinges on the support of localising manufacturing of those parts of the value chain that would not naturally be competitive yet in South Africa, this is discussed in 5.1 (system dynamics) and 6.2.2 (component level gross value add versus macro-economic impact). Historically, South Africa's industrial policy has hinged on excess electricity supply that was priced well below that in most of our trading partners and had, in essence, served as the country's competitive advantage. With rising electricity prices and compounding climate risk due to the carbon intensity of South Africa's exports, the country now needs to pivot its industrial economy whilst balancing upstream and downstream objectives. These include the need to:

- contain electricity costs and urgently restore the reliability of electricity supply – which is critical for restoring domestic and international market confidence,
- whilst also driving a rapid increase in the renewable energy rollout to enable localisation of the renewable energy value chain – an enormous opportunity for job creation and economic stimulus.

With this in mind, it is important to explain how one achieves industrialisation of the renewable energy value chain in the context of evolving our electricity sector. Power sector needs are evolving as the sector reforms. Ultimately, we need implementation and procurement focused on these evolving needs and not the current power sector.

3.1. The opportunity articulated in South African policy

South Africa has a strong base for manufacturing key components - a strong steel and cement industry for towers, a strong extrusion industry for mounting structures, strong electro-technical for key electrical

[6] Stranded Assets a Long-Term Risk for Major Fossil Fuel https://www.fitchratings.com/research/sovereigns/stranded-assets-long-term-risk-for-major-fossil-fuel-exporters-15-02-2021

components, raw and semi processed minerals for use in batteries and a strong boatbuilding and textile industry for blades.

With the published IRP2019, the DMRE has signalled the technologies that will form the South African energy mix. Renewables is a key part of this and will catalyse a local manufacturing market. As a peg in the ground for the potential market for components and services, the IRP envisages adding 14,400 MW of wind and 6,400 MW of solar PV, including some additional 4000MW of embedded generation and 2000MW of storage.

Capitalising on the value chain opportunity in IRP2019 could see us ramping up to a potential 2030 scenario of 39,000 full-time permanent jobs added and R23bn turnover of renewable energy manufacturing per year. Longer-term ambitions for growth scenarios such as the hydrogen economy, may see such numbers more than tripled in annual manufacturing turnover and a 200,000 strong workforce servicing the value chain in 2050. In the latter case, production of green hydrogen for export stimulates a high demand scenario for renewable energy MW.

3.2. Historical job creation and economic value-add

Renewable energy has a demonstrated job creation and protection effect from an electricity price and supply security perspective and direct jobs created.

3.2.1. Renewable Energy Independent Power Producers Procurement Programme

According to the Independent Power Producers Procurement Programme (IPPPP) *An Overview As of 31 December 2020,* REIPPPP has presented the following impacts to date:

Energy supply capacity impact:

- By the end of December 2020, the REIPPPP had made the following significant impact:
- 6 422 MW of electricity had been procured from 112 RE Independent Power Producers (IPPs)
- 4 949 MW of electricity generation capacity has been connected to the national grid.
- 56 206 GWh of energy has been generated by renewable energy sources.

Investment, economic, social and environmental impacts:

- Investment (equity and debt) to the value of R209.7 billion was attracted
- Created 57 236 job years[7] for South African citizens to date.
- Socio-economic development contributions of R1.4 billion to date
- Enterprise development contributions of R428.7 million to date
- The programme has realised carbon emission reductions of 57.0 Mton CO2 from inception to date[8],
- The programme has realised water savings of 67.4 million kilolitres from inception to date[9]

[7]The equivalent of a full-time employment opportunity for one person for one year

[8] Carbon emission reduction is calculated based on a displacement of power, from largely coal-based to more environmentally friendly electrical energy generation, using a gross Eskom equivalent emissions factor of 1.015 tons CO2 /MWh.

[9] Based on an estimated water use factor of 0.2L/kWh compared to a water use factor of 1.4L/kWh for Eskom fleet.

The REIPPPP programme to date (up to Round 4) has, through policy-driven procurement parameters in a 70/30 adjudication weighting on price and economic development, had the following outcomes:

Table 3-1: Economic Development achievements of REIPPPP up to Bid Window 4

	Minimum threshold	Target	Achieved	Value achieved
Job creation for Black South Africans as a share of the total workforce	25%	50%	84%	
Black Ownership (shareholding by Black People)	10%	30%	33%	
Shareholding by Local Communities	2.5%	5%	9%	
Black Top Management	40%	40%	67%	
Local Content	25%	60%	50%	
Preferential procurement				
Share of spend on BBBEE suppliers	50%	50%	83%	R106 bn
Share of spend on Qualifying Small Entities	8%	8%	26%	R4.1 bn
Enterprise Development (Revenue spend on business in local communities)	0.6%	0.6%	0.63%	R7.2 bn
Socio-economic Development (share of spend)	1%	1.5%	2.2%	R23.1 bn

3.2.2. Factory investments: what happened and why?

The business case for establishing a manufacturing facility could be premised on two assessments of the offtake market: invest when securing an offtake contract versus investing in long-term market certainty (Table 3). In either case, the long-term market certainty is a baseline requirement, at least to the extent that is securing an initial offtake contract of sufficient magnitude tips the scales on the investment decision.

> If we had known at the start of REIPPPP that all these procurement rounds would happen, you would see a (major component) factory in place now"
>
> - major wind component manufacturer eyeing the market since 2013

In the case of GRI's R450m investment in a wind turbine manufacturing plant in a joint venture with 25% Black ownership, the business case was made possible by mitigating risks around an "invest-when-win" approach. Timing of construction approvals was brought to a minimum by coordinating municipal departments with the result that production began within 11 months of the investment decision. With momentum building from round to round, market certainty grew, and other investments were made on the longer-term expectations around the rollout of the procurement envisaged under the IRP.

Table 3-2: Business case drivers: winning bid vs long term market

Invest-when-win	Invest based on market certainty
▪ Manufacturers wait until given either Preferred Bidder, Financial Close or Notice to Proceed ▪ Requires very tight timing on ramp-up to production capacity ▪ Very little line of sight to future capacity ▪ Timing is fully based on bid commitments ▪ Risk carried by the chain of contracting: supplier -> OEM -> EPC -> bidder ▪ Factors outside the control of the manufacturer require mitigating risk, e.g., delays in building plan approvals	▪ Manufacturers invest based on confidence in the potential market size and market share ▪ Has been effective in some markets, demonstrated pre-Bid Window 4 in South Africa ▪ The feedback loop is delayed – such certainty only grows after several cycles of procurement demonstrated, and the market is more risk-averse since BW4 stalled ▪ Requires mitigation of risk of uncertain cycles of procurement

Data from interviews with key component manufacturers showed a promising growth trajectory[10]. This was interrupted by market uncertainty at the stalling of Bid Window 4. The business case for investment in the long-term market opportunity was eroded when it was demonstrated that the procurement programme was exposed to interruptions that would compromise a sustainable pipeline of factory offtake.

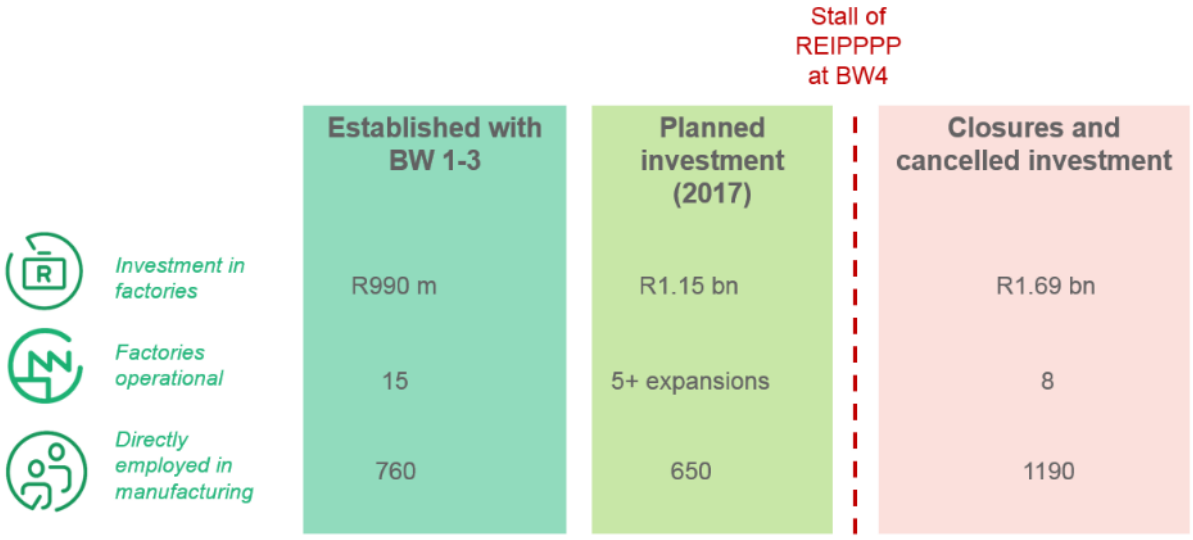


Figure 3-1: Effect of market certainty on industrialisation investments

Data compiled from interviews with active investors and manufacturers in the market[11] showed a market base of R990m invested in manufacturing facilities on the back of bid windows 1 to 3, 15 operational factories and 760 employees. The stalling of the procurement programme saw some R1.69bn in closures and cancelled investments, with a lost opportunity of over 1000 jobs. These numbers do not include the business rescue proceedings of several major construction and balance plant companies that ensued.

This section unpacks some of the primary drivers of the dynamics seen in the industrialisation of renewable energy in South Africa to date. It serves to illustrate the power of market certainty in driving the business case for investment.

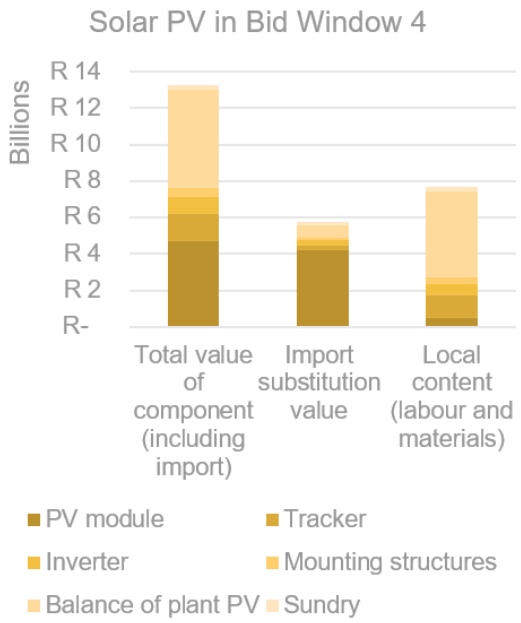
3.2.3. How much more could be achieved?

Looking at the data from the REIPPPP round 4 projects[12], which totalled 1 121 MW, gives a sense of the opportunity. The total capital value of the infrastructure in bid window 4 was R40bn. R19bn of that was local and R21bn of that was imported.

The bulk of localisation in solar PV was in balance of plant, mounting structures and trackers. In wind it was balance of plant and towers. The bulk of the imports in solar PV was in the photovoltaic module with its associated inputs such as frames, glass and cells. In wind the collection of components that constitute the rotor, nacelle and drivetrain are largely untapped.

[10] TIPS Policy Brief, April 2021: 12 As of December 2019, the REIPPPP had, for instance, generated R53.7 billion local content expenditure, achieving 50% local content (IPP Office, DBSA and NT, 2020).
[11] DTIC/GreenCape 2017, RE Closures_Retrenchments 2017
[12] IPP Office, 2021

BW4 local value	PV	Wind
BoP	88%	84%
Key Components	37%	23%
Combined	**58%**	**44%**



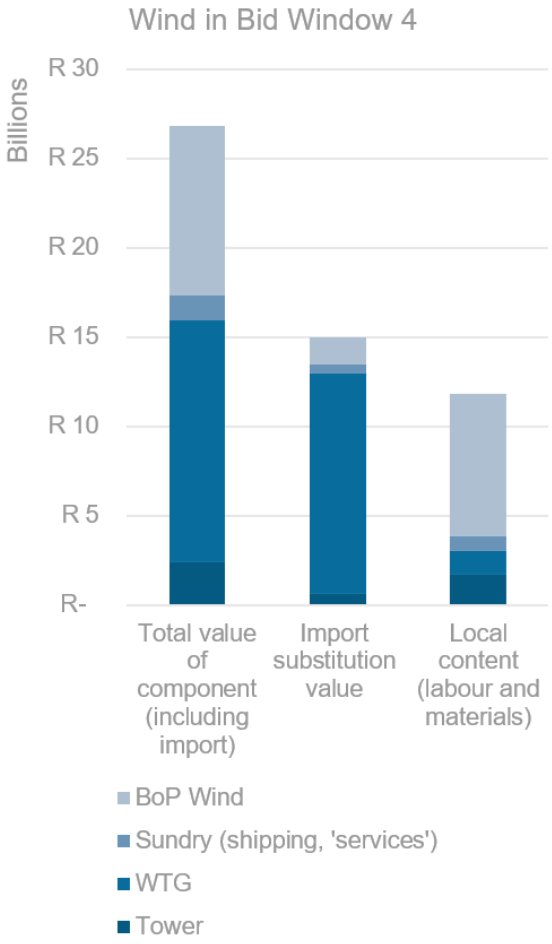


Figure 3-2: Wind and solar PV import and local content in REIPPPP round 4

Bid Window 5 commitments averaged 44% of total project value[13].

These numbers indicate the relative scale of opportunity in particular parts of the value chain. It could generally be assumed that these scale linearly in future procurement according to a REIPPPP procurement if the rules were consistent, up to the point where additional market dynamics play in, such as ramp-up of local capacity on the back of growing market certainty.

3.3. Future-looking job creation

The IRP released in 2019 shows a planned procurement of 6 000 MW large scale solar PV and 4000 MW of distributed embedded generation 2022 – 2030. A projected 14 400 MW of wind and 2000 MW of storage will be deployed between now and 2030.

Several studies have projected the future potential for job creation across the value chain by implementing the IRP2019. While these apply varying job intensities and methodologies, delivering some range in estimated impact, they are consistent in articulating a positive contribution to job creation that constitutes a significant opportunity embedded in current energy policy.

There are several terms describing jobs, and it merits taking care to differentiate. While a job may most simply be conceptualised as a person employed full time at the time of assessment (i.e., roughly equivalent to a headcount), a job sustained over a year is also a useful measurement of the amount of work secured. This latter measure is cumulative and may be expressed in job years or FTE (Full Time

[13] IPP Office presentation, 2021/11/03 “Power Futures Lab Webinar: : Analysing South Africa’s Renewable Energy IPP Procurement Programme Bid Window 5 Results Confirmation”

Equivalent). In Figure 3-3 below, an estimate of the potential new job creation in the IRP2019, from wind and solar alone, is expressed cumulatively up to 2030 in job-years and as a snapshot of employees in the year 2030. These numbers are the total amount of jobs across the value chain, expressing the potential (i.e., 100%) up to which, with successful localisation up to a workable level, a local job creation achievement would be defined.

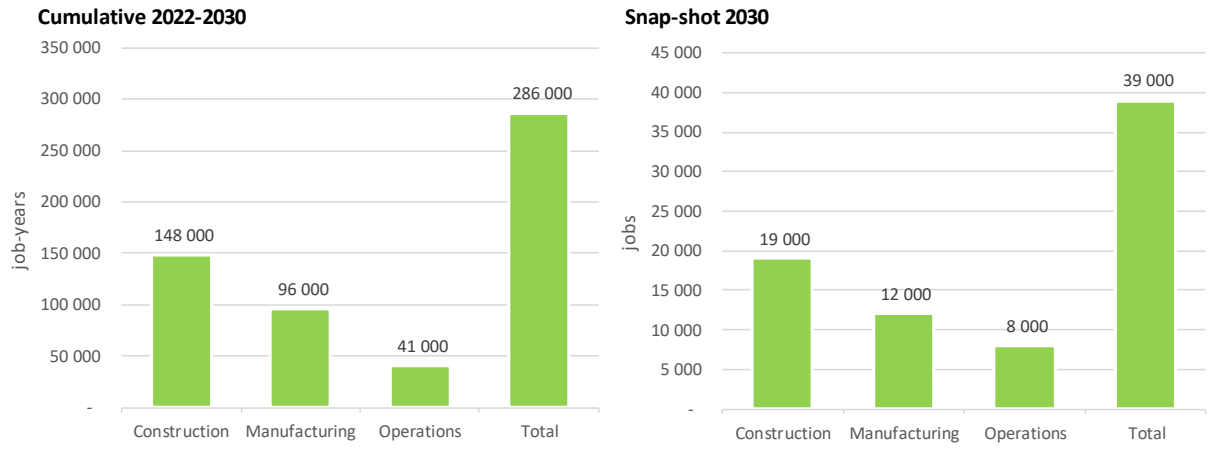


Figure 3-3: Direct job-creation potential (i.e., 100%) in rollout of IRP2019 from wind and solar

This indicates potential in the order of 39,000 direct jobs in 2030, added since 2022 and a cumulative 286,000 job-years of work created by 2030.

Taking the projection deeper into indirect and induced jobs amplifies the evident scale of the opportunity. According to the *A Just Energy Transition in South Africa, socio-economic needs and the positive impacts of a future low-carbon economy* report, "in terms of employment, the construction and operation and maintenance associated with the amounts of installed capacity stated in the IRP 2019 schedule will likely generate a net increase of 34 997 jobs by 2030". The report goes on to show that 252 616 (direct, indirect and induced) job-years will be created during the construction phase of solar PV projects envisioned in the IRP 2019[14]. The wind sector will create 594 098 (direct, indirect and induced) job-years during the construction. Aggregated direct construction job-years for the wind sector between 2020 and 2030 are estimated to be 179 887. Additionally, the aggregated indirect construction job-years are forecasted to be 198 287 for the wind segment. This sums up to 378 174 (direct and indirect) job-years between 2020 and 2030.

3.4. Future-looking economic value-add

An annual production value can be defined with the total investment in construction and balance of plant, operations and maintenance and the value of the products and components themselves. Applying GDP multipliers to this would, in turn, indicate the potential GDP contribution of the full value chain. Again, such estimates vary based on assumptions on capital expenditure and applied multipliers; however, the order of magnitude of the opportunity is not debated. Where components and value chain elements are identified to be of strategic value to localise, the eventual achievable target gross value adds would be articulated in the GDP contributions of that part of the manufacturing annual production value. While construction creates a greater job contribution, the higher GDP multipliers on manufacturing will be reflected in the relatively high economic contribution of the manufacturing sector.

[14] A Just Energy Transition in South Africa, CSIR and ERM https://www.res4africa.org/s/A-Just-Energy-Transition-in-South-Africa.pdf

3.5. Vision and objectives

Stakeholder inputs have motivated high-level aspirations in a vision statement and five core objectives. These are expressed in Figure 3-4.

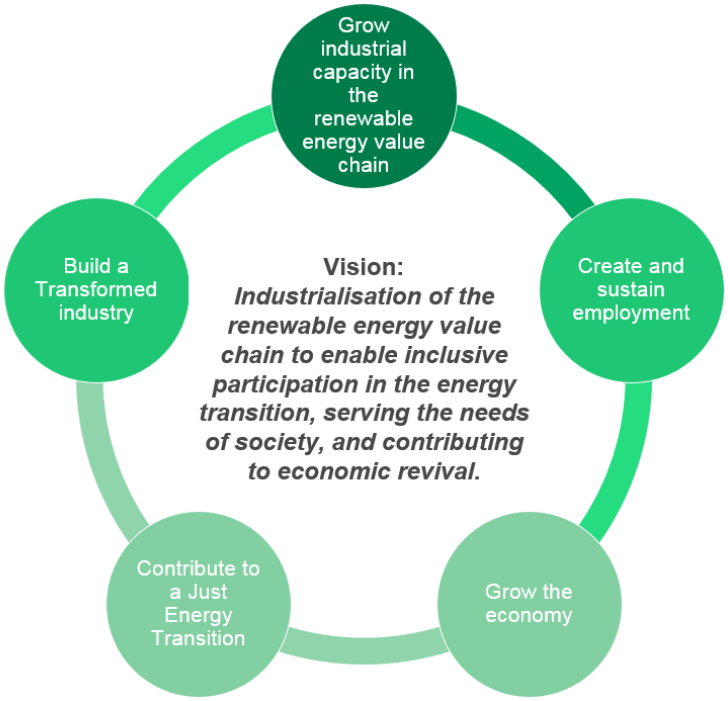


Figure 3-4: A vision statement and high-level objectives for SAREM

Against each of the five objectives, SAREM requires targets set on the back of an achievable range of opportunity that is both pragmatic and aspirational. Metrics and potential indicators for such objectives are mapped in Figure 3-3.

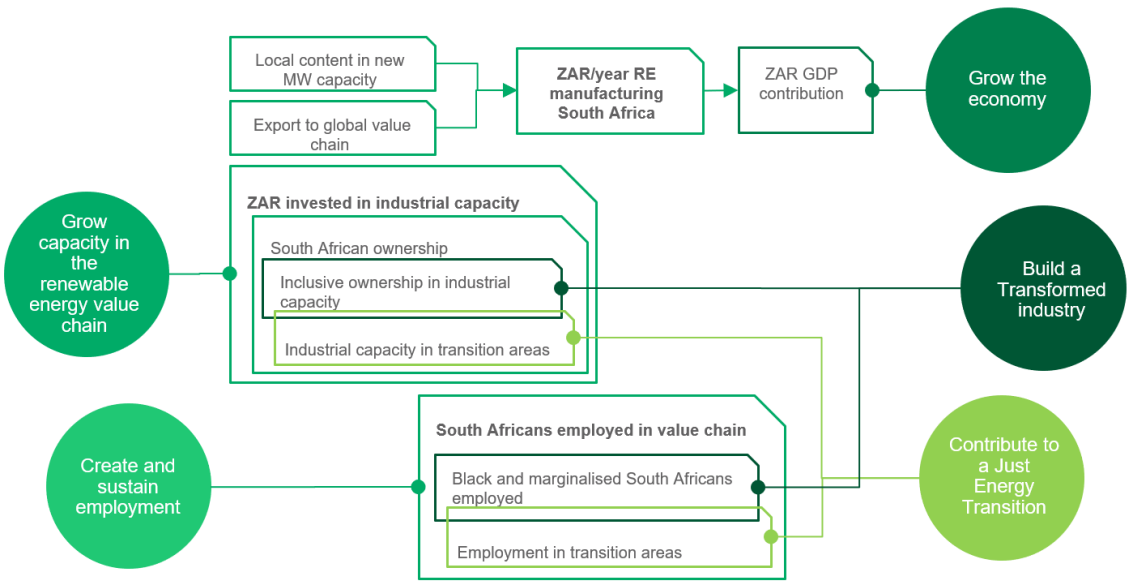


Figure 3-5: A matrix for indicators of objectives

The scale of opportunity is discussed in the prior section with reference to total employment creation and production value in ZAR per year. Mapping these to objectives of percentage achieved and targets

in Transformation and contributing to a Just Transition requires a combination of understanding the feasible range of localisation and agreeing on a level of aspiration between social compact partners.

By 2030, some **14 million solar panels** and **3,600 wind turbines**[15] would be required to fulfil IRP2019. The annual production opportunity in the market depicted by wind and solar PV in IRP2019 alone, is shown in Table 3-4. The right-hand column shows the "100%" value, with the 2025 and 2030 columns indicating a starting point for pragmatic levels of achievement.

Annual production, assuming **70-90% localisation of key components** and **90% of balance of plant** by 2030 would be **R38-44 billion per year** in 2030, contributing **R141-164 billion/year to GDP** and **employing 32,500 to 35,000 people** across the value chain. Looked at cumulatively, by 2030 the total production value from new capacity at these target levels would be up to R370 billion, with a combined GDP contribution of up to R1.4 trillion.

Ensuring that **51% ownership and management** is carried by Black persons, women, youth and disabled persons would equate to approximately **R21 billion/year production value** in inclusive and transformed ownership.

The journey to make a material contribution to providing more opportunities for economic diversity in Just Transition hotspots starts with establishing measures to build geographic competitiveness and skills base in areas such as Mpumalanga. By 2030, this could see establishing at least one major component manufacturer in such a hotspot and, through active follower-sourcing and secondary component capacity growth, capturing 10% of the national production value (i.e., **R14-16 billion per year through hotspot economies**).

[15] Example based on 450W PV panels and 4MW wind turbines.

Table 3-3: Vision targets

Objective	2025 target	2030 target
Grow the economy (annual GDP contribution)	R100-123 bn/year	**R141-164bn/year**
Create and sustain employment (new jobs)	26,000-29,000	**32,500-35,000**
Grow capacity in the value chain (% localised)	40-60% of key components, 80% of BoP	**70-90% of key components, 90% of BoP**
Build a transformed industry (ownership and management of local manufacturing capacity by Black persons, women, youth and disabled persons)	40% (R12 bn/year production value)	**51% (R21 bn/year production value)**
Contribute to a Just Energy Transition (integrate into hotspot economies)	Geographic competitiveness initiatives in place in SEZs, EIPs, repurposing	**10% of national production value (R15bn/year), 1 major component manufacturer in a hotspot**
	Skills programme operational	**3,500 Hotspot youth and former coal sector employees trained and employed**

Table 3-4: Baseline annual market opportunity from IRP2019 wind and solar[16]

	units	2025 target	2030 target	2030 opportunity (100%)
Demand (MW/year)	MW/year	2600 MW/year	2600 MW/year	2600 MW/year
Manufacturing				
% Localised, key components		40-60%	70-90%	100%
Direct jobs created; persons actively employed in that year	People employed	2000-3000	8,500-11,000	12,000
ZAR production value	ZAR bn/year	R11-17 bn/year	R20-26 bn/year	R28 bn/year
GDP contribution	ZAR bn/year	R45-68 bn/year	R80 – 102 bn/year	R114 bn/year
Balance of Plant & Construction				
% Localised		80%	90%	100%
Direct jobs created; persons actively employed in that year	People employed	15,000	17,000	19,000
ZAR production value	ZAR bn/year	16 bn/year	18 bn/year	20 bn/year
Total GDP contribution	ZAR bn/year	55 bn/year	62 bn/year	69 bn/year
Operations & Maintenance				
% Localised		80%	90%	100%
Direct jobs created; persons actively employed in that year	People employed	6000	7000	8000
Combined value chain				
Direct jobs created; persons actively employed in that year	People employed	26,000-29,000	32,500-35,000	39,000
ZAR production value	ZAR bn/year	R28-33 bn/year	R38-44 bn/year	R49 bn/year
Total GDP contribution	ZAR bn/year	R100-123 bn/year	R141-164 bn/year	R182 bn/year

[16] Intensity and multipliers from DoE, 2016 and DTIC, 2017

4. Process and Status

4.1. Research and consultation

This step in the process follows a research phase in which foundational research was supported by several focussed research packages commissioned to fill gaps in the literature. These included a skills gap analysis through interviews with industry, a component-level assessment of value-add and the impact of premiums and a macro-economic impact model. Some of the summarised outputs of the foundational research are included herein under SWOT analysis and common elements of comparator economies.

4.2. SWOT Analysis

A SWOT analysis, drafted out of the research phase and complemented with emerging insights, can be divided into the elements particular to localisation in general and industrialisation in particular. The initial indicators of areas of opportunity are then identified in primary sectors. These tables draw largely on Morris et. al 2020[17]

Strengths	**Weaknesses**

• Strong specialised services (e.g. environmental studies, legal services, structuring financials deals, engineering design, location assessment)
• Local experience in balance-of-plant (BOP) (i.e. civils, transport & erection, grid integration) and in manufacturing of BOP components (esp. electrical components for grid integration)
• Reasonably diverse representation of OEMs in country – renewable energy market beyond "emerging" stage[1]
• Proximity to- and established trade with- Sub-Saharan African (SSA)
• Relatively strong industrial sector and manufacturing capacity amongst Sub-Saharan African countries and SADC in particular.
• Strong finance sector with extensive experience in structuring of project finance both in SA and SSA
	• Policy context
	  • Lack of energy policy certainty / long term reliability / continuity and predictability in growth of market
	  • Lack of policy (implementation) certainty with regard to renewable energy allocations and procurement (bid windows in auctions) and market structure limiting bulk of market demand to REIPPPP
	  • Slow planning cycles that do not correspond to the dynamics of demand and supply
	  • Government and industry interactions focused primarily on compliance (rather than a strategic agenda)
	  • Complex business environment / low ease of doing business
	• Manufacturing enablers
	  • Policy instability leading to economic instability and exchange rate volatility
	  • Lack of energy security / load shedding
	  • Financial viability of primary buyer / off-taker (Eskom)
	  • Relatively expensive local finance compared to international finance

Opportunities	Threats
• Export revenue through strong specialised services (e.g. environmental studies, legal services, structuring financials deals, engineering design, location assessment)	• Localisation and industrialisation • Reduced economic growth expectations (in part due to COVID-19) leading to lower local energy demand than considered in energy planning

Table 4-1: SWOT analysis of localisation and elements shared with industrialisation

There is diverse representation of OEMs in South Africa, and the renewable energy market is no longer "emerging"; however, renewable energy *manufacturing* can still be considered as nascent or emerging (Note 1 in Table 4-1).

[17] Morris, M., Robbins, G., Hansen, U., and Nygaard, I. 2020. "Energy and Industrial Policy Failure in the South African Wind Renewable Energy Global Value Chain: The political economy dynamics driving a stuttering localisation process". *PRISM Working Paper 2020-3*. Cape Town: Policy Research on International Services and Manufacturing, University of Cape Town. Available from: http://www.prism.uct.ac.za/prism/Working-Paper-Series

Strengths

- Nascent renewable energy local component manufacturing industry (steel and concrete towers, solar module assembly)
- Access to local raw materials (e.g. steel, aluminium)[1]
- Manufacturing base in selected allied industries (e.g. structural steel, electrical equipment, fibreglass)[2]
- Special economic zones (SEZs) (including one Green Tech SEZ) and associated incentives

Weaknesses

- Policy context
  - Limited alignment between energy and industrialisation policy
  - Local content rules that focus on total spend rather than specifically tailored to industrialisation (i.e. focussing on content)
  - Local content rules that focus on quantum of employment rather capacity being built
  - Limited integrated industrial policy and support mechanisms (incl. lack of renewable energy specific support mechanisms)
  - Limited government support for localising technology suppliers and increasing technology capacity
- Market context
  - Relatively small local renewable energy market at great distance from other high growth markets
  - Due to delays in establishing local manufacturing, potentially missing the global renewable energy industrialisation window of opportunity
- Manufacturing enablers
  - Relatively weak industrial base and weak supply fields (e.g. steel, metal casting, electronics assembly)[3]
  - Cost of material inputs to renewable energy manufacturing and particularly steel and aluminium.
  - Low level of technology intensity in the market
  - Relatively limited R&D capability (technologies and manufacturing processes)
  - Shortage of required technical skills
    Applies to localisation as well.
  - Relatively unpredictable and expensive labour (compared in particular to Asian economies)
  - Skills base skewed to unskilled labour
    Majority of labour in renewable energy value chains is skilled labour and there is currently a shift to knowledge intensive services and higher order production capabilities in renewable energy value chains.
  - Other factors that reduce global competitiveness (compared in particular to Asian economics):
    relative expensive of electricity, relative expense of property rental, relative expensive of capital and relative cost of overheads

Opportunities

- Expansion of local steel and aluminium manufacture, provided cost can be reduced to be cost competitive with imports.
  For example, for the IRP2019 build, it is estimated that there is a potential for 5% (Wind: 4%, Solar PV 1%) increase in annual local steel production, which would contribute about 2.2 billion to GDP and create over 700 jobs.[4]
- Toll manufacturing facilities that allow production for more than one project/OEM so as to enable local manufacturing in response to the current nature of procurement of utility scale renewable energy in South Africa (i.e., local content requirements for concurrent projects with short lead times and considerable upfront uncertainty with regard to whether local manufacturing capacity will be utilised).
- Expanded manufacturing and export of small scale/embedded generation renewable energy technologies (particularly, small scale wind turbines, biogas digesters)

Threats

- Lower margins in industry leading to reluctance of OEMs to share technologically advanced and knowledge elements of value chain
- Competitions from other emerging economies: many other developing / emerging economy countries have increase own renewable market and put in place mechanisms to promote localisation
- Possible oversupply of renewable energy manufacturing capacity globally which could make it difficult to achieve local manufacturing profits or justify development of manufacturing capacity in a new region.

Table 4-2: SWOT analysis of industrialisation

Notes in Table 4-2:

1. There are some concerns regarding the relative cost of local raw materials
2. 2. There has been a decline in manufacturing in the last decade, and there are contradictory views on the ability of the local industries to produce
   at the quantity and quality required by the renewable energy industry

3. There are contradictory views on the ability of the local industries to produce at the quantity and quality required by the renewable energy industry
4. Estimate based on IRENA (2017a, 2017b) and South African Iron and Steel Institute factors per 1000 tonne steel (Engineering News, 2020)

4.2.1. Opportunities in solar PV

1. Additional module manufacturing. The business case for new entrants may not be strong based on local demand only, given currently established (dedicated OEM and toll) module manufacturing capacity.
2. Expansion of aluminium module frame and junction box manufacturing facilities, provided cost of aluminium can be reduced to be cost competitive with imports.
3. Inverters
    3.1. System assembly with core imported products and some local components, as well as manufacturing under license. This would require support to local producers to meet quality standards and access to testing and certification locally.
    3.2. Expanding magnetics production and support through additional milling capacity
    3.3. Expanding transformer production through reductions in input material costs (especially steel), and support for improvement in efficiencies to meet the standards expected by international inverter manufacturers.
    3.4. Expanding of enclosure and packaging production.
4. Mounting structures are more readily localised due to the high cost of transport but are relatively lower value components of a solar PV system.
5. Expansion of production of steel and aluminium mounting structures, provided steel-production and aluminum extrusion production capacity can be expanded, support provided for tooling and cost of these inputs reduced to be cost competitive with imports.
6. Small scale embedded generation renewable energy technologies
7. Expansion of cable production by expanding local production of conductors, insulation, and armour, provided input material costs (steel, aluminium, and polymers) are addressed. Local aluminium rod production could boost to local cable production.

4.2.2. Opportunities in wind

1. Additional wind tower and tower internal manufacturing
2. Local nacelle assembly (even if initially largely from imported components) is an important enabler of higher value local turbine component manufacturing. Local nacelle assembly could also enable expansion in existing casting, forging and transformer production if capacitated for renewable energy component production. However, it should be recognised that the localisation potential of all of these components is currently considered medium rather than high.
3. Expansion of cable production by expanding local production of conductors, insulation, and armour, provided input material costs (steel, aluminium and polymers) are addressed. Local aluminium rod production could boost to local cable production.

4.3. Toward a naturally competitive order of growth

A system of measures that enables localising local value chain elements in any form is the first step in building an ecosystem of local manufacturing. To then drill down into a merit order of prioritising at a component level requires working in balance to provide:

1. A competitive framework that naturally moves the local manufacturing toward those components for whom there are competitive benefits to produce locally (see 6.2.1 for more); and
2. Some strategic focus on those parts of the value chain that stimulate relatively high job creation and GDP value-add compared to their relative cost versus import (see 6.2.2)

Data to define the relative value add versus import is hard to come by. In many cases there is no data available for local production costs as there is insufficient local production of such products yet to use

as a benchmark. Premiums for import and local production costs from feasibility studies are commercially sensitive.

From one OEM or global value chain player to another, this merit order will differ. Notwithstanding this, initial indications group primary components into three categories, generally aligned with the initial SWOT analysis opportunities:

1. **Naturally localise with sufficient market certainty and scale:**
   1.1. Balance of system, cables and ancillaries
   1.2. Towers and internals (concrete and steel). Both strong job creators
   1.3. Some PV mounting hardware
2. **Low hanging fruit with some competitive measures required to tip the scales, e.g., in scoring:**
   2.1. Nacelle assembly
   2.2. Wind turbine hubs
   2.3. Inverters and transformers
   2.4. PV module with imported cell
   2.5. PV Trackers and mounting hardware
   2.6. Blade post-moulding (high labour intensity)
3. **Higher premium, requiring stronger measures to localise**
   3.1. Solar cells and hence PV module with local cells
   3.2. Full blade manufacture
   3.3. Major drive-train components

4.4. Common elements in comparator economies

Comparator economies have been explored in the research documents and the summary of these findings can be found in the Interim Research Summary discussion document, 2021. The core elements will be included in the Masterplan document. The following summarises the five common factors in countries that have successfully established local renewable energy manufacturing:

1. **Size of local market and longer-term visibility of / certainty in local market**
   - Wind: 400 MW/OEM/year for 5 years; Solar PV : 300 MW/OEM/year for 5 years
   - Can be smaller for countries close to large export markets (e.g., Morocco, Tunisia, Turkey)
2. **The establishment of "local content requirements“ (with the exception of Denmark)**
   - To (initially) protect “infant industries” and attract foreign investment
3. **Industry support mechanisms and government investment**
   - Includes (a) training; (b) diffusion of best practice (e.g., through clustering); (c) standards and means of testing and certification; (d) R&D (financial support & public programmes)
4. **Export aid**
   - Includes trade promotion, export credits, and binding commitments for export as part of local content requirements
   - Successful countries export 60-80% of production (e.g., Morocco local market = 30% of production of blades)
5. **Consistency with the industrial strengths of the country**
   - Existing capabilities: leveraging local strengths in existing or related industries
   - New capabilities: initially leveraging off foreign companies through a range of mechanisms (local subsidiaries, joint-venture, licenced production)

4.5. Focus groups

The consultations and research raised a set of focus areas, in which focus group workshops developed a deeper understanding of the issues and generated a set of ideas toward overcoming identified barriers and reaching for opportunities.

The focus group themes were:

- Optimise value add (i.e., jobs & investment) per megawatt of renewable energy installed
- Develop an export market for local products and expertise
- Enable locating in Transition economies
- Transformation
- Demand growth through future electricity planning efficiency (future-looking)
- Demand growth through future energy demand (future-looking).
- Identify and develop skills
- Market certainty

4.6. Drivers

There are existing and future drivers required to unlock the outcomes if SAREM is to be successful. The following drivers were prioritised out of the focus group phase:

1. Increasing the megawatt demand for renewable energy
2. Policy consistency in both procurement policy and energy/electricity policy.
3. Increase the demand for locally manufactured renewable energy products in the private sector market (largely price lead) and the public sector market (largely procurement lead).
4. Local price competitiveness of manufactured renewable energy products
5. Increased availability of high-quality renewable energy-based local skills
6. Increase availability of competitively priced, high quality, local input materials with a focus on steel, glass and aluminium.
7. Economic activity, economic diversification and skills development in hotspot economies.
8. Increase the attractiveness of hotspot economies for investment.
9. Development of consistent economic development policies to promote transformation
10. Industry-led strategies to promote economic participation by black and marginalised groups
11. Effective monitoring and evaluation of economic development policies/ strategies
12. Removing market entry barriers for local black/marginalised new entrants (manufacturing)
13. Effective support (access to markets, finance and business development) of businesses owned by Black and marginalised groups
14. Unlock the regional demand for locally produced renewable energy products (export).

4.7. Barriers

The South African renewable energy market has seen numerous challenges over the last ten years. During the SAREM engagements, more than 50 individual market bottlenecks have been identified. Each of these bottlenecks is limiting the growth of the renewable energy market and the linked value chain. The identified bottlenecks could be grouped into the following 11 areas of focus:

1. An inconsistent local content policy does not create a competitive advantage for local manufactures.
2. The price competitiveness of local manufacturers (current price premiums of 0-20%).
3. Market demand inconsistency and lack of clarity on possible future demand growth.
4. Technical systems and government systems ability to address growth in demand. This is particularly relevant in National Energy Regulator of South Africa (NERSA) processes, municipal system reform (i.e., wheeling) and grid readiness (transmission and distribution).
5. The lack of Black and marginalised South African ownership and employment in the South African renewable energy value chain.
6. Insufficient locally skilled people and the lack of experience relative to international counterparts.

7. Market access barriers for new entrants (e.g., ability to raise guarantees and break into supply chains) emphasise Black and marginalised stakeholders.
8. Limited investment attractiveness of value chain potential in transition hotspots.
9. The cost and availability of Input material required for local renewable energy manufacturing
10. The limited access to trade & market opportunities, specifically in the rest of Africa.
11. Thus far, very limited role of the SA development finance community in supporting local renewable energy manufacturing.

4.8. Workstreams and next steps

The culmination of the focus groups period was the identification of ten programmatic work areas and a set of potential levers in each of these. This was laid out in an IRG discussion document in August 2021. Task teams coalesced around these ten work areas. Their objective is to refine the set of levers into actionable form that can be championed by the decision-makers and implementers amongst the social compact partners.

This discussion document describes the progress on each work area and distils it into a draft set of actions. Where further action is required to put these into implementable form, this is identified. With further steer from the social compact partners, the task teams would look to conclude on outstanding concurrence by decision-makers such that the draft Implementation Plan document can be drafted for review. In this period, industry and social compact partners bring catalytic projects and commitments to the table.

5. System view of SAREM

Renewable energy manufacturing is embedded into an energy system. The model below shows a simplified version of how this system can interact to guide on the reinforcing aspects as discrete from the antagonistic. The energy sector in South Africa is embedded in a complex socio-economic context. Naturally the potential for industrialising the renewable energy sector means many things to many different stakeholders. Consequently, the combination of perspectives from businesses, government, labour and civil society – neither of which are homogenous in needs and priorities – quickly leads to a level of complexity that does not lend itself to a short and simple solution set. Systems thinking helps build a conceptual framework within which to find how these perspectives are interconnected so that interventions don't lead to unintended consequences.

In terms of the different parts of government, the strategic use of local content policy is a key tool for government. When viewed on two axes, one that builds demand through consumption assistance and one that builds competitiveness through production assistance, it is clear that in this case the roles of energy policy and trade and industrial policy go hand in hand to develop South Africa's niche across the local and international market.

Figure 5-1: Consumption and production: axes of assistance that define a market strategy[18]

5.1. Context, interventions, mechanism and outcomes

No system dynamic interpretation would be exhaustive; however, the mechanism illustrated in Figure 5-2 may prove useful in rationalising the interventions proposed.

Renewable energy demand defines market certainty, economy of scale and utility tariffs, making local content more cost effective. Cost-competitive local content increases relative contribution of local manufacturing through the market. Combined with what is driven by the market through local manufacturing competitiveness, policy-driven market controls increase the relative contribution of local manufacturing. Increased total local manufacturing increases in turn builds on the market certainty and economy of scale. This is the reinforcing loop on the right.

The outcome of such local manufacturing drives up primary impacts in jobs and GVA. Where such impact is monitored and noticeable, it informs policy decisions that guide the energy mix in the future.

[18] Haley. U.C.V and Schuler. D.A. (2011). *Government Policy and Firm Strategy in the Solar Photovoltaic Industry*. California Management Review VOL. 54, NO. 1 FALL 2011. Available from: https://journals.sagepub.com/doi/10.1525/cmr.2011.54.1.17

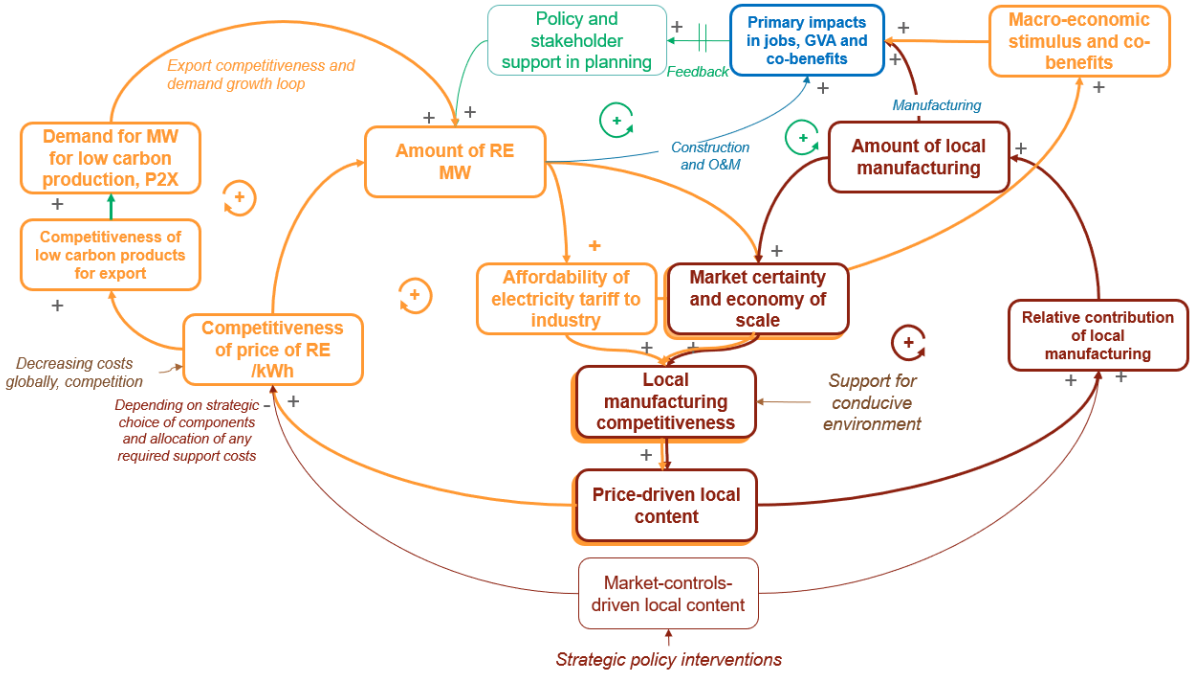


Figure 5-2: System dynamics for a conceptual framework for SAREM

The loop on the left is driven by price competitiveness of energy per kWh. Where renewable energy price competitiveness reinforces the amount of renewable energy demand in the system, this is further reinforced by a growing demand for such energy to produce low carbon products such as hydrogen for export. The contribution to macro-economic stimulus and co-benefits from affordability (and availability) of electricity is noted herein and presents as a trade-off, where a premium for high local content is assumed. This loop closes to become a positive feedback on local content when the manufacturing industry has built up sufficient competitiveness to maintain the price-competitiveness of renewable energy with local content. This trade-off is managed through firstly phasing of the two loops: build momentum with low-cost energy and ease in the local manufacturing capacity as competitiveness grows, and secondly introducing local content strategically by identifying those components well placed to maximise job creation and economic value add per unit capital added through a system that encourages competitiveness.

5.2. Reinforcing work areas

Ten work areas were identified out of the focus groups and research. These are presented schematically to indicate how they are reinforcing and what parts of the system they tackle. There is some simplification in the schematic, notably the way in which work areas overlap. As the levers emerge, they indicate how these cannot be considered in isolation and should be overlaid in more of a matrix pattern as shown in Figure 6-7. The grouping on the left is the building of a business case for investment in a manufacturing facility in South Africa. With a business case for investment, jobs and economic value-add are stimulated. How these are realised in terms of their inclusive beneficiation and how they contribute to providing new economic opportunity to support a Just Transition is addressed in the two work areas on the right. Skills and new entrant support help to enable how such impact is targeted and how competitiveness is reinforced. Enablers of priority levers across these groups may be found in the development of local content policy.

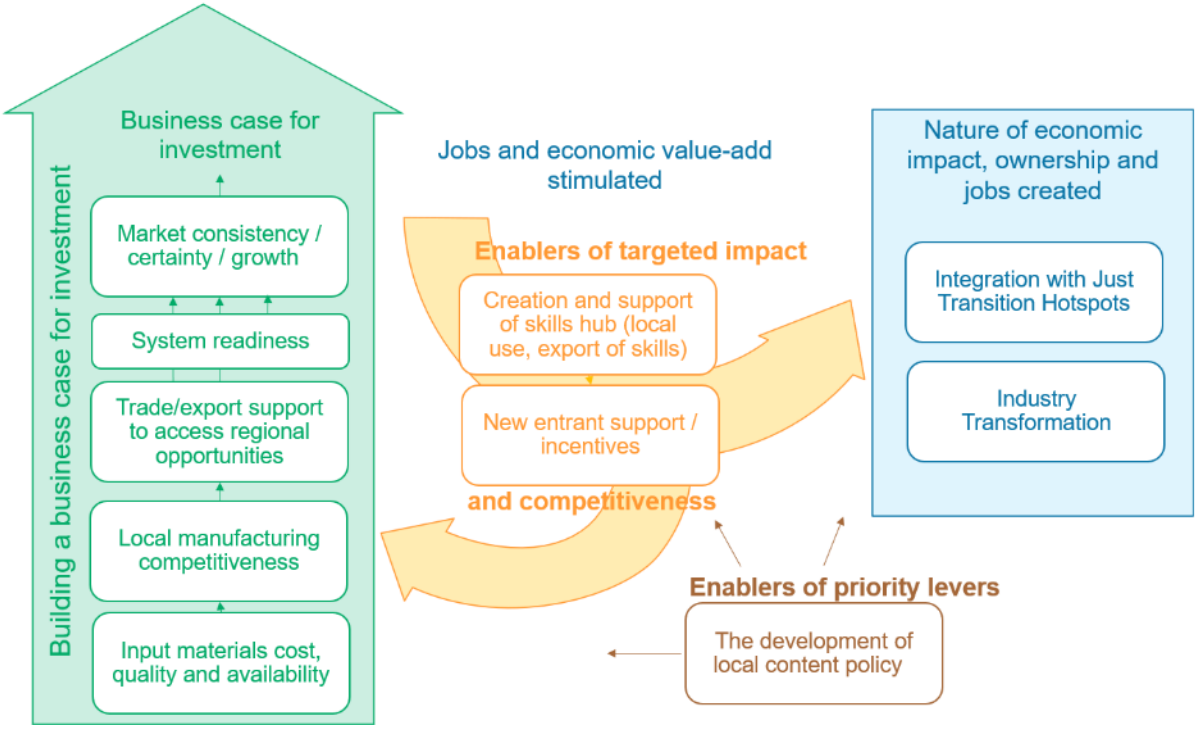


Figure 5-3: Schematic of work areas

When we overlay these work areas on the system dynamics, we see how they support driving and reinforcing the outcome (see Figure 5-4, below).

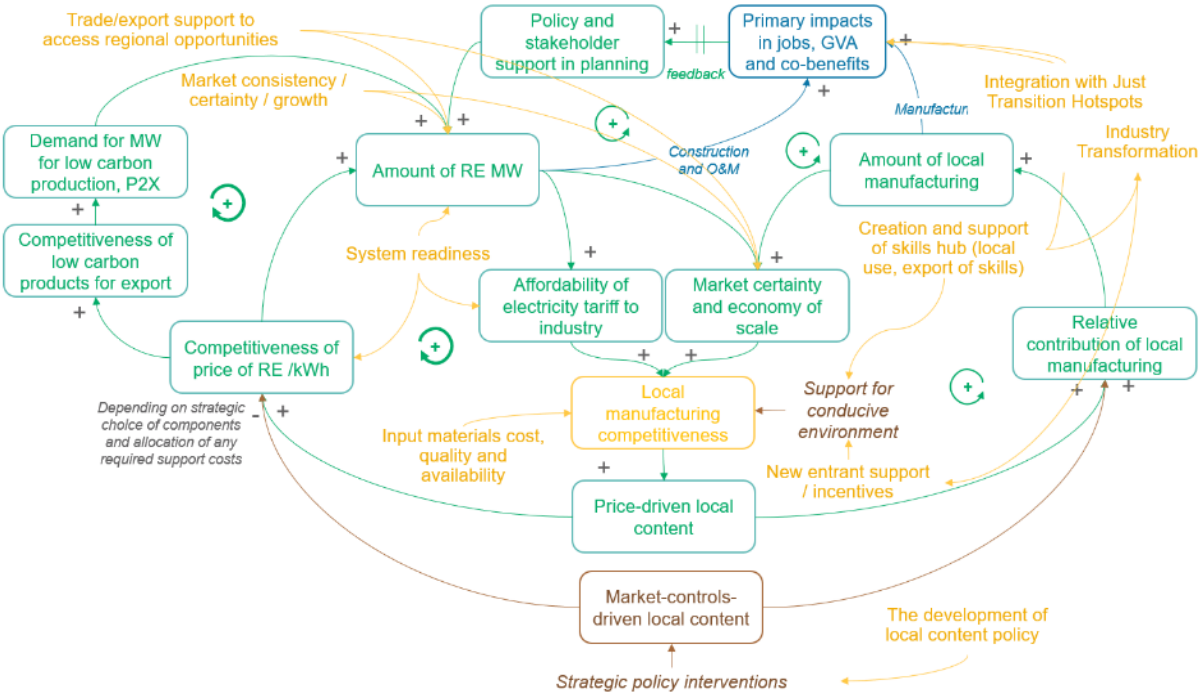


Figure 5-4: Work areas overlaid on system dynamics, indicating how they support the system

6. Work areas

6.1. Market Certainty

6.1.1. Context in the evolution of the market for renewable energy in South Africa

Market certainty was identified as the most important work area. Developers need to understand the framework for competition, Manufacturers need to build the case to invest and develop the necessary skills and teams to execute. Government aims for predictability and a long-term relationship with the industry. Banks, finance houses and unions need certainty to position their actions and interventions to optimise their contributions.

Systematic certainty entails the conditions for predictability such as in the roll-out of bid rounds and the processes to financial close of projects. Certainty requires a consistent approach. For the system to settle into a working state, a consistent approach is required. As efforts to work outside the system fail, this builds the kind of feedback that enforces such certainty and, provided it converges toward success and failures don't propagate, it settles into a working state than only requires refinement over time. To date, with some 102 REIPPPP projects completed successfully, the lack of failures creates the context or impression that there is always space for a negotiated settlement, a best-and-final-offer post preferred bidder. This introduces source of idiosyncratic uncertainty.

The source of market certainty in South Africa has a short term, medium term and long-term context to it. It can be viewed against the backdrop of how the market for renewable energy capacity may evolve and how the mechanisms by which it is procured evolves in the immediate, short term, medium term and long term.

The market for renewable energy capacity growth in South Africa – i.e., the MW to be installed – is defined in the Integrated Resource Plan. It is the mandate of the DMRE to develop this plan, of which the current version is IRP2019. In the medium- to- long term, the IRP would be expected to evolve, following re-evaluation of the national demand and the inputs to the modelling that informs it at intervals.

Market certainty as it pertains to the MW to be commissioned hence rests on the IRP, in its current timescale, plus certainty on factors that may see it evolve in the long term. Such long-term evolution may be affected by major shifts in the energy mix such as in the phased retirement of some 22GW of Eskom's existing coal fleet by 2035 and growth of potential adoption of electric vehicles, replacement of thermal loads with electrical and a future market for export of green hydrogen. Certainty on the implementation of the IRP rests in the mechanisms by which such capacity is to roll out and in turn this informs the certainty on the demand for local components and services to commission such capacity.

Implementation of the IRP, which informs by which means such MW are procured, is in the present predominantly defined by the oversight of the DMRE, which pronounces on procurement through such public procurement mechanisms as the REIPPPP. Such public procurement may contain requirements and incentives for supporting policy objectives, such as localisation. In the shortest time horizon, potential investors in manufacturing capacity may be focussed on the opportunity embedded in the most immediate and certain form: the present REIPPPP bid window, its RFP requirements and whether or not they are a winning bidder. In the medium term it would be on a view to how consistently such bid windows are implemented and with what consistency on local content requirements.

There is a growing trend in development and procurement of renewable energy outside of the REIPPPP. Municipalities have growing ability to procure their own capacity and further, outside of all forms of public procurement, customer-driven capacity choices are beginning to play a growing role with the private sector procuring their own power through various business models. SSEG is seeing MW-scale growth year on year and the lifting of the threshold on generation licence requirements to

100MW signals a possible tipping point in this trend, with major corporate players opting for their own generation capacity. Eskom is working toward its divisionalisation and eventual unbundling into separate business units. The establishment of the ITSMO would provide a foundation for a market mechanism further enabling such liberalisation of the generation capacity growth. The fundamental shift this signals in the medium term is a growing movement away from reliance on public procurement mechanisms to determine the market to one where private sector develops more of the share of capacity. What private sector procures is expected to be roughly aligned with what market forces are driving: lower carbon intensity requirements of financiers and offtakers, especially for export of products to foreign markets, combined with lower cost per kWh mean a growing preference for renewable energy. Eskom's own decisions around what to procure as an offtaker and what to develop itself will be informed by reading this market and understanding where its strategic offering to major offtakers lies.

While the DMRE's role remains the custodian of the overall energy and electricity mix planning, the shift is away from being the primary driver of what procurement of such electricity looks like to ensuring that the system mix is balanced and working. What these trends point to is that primary determinants of market certainty around renewable energy procurement are clearly dominated still by DMRE's implementation through such mechanisms as REIPPPP in the short term horizon, with a shift thereafter to a more diversified market. In the long term, certainty will come from a market setup where capacity is privately procured, and the system operator goes out to ask for players to come in.

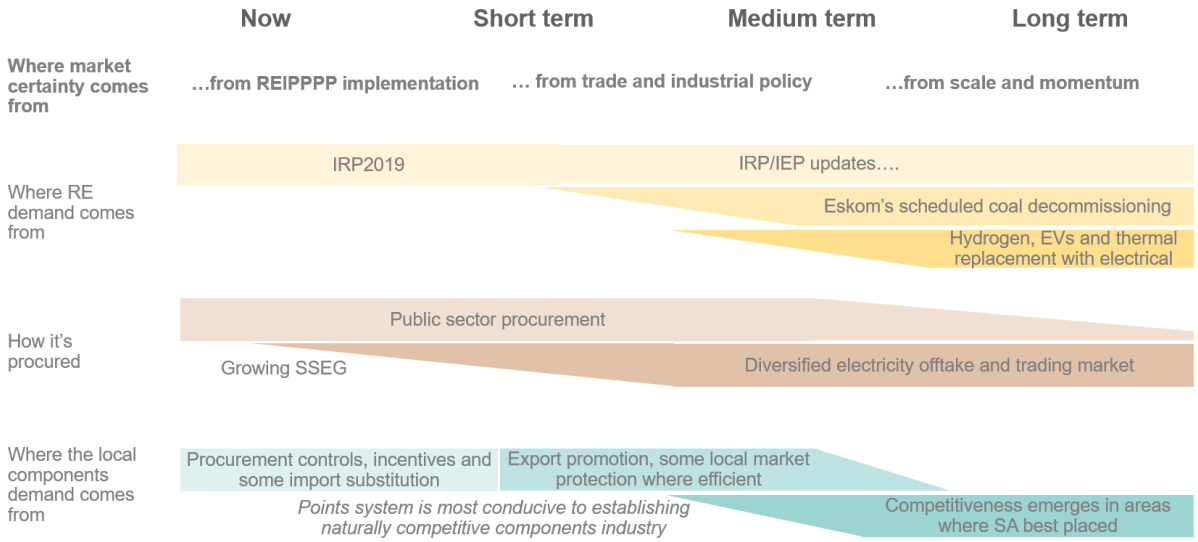


Figure 6-1: Market certainty over time

6.1.2. Building a framework for market certainty

In the long term, market certainty rests securely on two elements: trust built on the momentum established in the roll-out of the IRP and the scale of demand that will come with the amount of capacity growth required to fill the gap left by Eskom's scheduled ~22GW coal fleet retirement by 2035 and a trend to electrification of transport and thermal loads combined with power-to-x and production of green hydrogen. The sheer scale of this demand (estimated in excess of 150GW renewable energy by 2050) would be sufficient to offer a case for producing locally with efficiencies of scale. Coming out of a period of building local capacity and establishing local core competencies, there would be an offering that has established its competitiveness. For this trajectory to be clear, stakeholders need to know the policy position of South Africa, with respect to climate change. As communicated by one labour union representative, government's position on climate change will inform the energy mix going forward and this will help the market understand where it stands with regard to the growth of demand for components and services.

In the short term, the market relies on public procurement rolling out reliably with consistent requirements or incentivisation of local content in the bid rules. At this time, without the momentum in place yet, some measures of import substitution are required. The market will respond to this framework where it is consistently applied, with sufficient timeframes between bid rules and commercial operation. This can also be achieved by setting the bid rules for several rounds at once. Consistency is key in respect of having a level playing field. With a level playing field, developers and manufacturers alike have a business case for local investment. Where exemptions are applied on designated components, the business case for local suppliers being able to compete is disrupted. This is discussed further under *local content policy* in 6.2.

What happens in the medium term, between the certainty of rounds of public procurement such as the upcoming bids round of REIPPPP and the long-term momentum? During this period, the levers for incentivising procurement of local components cannot sit alone in public procurement and a conducive environment is required, regardless of the specific procurement mechanism. Trade and industrial policy come to the fore here. The means within the mandate of DTIC to encourage export and promote local competitiveness and are where the market will look for building a sustainable business case.

Within the three timeframes, the steps toward establishing market certainty motivate the following actions in the short-to-medium term:

1. Short term: build confidence through REIPPP implementation
    1.1. Provide confidence in the implementation of several years' worth of REIPPPP
    1.2. Establish a consistent set of local content policy criteria that would apply for this period over this quantum of MW to be procured. This will enable investors to take a longer time horizon view than on individual bid success or failure.
2. Medium term: create competitive environment through trade and industrial policy
    2.1. Develop consistent trade and industrial policy that builds a competitive environment beyond public procurement mechanisms. The suite of such policy includes promoting export, resolving trade-offs on local protection of input materials versus importing materials that make local beneficiation competitive and leveraging existing instruments to support local competitive such as SEZs and investment incentives
3. Long term: build momentum and grow demand
    3.1. Update IRP and ERP at consistent intervals
    3.2. Enable the diversified generation of power at scale by system readiness interventions
    3.3. Enable power-to-x market through interface with- and support of- the programmes to drive hydrogen, growth of electric vehicle adoption and conversion of thermal to electrical loads. These are not SAREM interventions per se; however, they indicate the requirement to interface with the IDC and DSI on implementation of the Hydrogen Society Roadmap and the Green Hydrogen Commercialisation Strategy.

6.1.3. Mitigating against market uncertainty risk

Investment always carries an inherent risk, and a business case will weigh these up against the opportunity and consider ways to mitigate such risk. A well-crafted commercial contract will allocate risk where the ability to control it lies. Providers of capital will price in risk into their valuation models' discount rate and into their return expectations on debt or equity.

It has been discussed above how the timeframe is a key factor in the nature of the risk. Investors considering a factory establishment or expansion must consider whether they are making a play on the background market certainty or on a concrete order book, such as may be secured from a successful bid into REIPPPP. In practice it is typically a combination of both, wherein an anchor order of sufficient size tips the scales toward a longer-term play. The challenges of securing such binding orders prior to having the capacity in place are discussed in the task team *new entrant support.* Amongst the ways of mitigating around a stalling of the public procurement pipeline, where control over such implementation certainty sits with government, are the government-sponsored investment support programmes such

as SEZs. Where SEZs could make strategic proactive investment into top structures that would be suitable for renewable energy manufacturers, this would significantly reduce risk around timeframes for ramp-up to production for new production capacity. SEZ operators could ensure these structures are not so bespoke as to rule out allocating to other types of manufacturing. Further consideration of soft terms on leases, where concessions are made in the case of public procurement- or policy-related interruptions to the IRP implementation. These proposals have yet to be tabled in the workstream and considered in depth by DTIC.

Certainty also lies in the ability of the offtaker to take on new power purchase agreements. Relying on Eskom as sole offtaker, through the REIPPPP, has been raised as a risk. This is mitigable through introducing offtaker diversity. This may involve enabling of municipal and private generation and procurement of power. The growth of the number of municipal SSEG-enabling tariff structures, wheeling frameworks and the lifting of the threshold on generation licence applications are examples of ways in which this is enabled. These are inherent to the evolution of the market discussed in the section above. Herein, viewed in the light that they help mitigate single offtaker risk, they can be seen as a positive feedback loop to building market certainty. Initiatives to assist with these are discussed in *system readiness.*

6.1.4. Summary of actions

Table 6-1: Summary of actions being explored toward market certainty

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Imple-menter	Additional steps to articulate in implementable form
1.	Market certainty					
1.1	Provide confidence in the implementation of sufficient years' worth of REIPPPP	Announce dates of procurement rounds for sufficient future rounds of REIPPPP	6 mo	DMRE	IPPO	Concurrence from decision makers
1.2	Establish a consistent set of local content policy criteria	Set bid RFP criteria for the same period	6 mo	DTIC	IPPO	Concurrence from decision makers
1.3	Develop consistent trade and industrial policy that builds a competitive environment beyond public procurement mechanisms.	This suite of policy actions is cross-referenced in the 3. Local content policy levers; and 4. Trade and export promotion levers	3 y	DTIC	DTIC	Concurrence from decision makers
1.4	Enable power-to-x market	Establish interface with the Hydrogen Society Roadmap and Green Hydrogen Strategy, to enable implementation and ensure manufacturing sector capacity trajectory to suit demand trajectory	3-10 y	DSI, IDC, DTIC, DMRE	DSI, IDC, DTIC, DMRE	
1.5	Cross-reference *system readiness* for enabling offtake diversity in the medium term					

6.2. Development of local content policy

Development of local content policy is relevant to ways in which various workstreams can be enabled. Herein, the particular mechanisms around designations and policy implications for public procurement are explored.

A primary tool for import substitution presently leveraged is designations. Designations are a powerful tool where the specific components' local value-add in the long term are well understood and there is a strong ability to define and forecast capacity. In private-to-private contracting, the premise is that with sufficiently binding conditions on an offer to supply, through the back-to-back contract chain from supplier through OEM and EPC, a bidder should be able to hold a local manufacturer to a commitment to produce the required capacity. The local supplier needs to either have the capacity available at risk (i.e., based on longer term market certainty), or to be confident in the ability to scale in the required timeframe – an investment difficult to commit to without the certainty of a notice to proceed after financial close. When this chain breaks down, players will resort to applying for an exemption. Should this exemption be granted, where bidders have some confidence that exemptions would be granted, the case for bidding with local content falls over as there is no longer a level playing field. Legal challenges follow. In a rapidly innovating tech sector, designation has an Achilles heel – it is unable to track the evolution of the technology. In this protected context, there is little incentive for local suppliers to innovate and, as variations on the solution are offered for import, the argument can be made that such products are not available in the country and hence exemption should be granted. Designation is constantly playing catchup rather than enabling a responsive market. With these limitations in mind, stakeholders are seeking alternatives.

6.2.1. Public procurement levers: REIPPPP

Up to the fourth window of the REIPPPP, a deviation from the PFMA was leveraged to incentivise a set of economic development objectives. A 70/30 adjudication weighting permitted 30% to be evaluated on the basis of a combination of parameters in addition to price, including socio-economic development, enterprise development, local content, Black and women-owned participation. This delivered outcomes as shown in Table 3-1, above.

In the fifth bid window, the adjudication framework was changed to the 90/10 weighting as required by National Treasury, rather than the 70/30 weighting deviation previously employed. Feedback from potential manufacturers has been that this change decreased the ability to invest in local content, indicating that in the 90/10 system we can only ensure the use of existing manufacturing capability but will not appropriately incentivise new investment.

If a reversion to a weighting system that deviates from 90/10 is being considered, the way in which that 30% is scored must be re-evaluated. While this has delivered significant movement, as shown in the achievements exceeding targets across many categories, it is notable that local content, achieved at 50%, was well above the threshold, however below target. Much of this was achieved through the natural localisation of balance of plant and where manufacturing facilities were established, many were unable to sustain themselves when the implementation of bidding rounds was interrupted. Further, it has been argued that, with local content measured in percentage of Rand value and scored on a relative scale, the system was susceptible to being gamed by bidders to drive up their scoring while minimising the amount of domestic manufacturing value-add. The percentage of CAPEX approach has unintended perverse incentives embedded – notably to reward inefficiency by rewarding higher cost local content. This drives down the competitiveness of the local products and services on the global stage. They require ongoing protection against more competitive imports and lack the ability to bolster the sustainability of their business by securing additional offtake markets in export abroad.

The proposed evolution of public procurement rules to respond to these challenges, subject to first exploring a deviation from 90/10 with National Treasury and the IPPO, is to shift that part of the bid scoring allocated for local content from a percent of CAPEX system to a points-based system. Points systems have been used effectively in such markets as Morocco and Turkey, for example. A points-based system would entail tabulating the list of components with points allocated to each one. In designing the table, the number of points allocated to each component can be chosen to have weighting toward those with highest value-add in terms of jobs and GDP contribution relative to what premium there may be on producing them locally versus importing. The OEMs can select from the list to meet

the targets and set the level of bid competitiveness. With OEMs able to choose, it opens the ability for them to develop manufacturing capacity in a competitive way and to contribute to local content requirements at the same time. This enables firstly ratcheting up the amount of local content as the market grows, following what is competitive and sustainable in the longer term as well as adapting to the evolution of the market.

Bidders choose how competitive they would be in the commitments in their bid – i.e., how many points they score. If the manufacturing capacity is not there at the outset, then across the board there will be low scores. Those who are most aggressive in establishing local capacity will score higher. In ensuing rounds, as capacity grows in this way then scores across the board rise. With such commitments driven by the incentive to outbid, the capacity tracks the commitments and the market growth.

In summary, a points-based system

1. Does not contain an embedded incentive towards less efficiency; and
2. Is not as easy to influence the relative ranking of scores by bidders (“gaming the system”) as the percentage of CAPEX value system is; and
3. Encourages building competitiveness on the international stage, requiring less protection.
4. Enables OEMs to focus on strategic development of local capacity where it is most competitive, leveraging areas where the domestic context provides most advantage and will be able to establish itself most sustainably; and
5. Adapts to the market, encourages innovation and tracking evolution of technology internationally; and
6. Enables progressively ratcheting up as the market grows; and
7. Includes the ability to provide some steer toward most efficient domestic value-add.

A points system does require good data and design to be effective. As with any preferential procurement system, it still bears the impact of adding a weighting factor for non-price parameters that increases the energy tariff from that which would have been the case without such scoring.

There are believed to "low hanging fruit" for industrialisation in RE value chains that can be achieved without preferential procurement mechanisms. This includes identifying existing industries that can supply components to the renewable energy value chain as an expansion to their existing customer base in other sectors or with a small pivot. Examples of this include the likes of cable tie suppliers. The goal of this work would be to characterise and document the best path to capitalise on this opportunity.

6.2.2. Exploration of value-add to the economy from localising components

The trade-off of domestic economic value add is raised in consultations. Research and modelling inputs to SAREM have explored the relative potential price premiums for local production of key components in South Africa, alongside their gross value add to the economy. These were viewed in combination with a macro-economic model that considers the impact on the economy of capital injected into such a premium. Taking into account the economic value-add from the manufacturing of key components, the indication of these models is that it is worth exploring localising certain components, notwithstanding that it may incur a level of premium.

There is a spectrum: from components that are on the cusp of competitive to manufacture locally under some conditions of input costs to those that incur some premium; however, where such premiums can be kept manageable by ensuring the market clears efficiently, the gross value-add results in a net positive impact. There is an ongoing data gathering to refine model inputs. With increased robustness of data and social accounting matrices’ multipliers, it will inform the prioritising of components to support and indicate those that may be inefficient to localise competitively.

Local assembly, for example of nacelles, is naturally required for incorporating any sub-components locally produced and is demonstrated to catalyse including additional components as the capacity grows. See summary of initial grouping in 4.3, above.

6.2.3. Policy and investment support across other workstreams

The suite of DTIC directorates' existing tools and mechanisms to boost competitiveness and promote investment may be targeted to renewable energy manufacturing and arranged so as to maximise their accessibility to potential investors e.g., through a one-stop shop kind of packaging. There are a few examples where these can be explicitly leveraged within this plan, including:

- The Black Industrialists Programme
- SEZs and eco-industrial parks:
  - Establish in Just Transition hotspots in order to boost their competitiveness for locating there, for example in the EMalahleni REDZ in Mpumalanga. Eco-industrial parks are a possible model for repurposing initiatives.
  - Strategic infrastructure build and flexible lease terms to reduce lead time and mitigate market certainty risk, proactively establishing top structures suited to major component manufacture
- Export promotion and incentives as structured for the Auto sector - Auto Investment Scheme (AIS) and Auto Production and Development Programme (APDP)
- Critical Infrastructure Programme
- Capital Projects Feasibility Programme

6.2.4. Summary of actions

Table 6-2: Summary of actions being explored toward local content policy

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Imple-menter	Additional steps to articulate in implementable form
2.	Local content policy					
2.1	Institute 70/20/10 adjudication weighting with points-based scoring table for components in REIPPPP.	Application to National Treasury for REIPPPP adjudication weighting of 70/20/10. Aligned with legislation 10 points toward transformation, 20 points to local content and 70 on price.	3 mo	National Treasury	DMRE, IPPO	Concurrence from decision makers
2.2		Add points-based scoring table for components in the RFP.	3 mo	DTIC	IPPO	DTIC and SAREM Project Team review data and models to propose scoring table. Task team explore optimisation within qualification criteria and minimum threshold to maximise use of existing local manufacturing capability.
2.3	Target existing suite of investment support to renewable energy competitiveness and make accessible	Build accessibility and knowledge of suite of incentives – e.g., through 1 stop shop. Target suite of incentives to renewable energy manufacturing (12i, CPFP, CIP, SEZs, CCA, export promotion)	1 y	DTIC	DTIC	Concurrence from decision makers and refine

6.3. Competitiveness of local manufacturing

The South African manufacturing sector is currently in survival mode due to many factors, including the small size of the domestic market, the threat of cheap imports, policy uncertainty, high input costs and a limited skills base. It is important to the sector's future that the local market be dynamic, growing and competitive. A review of the barriers to local competitiveness assists in identifying which levers in which workstreams will unblock this. Deloitte has identified the most important aspects influencing manufacturing competitiveness in South Africa: cost and availability of labour and materials, local market attractiveness, energy cost and policies, economic, trade, financial and tax system, physical infrastructure, supplier network government investments in manufacturing[19].

The insights below come out of industry consultation. Discussion on competitiveness with industry often return to the baseline theme of inability to make an investment decision and secure capital that is not priced commensurate to market risk because of uncertainty in the market.

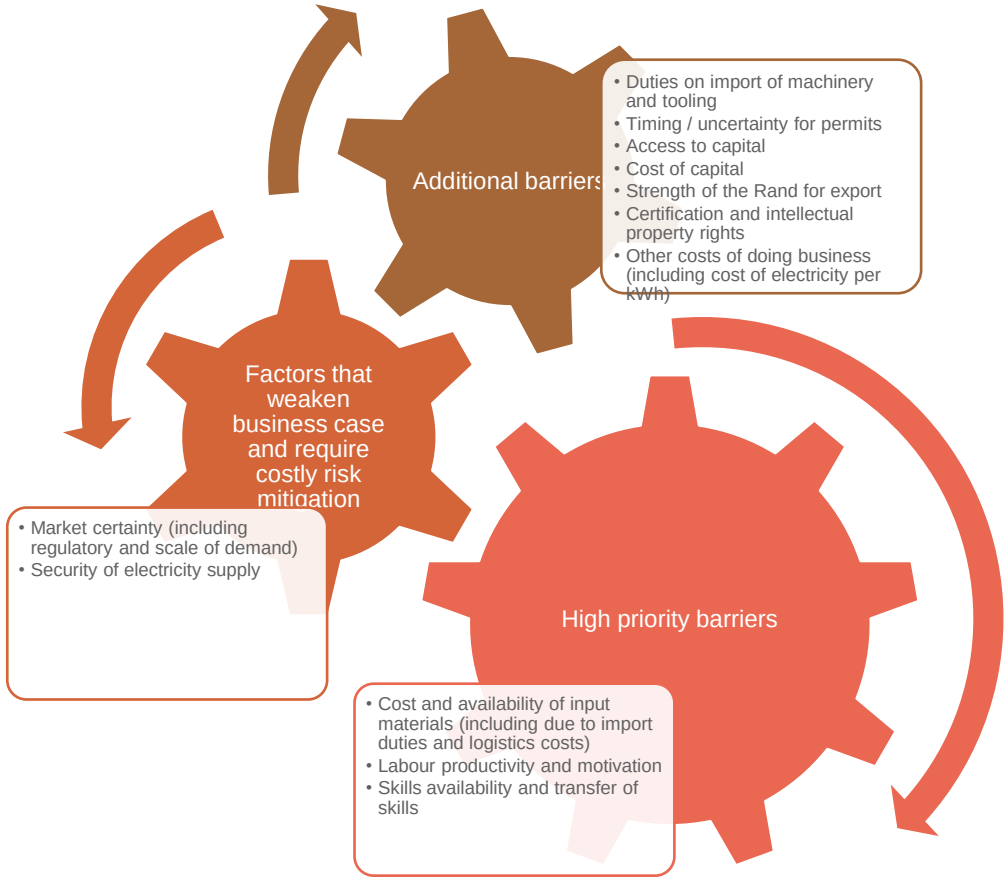


Figure 6-2: Barriers to competitiveness

Competitiveness of local manufacturing is a *path* to local industrialisation rather than a workstream on its own. The two paths to growth of local content are on the one hand, a policy framework that may *mandate* import substitution, and on the other hand being able to compete with imports and hence enable the market to naturally clear with procurement of local products and services. These two paths are illustrated in Figure 5-2, above, which shows the system dynamics of the inter-connected paths of competitiveness and protection through policy.

In this context, policy support comes clearly in two distinct areas:

[19] Deloitte, 2013. "Enhancing Manufacturing competitiveness in South Africa ", https://www2.deloitte.com/content/dam/Deloitte/dk/Documents/manufacturing/manufacturing-competitiveness-South-africa.pdf

1. Protection of local industry (a proxy for competitiveness through import substitution); and
2. Direct support to decrease the cost of doing business

The targeting and commitment of existing programmes is discussed in 6.2.3, above. How the workstreams collectively contribute to competitiveness as an enabling path is illustrated in Figure 6-3, below. The specific actions are detailed in the relevant chapter for each.

Distortion of the market clearing price is as a concern where there is insufficient competition locally. Having multiple players in a protected market is hence required and the business case for establishing more than one player rests on the confluence of the factors herein.

Market certainty is addressed in 6.1 and not presented as a competitiveness lever per se; however it is acknowledged as a required foundation upon which to make a sustainable business case and that there are circumstances in which failure to secure a long term pipeline of offtake results in direct impact on the cost of overheads relative to margin, driving down the ability to be price competitive. Similarly, uncertainty of electricity supply directly impacts the ability to make a compelling business case and may require mitigation through additional overheads such as auxiliary power supply and energy storage. While private generation of renewable energy is being widely adopted to drive down costs, it does not directly mitigate security of supply risk unless coupled with system additions such as auxiliary power and battery storage that are not yet net neutral or cost-saving. The imperative for South Africa to exit from load-shedding is hence clearly reinforced herein.

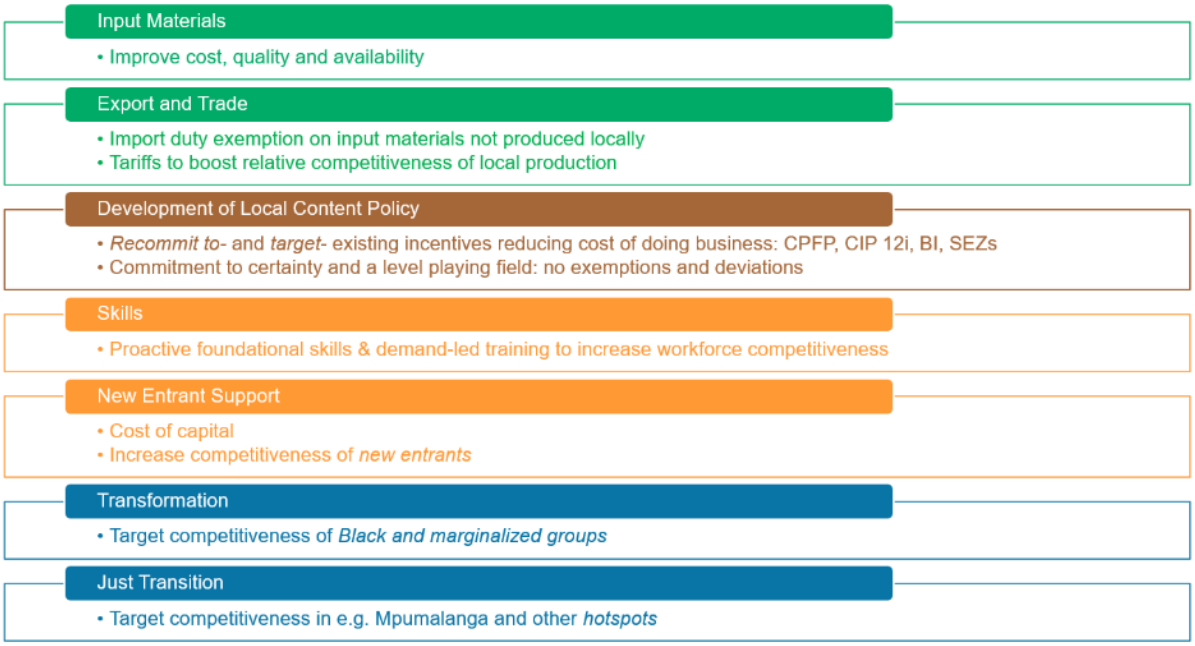


Figure 6-3: Workstream elements contributing to competitiveness

Skills transfer and development is acknowledged as one means by which to increase relative productivity and build a more competitive workforce. Some industrialists share that they struggle with what they describe as “motivation”, as reflected in their experience of work stoppages, in particular during production periods critical to timeous delivery for commercial operation deadlines. This has a knock-on effect on the confidence of their customers and the relative cost of production. This task team has not yet taken sufficient time to explore the relevant labour unions’ perspectives on this concern and whether there are potential solutions to be co-created to achieve a social compact. This is an area still to explore further. Seen as an opportunity, the championing of proactive training of workers, as contemplated in the *skills* workstream (6.9), could position the workforce to drive competitiveness.

All actions reinforcing competitiveness area are captured in other work areas.

6.4. Input materials cost, quality and availability

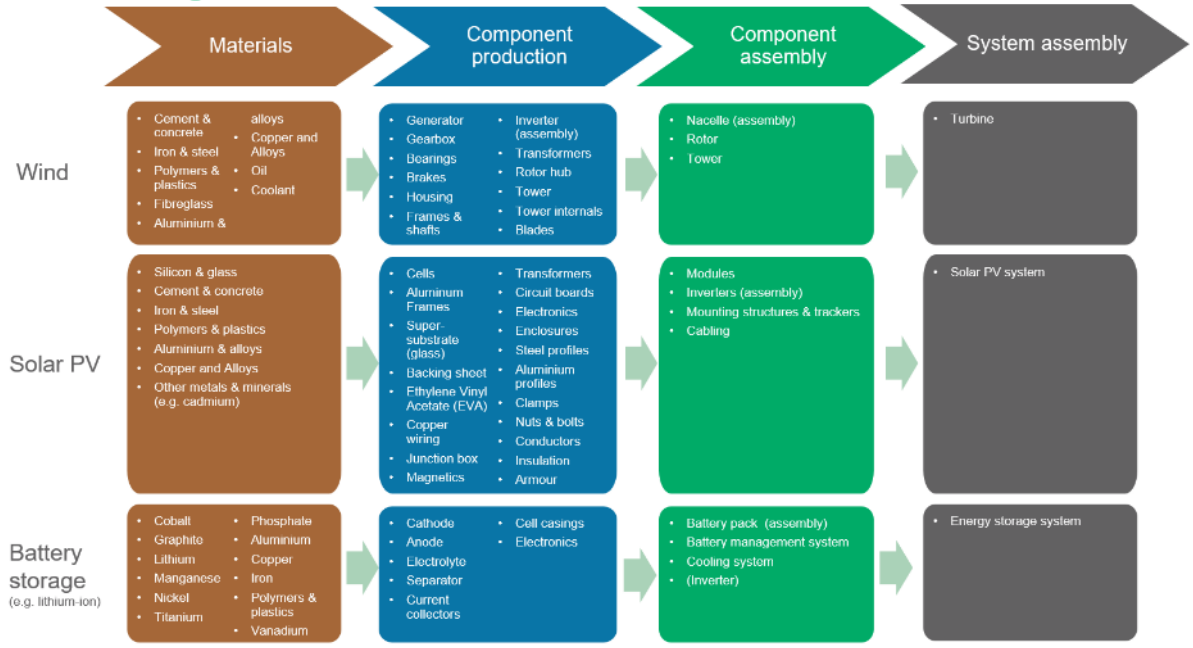
In order to produce competitively priced products that meet offtaker quality standards and can be supplied in time with the supply chain needs to reach commercial operation deadlines, input materials have been raised as a critical consideration.

This plan's focus on industrialisation means it looks to maximise beneficiation of materials locally by manufacturing facilities. As such, where suppliers of raw materials may have export markets and local manufacturers to serve, this plan would be focussing on enabling local manufacturers' access to such materials at competitive rates rather than on enabling export of raw materials sought by a growing renewable energy value chain demand internationally. In some cases, such raw materials have been earmarked for local beneficiation already and are hence protected by duties on the same material imports. Where this has introduced a price differential or a constraint in quality or availability of such materials, a trade-off is identified between enabling competitive local manufacturing versus protecting a local raw material market. In photovoltaics, South Africa is up against a steep disadvantage against China, where the leading global cell and module manufacturers are strategically supported by government. China encourages such beneficiation by constraining export of raw material and heavily incentivising export of completed products.

Looking at sector-specific policies in isolation can lead to unintended consequences in other sectors. For example, according to Intellidex, BUSA, BLSA study in May 2021 "the prioritisation of the basic iron and steel sector has been criticised for raising the costs of downstream activities in the metal products and other sectors, raising the costs of inputs for these sectors"[20]. This same study, referencing South Africa in an EU Chamber of Commerce and Industry in Southern Africa, observes that local content requirements increased the costs of production in the renewable sector by about 10%. Protectionism and industry concentration in the iron and steel and plastics sectors meant that imports were often cheaper and of better quality than local suppliers, limiting the options for localisation. This drives home the need to consider the combination of policies holistically, with an integrated system view, including through their respective sector-specific masterplans.

[20] BUSA, BLSA, Intellidex, 17 May 2021 "Localisation: what is realistic"

Table 6-3: Material inputs and beneficiated products



The table maps the beneficiation phases for each of the major technologies in IRP2019. Of these, the following have been flagged, meriting a deeper dive with manufacturers, suppliers, DTIC, ITAC, and other Masterplans relevant to those materials.

1. **Steel** is a protected material. It is a primary input to products across the sector that have potential for localising or are already being locally manufactured to some extent. Foundation re-enforcing cages are already a significant steel consumer. Wind turbine towers and flanges are already being locally produced; albeit that an increasing number of wind turbine OEMs now have a concrete tower solution, reducing the number of possible offtakers. Solar PV mountings, inverter casings and transformers are all low hanging fruit that depend heavily on steel as an input. Constraints in cost, specification and availability are the subject of existing dialectic between the local steel supply and offtakers. This task team relies on exploring resolution through close interface with the Steel Masterplan.
2. **Aluminium** is a material part of solar panel module assembly, with aluminium frames being locally designated.
3. **Glass** is protected locally and is an input into solar panel module assembly.
4. **Battery minerals**: South Africa has reserves in certain battery-related minerals, e.g., metric tons: Platinum group metals 63 000, fluorspar 41 000 million, rare earth elements 790 000, cobalt 29 000, manganese 230 000, lithium resources unknown, nickel 3.7 million, vanadium 3 500[21]

[21] GreenCape, 2021, Market Intelligence Report: Electrical Vehicles

6.4.1. Summary of actions

Table 6-4: Summary of actions being explored in input materials

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Imple-menter	Additional steps to articulate in implementable form
3.	Input materials					
3.1	Import duty exemption on strategic inputs	Analyse trade-offs on key materials that are protected locally and resolve on exemption or other mitigations where supply constraints reduce competitiveness of priority components. Apply import duty exemptions to strategic input materials.	3 mo	DTIC	ITAC	Additional data from manufacturers on critical inputs. Further interface with Steel Masterplan. Concurrence between DTIC and manufacturers on applicable qualifying inputs
3.2	Improve competitiveness of local materials	TBC	TBC	TBC	TBC	Other Masterplans, such as Steel. Build platforms for interface between OEMS, developers, and input material providers – neutral ground.

6.5. New entrant support

Entering the supply chain of global value chain players and OEMs is an opportunity both for startups and for established manufacturers currently serving other sectors; however, it presents challenges even to those are not facing the challenges generic to new ventures in any sector. It is helpful to break the needs here into two categories: those business development and capacity building needs generic to all new ventures and small businesses and those barriers to entry specific to this sector and its contracting framework.

Overlaid onto this work area is the imperative to target interventions toward the objectives of transformation and integrating with Just Transition hotspots. To this end, beneficiary selection can be focussed on Black persons, women, youth, rural communities, those with disabilities and businesses located in hotspots such as Mpumalanga.

On-boarding a new supplier into a major OEM's supply chain is non-trivial and time-consuming. Provided that the OEM has an incentive to do so in the first place, new suppliers need to be identified, vetted, audited and their product must be proven to meet all standards and certification requirements. Major changes to the supply chain affect conditions of financing, for example IEC certification, and require updates to such certification. In all, this can take 12 months, before actual production commences. This timeframe is beyond what is workable between Notice to Proceed and COD. While it may be conceivable to implement between RFP and COD, it is more conducive to make the decision to undertake such onboarding is made on the basis of a longer term understanding of the RFP requirements such as would come from the announcement of several rounds' worth of bidding windows at a time. This is a short-to-medium term market certainty lever, as described in 6.1. Once an OEM has adopted a new supplier, it is within their interest to mentor them to build capacity, improve quality and efficiencies and integrate into a broader network of secondary suppliers. Such mentoring is an opportunity for industry to voluntarily contribute to building capacity and is demonstrated in several case studies, e.g., by Goldwind and Siemens.

Emerging suppliers are not in the position to put up warrantees and guarantees to the extent that the global value chain players can. Several contracts' worth can quickly exceed their balance sheet. Innovation with a blended finance instrument may assist. Industry players have innovated on warranty arrangements in which a third party is introduced to assist with derisking.

Investing in factory expansions or new facilities at risk, without a sufficiently sized committed order book, is challenging against the backdrop of short-to-medium market uncertainty. Even if investment decisions are to be made on a critical mass from a single successful bid, investors struggle to secure binding conditional orders at the time of bid and are similarly unable to make binding commitment to supply as they are unable to raise capital on the basis of conditional orders in bids. While the ultimate solution to this lies in the market certainty built on securing momentum in public procurement and track record in the private offtake market, there may be an interim means to backstop such commitments in the uncertain period between bid and notice to proceed with an innovation leveraging blended finance.

6.5.1. Summary of actions

Table 6-5: Summary of actions being explored toward new entrant support

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Imple-menter	Additional steps to articulate in implementable form
4.	New entrant support					
4.1	Develop solution to warrantees and guarantees	TBC	TBC	TBC	TBC	Follow up with task team members who offered to champion warranty models with 3rd party
4.2	Blended finance instrument for guarantees and factory investment	Craft blended finance instruments that a) assists smaller suppliers to put up guarantees in bids and b) provides capital for factory investment to enable commitment pre-financial close	TBC	IDC, DBSA	TBC	Follow up with DBSA, IDC, banks through BASA on opportunities.
4.3	Mentoring of emerging suppliers by OEMs	Identify and on-board emerging suppliers	TBC	Industry	Industry	Identify existing mentoring programmes and voluntary commitments by OEMs
4.4	Target existing business incubation and capacity building support to emerging suppliers	TBC	TBC	TBC	TBC	Identify host for generic business development support in existing programmes
4.5	Target the above to Transformation					
4.6	Target the above to Just Transition hotspots					

6.6. Trade/export support to access regional opportunities

Access to export markets alongside local offtake helps local manufacturers to make a sustainable business case. In the medium term, the domestic demand based on the renewable energy pipeline in the IRP and the timing of its procurement, is considered by some major component suppliers and OEMs to insufficient on its own to provide the offtake certainty to invest locally. Export market share decreases market certainty risk and smooths out lumpiness on local procurement programmes such as REIPPPP – both with respect to the timing reflected in PV in the IRP and to the uncertainty in implementation.

In the medium term as local renewable energy offtake markets may become more diverse and less dependent on public procurement levers, trade and industrial policy comes to the fore. The medium-to-long term objective should be to make local producers more competitive on the global stage.

Markets considered include not only continental Africa, with the hope of leveraging the AfCFTA, but also internationally, e.g., to the USA. GRI's wind tower production facility is an example where the ability

to fill some international orders assisted them to weather the hiatus in the REIPPPP implementation between Bid Window 3 and 4.

Global Value Chain players allocating market share to South African production would be a win – what would that take? At present, some OEMs indicate that, bringing all available incentives to bear they are still challenged to make the case for shifting production capacity from other countries to South Africa to serve their international distribution. If they are not well beyond the cost-benefit tipping point to do so, the uncertainties around the local offtake market swing the decision. Thus, the local and export market are intertwined – the case for setting up to serve the domestic market requires the ability to serve some export market and this requires that establishing locally is supported in such a way as to enable their competitiveness against production outside South Africa.

In order to hone in, it helps to parse levers for supporting this workstream into

1. Tools already available to investors in some form (e.g., the suite of export support incentives, methods to apply for exemptions etc); and
2. How to make them more accessible to those considering a local investment, targeting them to the specific industries in the sector and packaging them – largely the existing domain of investment and export promotion agencies and the DTIC. Requests from industry include access to consolidated, coherent and comprehensive investor information (include finance, tax etc.) in 1-stop format, coordinated export promotion, especially focusing on SADC and the AfCFTA.
3. New tools or improvements

Three themes emerge, two of which are strongly cross-cutting: competitiveness, input materials and export promotion.

6.6.1. Competitiveness

Competitiveness through all the measures contributing to that path as discussed in 6.3, in particular through such programmes as SEZs with their Customs Controlled Areas (CCA) and the suite of existing DTIC programmes (including 12i, CPFP, CIP) identified in 6.2.3.

6.6.2. Input materials

Input materials are identified as a key determinant of ability to compete internationally. This workstream looks to identify what inputs would be required for inclusion for under Schedule 3 and 4 in order to make export competitive and whether DTIC and ITAC would consider their exemption. Ad hoc applications have been made in the past and failed. This indicates a deeper dive required into trade-offs, discussed in some detail in 6.4.

6.6.3. Export promotion

The Auto sector is often raised as a model for what may be possible through trade and industrial policy, in particular where the market turns beyond the REIPPPP for certainty. Export promotion, leveraging the learnings from the Auto sector would require understanding what the parameters for decision-making would be to establish an equivalent to the Auto Investment Scheme (AIS) & Auto Production and Development Programme (APDP). This task team, bringing to bear the relevant directorates within DTIC would articulate this further.

6.6.4. Summary of actions

Table 6-6: Summary of actions being explored in trade and export promotion

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Imple-menter	Additional steps to articulate in implementable form
5.	Trade/export support to access regional opportunities					
5.1	Export promotion, incentive framework	Support local manufacturing competitiveness through incentive structure and export promotion embedded in trade and industrial policy. Institute system of export credits for renewable energy components	TBC	National Treasury, DTIC	DTIC	DTIC explore the parameters for decision-making for emulating the Auto Investment Scheme (AIS) & Auto Production and Development Programme (APDP). Global Value Chain leaders and DTIC reach concurrence for conditional investment commitments.
5.2	Bilateral arrangements with other countries	To be explored, in particular in Africa	TBC	TBC	TBC	To be explored. Include engagement with ITAC on strategic designation of components under AfCFTA

6.7. Transformation

As one of the primary objectives of SAREM, of building an industry that is inclusive and demonstrably transformed, this is a work area that does not stand alone as a distinct set of activities in isolation from the rest. Transformation cannot be seen separately from the other work areas but must rather be viewed as an intent embedded across the system view, such that each implementation plan element has a lens on its activity that looks to ensure inclusiveness. As such, while there are some implementation plan elements that can be championed under this theme, it is viewed as an outcome driven by an awareness and a targeting across multiple work areas.

How transformation is defined has been guided by focus groups' clear communication that it is built on the principle of inclusiveness. In this light it looks to enable Black, gender-inclusive, youth, people with disabilities and rural communities' active participation. Throughout, this is the intent where marginalised groups are referred to.

Consultation indicates a widely held view, also reflected in the imperative to REIPPPP Round Four bidders to integrate "boots-on-the-ground" shareholding in IPPs, that inclusive participation in the sector must go beyond passive equity in assets. Active ownership in manufacturing and services is encouraged. This is where the scope of SAREM, in the industrial capacity serving customers such as these IPPs, comes into play. We focus on industrialisation of the value chain. In the past, BUSA, BLSA and Intellidex (2021) report that foreign firms have been discouraged by the costs associated with PPPFA and BBBEE compliance and chosen to sell their products through South African agents rather than invest in local capacity and transfer equity to domestic partners. This raises the price of domestic output and still doesn't achieve meaningful local participation. The SAREM interim research summary report, December 2020, generated a set of typologies for structuring a local manufacturing business in which there are various modes for local and Black participation demonstrated. This is shown in the Figure 6-4, below, and it provides a set of options to explore when considering the most suitable model to encourage meaningful and inclusive empowerment. The relationships between owners could influence the relative distribution of benefits. The type of manufacturing facility also influences the extent to which the local production facilities can meet local demand, especially concurrent demand for a number of projects/OEMs.

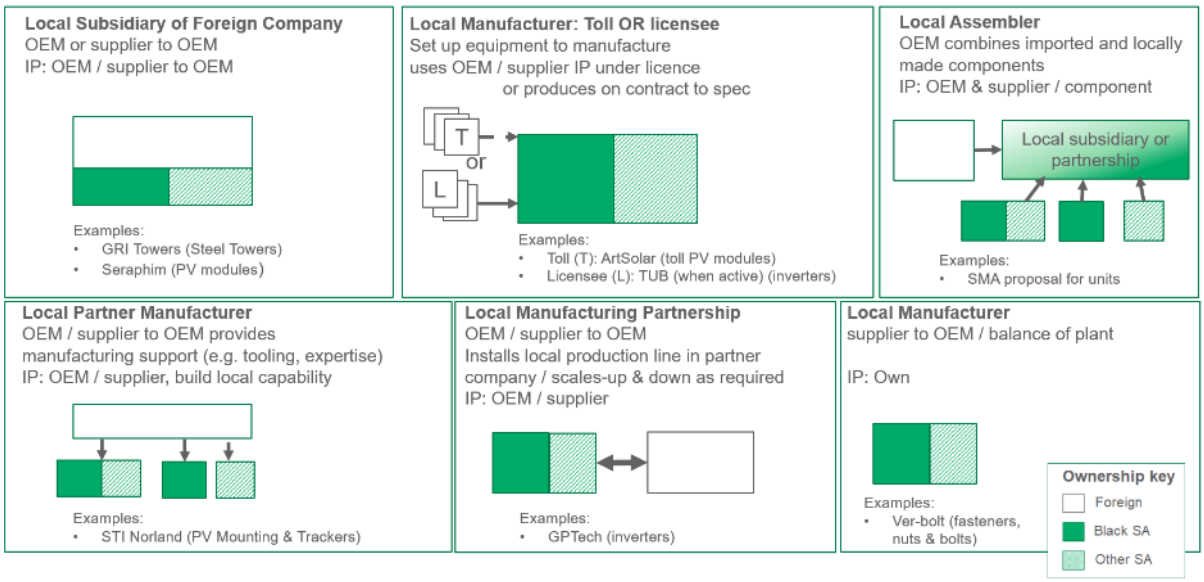


Figure 6-4: Typologies for structuring local manufacturing business ownership

From the focus groups, five areas of opportunity emerged which, when fleshed out as in Figure 6-5, below, reflect the complexity of the picture. It is indicative of the fact that this is a systemic effort, which by definition needs to be embedded in the intent across all areas. Where people exist in the industry, so does the imperative for inclusivity. These are the five areas of opportunity:

1. Effective implementation of transformation strategies
2. Access to opportunities – e.g., via public procurement and policy
3. Increase ownership in value chain
4. Increase competitiveness of inclusive business
5. Increase competitiveness of inclusive workforce

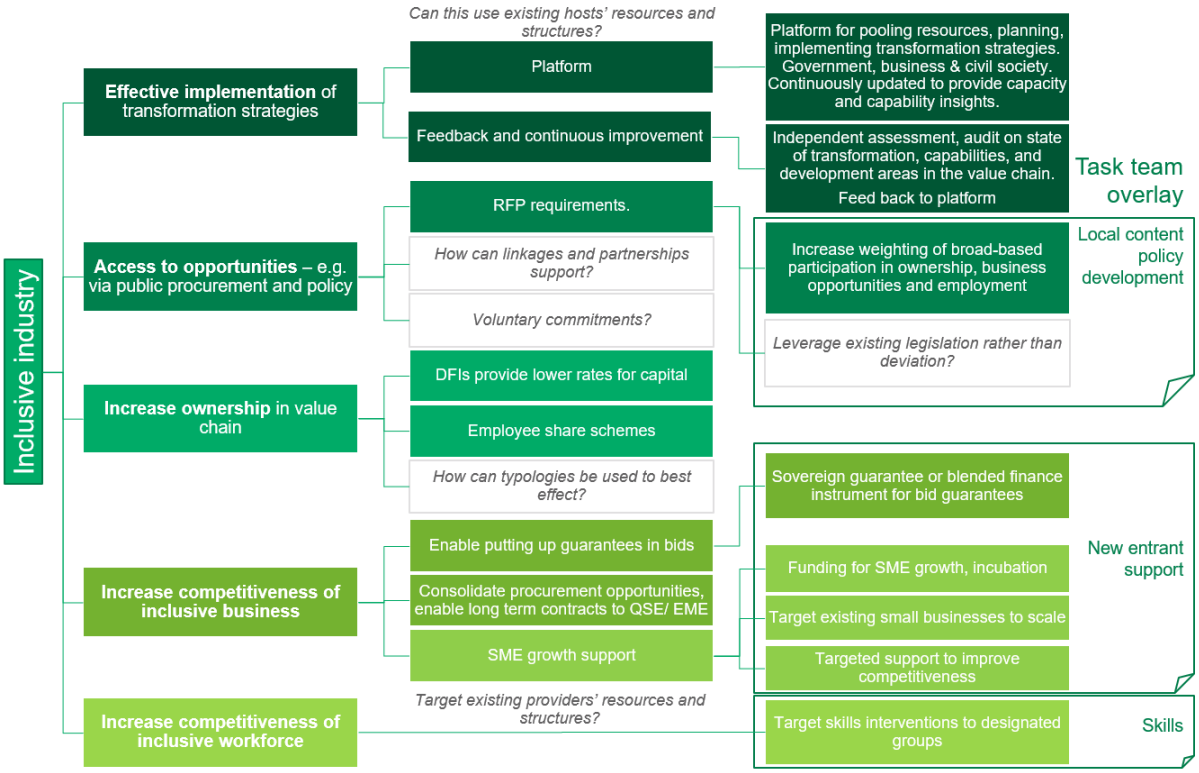


Figure 6-5: The view generated from consultation, reflecting the complexity of the work area

In counterpoint to this, the refrain has also been that we need to keep the focus simple, else we risk diffusing efforts into a distributed set of uncoordinated activity that has less impact overall. In order to get to this core set of implementation plan elements in this work area, consider what can be done to customize things we already have, embed the intent into workstreams that can target interventions toward inclusivity and focus on what is left that is aspirational, implementable and can be championed by all social compact partners.

There is a set of levers that are foundational and need to be in place to inform the development of good strategies and support decision making. These are housed in the grouping “Effective implementation of transformation strategies”, combined with the recurring refrain of policy certainty, as discussed in Market Certainty. To put effect to this, ensure there is a host platform that carries the strategic intent for effective implementation and credible feedback. The host would establish a multi-stakeholder steering committee and resource an implementing agent where necessary to support actions. The scope would provide for pooling of resources, coordination and planning, oversight and tracking. Within the scope of this platform should be the mandate to conduct periodic audits of the state of transformation within the renewable energy manufacturing industry to provide a feedback loop to stakeholders on the effectiveness of implementation strategies.

Rather than duplicate efforts and resources, it would be efficient and effective to leverage and target existing programmes such as the Black Industrialist Scheme – to have a renewable energy manufacturing focus and carry some of the strategic oversight and/or implementation where it matches their remit. In the latter case, *new entrant support* levers related to capacity building of emerging suppliers is an example.

Work areas that would pick up on elements of the rich picture in Figure 6-5 would do so by ensuring that their interventions target inclusivity. These include *local content policy development, skills* and *new entrant support.*

The remaining levers for exploration yield the following proposed actions and areas for follow-up:

The role of capital was split by the task team into two aspects:
1. How to incentivise transformation through procurement by IPPs and other private sector; and
2. How to provide capital for factory startup and expansion at competitive rates

These constitute distinct levers in each of *access to opportunities* and increasing *ownership in the value chain*.

6.7.1. Access to opportunities

With the focus on REIPPPP’s requirements on economic development, in particular on the shift from the 70/30 adjudication weighting, which included deviations from BBBEE legislation, to the traditional 90/10 weighting in Bid Window 5, there is notable debate on the best ways to further transformation objectives through REIPPPP rules. Leveraging public procurement is discussed in further detail in the section 6.2.1 above. Achievements in supply chain transformation with the 70/30 system are tabulated in Table 3-1, above. It remains to be seen how effective it will be for supply chain transformation to have leveraged the existing legislation in Bid Window 5 and the market awaits feedback on this with data from the assets once they are established. The proposal under discussion in 6.2.1 above, is to maintain the 90/10 system’s 10% allocation to transformation, while introducing a further 20% weighting on local content through a points system – effectively a 70/20/10 scoring, where 70% is on price. The set of additional measures to increase access to opportunities discussed herein should be brought to bear.

The first point on capital discussed above speaks to the growth in the amount of growth in renewable energy capacity enabled by private sector procurement – e.g., as signalled by the 100MW generation licence cap change. This is an opportunity to explore additional levers beyond the procurement rules in

the REIPPPP to require or incentivise transformation in the value chain. This is a theme across workstreams. Here, it is posited that there is motivation for DFIs, through their socio-economic development mandate or debt and equity providers with some requirement to demonstrate such objectives in their investments, either as impact investors or through ESG imperatives from their fund participants or shareholders. If these capital providers placed such requirements on their investees, it could be a means to require them to ensure inclusive participation in their management structure and through procurement.

In private procurement, while it would be considered by some to be counter to the intent of reducing bureaucratic constraints on embedded generation to load requirements on registration of all small embedded registrations, including some requirement on those generation licence applications above the 100MW threshold has put forward.

6.7.2. Increase ownership in value chain

The second point on capital responds to the concern raised that capital providers for Black equity and community trusts (in the example of IPP generation assets) have historically demonstrated a perception of risk reflected in their rates. If such risk perception were to be addressed, rates could come down for supporting capital for such investment in manufacturing facilities. Again, DFIs with a developmental mandate could make capital available at preferential rates. The IDC is an active player in investment in renewable energy manufacturing and may leverage blended finance in this way. This requires further exploration with task team members such as IDC, DBSA, DTIC Black Industrialist programme and the major lenders through BASA.

Employee share schemes have been touted in other Masterplans and have been put forward by labour participants in particular as one of the paths to inclusive participation in ownership. This task team needs to explore this further, with deeper participation by the Labour members to co-create possible initiatives with interested industry participants.

6.7.3. Private sector and corporate values

Outside of public procurement levers and policy directives, there are a set of opportunities for private sector to influence the system either through direct investment or through incentivising via their values applied in procurement. These have been proposed directly in task teams focussing on transformation and integrating with Just Transition hotspots and could also be applied to incentivising general localisation and supply chain development.

The scale of these is non-trivial, taking indicative numbers from recent announcements by Sasol (1200 MW by 2030)[22] and the Minerals Council (a medium-term opportunity of 2000-3000 MW), combined with announcements by other major corporates, several thousand MW of procurement presents a low hanging fruit for commitments to social objectives aligned with the values of major players in the economy. Seen in the context of supply chain, such procurements would be counted toward the scorecard. Based on the existing BEE Codes, the framework for such scoring exists and the action here would be for such corporates to indicate their intention to aspire to a level of transformation and to apply the codes to their procurement. Suppliers then have a clear imperative to develop and demonstrate their levels of transformation.

There is a similar suite of opportunity applicable to Eskom's own procurement. Eskom is subject to the PPPFA which is prescriptive in its scoring with regard to historically disadvantaged individuals, women, and youth as beneficiaries. Eskom is further subject to the prescripts of NIPP and is committed to

[22] https://www.theafricareport.com/130239/south-africa-sasol-to-revise-greenhouse-gas-emissions-target-from-10-to-30-by-2030/

supplier development.

This is a path aligned with- and reinforcing- the items discussed above, forming a suite of opportunities outside of public procurement programmes:

- Employee shareholder schemes
- Procurement of energy by corporates, where supply chain is leveraged
- Voluntary supplier commitments
- Funds and lenders with ESG and impact imperatives

6.7.4. Summary of actions

Table 6-7: Summary of actions being explored toward transformation

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Imple-menter	Additional steps to articulate in implementable form
6.	Transformation					
6.1	Establish a platform for oversight of effective implementation of transformation strategies	Host to establish multi-stakeholder steering committee and resource an implementing agent to support the scope as described.	6 mo	TBC	TBC	Task team to identify possible host programme or department, propose structure and scope. Consider DTIC.
6.2	Scope and adopt employee share scheme model	TBC	TBC	TBC	TBC	Further input from Labour and interested industrialists
6.3	Include transformation criteria in public procurement	10 points of REIPPPP adjudication weighting to transformation.	3mo	DMRE, National Treasury	IPPO	Concurrence from decision makers
6.4	Transformation via private sector procurement through capital and corporate objectives	Supply chain requirements of local content and transformation	6 mo	Major corporates	Corporates (procurement manager), OEMs / suppliers	Task team to explore further, identify voluntary commitments c/o follow ups with major procurers including Sasol, Minerals Council. Engage with major OEMs/suppliers regarding transformation objectives
6.5		Requirements embedded in ESG / finance terms from capital providers	6 mo	Individual capital providers	Individual capital providers	Task team to explore further, identify voluntary commitments c/o DFIs, banks and funds. (Follow up with IDC, DBSA, BASA, Labour)
6.6	Competitive rates for factory investment capital	Develop finance offering at competitive rates for factory investment / expansion by transformed industrialists	6 mo	Individual capital providers	Individual capital providers	Follow up with IDC, DBSA, BASA
6.7	Cross reference other workstreams' focus (new entrant support, skills, local content policy)					

6.8. Integration with Just Transition hotspots

Contributing to a Just Transition is one of the key objectives of the industrialisation plan. Amongst the opportunities for job creation and economic value-add, where these can be co-located with hotspots such as Mpumalanga, it will add to diversifying these economies.

South Africa is committed to a sustainable development pathway. This notably involves moving towards a low-carbon economy. In a highly unequal society like South Africa, the need for a Just Transition, which would empower vulnerable stakeholders, has emerged as an imperative. Vulnerable stakeholders (such as workers, small businesses and low-income communities) should not be negatively impacted by the transition and should ideally be better off through it. A Just Transition can be defined as a framework to foster inclusive and empowering social dialogue and decision-making, mitigate negative impacts associated with the transition and effect positive solutions, and rectify or ameliorate situations of harmed or disenfranchised communities.

While the Just Transition agenda has an economy- and society-wide relevance, discussions in South Africa (and globally) have primarily focused on the coal value chain, particularly coal-fired power generation and associated coal mining. In South Africa, the bulk of coal-related operations is concentrated in (but not limited to) the Mpumalanga province, especially in eMalahleni and Steve Tshwete.

The mix of measures required to foster a Just Transition in South Africa is broad. It would encompass social dialogue, labour market policies, industrial policy, social protection and regulatory reform and enforcement. In the case of Just Transition hotspots, i.e., communities impacted by the coal transition, this calls for social engagement and upliftment, material support for vulnerable stakeholders (workers, small businesses and communities as a whole) and an economic rejuvenation and diversification of communities (considering all possible economic activities in and outside of the energy sector).

As part of the process for defining a list of levers whereby SAREM could contribute to a Just Transition, a focus group, facilitated by GreenCape and Trade & Industrial Policy Strategies (TIPS) explored opportunities. As part of an overall, broad strategy and mix of measures, the renewable energy sector can make a positive contribution towards a Just Transition on at least three key levels:

- The rollout of renewable energy-based electricity generation can provide a source of economic activity and employment through the deployment (project planning and design, procurement, construction/installation, operation and maintenance) of large-scale power plants and small-scale systems.
- Renewable energy technologies provide a platform to enhance the access to modern energy services by all, including through increased new ownership models; and
- The development of the renewable energy value chain, from the mining and beneficiation of minerals to the manufacturing of parts, components and systems, to the recycling of components, can generate economic activity and employment in the country.
- Across the board regardless of where they are geographically located, commitments to decent work commitments (working conditions, union access, gender, youth, etc.) and community / worker ownership schemes will contribute to a Just Transition.

Such channels are mutually supportive but largely independent from each other. In all cases, locating such activities in communities directly impacted by the coal transition (Just Transition hotspots) is paramount to foster a Just Transition.

The task team for integrating into Just Transition hotspots aims to champion a set of implementable levers. This work area requires continued refinement with deeper engagement, including in particular with the task team members from Labour and DTIC. Just Transition is a critical concern for labour. It involves a fundamental re-organising of the workforce as some sectors wane and others emerge. In the growth of a new economic sectors and opportunities for employment there is an opportunity for labour unions to secure a trajectory of sustainable employment.

Elements of various other initiatives have captured some of this intent, including the Framework Agreement for a Social Compact on Supporting Eskom for Inclusive Economic Growth, 2020. For most

unions, there is a recognition that the transition is underway, and the focus of concern is to ensure that it happens in a just manner. There are many facets to this, and these are expressed in aspects outside the scope of SAREM's influence, including on the structure of ownership and procurement of generation assets in a future evolving energy mix. Within the scope of SAREM, it is of primary importance to ensure that workers have the opportunity to continue to secure sustainable livelihoods and this means creating new economic opportunities and making these readily accessible to all who seek such opportunities, including unions' constituencies. Potential jobs in emerging renewable energy manufacturing constitute one such opportunity. It has been expressed in focus groups that, in order to secure such opportunities, the means to identify such potential placements, prepare the workforce for them and connect potential candidates will be a key enabler. This opportunity for potential placement in a different sector, in an industry that largely does not yet exist, is an intangible that presents considerable frustration to the incumbent union constituencies facing the transition. This is explored in the *skills* work area, in particular through two initiatives:

1. Skills development, identifying transferrable skills and leveraging existing institutional capacity to reskill workers employed in the coal sector; and
2. A platform to connect opportunities for placements to those with existing and transferable skills.

The model for implementing this is demonstrated effectively in NAACAM's High Gear, in which NUMSA is an active participant. Solidarity is another union with a proactive skills development approach, including a technical training centre.

In the implementation framework of SAREM, contributing to a Just Transition can be taken to be a cross-cutting objective, in a similar vein to building a transformed and inclusive industry. It should be taken as a lens on the spectrum of possible industrialisation levers, whereby opportunities should be sought to target such levers to encourage integrating with the economies of hotspots. Examples of this can be considered in such elements as skills development, where opportunities are sought to equip the existing and potential workforce in areas such as Mpumalanga with transferrable skills. *New entrant support* work area initiatives could be targeted to emerging suppliers in hotspots.

Several groupings of levers are explored here: improve competitiveness, direct investment, incentives through procurement and demand stimulation.

6.8.1. Improve competitiveness in Just Transition hotspots

Where programmes to assist with increasing the competitiveness of local industry by reducing relative cost of infrastructure and cost of doing business, these can be targeted to increase the relative competitiveness in specific areas. These include the likes of SEZs, the 12i tax allowance, Capital Project Feasibility Program (CPFP) and Critical Infrastructure Program (CIP) as described in 6.2.3.

SEZs with a renewable energy, or broader Just Transition-related scope, in hotspot areas could encourage locating in these regions. This could be by establishing them in close proximity to areas earmarked for renewable energy development such as the Emalahleni REDZ. Similarly, the eco-industrial park model, also supported by DTIC could be leveraged in repurposing of coal power station sites.

6.8.2. Direct investment in RE industry in hotspot economies

Where industry has either already made the business case or undertakes to do so, such investments in hotspot regions build the case for transition support and the task team will look to identify such catalytic projects. Eskom has plans underway, for example, to establish a micro-grid manufacturing park at Komati, having elected to move to that location from the original site proposed in order to further the repurposing objective.

Mpumalanga already has a spectrum of existing industries that may be pivoted to supply the renewable energy value chain. In order to assist such industries to identify the opportunity, these types of manufacturers need to be identified and then linked to potential offtakers through the kinds of new entrant support and on-boarding discussed in *new entrant support* work area. The Minerals Council's supplier database may be a starting point that the task team could work with.

Direct investment through government (DTIC, DSI) into supportive capacity, for example quality assurance, testing and certification, has yet to be explored in detail.

6.8.3. Demand stimulation through renewable energy MW development in hotspots

Indications from developers are that in excess of approximately 3000 MW of renewable energy capacity is at various stages of development in Mpumalanga. Such development, where it is not for own consumption or by Eskom, is typically done at risk, pending securement of an offtaker such as via private or municipal PPAs or the REIPPPP. Eskom's estimated grid capacity for connecting such generators stands at 5000 MW in Mpumalanga. Solar resources are competitive and, in some areas, wind resources are sufficient for commercially viable wind farms, albeit less competitive than a large amount of other readily available wind under development in other parts of the country.

It has become empirically evident in areas such as Cookhouse and Bedford in the Eastern Cape that clustered wind and solar project development, construction and operation has led to demonstrable socio-economic upliftment in these areas over the course of a decade. This is due to the increased economic activity generated and induced, in some cases combined by deployment of SED/ED spend by such facilities.

While such spin-offs of renewable energy generation capacity growth are outside the scope of SAREM to influence, could it be posited that the growth of such capacity would lead naturally to industrialisation through manufacturing in closer proximity to this construction demand? If this were the case then incentivising capacity in these regions could be explored through geographic-specific public procurement, Eskom procurement or a voluntary targeting by such procurers as Sasol and mines seeking private generation capacity and/or best use of land under rehabilitation.

6.8.4. Summary of actions

Table 6-8: Summary of actions being explored toward integrating with Just Transition hotspots

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Imple-menter	Additional steps to articulate in implementable form
7.	Integration with Just Transition hotspots					
7.1	Improve competitiveness in Just Transition hotspots	Establish SEZs and eco-industrial parks in hotspot areas	3 y	DTIC	DTIC	DTIC explore in principle, via steps to motivate for such new zones.
7.2		Target suite of incentive programmes to JT hotspots	3 y	DTIC	DTIC	DTIC explore in principle, considering e.g., 12i, CPFP, CIP.
7.3	Direct investment	TBC. (Investments to be brought forward)	TBC	Industry, Eskom	Industry, Eskom	Eskom, potential investors, to contribute plans. Identify who can scope the manufacturers positioned to pivot. Minerals Council supplier database?
7.4	Incentivise through public procurement / Eskom	TBC	3mo – 3y	DMRE	IPPO, Eskom	DMRE, IPPO, NT evaluate merit to geographically focussed procurement round and/or procurement criteria to support JT objectives.

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Imple-menter	Additional steps to articulate in implementable form
7.5	Incentivise through non-REIPPPP procurement	Voluntary procurement requirements to incentivise local manufacturing	TBC	Private sector, Eskom, munics	Private sector, Eskom, munics	Explore with Minerals Council, SASOL, Eskom, other major corporates, municipalities.
7.6	Stimulate regional demand	Voluntary and incentivised development of RE generation capacity in hotspots	TBC	DMRE	IPPO	Test assumption that it leads to local supply chain simulation. Bring forward voluntary developments. Explore concessional finance
7.7	Incentivise private sector procurement through capital and corporate objectives: Cross-reference same action for Transformation, targeted to hotspots					
7.8	Competitive rates for factory investment capital: Cross-reference same action for Transformation, targeted to hotspots					
7.9	Cross reference other workstreams' focus (new entrant support, skills, local content policy)					

6.9. Skills

In order to support existing and enable the establishment of new manufacturing through an available and competitive skilled workforce and to further the objectives of transformation and Just Transition in that manufacturing industry, skills development is a critical component of the masterplan. Availability of the correct local skills could be (cited as) a barrier to investment in renewable energy manufacturing in South Africa. The cost and time required to develop local skills for manufacturing may make setting set up manufacturing in South Africa too costly and/or too slow to meet the timeframes for local content in the REIPPPP. The importation of skills to enable such local manufacturing is a lost economic and job creation opportunity for South Africa and its citizens. South Africa has to compete with many other countries to gain a share of the global renewable energy manufacturing value chain. The availability of appropriate (foundation) skills, and mechanisms for rapidly and affordably training renewable energy manufacturing skills could increase South Africa's attractiveness as a renewable energy manufacturing destination.

It is recognised that in order to build a long-term pipeline of participants in the industry, school-goers and those in vocational and other tertiary education should have an awareness of career options in the sector. Existing career awareness programmes should incorporate renewable energy and renewable energy manufacturing into their scope and existing initiatives by various industry associations should continue to be championed.

Skills development involves a wide-ranging set of stakeholders, policymakers and practitioners. This first observation is borne out in any engagement on the topic where it is identified that there are many initiatives and programmes and an immediate challenge is finding ways to connect these to the need by some interface with industry and to ensure they are aligned, complementary and, ideally, mutually reinforcing. Hence the first intervention proposed is some means to achieve this: to host this function in a platform whose objective is to connect stakeholders in such a way that strategy and implementation are guided by ongoing feedback through an interface with industry and each other. DHET, MerSETA, EWSETA and TVET colleges are key players from the government policy and implementation side. Existing institutions such as SARETEC and the programmes run by Harambee and Yes4Youth are notable resources to consider in implementation. NUMSA's insights have been instructive in shaping the approach to this platform, having been active participants in the equivalent structures in the automotive sector. This will be an area of opportunity for the labour unions relevant to renewable energy manufacturing, e.g., NUMSA, Solidarity and CEPPWAWU, to come to the fore.

The scope of such a platform is proposed to include:

- Connect industry needs to institutions such as TVET colleges so that training is demand-led and evolves with the market
- Provide connection between available skilled workforce and placement, consider leveraging existing platforms, such as SA Youth, which is part of the Presidential Youth Employment Intervention (PYEI) and/or other relevant mechanisms/platforms
- Secure and channel funding for training
- Coordinate initiatives – e.g., with DHET's skills strategy and implementation framework. Build on existing initiatives and integrate interventions in such initiatives, where appropriate
- Audits / ongoing assessment of capacity and feedback

As part of this work area, the implementation team at the automotive sector's Automotive Supply Chain Competitiveness Initiative (ASCCI) and the National Association of Automotive Component and Allied Manufacturers (NAACAM)'s flagship skills initiative High Gear have been engaged with. High Gear demonstrates a working model for implementing this set of objectives and it may offer an opportunity to either map to an equivalent initiative for renewable energy, or to be directly adapted through a collaborative framework still to be defined. The model is well funded by both local and international funders and demonstrates how effective resourcing and oversight can generate results. ASCCI and High Gear are industry-lead initiatives, with strong links to government and labour. Industry (i.e., incumbent, emerging and global value chain renewable energy manufacturers) would thus be best placed assists in understanding the mechanism and exploring possible ways to replicate or augment to include renewable energy.

The steps to implement this would involve:

1. Establish a voluntary steering committee, including Labour, DHET, DTIC, industry associations, MerSETA and TVET colleges
2. Find a host convenor and secure funding
3. Appoint an implementing partner to set up, host and maintain the platform with the scope as described above - bespoke or through collaboration with existing initiatives

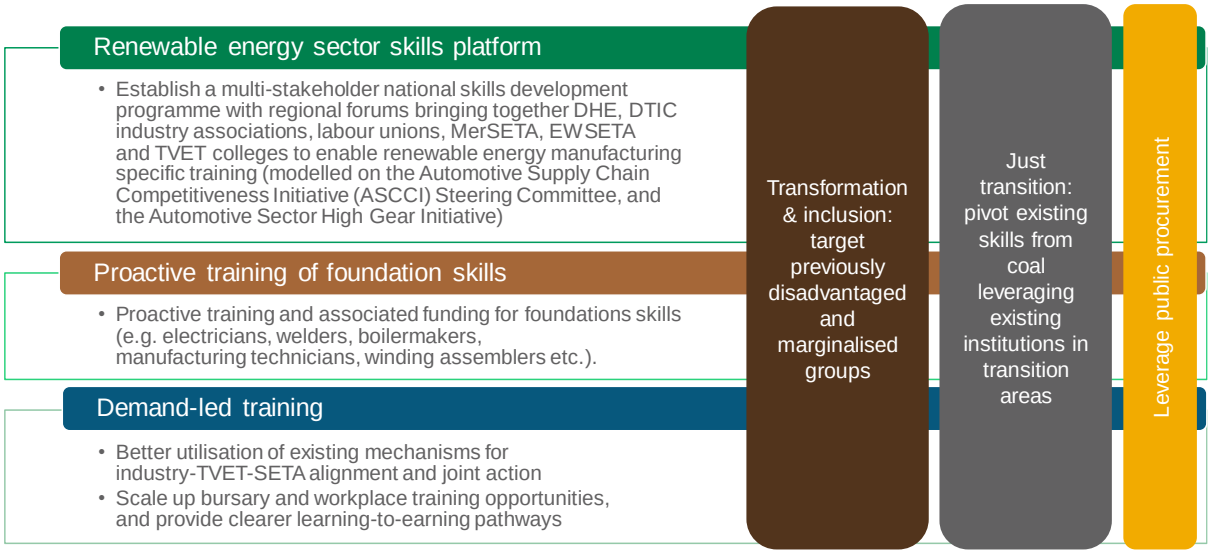


Figure 6-6: Schematic overview of skills levers

While it is typical for employers in specialised manufacturing sectors to induct their hires with their own training in-house, it is necessary for them to be able to access a pool of available labour who have a core set of foundational skills, including certain generic levels of competency and certification. This is the basis for a programme in pro-active training in foundational skills.

Demand-led training, informed by the interface between industry and training institutions described in the sector skills platform scope then ensures a match between the growth of manufacturing capacity and available skills.

A study on the skills needs for the renewable energy build in IRP 2019[23], identified the following as occupations that are currently in high demand in the manufacturing component of renewable energy value chains.

Table 6-9 Occupations in high demand in the various parts of the renewable energy value chain

Value Chain Stage	Highly Skilled	Skilled	Semi-Skilled
Manufacturing Wind		Welders, electricians, boilermakers, production/ manufacturing technicians.	Spray painters.
Manufacturing Solar	Electrical/ mechanical transformer designers.	Electricians, mechatronic technicians	Winding assemblers, soldering specialists.

Collectively, the study's individual detailed recommendations point to a need for more engagement and co-ordination between industry and training institutions (particularly TVETs in the case of manufacturing), and the leveraging of existing government initiatives and implementation mechanisms. This is well aligned with the proposed core lever of a renewable energy sector skills platform outlined above.

Overlaid onto this work area is the imperative to target interventions toward the objectives of transformation and integrating with Just Transition hotspots. To this end, beneficiary selection can be focussed on historically disadvantaged persons, women, youth, rural communities, those with disabilities. To support a Just Transition, the levers should target businesses located in transition hotspots such as Mpumalanga. In order to open new opportunities for employment for those affected by the transition from coal in areas such as Mpumalanga, reskilling is proposed to be championed through leveraging existing coal sector and power generation institutional capacity for training. This involves pivoting existing skills attained in the coal industry to the renewable energy manufacturing industry, including systems for RPL (recognition of prior learning) and systems for certification and accreditation to meet international standards to work in a particular renewable energy manufacturing environment. This would ideally be supported by commitment from TVET colleges, mines and power stations present in the transition areas to assess their current offerings, adapt as needed and actively contribute to the reskilling of coal sector workers to be re-employed into renewable energy manufacturing and wider renewable energy value chain. Eskom has existing facilities, has historically implemented artisan training programmes and is considering this use for some of the repurposing.

6.9.1. Summary of actions

Table 6-10: Summary of actions being explored in skills

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Imple-menter	Additional steps to articulate in implementable form
8.	Skills					

[23] The study, title *Assessment of local skills for the South African renewable energy value chain,* considered the skills demand across the entire value chain solar PV, wind and battery storage. The study was commissioned by Hydrogen and Energy Sub-Programme of the Technology Innovation Programme of the Department of Science and Innovation (DSI), in collaboration with the Department of Trade, Industry and Competition (DTIC), via the Energy Secretariat at the South African National Energy Development Institute (SANEDI).

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Imple-menter	Additional steps to articulate in implementable form
8.1	RE sector skills platform that iteratively links demand-led skills development with industry needs.	1. Set up steering committee, 2. Identify a host, secure funding, 3. Appoint implementer and roll out programme as described in scope: connect industry and TVETs, maintain platform for placements, ongoing audit and assessment.	1. 3 mo 2. 6 mo 3. 4 y	Labour, Industry, DHET	(TBC)	Articulate possible structure, through further engagement with High Gear and Labour Unions. Task team review and refine proposed steps and champions.
8.2	Proactive training of foundational skills	(1. Identify relevant foundation skills as communicated through DHET Masterplan support process (DHET forms) and further engagement with industry if required. 2. DHET to further define actions required for implementation)	2 y	DHET	DHET	Obtain better understanding of DHET / TVET funding and intake models to determine mechanisms. Identify relevant foundation skills (in progress through SANEDI DSI skills project). Communicate need to DHET via DHET Masterplan support process (DHET forms) and direct engagement.
8.3	Demand-led training	Industry to introduce/scale up internal training programs partnering with government training providers and including bursaries, internships, apprenticeships and mapping clear skills development and employment pathways for trainees	1-2 y	Industry, National Treasury	Industry	1. Clarify whether there are any tax benefits or incentives for industry to set up / scale these programmes. (National Treasury?) 2. Obtain commitment from industry to scale current programmes / introduce new programmes.
8.4	Pivot existing skills in transition areas	1. Identify priority skills to pivot, design and implement programme 2. Existing industries and institutions assess their current offerings, adapt as needed and actively contribute to the reskilling	1. 1 yr 2. 1 yr	TVET, Eskom, Minerals Council, Labour unions.	TBC	Engage Minerals Council and Eskom. Link implementers to existing initiatives to determine (supporting) role required from SAREM. (Existing include CSIR/Res4Africa; TIPS/GIZ, IKI, others?) Engage with TVET colleges in transition zones to gauge status of own initiatives aimed at reskilling.
8.5	Target the above to for inclusivity					

6.10. System readiness

Providing market certainty, as discussed in 6.1, identifies the growth of demand for components and services via the growth of capacity in renewable energy MW installed is a driver. With the aim of meeting the allocations detailed in the IRP, the licensing threshold for distributed generation has been raised to 100 MW. The shift in the exemption limit from 1MW to 100MW has substantially changed how the South African government approaches the implementation of the IRP in meeting South Africa's electricity demand. It is expected that the future demand for renewable energy will be customer-driven rather than centrally procured. As such, the government is adjusting its approach to function better in this changing landscape.

The rapid and distributed growth of the South African renewable energy market will put added pressure on technical systems and government systems. The ability of these systems to address growth in

demand will be key to future market growth and consistency. This is particularly relevant in National Energy Regulator of South Africa (NERSA) processes, municipal system reform (i.e., wheeling) and grid readiness (transmission and distribution).

Eskom intends to build out transmission and distribution infrastructure over the next 15 years to the value of over R250bn that will enable access to the wind and solar resource areas. Eskom intends to secure concessional finance to support this, thereby acting as an enabler of the growth of the market for new renewable energy capacity. This would see progressive unlocking of grid constraints over the period from 2021 to 2036.

6.10.1. Summary of actions

Table 6-11: Summary of identified levers being explored toward system readiness

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Imple-menter	Additional steps to articulate in implementable form
9.	System readiness					
9.1	Build capacity of distribution licensees (e.g., Municipal distribution entities) to accommodate smaller-scale distributed generation projects).	TBC	TBC	DMRE,	NERSA , Municipalities	Explore further with DMRE, NERSA
9.2	National wheeling and trading frameworks, including for local municipalities	TBC	TBC	DMRE	NERSA, Municipalities, Eskom	Explore further with Eskom, NERSA
9.3	Invest in transmission and distribution infrastructure to enable best wind and solar resource deployment	Build-out new transmission and distribution infrastructure, leveraging access to concessional finance to enable.	15 y	Eskom	Eskom	

6.11. Combined set of actions

Each section has laid out its current considerations and emerging actions, some with steps still required in order to reach concurrence between decision makers and to articulate in implementable form. While there are many workstream and tasks, these can be grouped quickly into relevant categories. This helps to show how core tasks have connections across categories and helps reduce the number of discrete actions.

The market certainty category having been identified by all stakeholders as critical is on the centre left, clearly encompassing several sub-elements. The combination of factors that drive competitiveness are shown on the left, indicating how these are housed in other work areas, rather than as a workstream of its own.

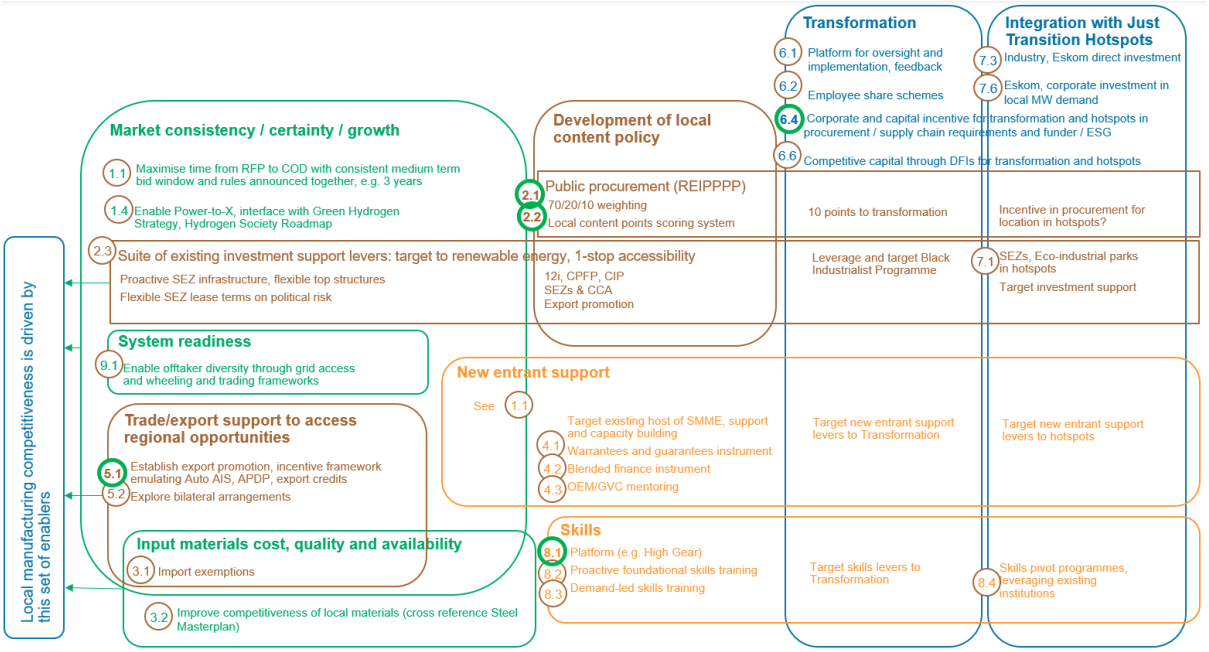


Figure 6-7: Summary of actions and work areas

The full set of actions is provided in the Annexures.

7. Conclusion and next steps

The process of developing this masterplan is presently refining the set of ideas emerging, focussing on the priority actions. How far they get down this process on each action will determine what level of granularity the plan takes at adoption and how much of the detail is developed in implementation phase.

No plan is implementable until it can be championed by those who are decision-makers, implementors and stakeholders impacted upon by its implementation. Hence there are critical steps to adoption underway. Within the mandate area of each proposed action, decision-makers are to confirm concurrence. Social compact partners are to review the plan elements and affirm support. Potential investors from industry and other implementers are to underpin the commitment with proposed catalytic projects and investments. An estimated impact in jobs and economic impact, based on a targeted level of localisation achieved requires a starting point in investments committed toward such industrial capacity to give it credence. Such commitments may be conditional upon the framework of the plan's implementation.

The foundation of a social compact is the give and take between parties. Where there is space to create shared value, these should be maximised. The system of interventions explored in the plan to date are mutually reinforcing and create shared value through a system dynamic (see Figure 5-2). An oft-repeated refrain in masterplan formulation is to ask what each party can *"bring to the braai"*. When we identify where parts of the picture are contributed to, it is evident that there is opportunity for collaborative contributions from each of industry, government and labour on multiple fronts - see Figure 7-1, below.

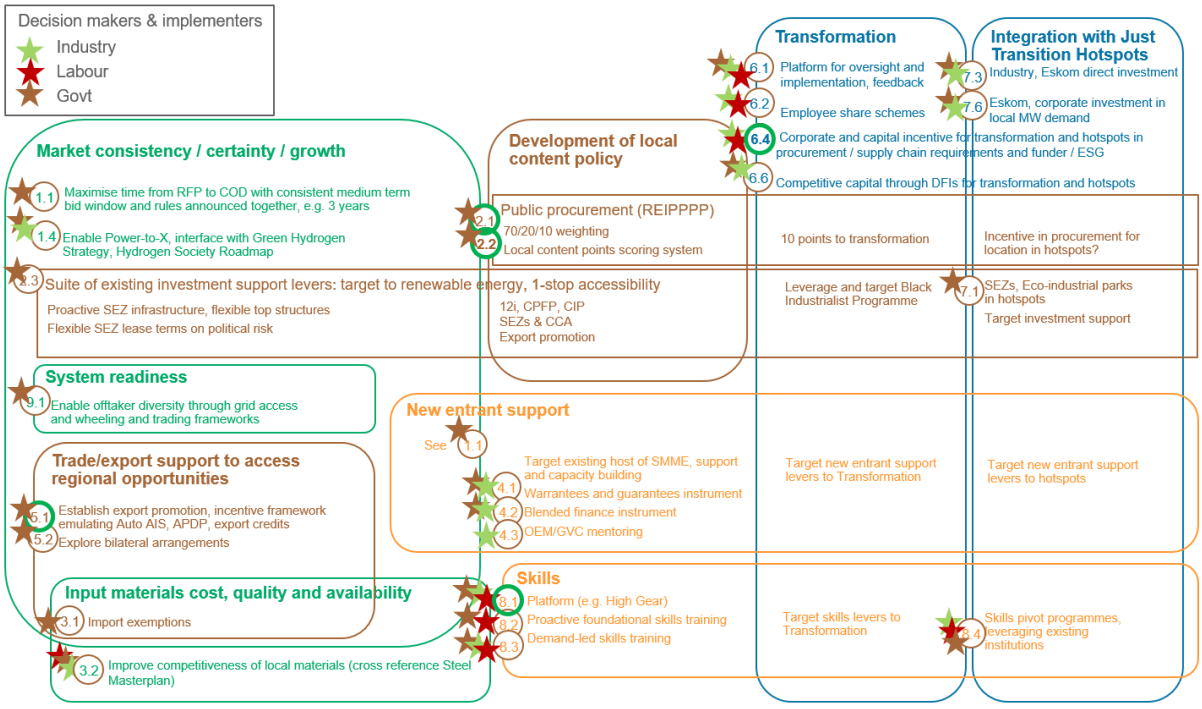


Figure 7-1: Opportunities to "bring to the braai"

Task teams are to continue to work on refining the emerging ideas list according to the actions flagged for each one and look to secure decision-maker championing in each case. Through multiple departments, government has levers in existing mandates and in targeting of these to the sector (DMRE, DHET, DTIC, DSI and National Treasury). Industry players are to look for opportunities in which to put forward aligned projects and proposed investments. Labour unions have a powerful ability to influence and drive success across multiple elements, including ensuring ongoing alignment with the objectives through oversight structures, skills development, pivoting the workforce to new opportunities,

employee shareholding and fiduciary duty over investment vehicles. In the spectrum of voluntary measures, where major corporates and providers of capital may drive localisation, transformation and a Just Transition, through their shareholder values, there is an opportunity to embed the plan on a foundation of shared value creation.

Annexure A: Summary of emerging actions

Collated actions toward implementable plan elements

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Implementer	Additional steps to articulate in implementable form
10.	Market certainty					
10.1	Provide confidence in the implementation of sufficient years' worth of REIPPPP	Announce dates of procurement rounds for sufficient future rounds of REIPPPP	6 mo	DMRE	IPPO	Concurrence from decision makers
10.2	Establish a consistent set of local content policy criteria	Set bid RFP criteria for the same period	6 mo	DTIC	IPPO	Concurrence from decision makers
10.3	Develop consistent trade and industrial policy that builds a competitive environment beyond public procurement mechanisms.	This suite of policy actions is cross-referenced in the 5. Local content policy levers; and 6. Trade and export promotion levers	3 y	DTIC	DTIC	Concurrence from decision makers
10.4	Enable power-to-x market	Establish interface with the Hydrogen Society Roadmap and Green Hydrogen Strategy, to enable implementation and ensure manufacturing sector capacity trajectory to suit demand trajectory	3-10 y	DSI, IDC, DTIC, DMRE	DSI, IDC, DTIC, DMRE	
10.5	Cross-reference *system readiness* for enabling offtake diversity in the medium term					
11.	Local content policy					
11.1	Institute 70/20/10 adjudication weighting with points-based scoring table for components in REIPPPP.	Application to National Treasury for REIPPPP adjudication weighting of 70/20/10. Aligned with legislation 10 points toward transformation, 20 points to local content and 70 on price.	3 mo	National Treasury	DMRE, IPPO	Concurrence from decision makers
11.2		Add points-based scoring table for components in the RFP.	3 mo	DTIC	IPPO	DTIC and SAREM Project Team review data and models to propose scoring table. Select weighting of components in table, based on value-add and efficiency.
11.3	Target existing suite of investment support to renewable energy competitiveness and make accessible	Build accessibility and knowledge of suite of incentives – e.g. through 1 stop shop. Target suite of incentives to renewable energy manufacturing (12i, CPFP, CIP, SEZs, CCA, export promotion)	1 y	DTIC	DTIC	Concurrence from decision makers and refine
12.	Input materials					
12.1	Import duty exemption on strategic inputs	Analyse trade-offs on key materials that are protected locally and resolve on exemption or other mitigations where supply constraints reduce competitiveness of priority components. Apply import duty exemptions to strategic input materials.	3 mo	DTIC	ITAC	Additional data from manufacturers on critical inputs. Further interface with Steel Masterplan. Concurrence between DTIC and manufacturers on applicable qualifying inputs
12.2	Improve competitiveness of local materials	TBC	TBC	TBC	TBC	Other Masterplans, such as Steel. Build platforms for interface between OEMS, developers, and input material providers – neutral ground.
13.	New entrant support					
13.1	Develop solution to warrantees and guarantees	TBC	TBC	TBC	TBC	Follow up with task team members who offered to champion warranty models with 3rd party
13.2	Blended finance instrument for guarantees and factory investment	Craft blended finance instruments that a) assists smaller suppliers to put up guarantees in bids and b) provides capital for factory investment to enable commitment pre-financial close	TBC	IDC, DBSA	TBC	Follow up with DBSA, IDC, banks through BASA on opportunities.
13.3	Mentoring of emerging suppliers by OEMs	Identify and on-board emerging suppliers	TBC	Industry	Industry	Identify existing mentoring programmes and voluntary commitments by OEMs
13.4	Target existing business incubation and capacity building support to emerging suppliers	TBC	TBC	TBC	TBC	Identify host for generic business development support in existing programmes
13.5	Target the above to Transformation					
13.6	Target the above to Just Transition hotspots					
14.	Trade/export support to access regional opportunities					
14.1	Export promotion, incentive framework	Support local manufacturing competitiveness through incentive structure and export promotion embedded in trade and industrial policy. Institute system of export credits for renewable energy components	TBC	National Treasury, DTIC	DTIC	DTIC explore the parameters for decision-making for emulating the Auto Investment Scheme (AIS) & Auto Production and Development Programme (APDP). Global Value Chain leaders and DTIC reach concurrence for conditional investment commitments.
14.2	Bilateral arrangements with other countries	To be explored, in particular in Africa	TBC	TBC	TBC	To be explored. Include engagement with ITAC on strategic designation of components under AfCFTA
15.	Transformation					
15.1	Establish a platform for oversight of effective implementation of transformation strategies	Host to establish multi-stakeholder steering committee and resource an implementing agent to support the scope as described.	6 mo	TBC	TBC	Task team to identify possible host programme or department, propose structure and scope
15.2	Scope and adopt employee share scheme model	TBC	TBC	TBC	TBC	Further input from Labour and interested industrialists
15.3	Include transformation criteria in public procurement	10 points of REIPPPP adjudication weighting to transformation.	3mo	DMRE, National Treasury	IPPO	Concurrence from decision makers

	Implementation plan element	Actions	Time-frame	Mandate/ decision maker	Implementer	Additional steps to articulate in implementable form
15.4	Transformation via private sector procurement through capital and corporate objectives	Supply chain requirements of local content and transformation	6 mo	Major corporates,	Corporates (procurement manager), OEMs / suppliers	Task team to explore further, identify voluntary commitments c/o follow ups with major procurers including Sasol, Minerals Council. Engage with major OEMs/suppliers regarding transformation objectives
15.5		Requirements embedded in ESG / finance terms from capital providers	6 mo	Individual capital providers	Individual capital providers	Task team to explore further, identify voluntary commitments c/o DFIs, banks and funds. (Follow up with IDC, DBSA, BASA, Labour)
15.6	Competitive rates for factory investment capital	Develop finance offering at competitive rates for factory investment / expansion by transformed industrialists	6 mo	Individual capital providers	Individual capital providers	Follow up with IDC, DBSA, BASA
15.7	Cross reference other workstreams' focus (new entrant support, skills, local content policy)					
16.	Integration with Just Transition hotspots					
16.1	Improve competitiveness in Just Transition hotspots	Establish SEZs and eco-industrial parks in hotspot areas	3 y	DTIC	DTIC	DTIC explore in principle, via steps to motivate for such new zones.
16.2		Target suite of incentive programmes to JT hotspots	3 y	DTIC	DTIC	DTIC explore in principle, considering e.g. 12i, CPFP, CIP.
16.3	Direct investment	TBC. (Investments to be brought forward)	TBC	Industry, Eskom	Industry, Eskom	Eskom, potential investors, to contribute defined plans. Identify who can scope the manufacturers positioned to pivot. Minerals Council supplier database?
16.4	Incentivise through public procurement / Eskom	TBC	3mo – 3y	DMRE	IPPO, Eskom	DMRE, IPPO, NT evaluate merit to geographically focussed procurement round and/or procurement criteria to support JT objectives.
16.5	Incentivise through non-REIPPPP procurement	Voluntary procurement requirements to incentivise local manufacturing	TBC	Private sector, Eskom, munics	Private sector, Eskom, munics	Explore with Minerals Council, SASOL, Eskom, other major corporates, municipalities.
16.6	Stimulate regional demand	Voluntary and incentivised development of RE generation capacity in hotspots	TBC	DMRE	IPPO	Test assumption that it leads to local supply chain simulation. Bring forward voluntary developments. Explore concessional finance
16.7	Incentivise private sector procurement through capital and corporate objectives: Cross-reference same action for Transformation, targeted to hotspots					
16.8	Competitive rates for factory investment capital: Cross-reference same action for Transformation, targeted to hotspots					
16.9	Cross reference other workstreams' focus (new entrant support, skills, local content policy)					
17.	Skills					
17.1	RE sector skills platform that iteratively links demand-led skills development with industry needs.	1. Set up steering committee 2. Identify a host, secure funding, 3. Appoint implementer and roll out programme as described in scope: connect industry and TVETs, maintain platform for placements, ongoing audit and assessment.	1. 3 mo 2. 6 mo 3. 4 y	Labour, Industry, DHET	(TBC)	Articulate possible structure, through further engagement with High Gear and Labour Unions. Task team review and refine proposed steps and champions.
17.2	Proactive training of foundational skills	(1. Identify relevant foundation skills as communicated through DHET Masterplan support process (DHET forms) and further engagement with industry if required. 2. DHET to further define actions required for implementation)	2 y	DHET	DHET	Obtain better understanding of DHET / TVET funding and intake models to determine mechanisms. Identify relevant foundation skills (in progress through SANEDI DSI skills project). Communicate need to DHET via DHET Masterplan support process (DHET forms) and direct engagement.
17.3	Demand-led training	Industry to introduce/scale up internal training programs partnering with government training providers and including bursaries, internships, apprenticeships and mapping clear skills development and employment pathways for trainees	1-2 y	Industry, National Treasury	Industry	1. Clarify whether there are any tax benefits or incentives for industry to set up / scale these programmes. (National Treasury?) 2. Obtain commitment from industry to scale current programmes / introduce new programmes.
17.4	Pivot existing skills in transition areas	1. Identify priority skills to pivot, design and implement programme 2. Existing industries and institutions assess their current offerings, adapt as needed and actively contribute to the reskilling	1. 1 yr 2. 1 yr	TVET, Eskom, Minerals Council, Labour unions.	TBC	Engage Minerals Council and Eskom. 2. Linking implementers to existing initiatives to determine (supporting) role required from SAREM. (Existing include CSIR/Res4Africa; TIPS/GIZ, IKI, others?) Engage with TVET colleges in transition zones to gauge status of own initiatives aimed at reskilling.
17.5	Target the above to for inclusivity					
18.	System readiness					
18.1	Build capacity of distribution licensees (e.g., Municipal distribution entities) to accommodate smaller-scale distributed generation projects).	TBC	TBC	DMRE,	NERSA , Municipalities	Explore further with DMRE, NERSA
18.2	National wheeling and trading frameworks, including for local municipalities	TBC	TBC	DMRE	NERSA, Municipalities, Eskom	Explore further with Eskom, NERSA
18.3	Invest in transmission and distribution infrastructure to enable best wind and solar resource deployment	Build-out new transmission and distribution infrastructure, leveraging access to concessional finance to enable.	15 y	Eskom	Eskom	