



# DEA NATIONAL STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE EFFICIENT AND EFFECTIVE ROLLOUT OF WIND AND SOLAR PHOTOVOLTAIC ENERGY PHASE 2

March 2019

Webpage: <https://redzs.csir.co.za/>

## Contents

1	Purpose .....	1
2	Methodology.....	2
2.1	Technical Criteria for areas with good development potential .....	2
	• Brief Description .....	2
	• Technical Criteria .....	2
	• Solar PV Development Potential.....	2
	• Wind Development Potential .....	3
2.2	Identification of Features of Critical Importance (negative mapping) .....	3
	• Brief Description .....	3
	• Features and Buffers.....	3
	• Features of Critical Importance .....	5
2.3	Identification of Second Draft Focus Areas.....	6
	• Brief Description .....	6
	• Second Draft Focus Areas .....	6
	• Third Draft Focus Areas.....	7
	• Fourth Draft Focus Areas .....	9
3	Study Area Maps.....	10

## 1 PURPOSE

The National Department of Environmental Affairs (DEA) appointed the Council of Scientific and Industrial Research (CSIR), to undertake the Phase 2 Strategic Environmental Assessment (SEA) for the effective and efficient roll-out of large scale wind and solar development in South Africa. Phase 2 of the SEA follows on from the recently completed Phase 1 Wind and Solar SEA which identified 8 Renewable Energy Development Zones (REDZs) in South Africa and was approved for gazette in February 2016 and went out for public comments in April 2017.

Much like its predecessor, Phase 2 of the Wind and Solar PV SEA aims to identify geographical areas best suited for the roll-out of wind and solar PV energy projects. It is envisaged that wind and solar PV development will be incentivised and streamlined in the REDZs. The SEA process also provides a platform for coordination between



the various authorities responsible for issuing authorisations, permits or consents and thereby allows for an integrated environmental authorisation process.

The purpose of this document is to provide a brief overview of the process followed in the identification of focus areas.

## 2 METHODOLOGY

During the identification of focus areas, and in consultation with authorities and stakeholders, consideration was given to a number of positive and negative aspects including the energy potential and environmental factors.

### 2.1 Technical Criteria for areas with good development potential

- **Brief Description**

Development potential was calculated by using the resource data as a base layer intersecting this with other key criteria to consider to ultimately determine development potential.

- **Technical Criteria**

The following criteria were applied to determine suitable areas for wind and solar PV development in the country:

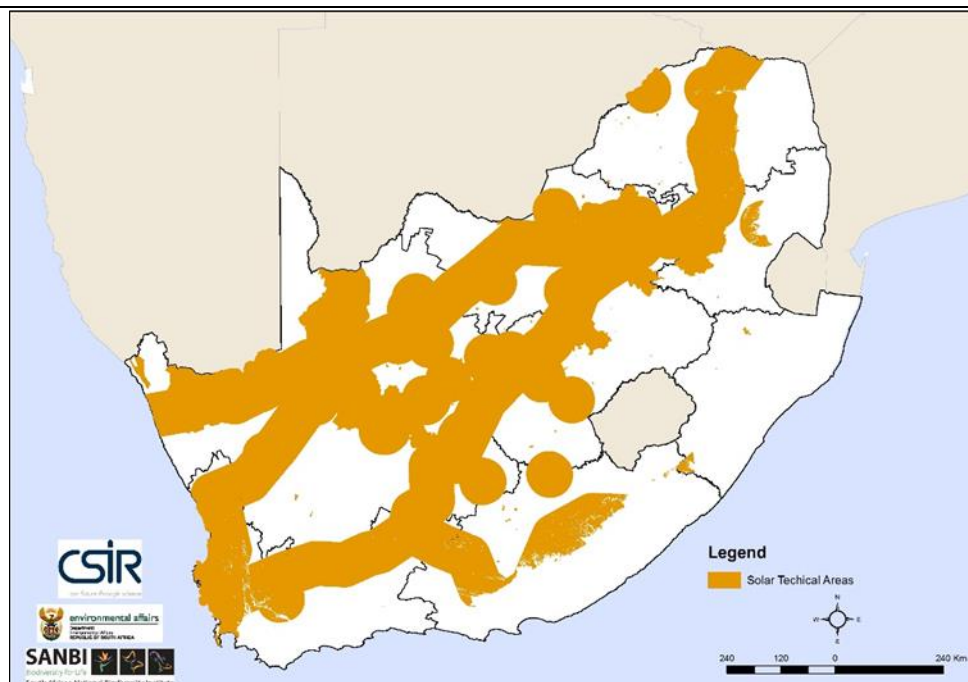
**Solar PV technical criteria:**

- areas with PV yield (single axis tracking) above 1850 kWh/kWp and within municipalities with clusters of previously mined land
- areas with PV yield (single axis tracking) above 1850 kWh/kWp and within 50km of the solar PV projects selected in round 1 to round 4b of the REIPPPP
- areas with PV yield (single axis tracking) above 1850 kWh/kWp and within 50km of the solar PV projects with an approved EA from DEA
- areas with PV yield (single axis tracking) above 1850 kWh/kWp and within the EGI corridors

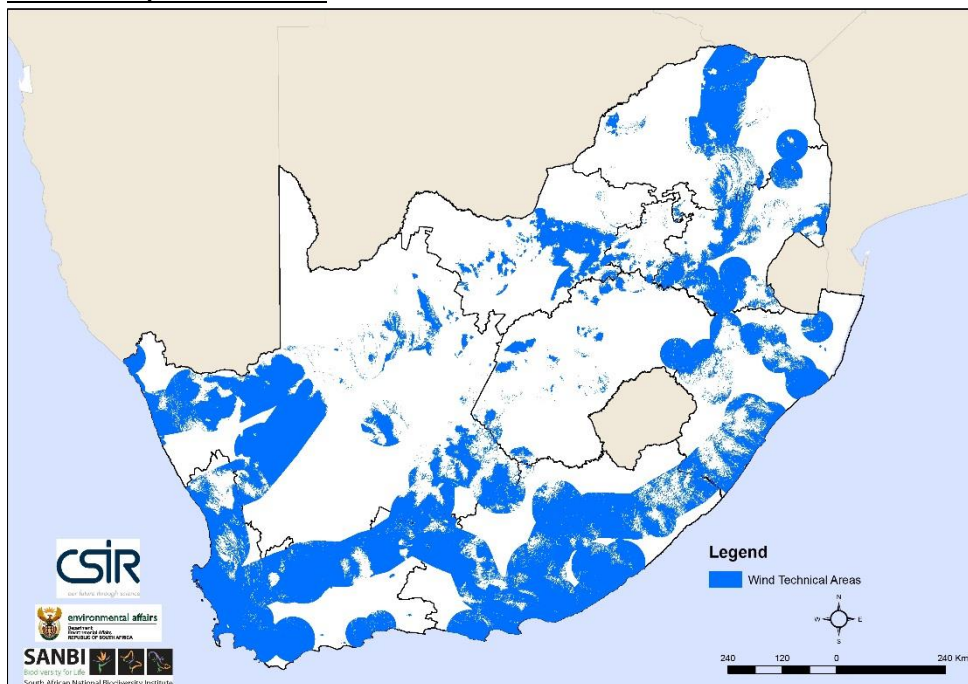
**Wind technical criteria:**

- areas with power density above 250 W/m<sup>2</sup> and within 50km of the projects selected in round 1 to round 4b of the REIPPPP
- areas with power density above 250 W/m<sup>2</sup> and within 50km of the projects with an approved EA from DEA
- areas with power density above 250 W/m<sup>2</sup> and within the power corridors identified for the expansion of the strategic grid infrastructure
- areas with power density above 250 W/m<sup>2</sup> and within 35km of MTS substations identified in the TDP and GCCA2017 datasets

- **Solar PV Development Potential**



- **Wind Development Potential**



## 2.2 Identification of Features of Critical Importance (negative mapping)

- **Brief Description**

Key environmental features with relevant buffers that are considered not available for wind and/or solar PV development were mapped.

- **Features and Buffers**

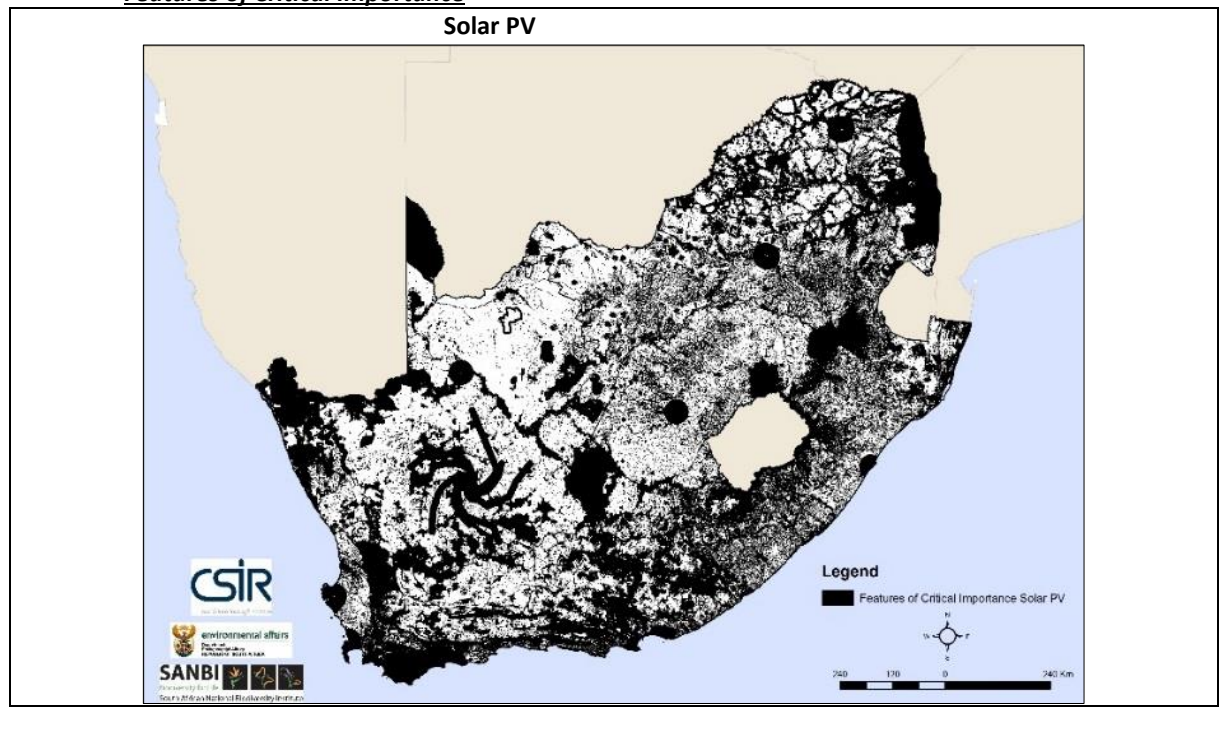
The following features and related buffers were considered when creating the features of critical importance layer.

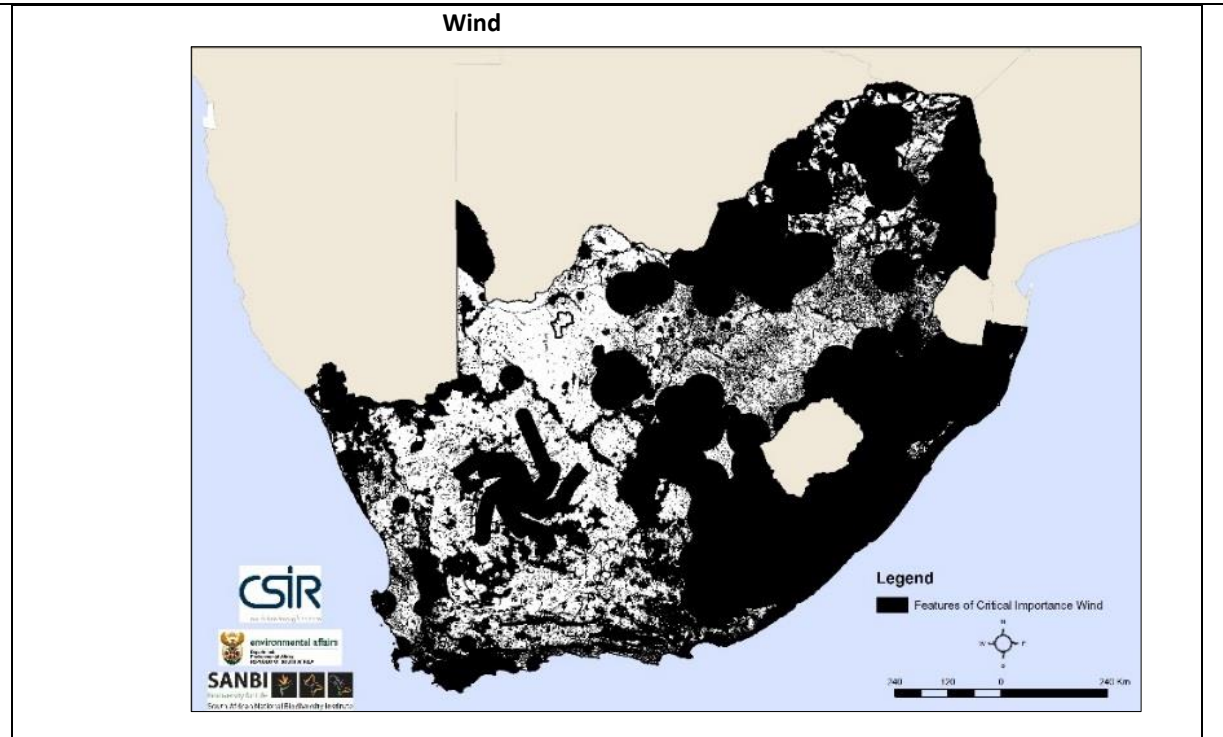


Criteria	Source	Features	Wind Buffers	Solar Buffers
Protected Areas	South African Protected Areas Database (SAPAD) - Q1, 2017, South African National Parks (SANParks) and Provincial.	Marine Protected Areas		
		National Parks		
		Nature Reserves		
		World Heritage Sites (Core)		
		Mountain Catchment Areas (Natural)		
		Protected Environments (Natural)		
		Forest Nature Reserve		
		Forest Wilderness Area		
		Special Nature Reserve		
Critical Biodiversity Areas (CBAs)	Provinces	CBA1 only		
Water features	NFEPA	Wetlands (500m) and Major Rivers(32m)		
	CSIR	Estuaries (Floodplain)		
	CSIR	SWSAs (Natural) --> ONLY KEEP SURFACE SWSAs		
Forest	DAFF	Forest		
Square Kilometre Array (SKA) Area	SKA	SKA study Area		
Heritage	SAHR	All grades and declared sites (add UNESCO sites)		
Field Crop Boundaries	DAFF	Pivot, Shadenet, Horticulture and Viticulture		
Land Capability	DAFF	Categories 11-15		
Defence	SANDF	Features		
Birds	VULPRO	VULPRO cape vulture colonies	50km	N/A
		VULPRO cape vulture restaurants	50km	N/A
	NMMU	NMMU cape vulture roost sites	50km	N/A
Bats		Bat Roosts		N/A
		Ecoregions		N/A
		Dolomite and Limestone		
		Dams		
		Vegetation		
Visual: Very high sensitivity areas for elimination from Focus Area				
Criteria	Source	Features	Wind Buffers	Solar Buffers
Protected Areas	South African Protected Areas Database (SAPAD) - Q1, 2017, South African National Parks (SANParks) and Provincial.	Marine Protected Areas		
		National Parks	0-5 km	0-2.5 km
		Nature Reserves	0-3 km	0-1.5 km
		World Heritage Sites (Core)	0-5 km	0-2.5 km
		Mountain Catchment Areas (Natural)		
		Protected Environments (Natural)	0-3 km	0-1.5 km
		Forest Nature Reserve	0-3 km	0-1.5 km
		Forest Wilderness Area	0-3 km	0-1.5 km
		Special Nature Reserve	0-3 km	0-1.5 km

Critical Biodiversity Areas (CBAs)	Provinces	CBA1 only		
Large Water features	NFEPA	Wetlands (500m) and Major Rivers(32m)	0-1 km	0-500 m
	CSIR	Estuaries, lagoons, lakes, state dams	0-1 km	0-500 m
	CSIR	SWSAs (Natural) --> ONLY KEEP SURFACE SWSAs		
Coastline			0-1 km	0-1 km
SA Large Telescope	SALT	Exclusion area	0-25 km	0-15 km
Square Kilometre Array (SKA) Area	SKA	SKA study Area		
Heritage	SAHRA	All grades and declared sites (add UNESCO sites)	0-1 km	0-1 km
Steep slopes > 25% (1:4)				
Towns, settlements			0-2 km	0-500 m
Major airports			0-8 km	
Small airfields, landing strips			0-3 km	
National roads			0-1 km	0-500 m
Main Passenger Rail Lines			0-1 km	0-500 m
Scenic routes and passes	No data base			

• **Features of Critical Importance**





### 2.3 Identification of Second Draft Focus Areas

- **Brief Description**

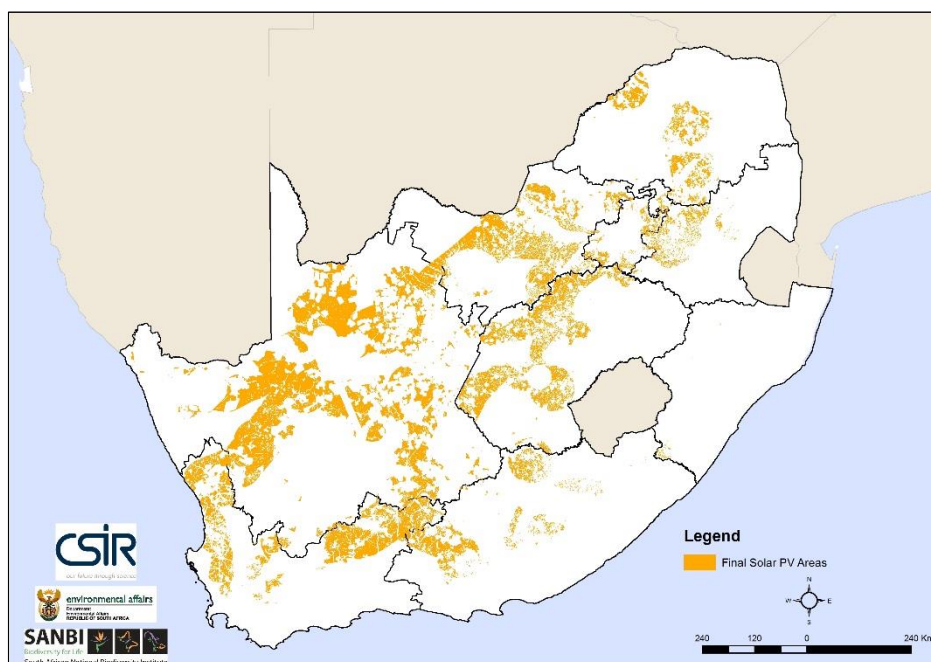
Focus areas were identified by removing all the Features of Critical Importance from the Technical Criteria results. The resulting maps can be seen below.

- **Second Draft Focus Areas**

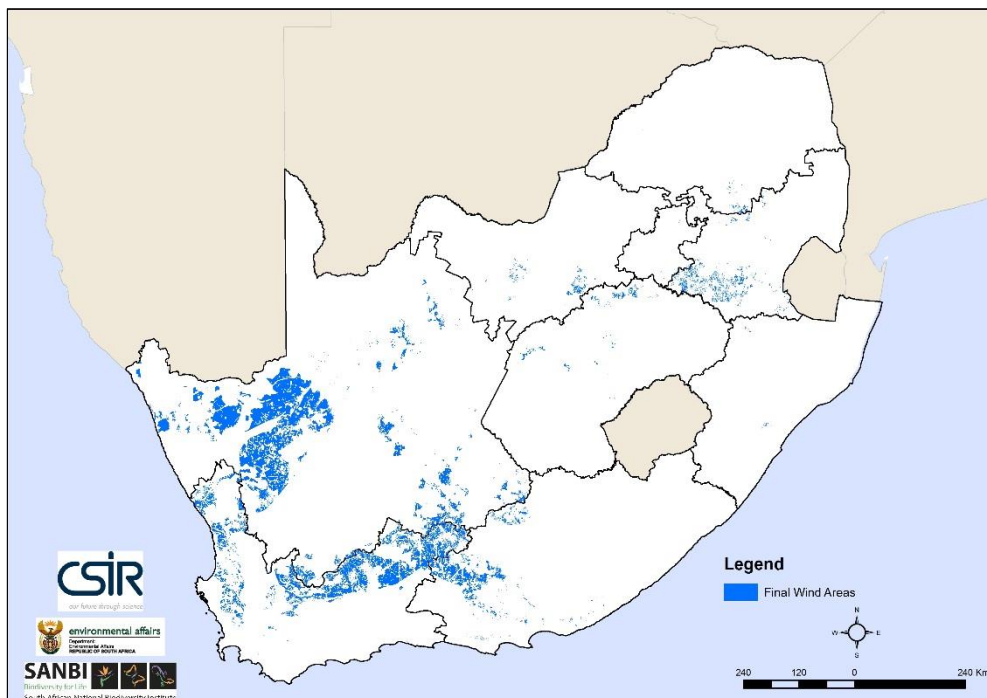




### Second Draft Focus Areas –Solar PV



### Second Draft Focus Areas -Wind



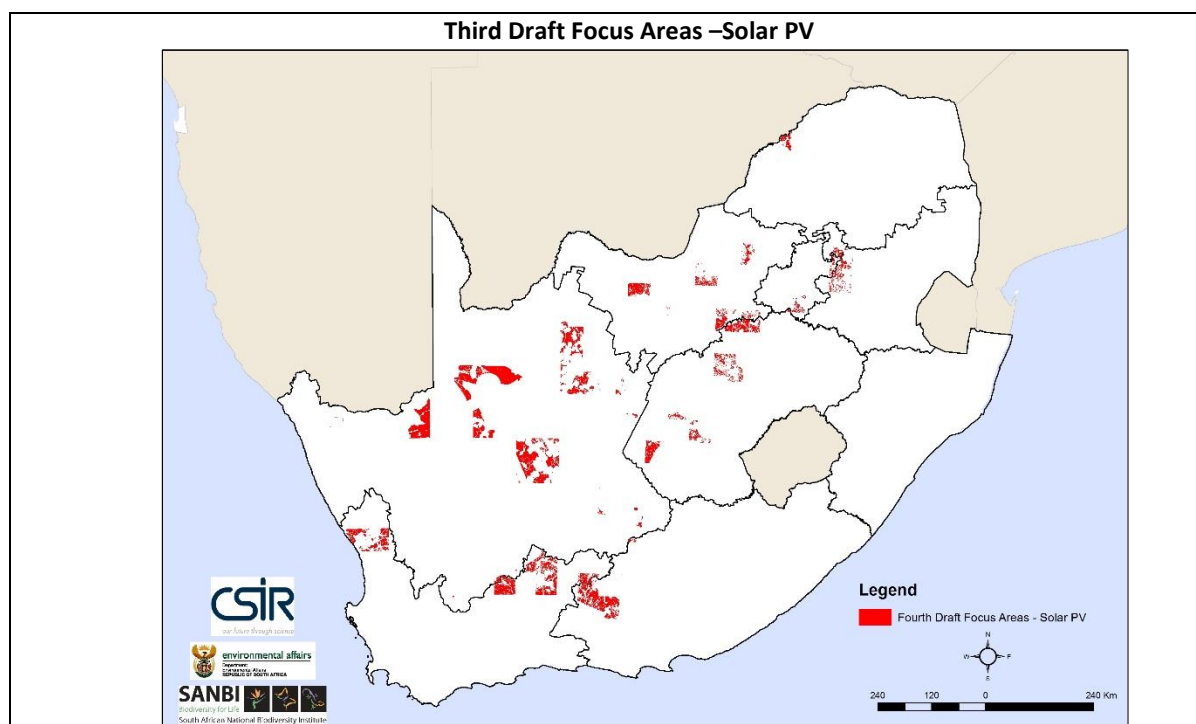
- **Third Draft Focus Areas**

Following the removal of all features of critical importance from the technical areas a GIS intersect of the remaining areas (second draft focus areas) was performed on a number of key layers. The layers the intersect was run on were:

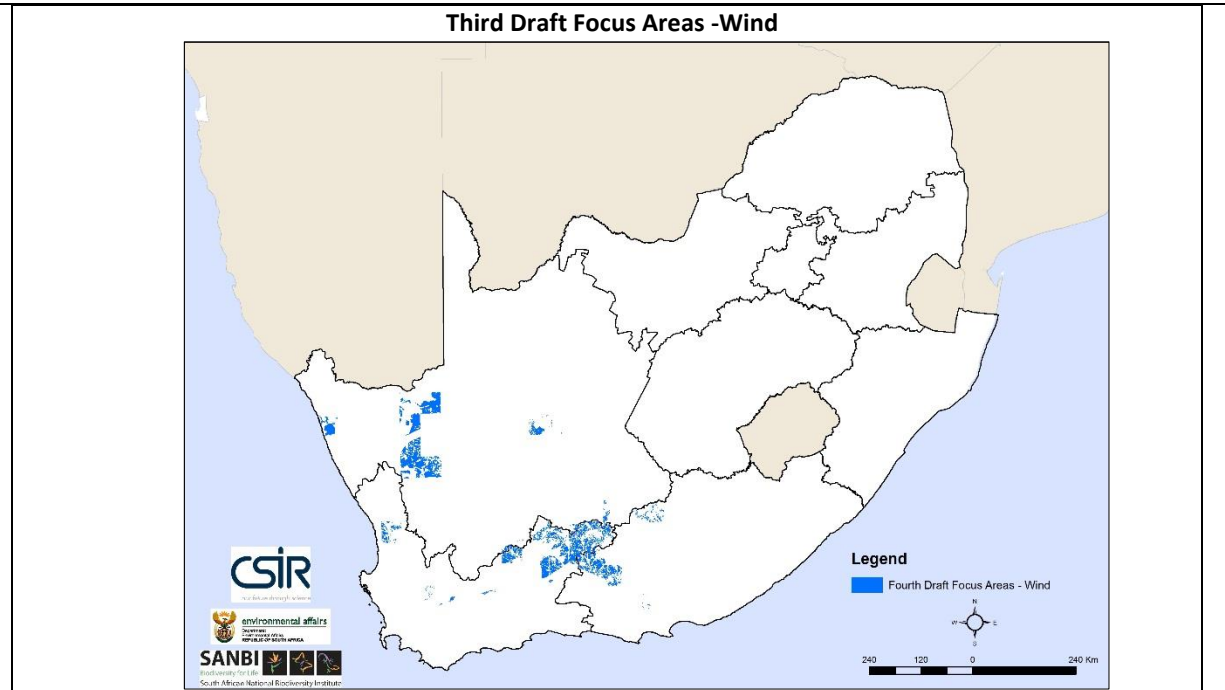
- Renewable Energy Industry survey results from the exercise that requested industry to select up to five (5) grid cells per time horizon which best reflects planned solar or wind development within South Africa. The time horizons were divided into three key time horizons, namely, 0 - 5 years (immediate plans), 6 - 10 years (intermediate plans) and 11 - 15 years (future plans, based on current knowledge of the industry and potential transmission development plans).
- Comments from phase 1 release of focus areas to the public
- For solar PV, key mining municipalities

A GIS intersect identifies all areas which have features or portions of features which overlap in all layers and/or feature classes.

The result of this were areas of high development potential and the lowest environmental sensitivities (based on available data) as can be seen below.

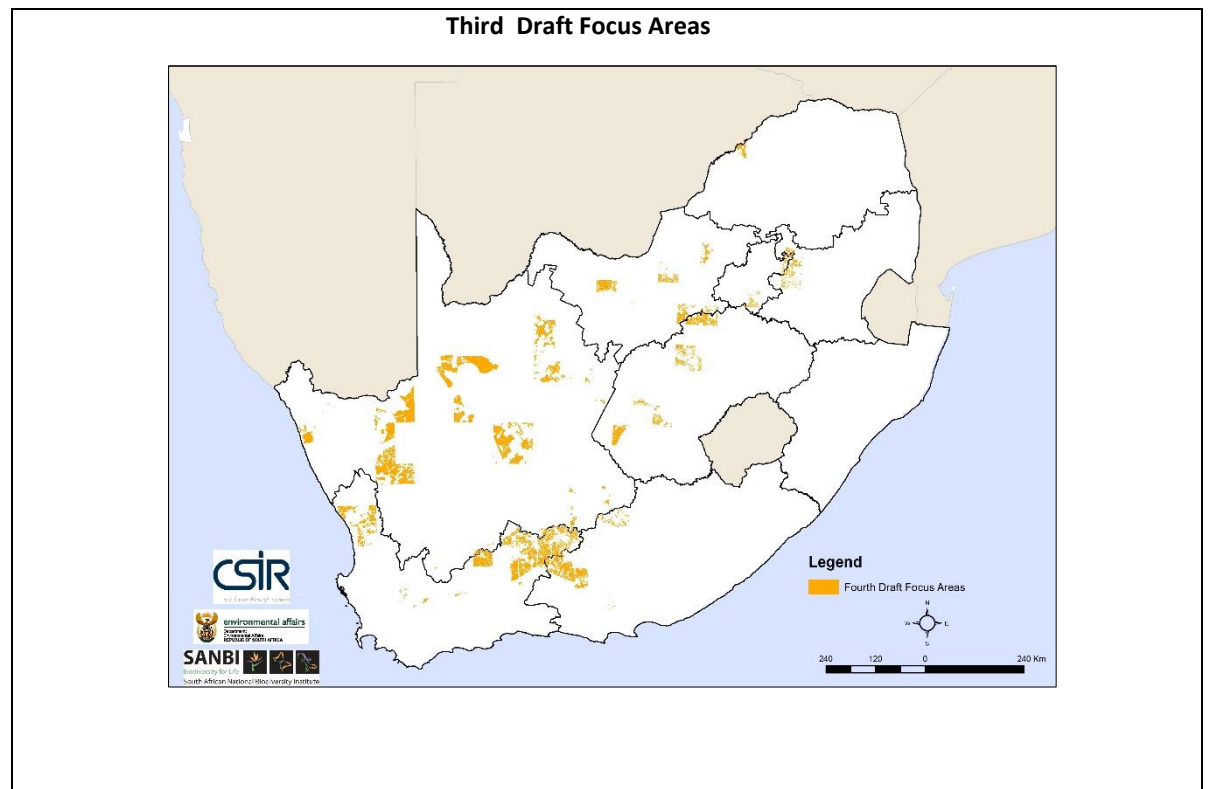






- **Fourth Draft Focus Areas**

The study area boundaries were then determined by creating contours from the above intersect map around areas with closely placed polygons. (To be noted: contours were arbitrarily drawn some focus areas may contain areas of high sensitivities and these will be mapped and noted by specialist data)





### 3 STUDY AREA MAPS

#### Phase 2 Wind and Solar PV Study Areas

