

# Introduction and Update to: Africary's Theunissen UCG Project



**AFRICARY**  
African Carbon Energy

**Johan Brand**

**Public Participation Meeting Presentation**

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# African Carbon Energy (“Africary”)

AFRICARY

- African Carbon Energy was established in 2007 as a BEE South African mining and minerals solutions company in order to fulfil the need for a diversified commodities technology supplier in Southern Africa
- Africary plans to build own and operate the first commercial Underground Coal Gasification (UCG) power generation project in South Africa by winning a Base-Load coal PPA from the recently announced DoE programme.

# What is UCG?

“Replace mechanical mining with chemical mining”

“Transforms a coal field into a gas fuel supply”

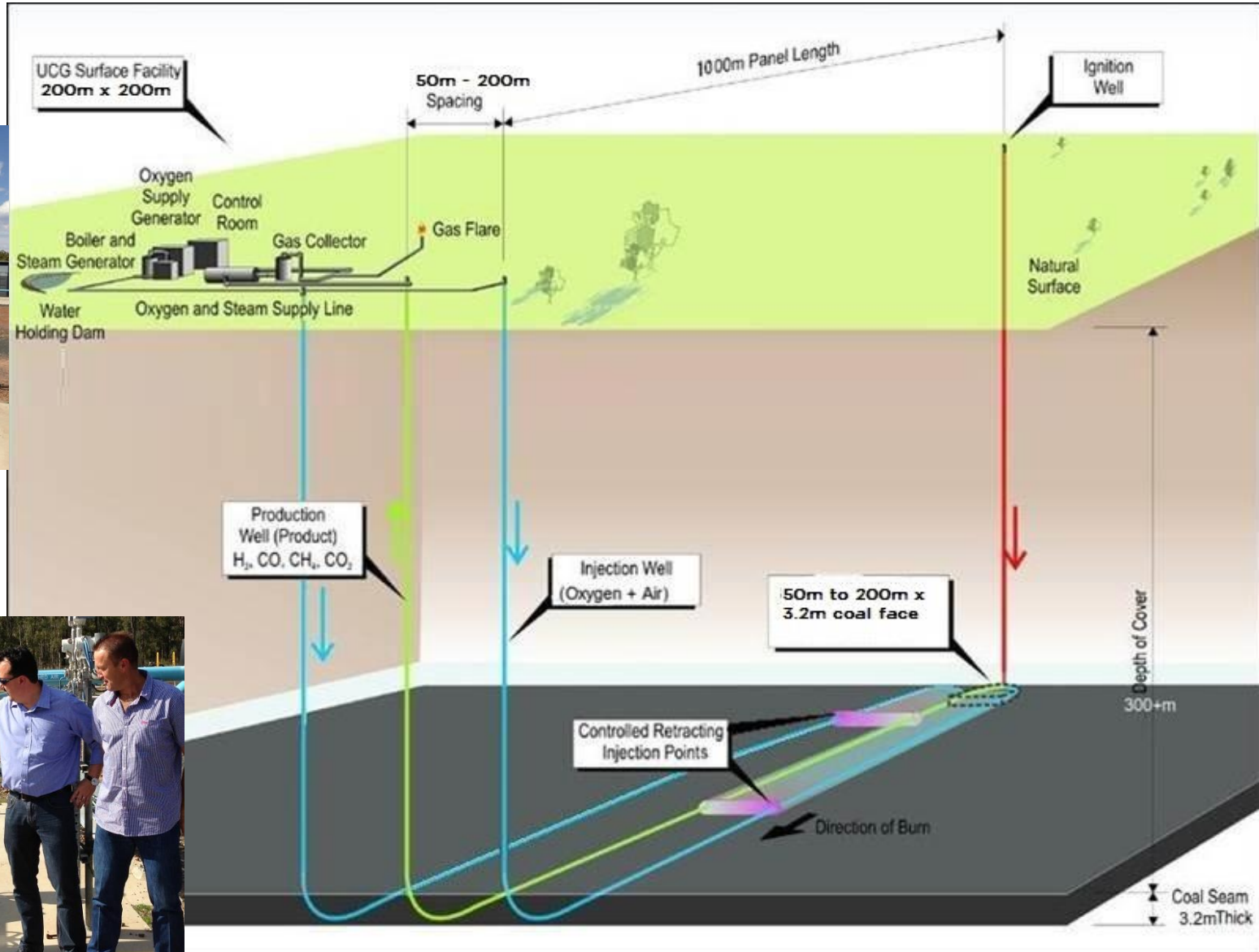
- Essentially, UCG is a process which unlocks the energy potential of stranded deep coal reserves
  - through the injection of air and oxygen delivered via an injection well
- In-situ coal conversion to Synthesis Gas ‘**Syngas**’,
  - which is a fuel feedstock for power generation
- This method utilises **directional drilling** techniques proven in the oil and gas industry
- Numerous **environmental, safety and financial benefits**
- Requires very little of the infrastructure associated with large scale mines

# Typical UCG Setup

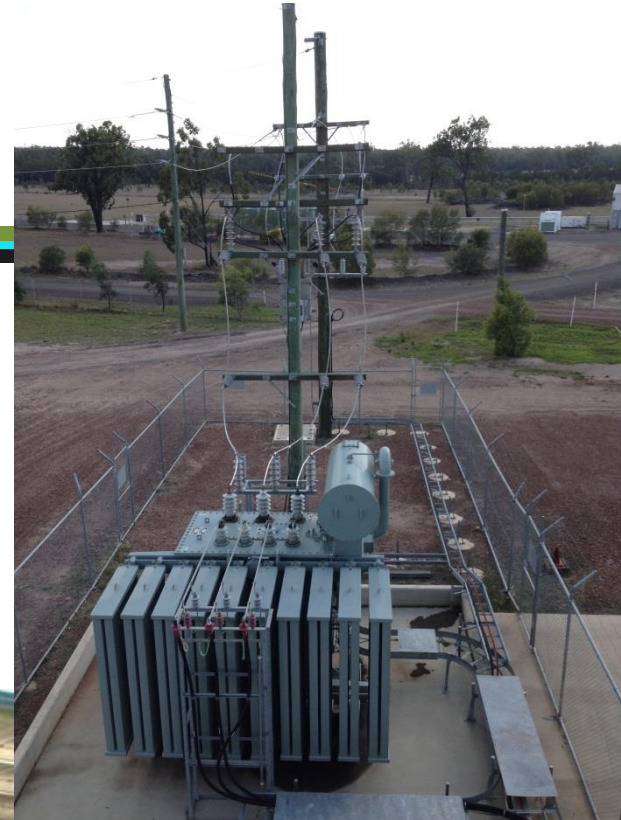
Production Well



Injection Well



# UCG Gas Engines in commercial operation



# Coal gasification is an old concept

## UCG has a long history...

- Coal gasification was used more than **150 years ago** to produce “town-gas” for lighting streets in the UK and the US
- Sasol (South Africa) has been gasifying coal for over **50 years** and currently produces about 40% of the nation's current liquid fuel requirements (160,000 bbl/day)
- Commercial UCG has been successfully operated for **more than 50 years in Angren, Uzbekistan** – supplying UCG syngas for power generation

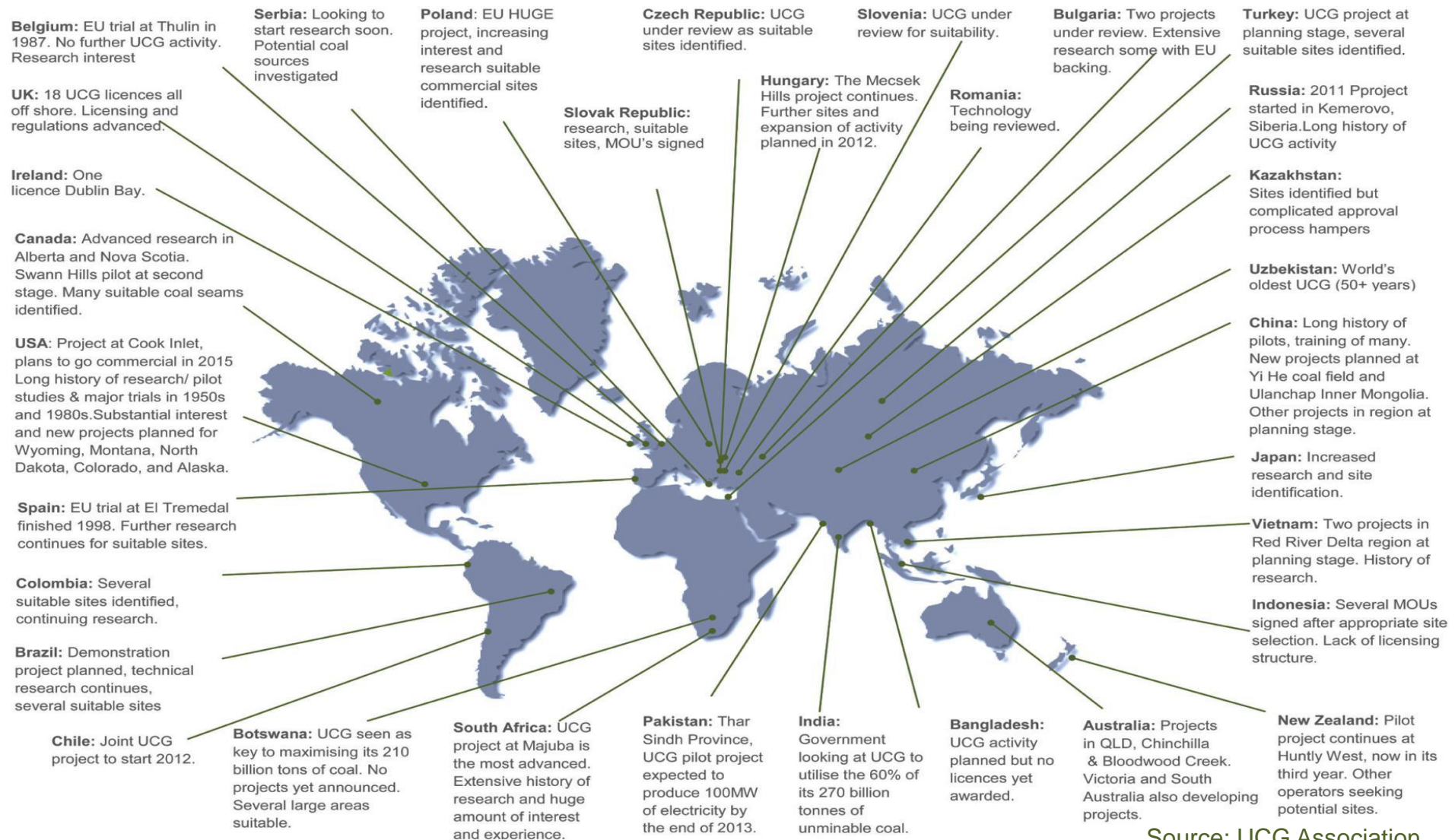
### Most notable historical developments



# >30 Countries Globally currently implementing UCG

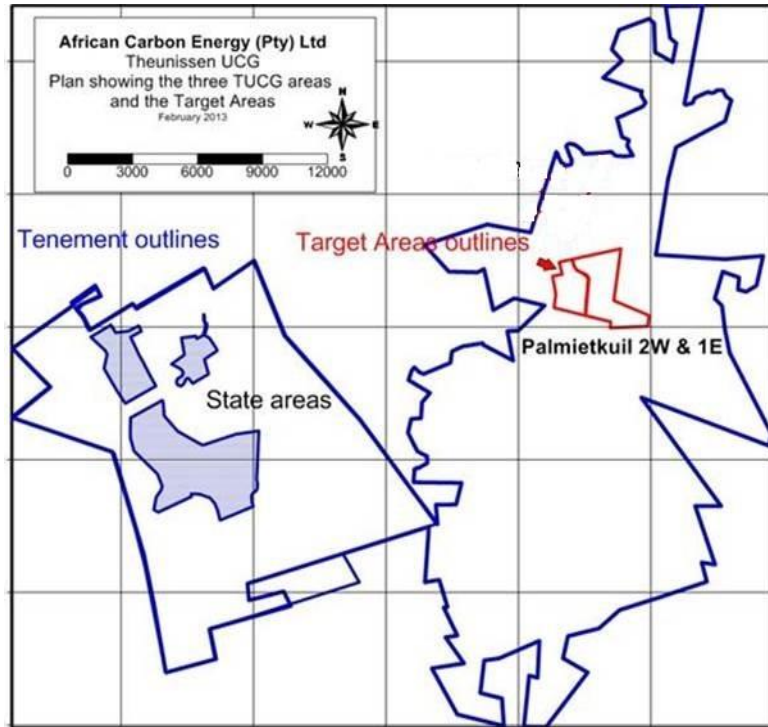


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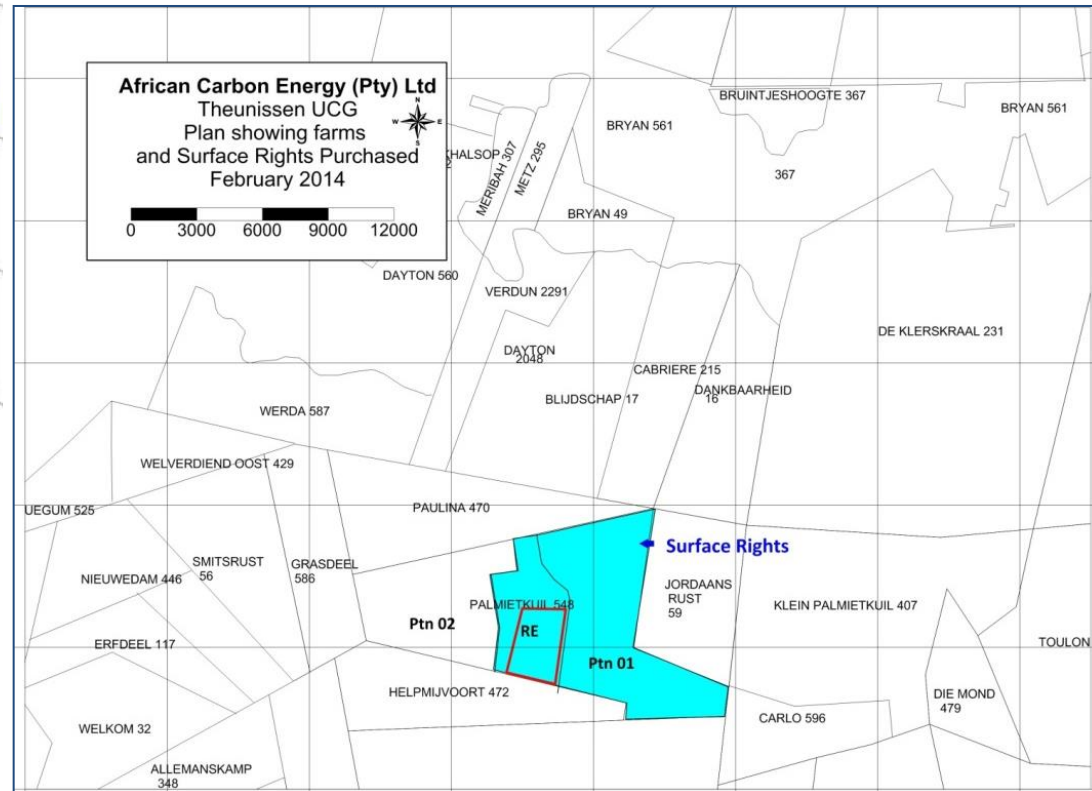


Source: UCG Association

# Africary Coal Target Blocks



The coal tonnage in the target farms are inferred as 20 million tons and measured as 3.7 million tons (gross-in-situ)

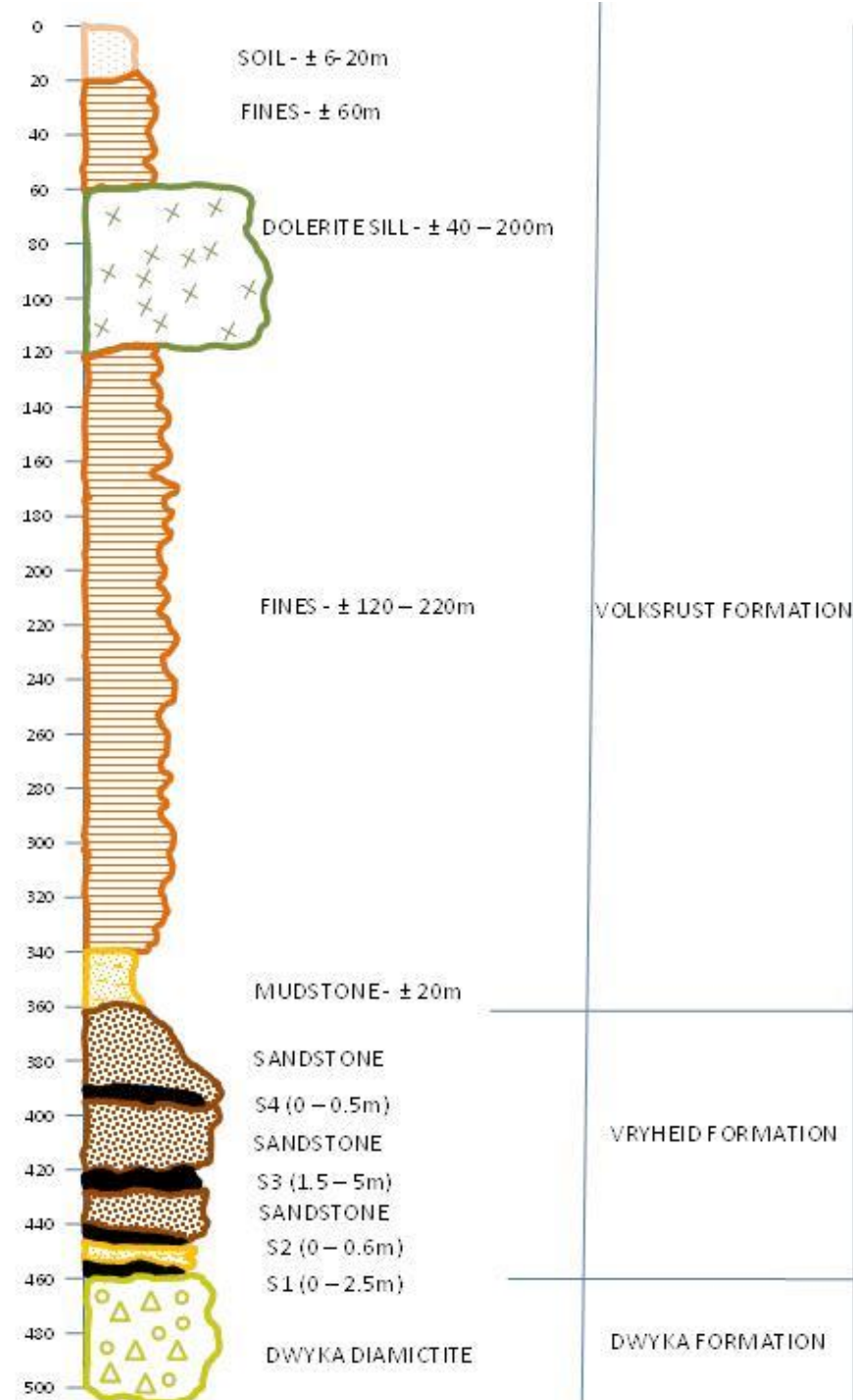




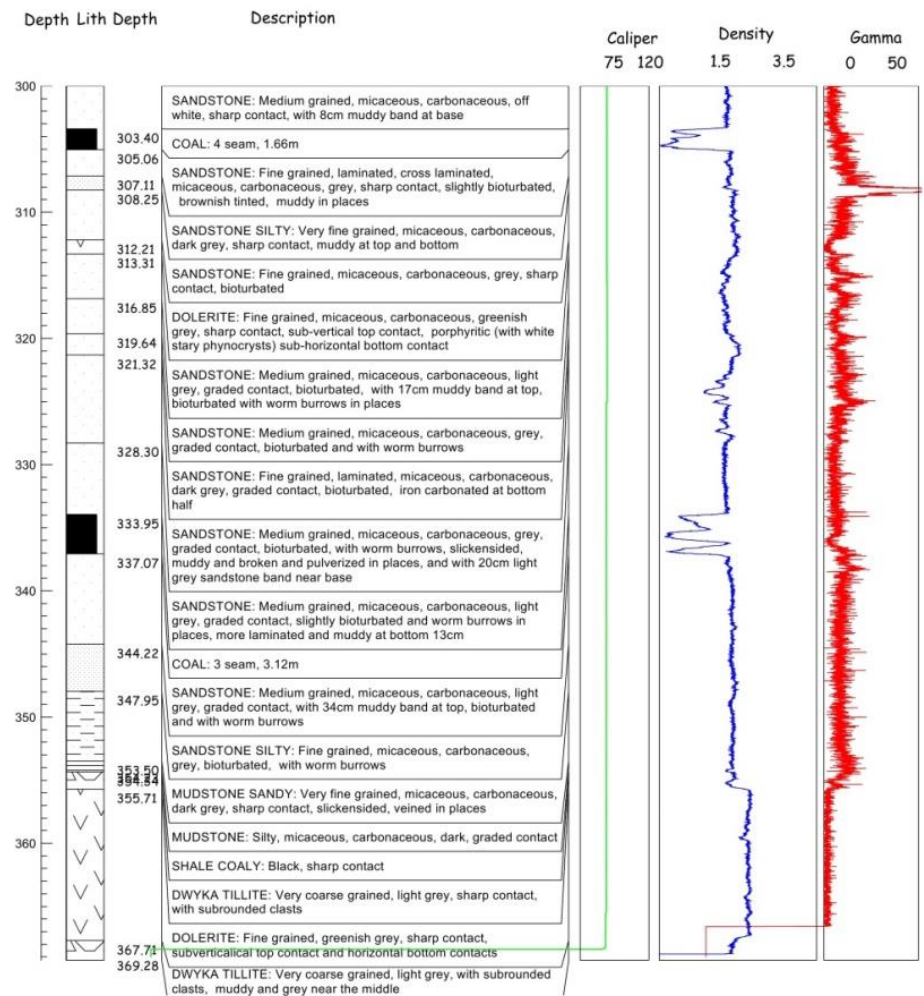
# Schematic coal seam



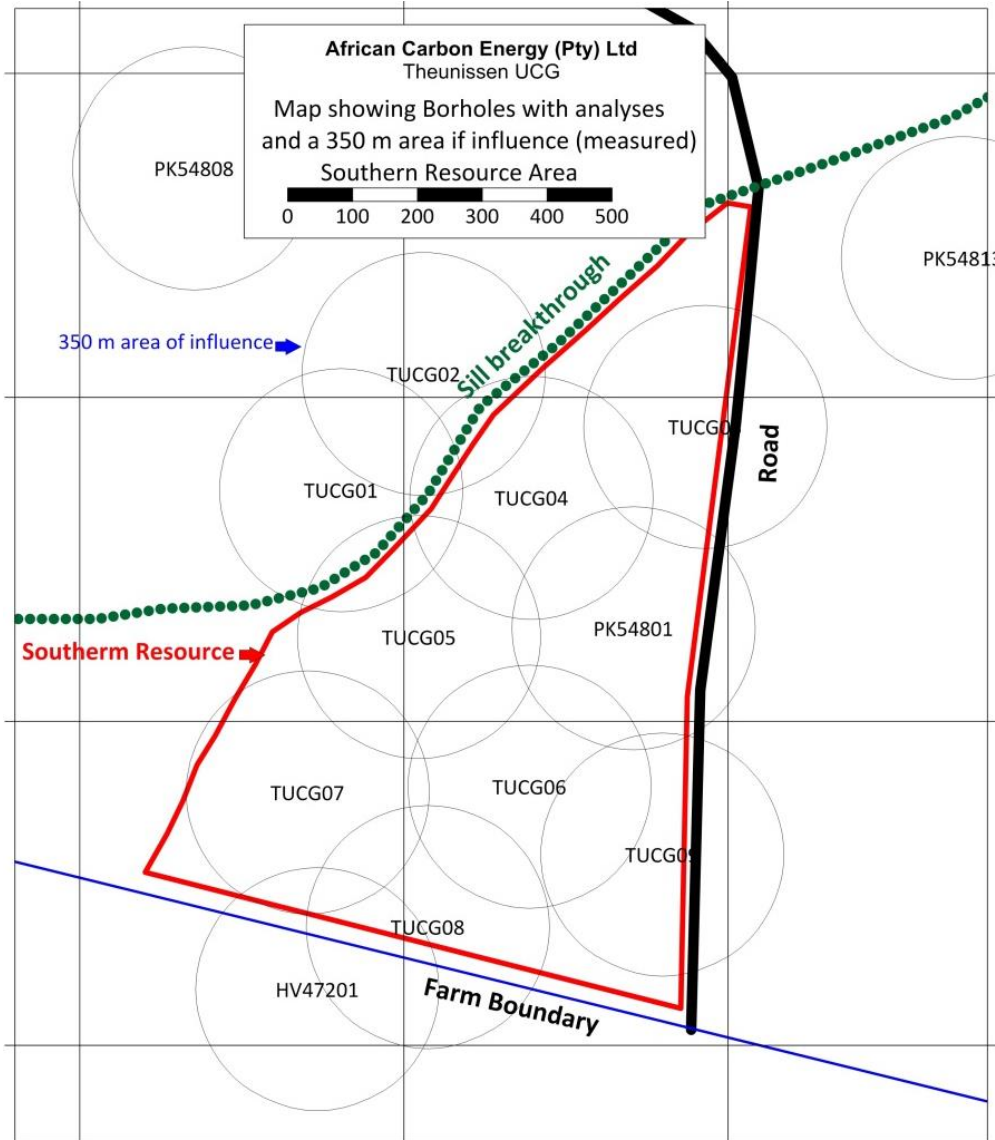
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KAROO SUPER GROUP



# Recent completed drilling



## 350m radius classification



# 3 Seam Reserve

(within owners surface rights has enough coal for 100 years)



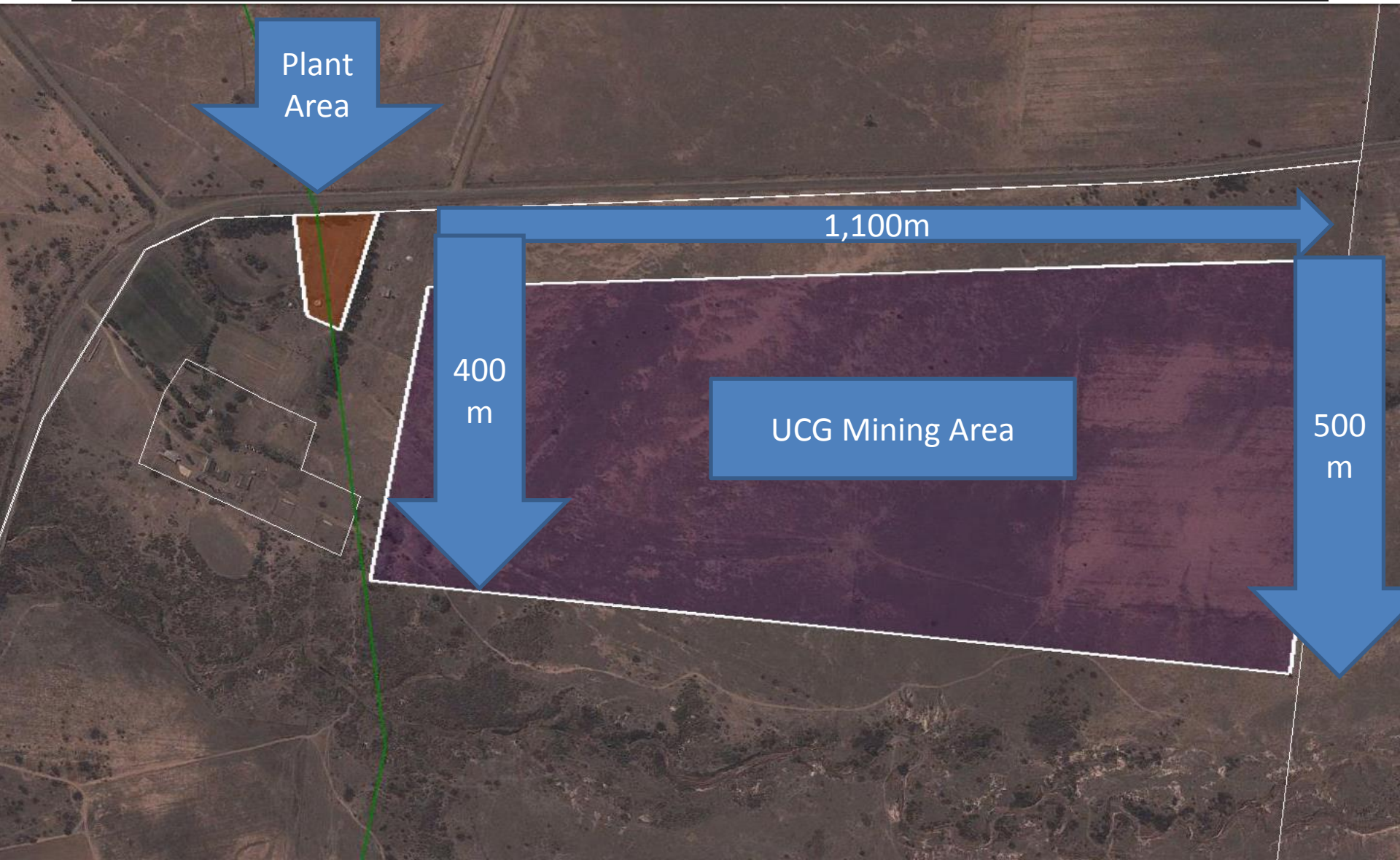
Target Area 3 Seam Resources					
Block	Area	Gross Tons In-Situ	SAMREC	Gross Tons In-Situ	SAMREC
South01	435 001	2 757 943	Measured		
South01	128 450			317 934	Inferred
South02	30 000			221 606	Inferred
South03	20 000	355 282	Measured		
South03	2 253 751			12 022 152	Inferred
North01	81 250	610 723	Measured		
North01	572 501			2 785 106	Inferred
North02	1 058 752			5 207 513	Inferred
<b>Total Measured</b>		<b>3 723 948</b>			
<b>Total Inferred</b>				<b>20 554 312</b>	
<b>Total</b>				<b>24 278 260</b>	

# Proposed area for Project



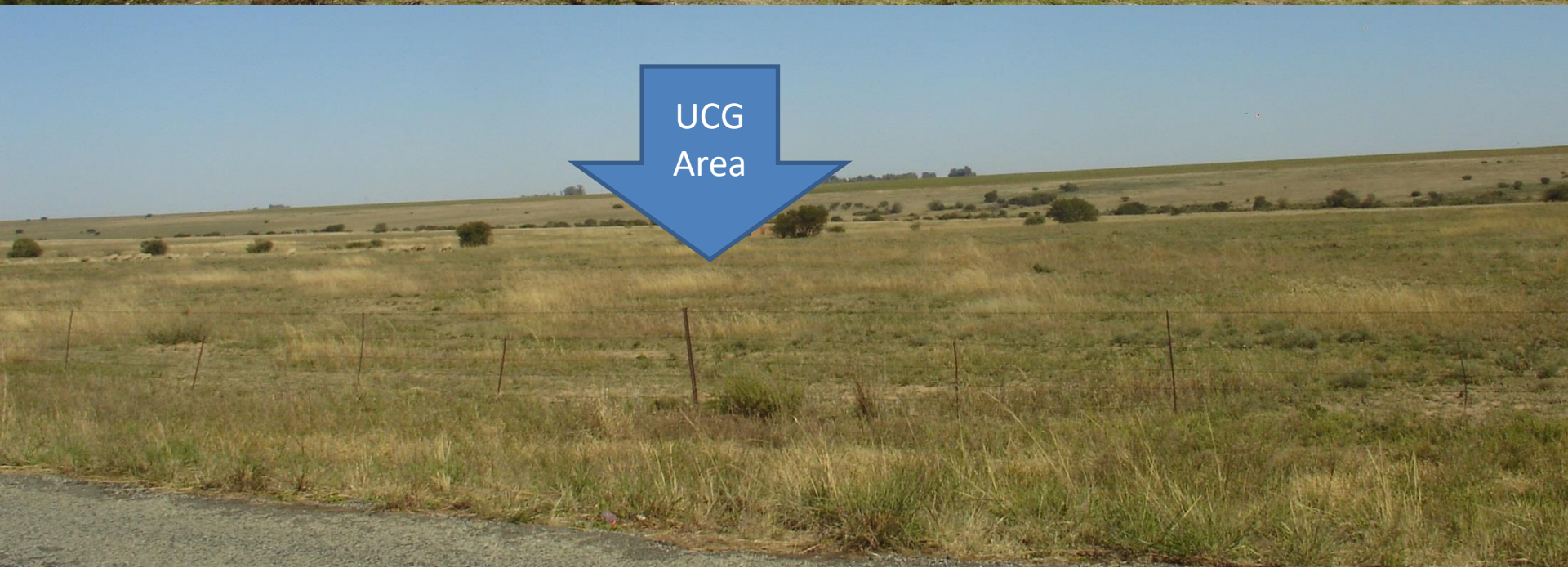
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# Site optimization



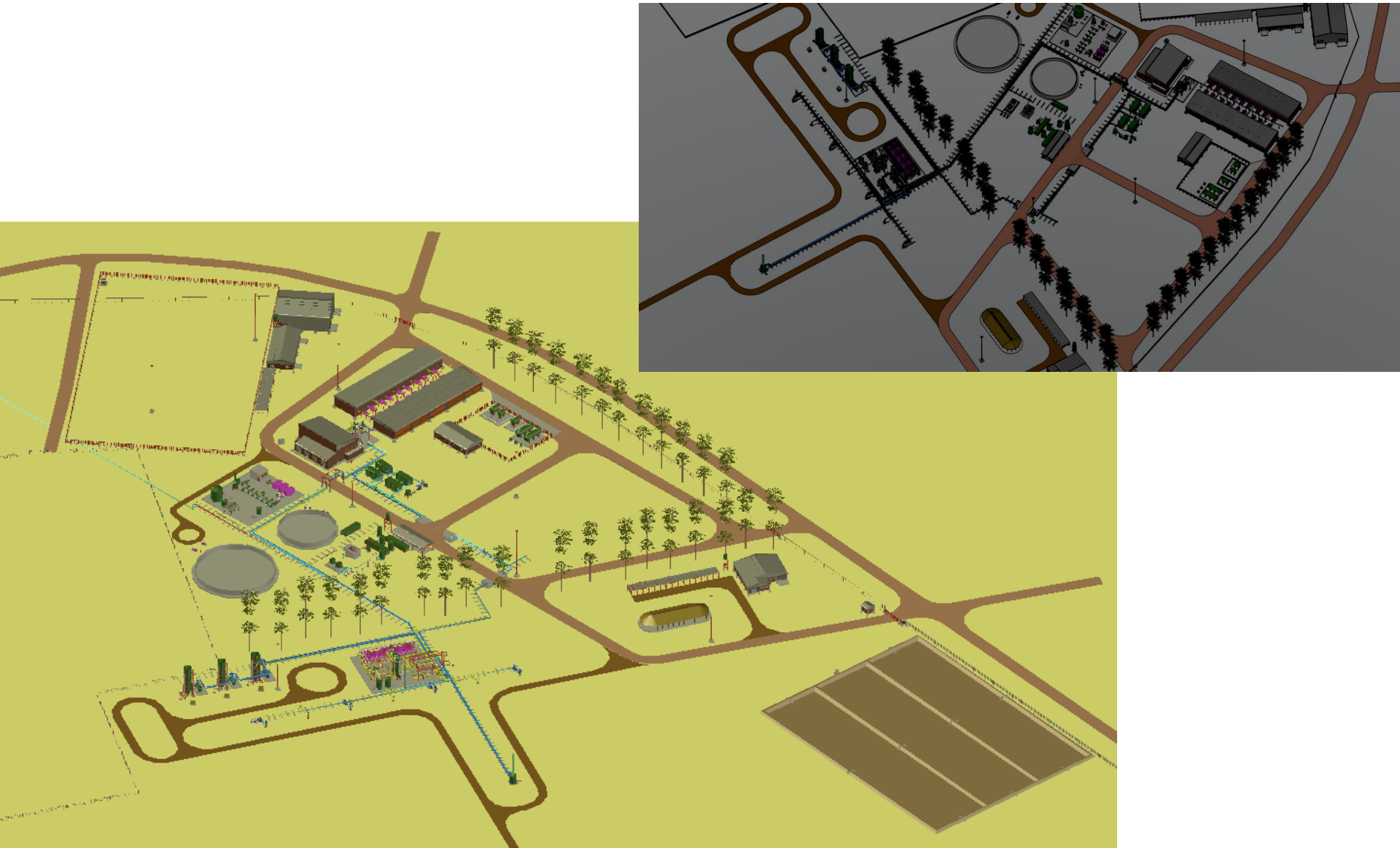


Plant  
Area



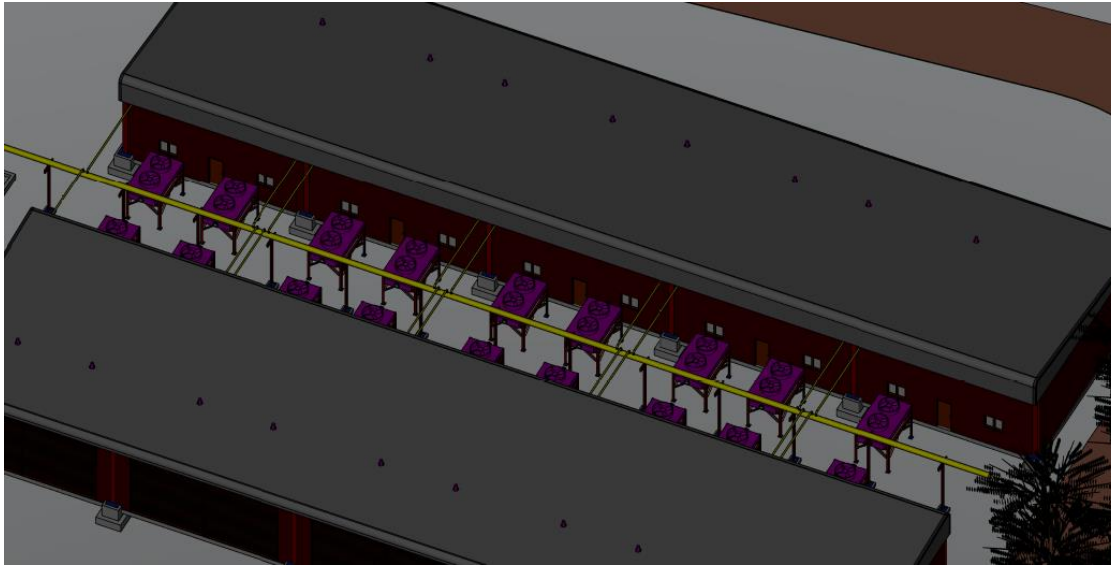
UCG  
Area

# Areal overview of plant



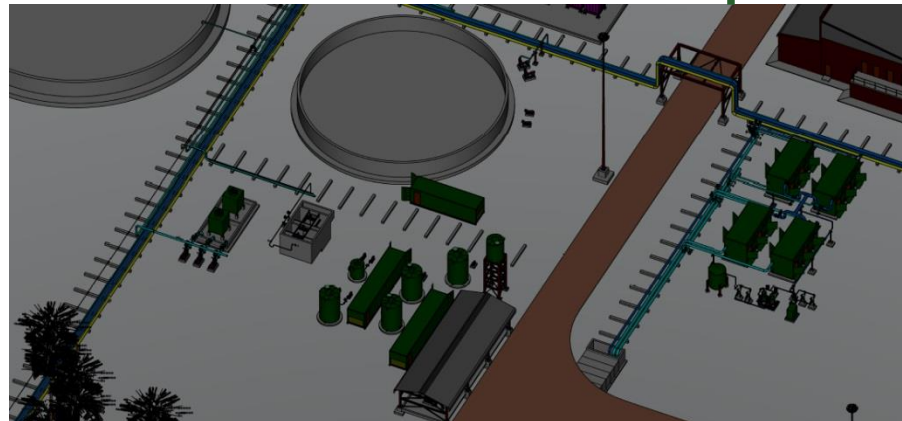
# Plant sub-buildings

## Engine buildings



**24 x GE-Jenbacher  
Gas Engines to  
operate on Syngas**

## Waste treatment and air compression



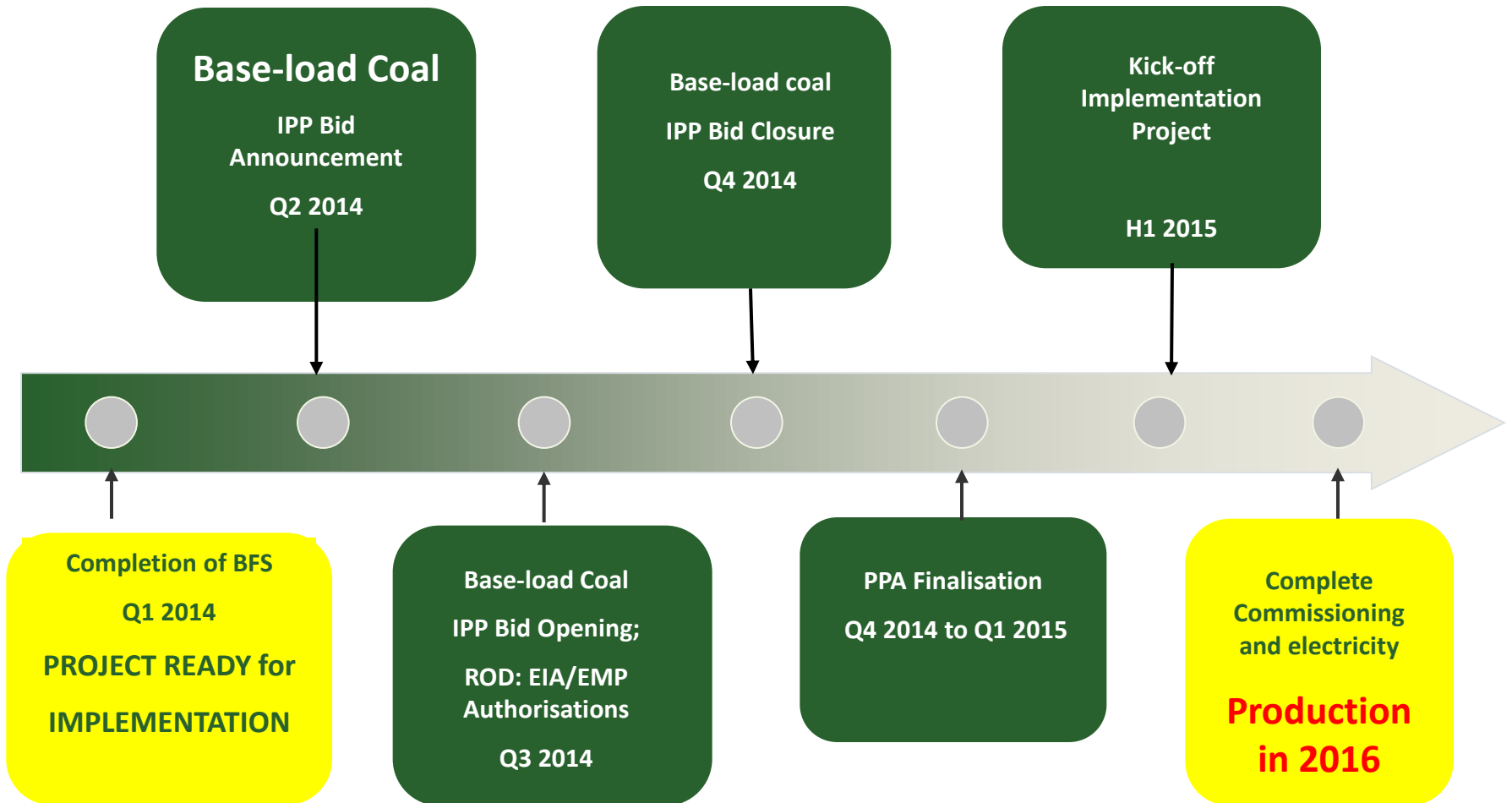


# SandVet Water Supply Agreement



- In negotiations to source water from SandVet
- Will benefit Alman canal
  - Buy water
  - Regular water testing
  - Adhere to regulatory and environmental procedures

# Impending Key Milestones



# Key Message on UCG



**Clean coal power production that can be done safely and in an environmentally acceptable way**

- **Uses 10 times less water than conventional coal**
- **Has 20% higher energy efficiency than conventional boilers**
- **Has no particulate emissions and low environmental impact.**

**Is proven world-wide**

- **Eskom - South Africa – Majuba Project**
- **Australia**
- **USA**
- **Canada**
- **Former Soviet Union**
- **China**
- **New Zealand**

## Contact info

Johan Brand

CEO / MD

Mobile: +27 82 497 1995

Email: [Johan.Brand@Africary.com](mailto:Johan.Brand@Africary.com)



**AFRICARY**  
African Carbon Energy

Eliphus Monkoe

Chairman and Director

Email: [eliphus@Africary.com](mailto:eliphus@Africary.com)