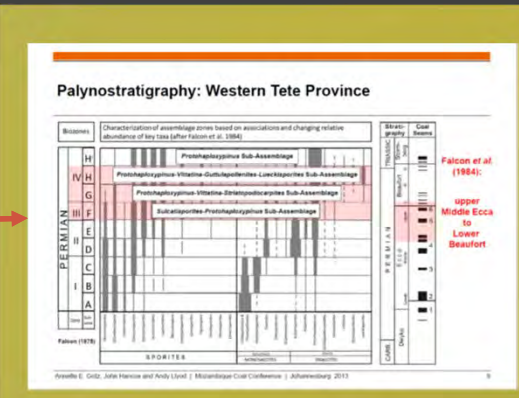
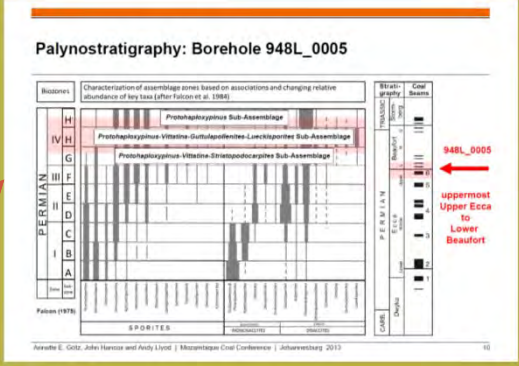
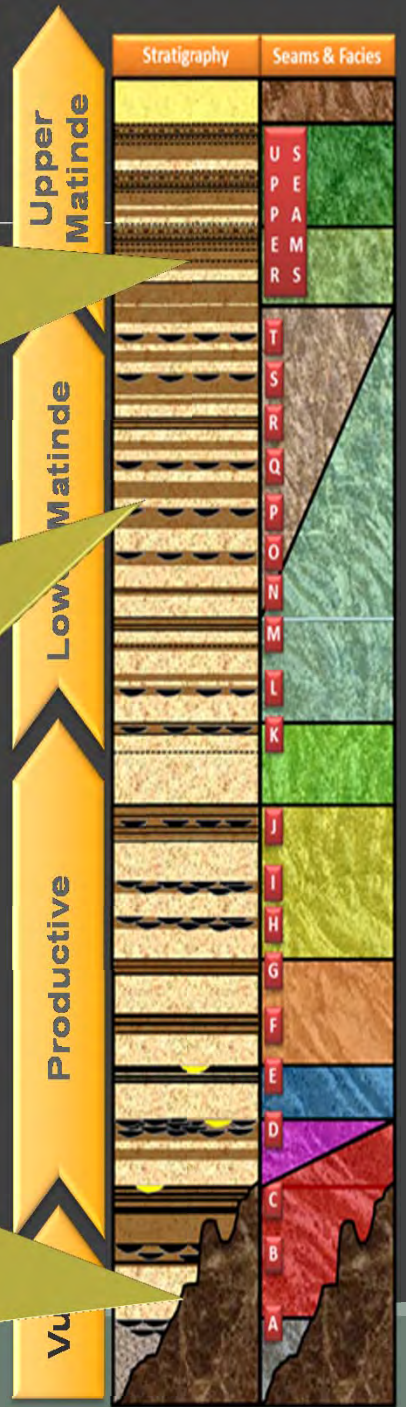
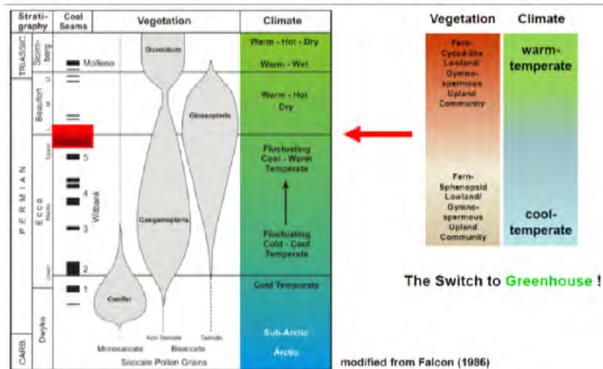


Converting stratigraphy to time

Stratigraphy					Age (My)	Tete		East Africa	South Africa
Era	Period	Epoch or Series	Super-group	Group		W	E	Ruhuhu	Main Karoo
MESOZOIC	Jurassic	Early	KAROO SUPERGROUP	UPPER KAROO	161.2 +/- 4.0				
		Late			183 +/- 0.3	Lualadzi Fm. (JrZ)		Drakensberg	
	Triassic	Middle			199.6 +/- 0.6				
		Early			228.0 +/- 2.0	Zumbo Fm. (JrUz)		Stormberg Group	
					245.0 +/- 1.5			Manda Beds	
PALAEOZOIC	Permian	Late	LOWER KAROO	251.0 +/- 0.4	Cadzi Fm. (PeC)	Cadzi Fm. (PeC)	Usili Fm.	Beaufort Group	
		Middle		260.4 +/- 0.7	Matinde Fm. (PeT)	Matinde Fm. (PeT)	Mhukuru Fm.	Ruhuhu Fm.	
		Early		270.6 +/- 0.7	Mbatize Fm. (PeM)	Mbatize Fm. (PeM)	Mbuyura Fm.		
				299.0 +/- 0.8	Muzi Fm. (CbV)	Muzi Fm. (CbV)	Mchuchuma Fm.	Ecca Group	
				318.1 +/- 1.3			Indusi Fm.	Dwyka Group	



Climate Change and Vegetation



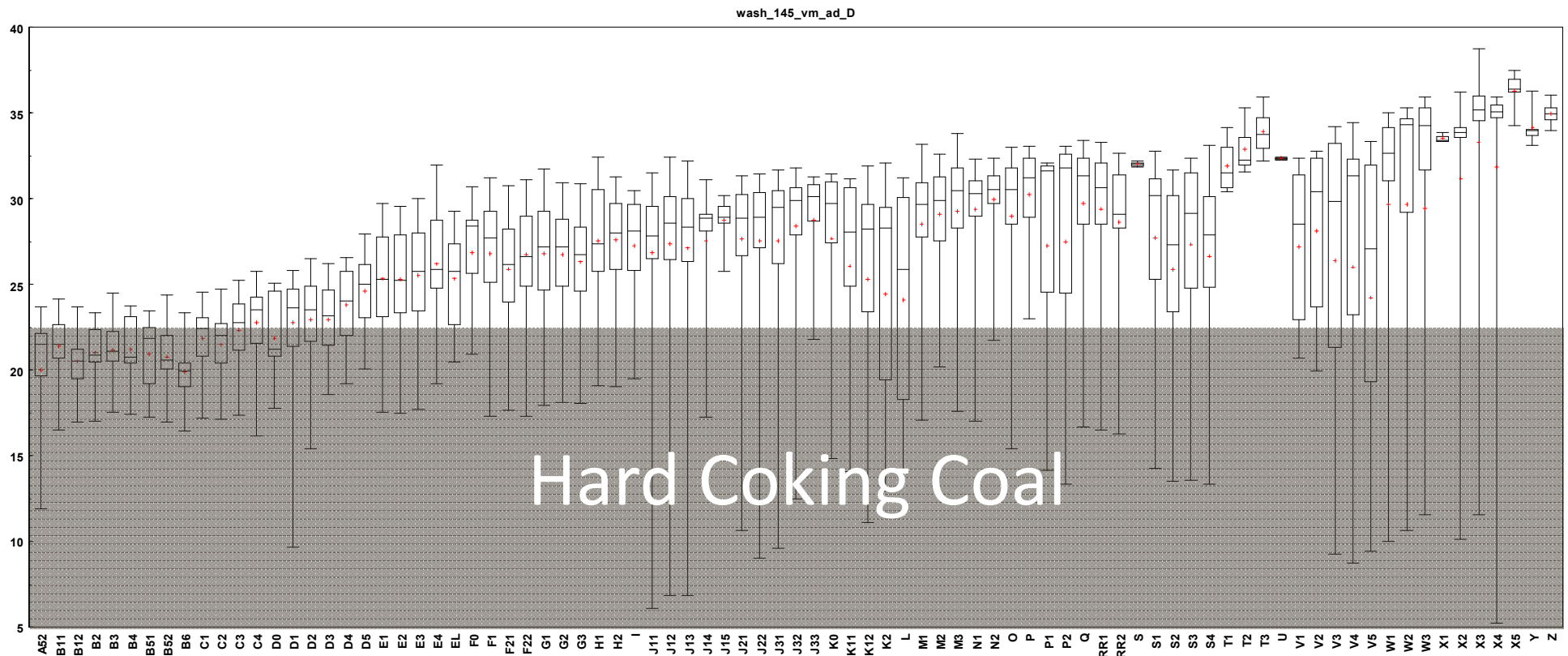
Plys and Coal Quality – 1.45SG VM%

Vuzi

Moatize

Lower Matinde

Upper Matinde



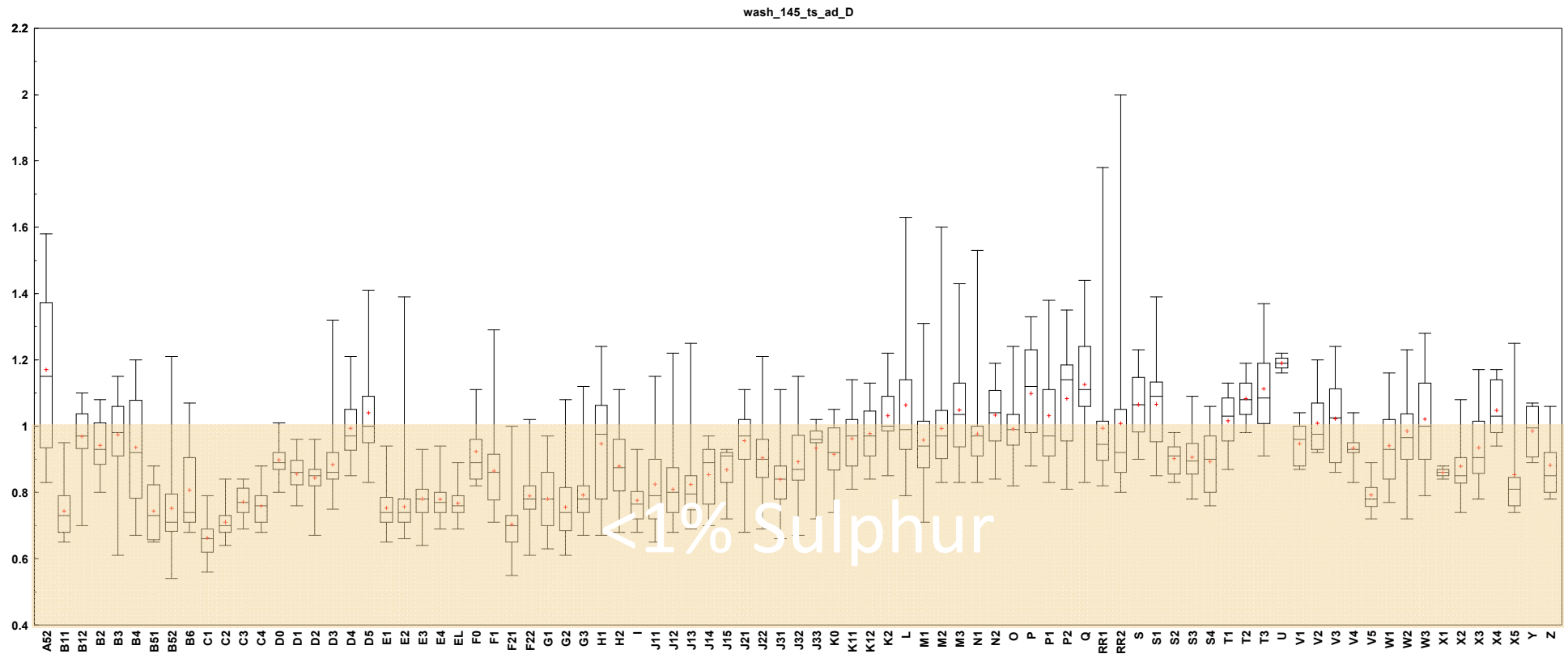
Plys and Ash Chemistry – TS%

Vuzi

Moatize

Lower Matinde

Upper Matinde



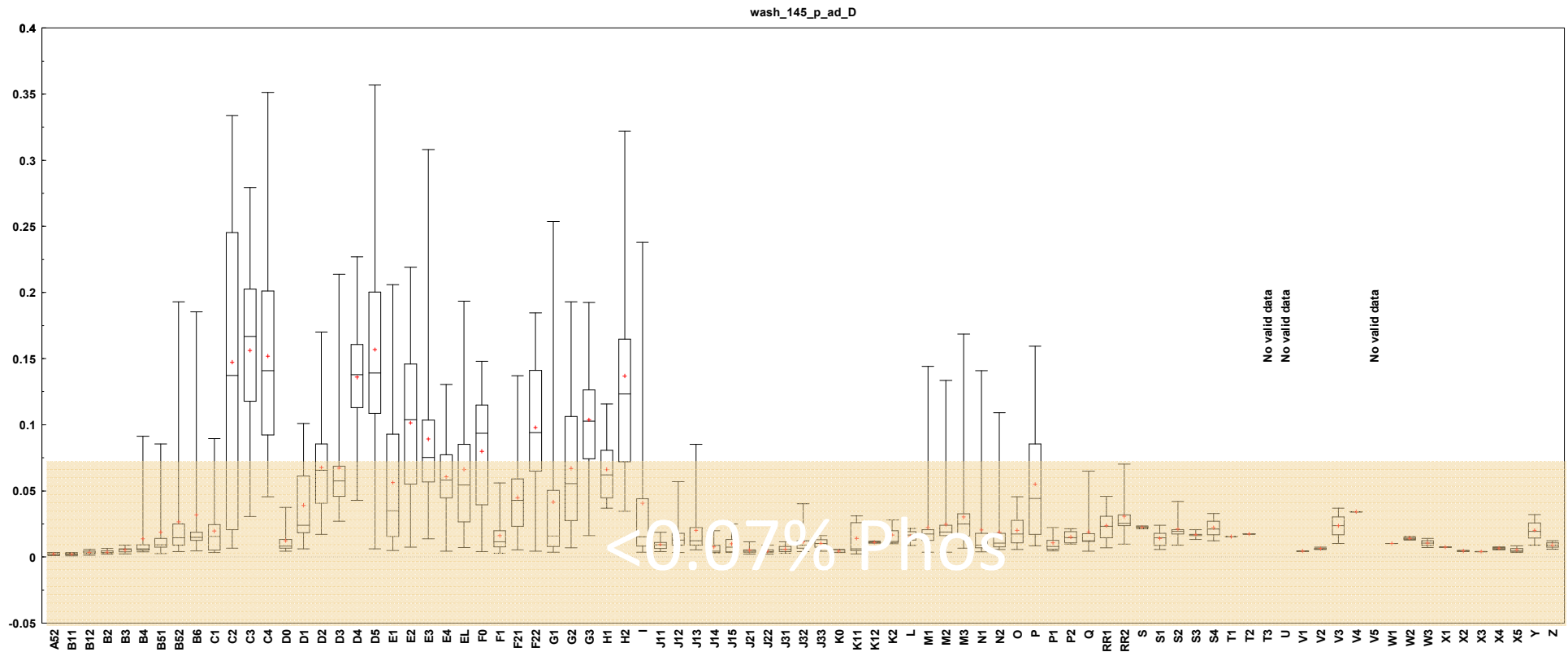
Plys and Ash Chemistry – P%




Vuzi

Moatize

Lower Matinde

Upper Matinde



Era	Period	Super-group	Group	Formation	Stratigraphy	Depositional Environment	Depositional Process	Coals Contained	Coal Characteristics	
									P%	S%
Palaeozoic	Permian	Karoo	Lower Karoo	Matinde Fm.		Fluvial	River channel system?	Discordant lenses		
						Marsh	Marsh system with thick (approx. 20-30m) coal packages consisting of interbanded coal and mudstone. Sandstone partings commonly display coarsening up sequences.	Thicker upper seams	0.03	0.9
						River Channel and Marsh	Transition zone between the underlying river channel system with a series of abandoned channels and the overlying marsh system with thick mudstone dominated packages.	Discordant lenses N+	0.02	1.1
						Fluvial	River channel system with a series of abandoned channels. Seams are less correlatable.	J,K,L,M	0.01	1.0
						Fluvial	River channel system with correlatable seams.	H,I	0.08	0.9
								F,G	0.06	0.8
						Braided Delta	Braided delta system with interchannel coal formation.	E	0.08	0.8
								D	0.08	0.9
	Post Glacial	Post Glacial outwash fans and channels. Lake and marsh system at top of sequence containing C-seam.	C	0.11	0.7					
			A	0.00	1.3					
	Carboniferous			Vuzi Fm.		Glacial	Glacial till deposited by melting glaciers.			
Meso Proterozoic	Stenian					Intrusive	The Tete Complex is the basement rock consisting of serpentinised gabbro; the basement includes intrusive stocks and plutons.			

Coal Type log

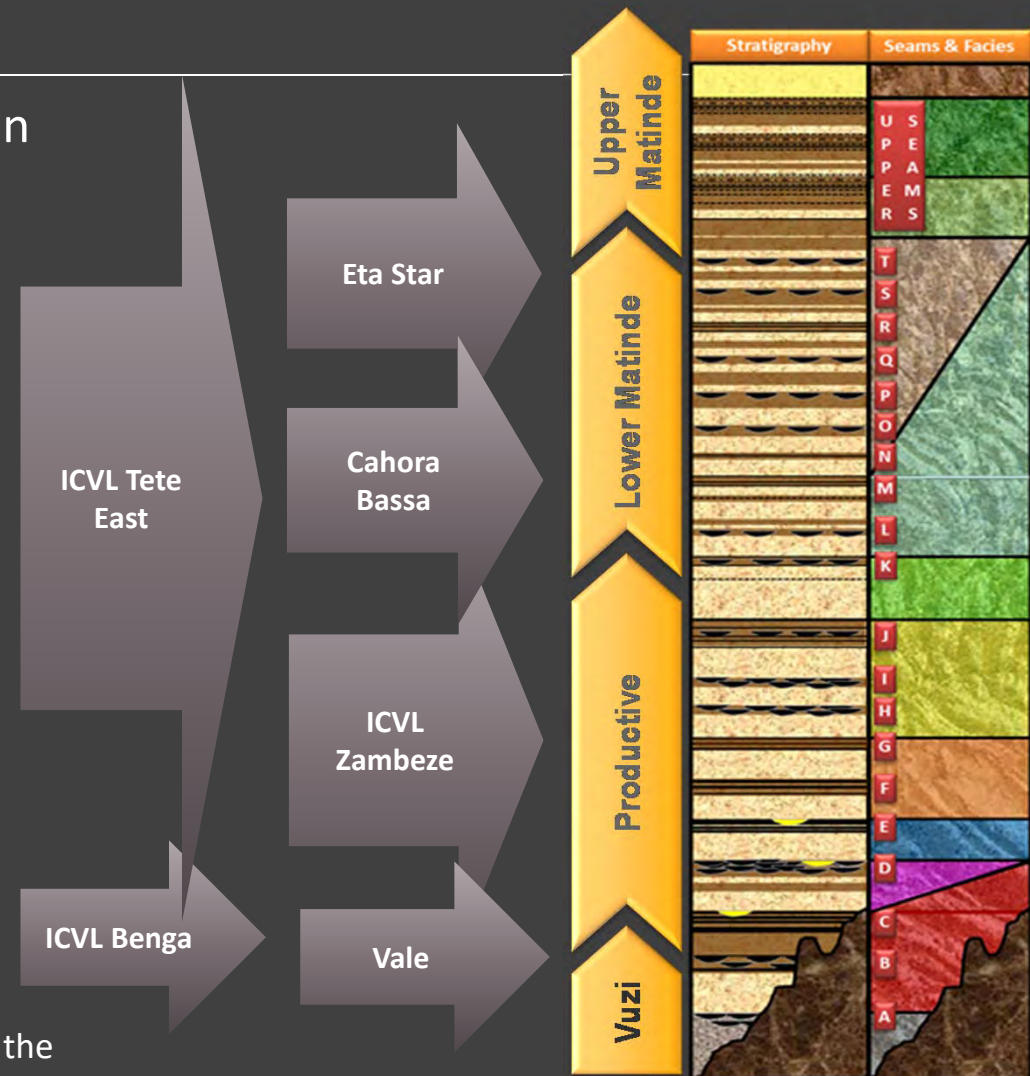
Up to 60 coal seams in the basin
(seam >1m)

Seams thickness's up to 90m

Interburdens average 40-50m

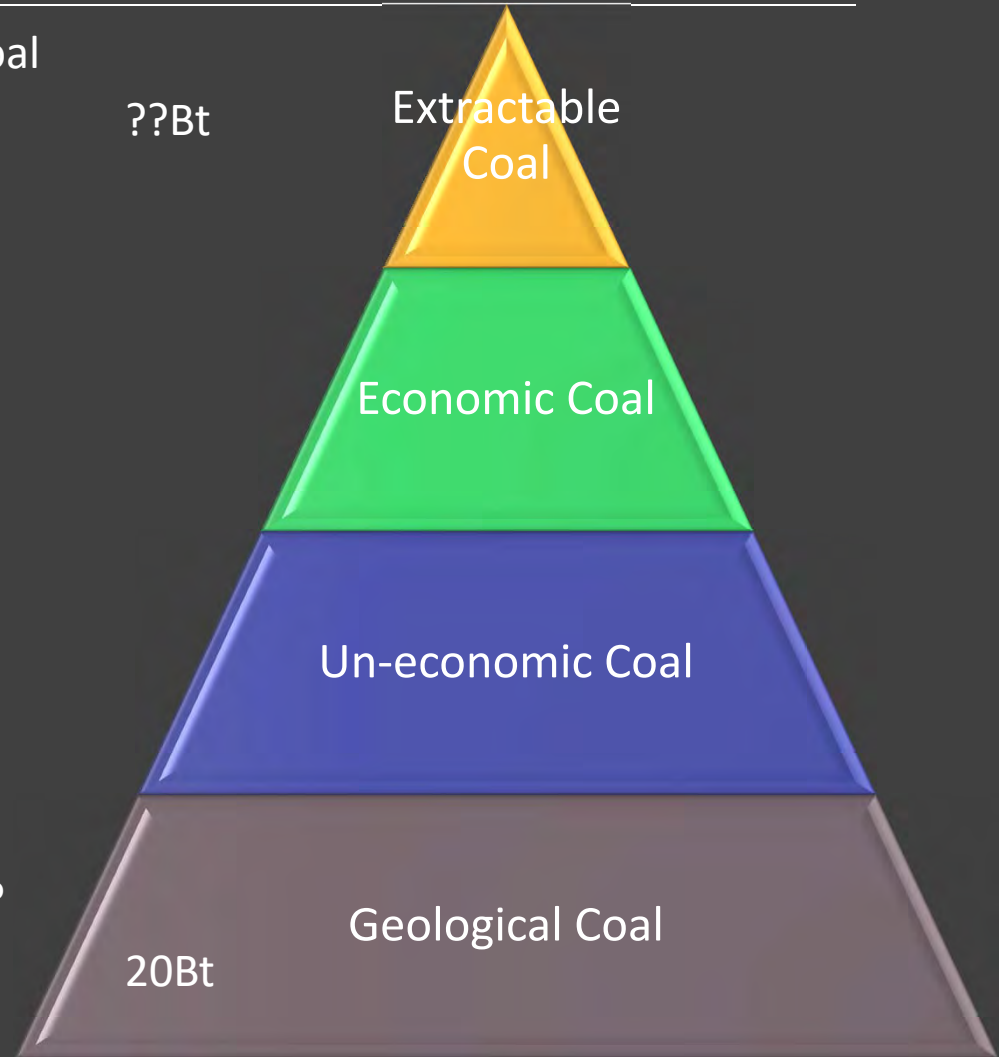
Coal characteristics

- Sulphur – 0.8- - 1.2%
- Phos – 0.001 - 0.2%
- VM – 20 - 35%
- Coke Yields – 5-60%
- Rank – 0.8-1.7
- Additional Thermal Yields – 10 - 30%
- Potential resources
 - Faulted
 - Seams show varying continuity
 - Intrusions become more prevalent to the east



How much “coal” is there in Mozambique??

- Possibly >20Bt of Geological Coal
 - Moatize (Vale) – >4Bt
 - ICVL – >10Bt
 - Minas de Revuboé – 1Bt
 - ETA Star – 2Bt
 - Jindal – 0.7Bt
 - KingHo – 0.5Bt
 - ENRC – 3Bt
- How much is extractable?
 - Yield – 30%
 - Interburdens – 40-50m
- What type of coal?
- How Deep?
- At current coal prices?
- At current Infrastructure costs?

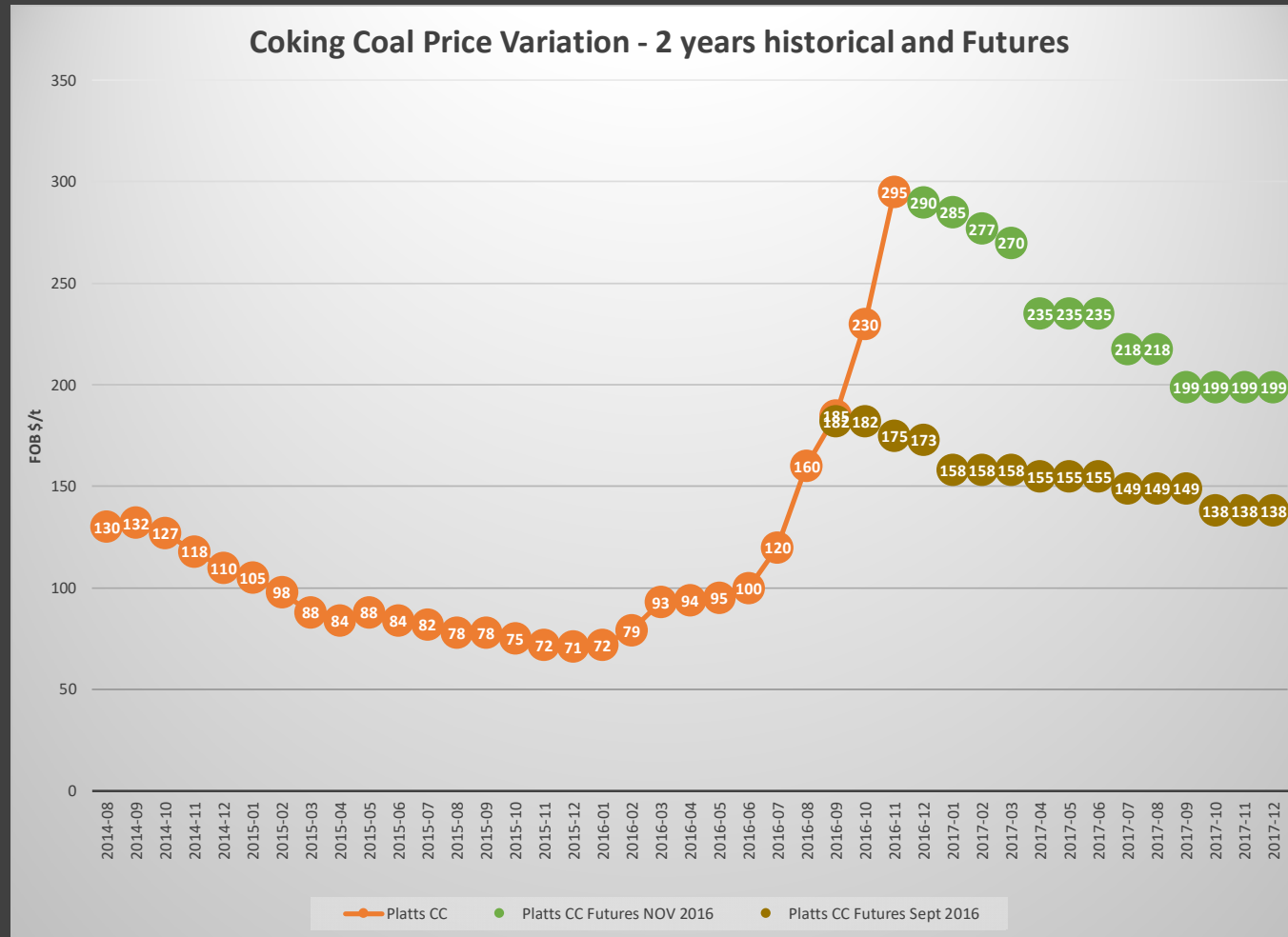
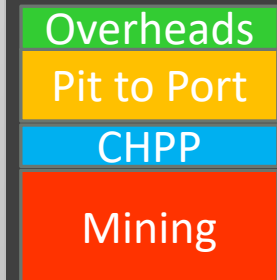


Coking Coal Prices (FOB \$/t)

2014 Cost Model



Future Cost Model



Elephants – “country” rather than “room”

Significant resources – multiple Bt resources.

But – costs structures need to be addressed.

Mozambique Coal is part of the Southern African Karoo system, multiple mines tackle similar challenges – learn from them.

There is now technical expertise in coal mining in Mozambique, it should be utilised.

Going forwards – unlocking value needs:-

- The right people
- The right balance of risk – smart rather than prescriptive
- The right expertise
- Honour the geology
- Mining models need to reflect the geology
- Understand the products and markets

What does this mean for Mozambique?

Coal resource base changes on daily basis – but the geological coal does not.

Mozambique Factors

- Mining Costs
- Infrastructure

Global Factors

- Coal Price

The Moatize basin has the potential to produce a large percentage of the world's Coking coal, but only if the current cost regime is reduced and infrastructure is developed.

