Eskom Presentation to the Portfolio Committee on Public Enterprises

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22 May 2012

Paul O'Flaherty: Finance Director

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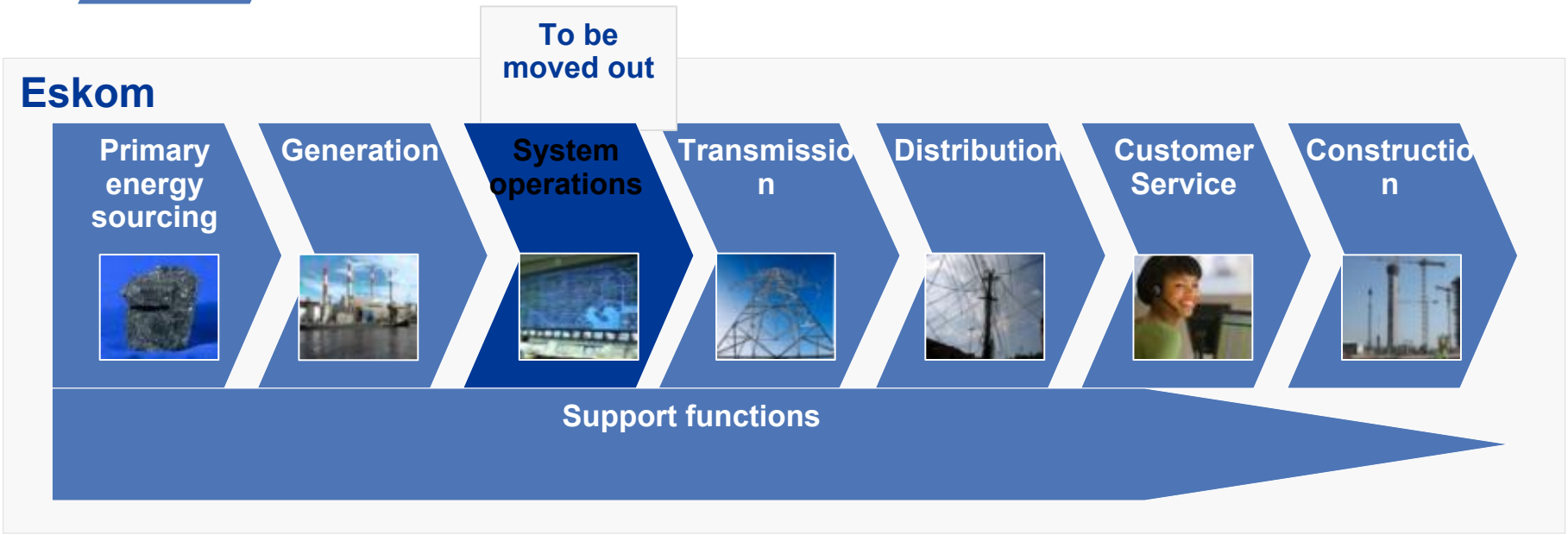
The structure of SA's electricity industry is changing

Change of the industry value chain

- The ISMO Bill was tabled in Parliament on 13 May 2011
- The actual path to be followed is being finalised



In support of

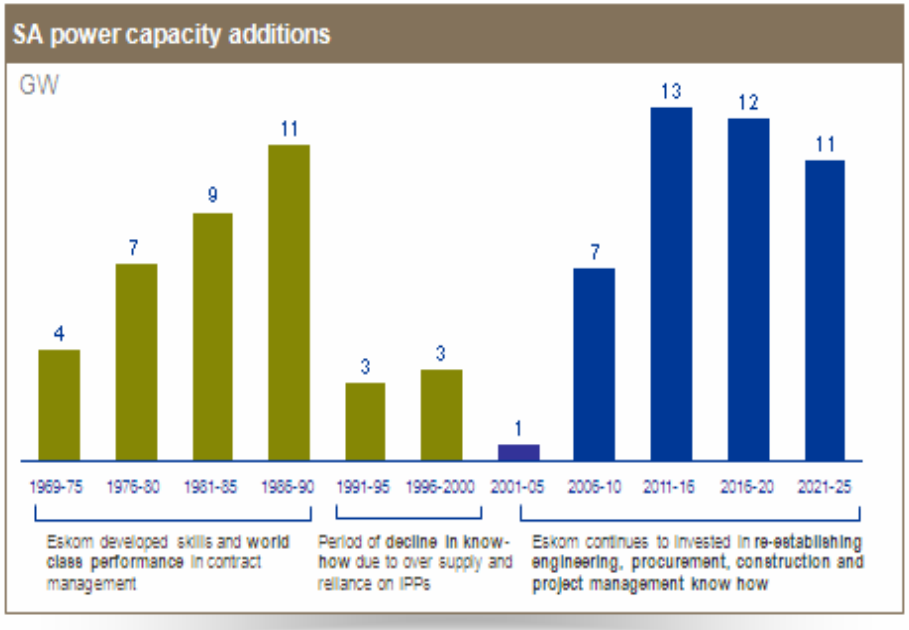
Eskom Corporate Overview

Context for creating a world class EPCM organisation

- Infrastructure is the foundation of economic growth and leads it. For electricity supply, a 1% GDP increase requires a 1,5% increase in electricity supply
- Eskom was established in 1923 as the Electricity Supply Commission. In July 2002, it was converted into a public limited liability company, wholly owned by the SA government
- We are one of the top 20 utilities in the world by generation capacity (41 194MW). We generate 95% of the electricity used in SA and about 45% of that used in Africa
- We are vertically integrated - generating, transmitting and distributing electricity to approximately 4.5million customers in the residential, mining, industrial, commercial, and agricultural sectors
- To meet the increasing electricity needs of South Africa, Eskom managed the construction of 31 000MW of new capacity between 1970 and 1990.
- In the following decade, electricity was in over supply and little was invested in new electricity generation. This resulted in a gradual loss of skills, knowledge and know-how from Eskom and from South Africa.
- We have now returned to the cycle of under supply. We are committed to meeting the electricity and related infrastructure needs of our customers and contributing to the developmental needs of South Africa
- During the last decade we have invested in re-establishing our engineering, procurement, construction and project management expertise to support a massive expansion programme.

Eskom Corporate Overview

Context for creating a world class EPCM organisation



Eskom EPCM Organisation Overview

Delivering world class Engineering, Procurement, Construction and Project Management in Africa

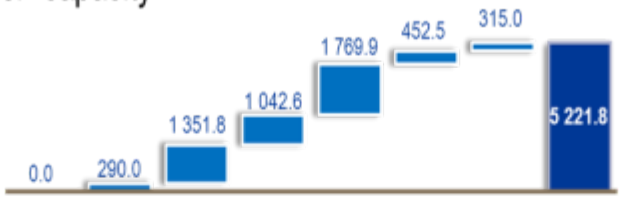
- Eskom's EPCM organisation is undertaking and managing amongst the largest construction projects in the world. The Medupi and Kusile Projects rank amongst the top 5 power generation projects in the world by capacity
- Our portfolio is diverse and includes projects in the energy, transportation, water and communications sectors. Geographically, our portfolio of newly constructed projects are positioned all across South Africa. We are also actively engaging in projects in Southern Africa
- Through delivery of large construction projects, Eskom has and continues to invest on improving its engineering, procurement, construction and project management (EPCM) capability, its people and its systems, processes and tools
- We have aligned our contract management, financial systems, project controls, project system and processes, quality standards and safety with that of our peers. Together with lessons learnt, we are embedding this into the EPCM organisation.
- Increasing supply from local industry and creating jobs is critical. This requires knowledge, skill and technology transfer. We continue to actively drive this by incentivising industry partnerships, employing local labour and through training
- Since 2005, we have delivered 5 200 MW of generation capacity , 3 200 km of transmission network, and 17 700 MVA of substation transformers. The infrastructure currently under construction will create approximately 40 000 jobs and more than 50% of the spend will be local

Eskom EPCM organisation has a diverse infrastructure portfolio and which it continues to deliver upon

Actual delivery since 2005

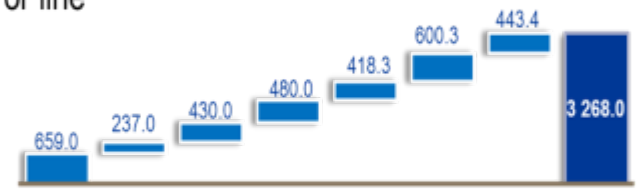
Generation

MW of capacity



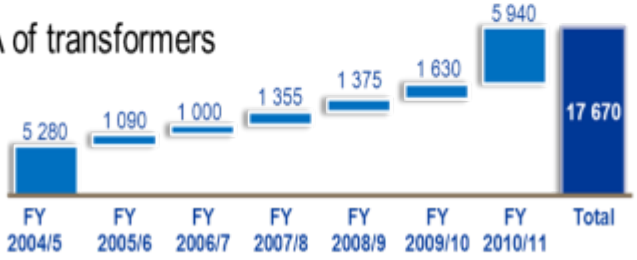
Transmission

Km of line



Substations

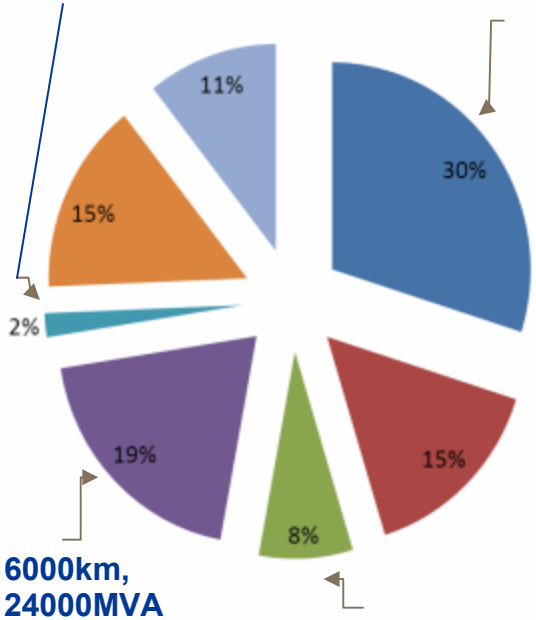
MVA of transformers



Current 6-year capital project portfolio - R453bn

200MW in development

>10000MW in construction



- Current Generation New Build
- Existing Generation Refurbishment
- Primary Energy (includes new infrastructure)
- Transmission
- Renewables
- Distribution
- Other (includes Telecommunications and Information Technology)

6000km, 24000MVA (50% in construction)

~70km rail ready for construction. Includes water infrastructure

Within a global context, we continue to benchmark ourselves and embed improvements

The world has changed since Eskom last build power stations

The supply industry is **consolidating** (less competition) and **capacity** is reduced

Asian suppliers entering but do not yet meet Eskoms requirements. Established suppliers are **outsourcing** to these which cause significant **delays** - also in South Africa

Economic boom created pressure on **construction costs**, while financial crisis caused **financial constraints**

South Africa has increased focus on local **creation** and **industry development** which creates increased **complexity**

Medupi and Kusile are among the largest coal-fired power plants in the world

Coal-fired power plants (MW)

1. Taichung (Taiwan, 7 100[1])
2. Waigaoqiao (China, 5
3. 000)
4. Kusile (South Africa, 4 800)
5. Medupi (South Africa, 4 800)
6. Zouxian (China, 4 540)

Challenges

- **Massive size** with multiple **interfaces** to manage for Eskom as **EPCM**
- **Local content** and **ASGI-SA** drives large, unskilled worksforce
- Medupi and Kusile have **different execution partners and design**, which complicates full utilization of learning
- Contracting on **virtual design** because of step ramp-up curve so significant design changes occur during construction
- Target of building Medupi **faster** than done in South Africa or by our contractors anywhere before

One power plant is 4x the investment of the Gautr

A number of steps were taken to understand our performance and improvement potential …

External review of performance

International best practice benchmarking trip

… and Eskom has learned that we are not alone

Almost all European plants visited are 1,5 to 2 years **late**

Primary reason for delay is problems with **individualized design**

Other problems include welding of **T24** steel, low steel manufacturing **quality**, **logistics** issues on and off site and insufficient **crane** capacity

Refining our approach to perfection is an on-going journey

To 2006/2007	2008/2009	2010/2011	2012/2013	2014 -
1st phase	2st phase	3st phase	4st phase	
Set-up	**Initiation**	**First profes-sionalization**	**Closing the gap to world performance**	**Stabilize**
Initiate fast ramp-up of projects in a market with high demand Understand implications of requirements for **local content**	Initiate all **contracts** Initiate **assurance** Initiate **construction** on site Start establishment of **project teams**	Introduce **lean construction** Adjust **organizational structure** Initiate **performance tracking**	Revise and re-negotiate **contracts** Develop and utilize **international network** to share knowledge Become a more active owner	**Continuous improvemen**

Within a global context, we continue to benchmark ourselves and embed improvements

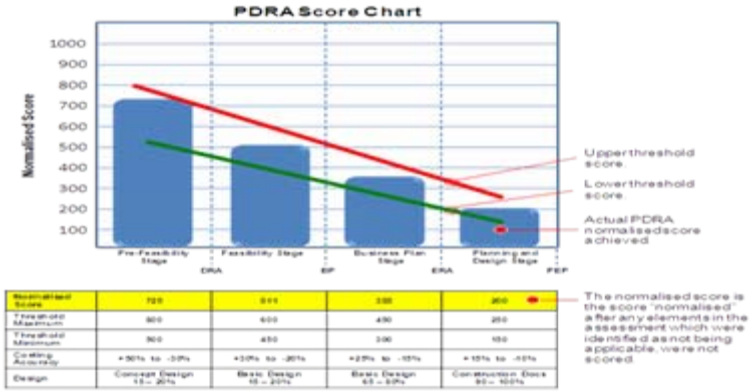
Eskoms approach is aligned with what our peers are doing

	Shell	EXXON	EnBW	e·on	Eskom
NEC/FIDIC contracts	✔	✔	✔	✔	✔
SAP system	✔	✔	✔	✔	✔
Project lifecycle management	✔	✔	✔	✔	✔
Primavera	✔	✔	✔	✔	✔
ISO 9001	✔	✔	✔	✔	✔
LTI/fatality tracking	✔	✔	✔	✔	✔

Construction Industry Institute®

PDRI

Project Definition Readiness Assessment



Aspect of Project	Ranked by # of Associated Lessons-Learned	No. of Associated Lessons-Learned
Cost	1	79
Planning & Develop.	2	73
Specifications	3	69
Schedule	4	65
Design	5	56
Criteria	6	49
Contract. Strategy & Scoping	7	48
Mechanical	8	39
Civil & Structural	9	37
Project Management	10	36
Execution	11	32
Procurement	12	28
Executive Management	13	27
Permitting	14	25
Boiler	15	22
Turbine	16	22
Siting	17	22
Communication & Coordination	18	16
Site Layout	19	16
Construction Management	20	14
Material Handling	21	13
Geotech	22	13
Project Staffing & Organization	23	13
Electrical and Controls & Instrumentation	24	10
Construction	25	10

New Generation Capacity and Transmission Networks 2005–2018

	Return-to-service (RTS)	Base Load	Peaking & renewable	Mpumalanga refurbishment	Transmission
					
In development	• None	• Nuclear–site development and front end planning • Biomass • Primary Energy projects (Road & Rail)	• Sere (100 MW) • Pilot CSP (100 MW) • PV (Own use)	• Refurbishment and air quality projects	• 60 Grid strengthening projects
Under Construction/ complete	• Komati (1 000 MW) • Camden (1 520 MW) • Grootvlei (1 180 MW) • **3 700 MW**	• Medupi (4 764 MW) • Kusile (4 800 MW) • **9 564 MW**	• Ankerlig (1 338.3MW) • Gourikwa (746 MW) • Ingula (1 332 MW) • Solar PV installations at MWP (0.424 MW) • **3 518 MW ***	• Arnot capacity increase (300 MW) • Matla refurbishment • Kriel refurbishment • Duvha refurbishment • **300 MW**	• 765kV projects • Central projects • Northern projects • Cape projects • **~ 4 700 km**

Note: Solar PV Plants at Lethabo (0.575 MW) & Kendal (0.620 MW) are in operation phase

Commissions of new stations

	First Unit	Last Unit
Medupi	2013	2017
Kusile	2014	2018
Ingula	2014	2014

- ~ 17 082 MW of new capacity (5 501 MW installed and commissioned)
- ~ 4 700 km of required transmission network (3 747.6 km installed)
- 20 600 MVA planned (17 945 MVA installed)

Medupi is the first coal-generating plant in Africa to use supercritical power generation technology

CSP: Concentrated Solar Power
PV: Photovoltaic
* Includes 1.62 MW for Solar PV (MWP, Lethabo & Kendal)
Source: Eskom Group Capital Division (Construction Management)

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Generation Projects

Of the coal-fired power stations, all but Medupi are located in the Mpumalanga province. Medupi is in Lephalale (Limpopo province).

- Renewables
- New Coal
- Peaking
- Return To Service
- Capacity Upgrade

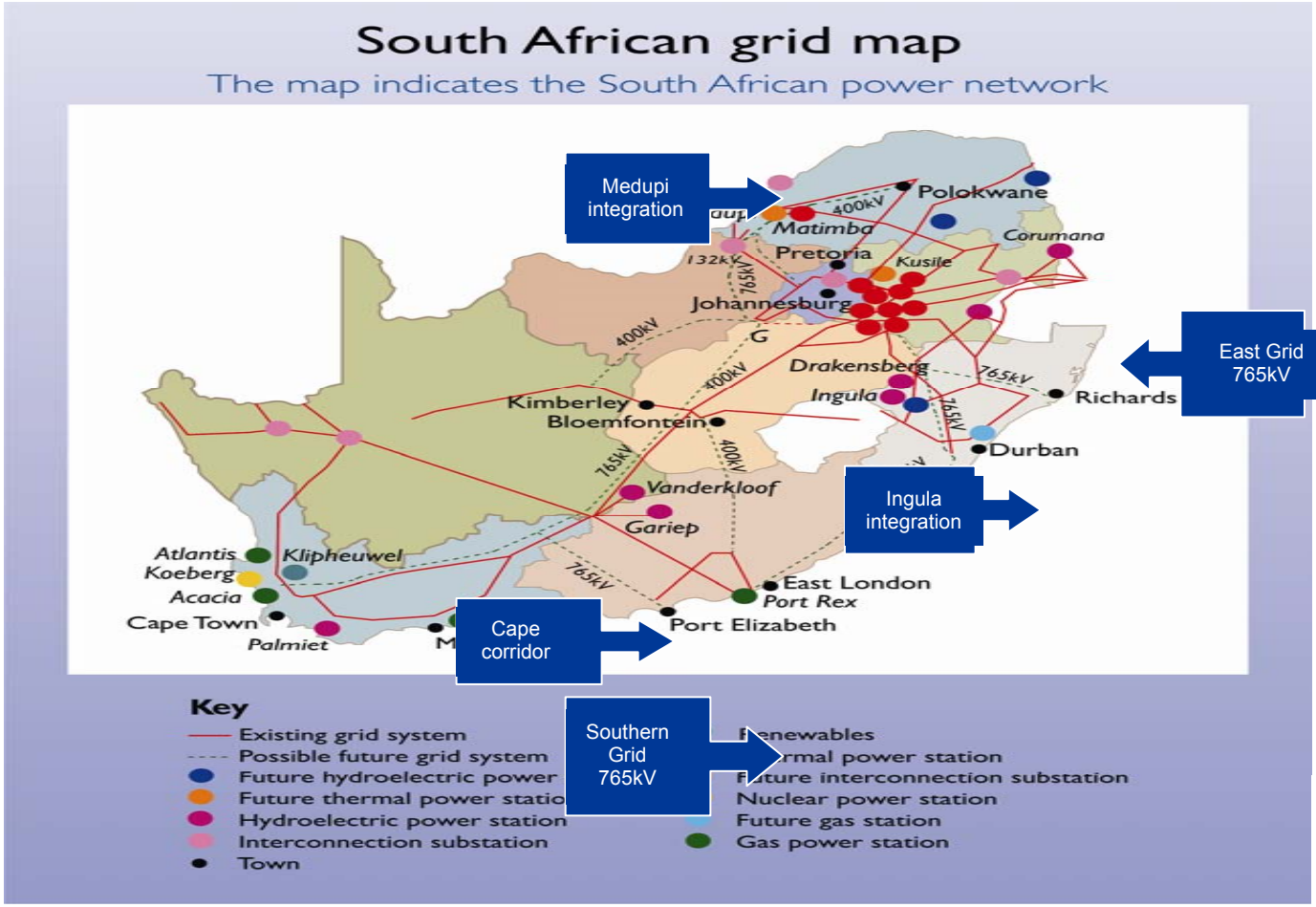
In support of

Source: Eskom Group Capital Division (Construction Management)

Key transmission projects

Keys

- Existing grid system
- Possible future grid system
- Future hydroelectric power station
- Future thermal power station
- Hydroelectric power station
- Interconnection substation
- To wn
- Renewable s
- Thermal power station
- Future interconnection substation
- Nuclear power station
- Future gas station
- Gas power station



Source: Eskom Group Capital Division (Construction Management)

In support of

Programme challenges since inception (I/II)

The market

- The market within which Eskom is operating was extremely tight, with significant demands on supplier capacity and basic commodities being a feature since 2005

Contracting and risk sharing

- New thinking on contracting and risk sharing was essential based on the following
  - Global demand for new plant was high
  - The supplier market was global and limited
  - Supplier market was experiencing shortages of material, components and engineering capacity
  - Fixed price or construction commitments were unable to be secured
  - Increased demand for power plants leading to significant escalation in prices
  - Seller's market, not a buyer's market
  - Contract and risk-sharing profiles fundamentally changed

Timeline

- Given the reserve margin, the Eskom programme was and is working with very tight timelines

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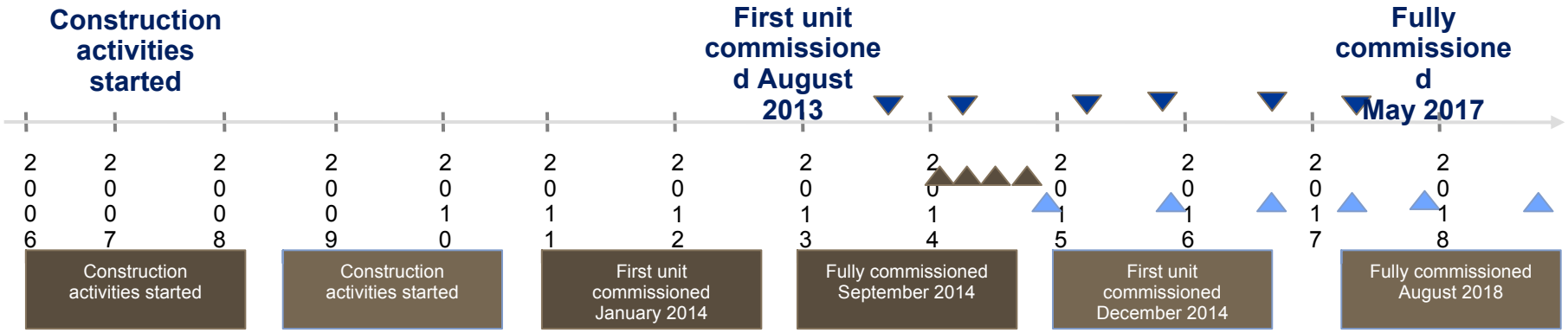
Programme challenges since inception (II/II)

Funding	• Eskom clearly found itself in a very challenging funding environment. Until October 2010, Eskom did not have a full funding plan to complete the capacity expansion programme; it now has one
Safety	• Despite the importance of executing projects on a tight schedule and within a tight budget, it is Eskom's firm belief that safety is the most important objective of all. The inherent risky nature of major construction activities requires constant management and leadership
Skills development	• The build programme is used to contribute to skills development and facilitate manufacturing capability in South Africa • Skills remain a significant factor for Eskom. The competition for skills is fierce, both internationally and locally
Project Management	• The new build began with capabilities, processes and systems undefined; the reality is that Eskom currently needs to spend R450bn for the six years until 2017 and be part of the Integrated Resource Plan 2010 beyond

Focus is now on Medupi, Kusile, and Ingula—the first units will come on line between 2012 and 2014



Medupi Power Station

Execution partner

- Coal supply
- Boiler
- Turbine
- Enabling Civils
- Main Civils
- Generator transformers

Ingula Power Station

Road works

Civil works

Infrastructure

- B&E Quanza

Dam construction

- Silver Rock
- Concor -WBHO
- Edwin

Kusile Power Station

Execution partner

- Coal supply
- Boiler
- Main Civils
- Turbine
- Enabling Civils
- Generator transformers

Unit commissioning

Source: Eskom Group Capital Division (Construction Management)

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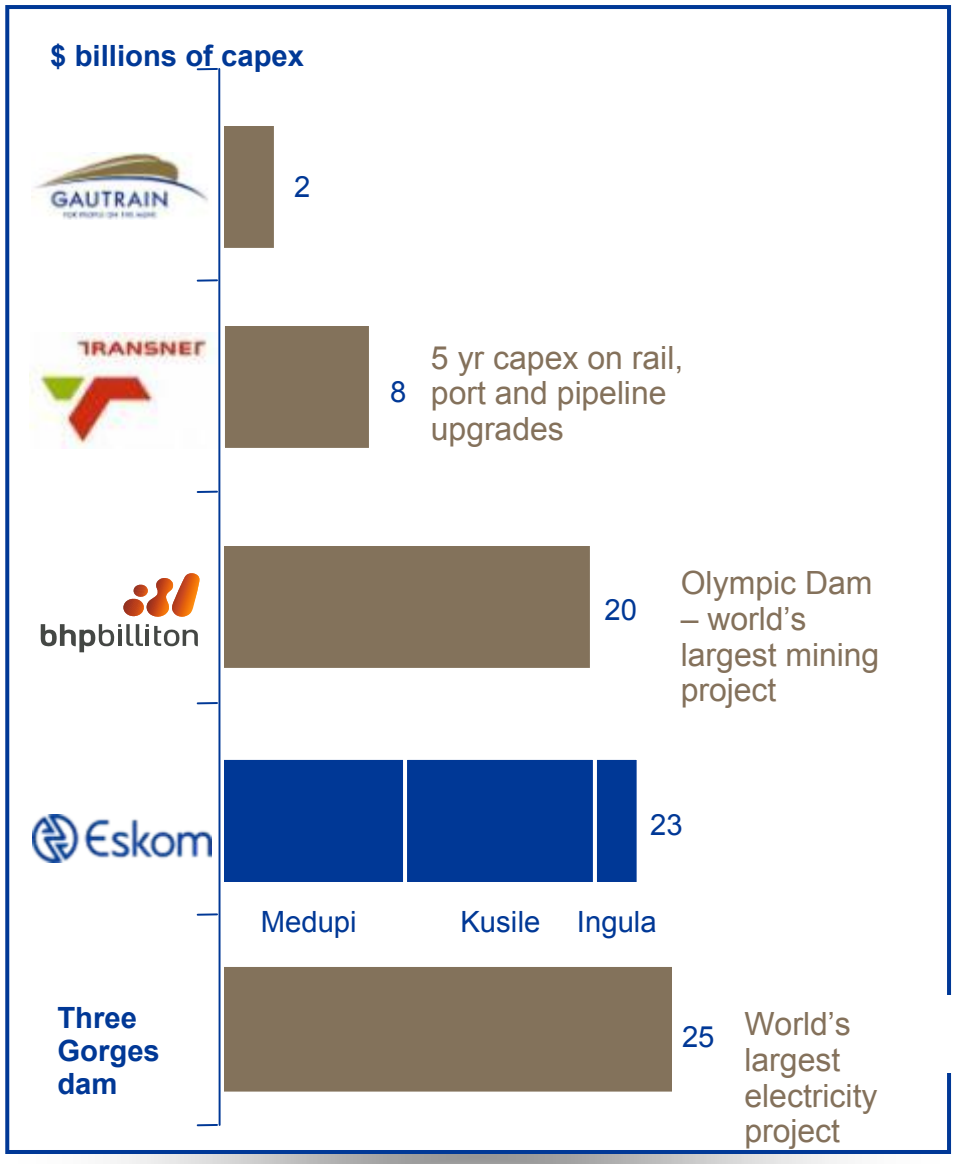
The capex for Eskom's 3 largest new build projects ranks among the world's largest construction projects and will result in the most ambitious infrastructure investment South Africa has ever undertaken



- **Funding required:** R227bn
- **Capacity increase as % of Eskom's installed base:**
  - Base load increases from Medupi and Kusile: 25% (+9,564 MW)
  - Peaking capacity increase from Ingula: 30% (+1,332 MW)
- Will be **4th and 5th largest** coal plants in the world and **19th largest** pumped storage scheme
- **Direct construction employment:** 20,000
- **People directly impacted** ~ 155,000
- Pace of build of Medupi is **30% faster** than previous Eskom and main contractors coal builds

… plus they will keep the lights on for all of South Africa!

The contracting set-up at all stations is international and has a large number of interfaces

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REMEMBER YOUR POWER 49

Medupi – FIDIC contract (34)

Package title	Contractor	Package title	Contractor
• Boiler	• Hitatchi Power Africa	• Terrace Coal & Ash	• ELB Engineering Services
• Turbine	• Alstom S&E Africa	• Coal Stockyard Equipment	• ThyssenKrupp Materials Handling
• Main Civils	• MPS-JV	• Electrical Power Installation	• Actom
• Accommodation	• Various	• Chimneys and Silos	• Actom
• Enabling works	• Roshcon	• Water treatment	• Aqua Engineering SA
• C&I	• Alstom	• 3rd party inspection	• Moody's Tata's, and others
• LP services	• LP Serv. Consortium	• LV switchgear	• General Electric SA
• Ash Dump Infrastructure Part B	• Basil Read		

Kusile – FIDIC contract (46)

Package title	Contractor	Package title	Contractor
• Boiler	• Hitatchi Power Africa	• Terrace Coal & Ash	• ELB Engineering Services
• Turbine	• Alstom S&E Africa	• Coal Stockyard Equipment	• ThyssenKrupp Materials Handling
• Main Civils	• MPS-JV	• Electrical Power Installation	• Actom
• Accommodation	• Various	• Chimneys and Silos	• Actom
• Enabling Works	• Roshcon	• Water Treatment	• Aqua Engineering SA
• C&I	• Alstom	• 3rd Party Inspection	• Moody's Tata's, and others
• LP services	• LP Serv. Consortium	• LV Switchgear	• General Electric SA
• Ash Dump Infrastructure Part B	• Basil Read		

Ingula – NEC contract (11)

Package title	Contractor	Package title	Contractor
• Boiler area	• Hitachi Power Europe GmbH	• Combustion Waste Terrace Constr. (Phase 1 & 2)	• TBD
• Main turbine area	• Alstom S&E Africa	• Electrical & Aux Power	• Siemens
• Main Civils	• Kusile Civil JV	• Coal Stockyard	• Bateman Africa
• FGD	• Alstom	• Terrace Material Handling Systems	• Bateman Africa
• Terracing Construction	• Roshcon	• Railroad Construction	• TBD
• Control & instrumentation	• Alstom	• Water Treatment Plant	• PDNA
• Miscellaneous structures	• SSBR JV	• Chimney Construction	• Concor Karrena JV
		• Site Services	• Roschcon

Build progress to date (as at 31 December 2011)

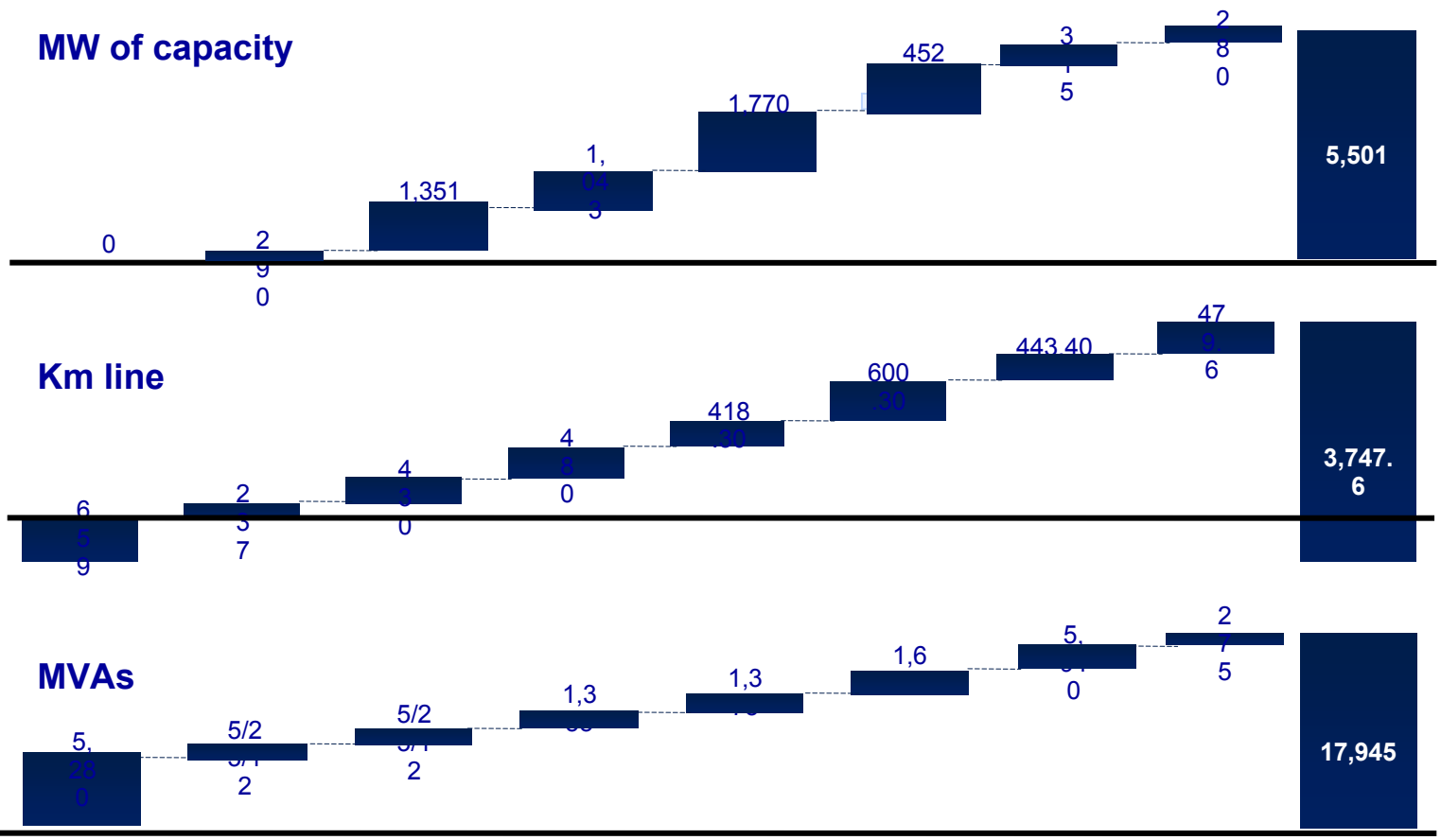
To date, a large amount of construction work has been completed, adding ~5,501MW, 3,747.6 km of transmission network, and ~17,945 MVAs . . .

Megawatt

Transmissio

Substations

In support of



Note: 280MW reported include Gvl U6 (160MW – SHC) , Komati U4 (100MW) & Camden U6 (20MW) which are included in the GC Incentive Scheme
Source: Eskom Group Capital Division (Construction Management)

Current planned capacity expansion plan

Project		Projections							
	11/12 FY	12/13 FY	13/14 FY	14/15 FY	15/16 FY	16/17 FY	17/18 FY	18/19 FY	Total
Grootvlei (return to service)	160	30							**190**
Komati (return to service)	225	200							**425**
Arnot capacity upgrade (coal fired)		30							**30**
Medupi (coal fired)			794	794	1 588	794	794		**4 764**
Kusile (coal fired)				800	800	800	800	1 600	**4 800**
Ingula (pumped storage)				1 332					**1 332**
Sere wind farm (renewable)			100						**100**
TOTAL (MW)	**385**	**260**	**894**	**3 387**	**2 388**	**1 594**	**1 594**	**1 600**	**11 641**

In addition, Eskom has commenced the development of a 100MW CSP plant


Medupi


Kusile - Unit 1 Turbine Pedestal


Central Grids


Ingula - Bramhoek dam

In support of

Significant progress in build programme – began in 2005 with completion in 2017/18

% of estimated total cost spent as at 30 September 2011

25.9%

R billion spent and to be spent on the capacity expansion programme (excluding borrowing costs capitalised)

121.0

50.3%

98.9

In addition, we plan to spend:

- More than R10 billion over each of the next 6 years to strengthen, refurbish and expand our Distribution network; and
- R82 billion on refurbishing our generation plants over the next 6 years

42.9%

21.4

87.4%

25.5

70.4%

23.5

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Project cost benchmarks - overnight cost ($/kW) benchmarks

Source	Exchange Rate R/US$	Technology	Overnight cost ($/kW)	Cost Components	Medupi – Overnight Cost ($/kW)	Kusile – Overnight Cost ($/kW)
EPRI (May 2010) Data for IRP2010	7.4	Pulverized Coal with FGD	2,403 - 2,656	Basic cost Contingency	2,210	2,399
		Pulverized Coal without FGD	2,091 - 2,281			
Lazard (June 2009)	8.3*	Super-critical with and without carbon capture	2,800 - 5,925	• Basic cost • Contingency • ODC • IDC • Transmission	2,786	3,269
IEA (2010 Edition)	8.2	Super-critical from various countries	672 - 2,539	Basic cost Contingency ODC	2,048	2,325

EPRI: Electric Power Research Institute
IRP: Integrated resource Plan
FGD: Flue Gas Desulphurisation

ODC: Owner's Development Cost
IDC: Interest During Construction
IEA: International Energy Agency

In support of

Funding plan – R300 billion to 2017 as at 31 December 2011

Source of funds	Funding sourced Rbn	Currently secured Rbn	Draw-downs to date Rbn	Amount supported by Government Rbn
Bonds	90.0	31.8	31.8	19.3
Commercial paper	70.0	70.0	17.5	0.0
Export Credit Agency backed	32.9	32.9	13.9	0.0
World Bank loan	29.7	27.8	4.1	27.8
AFDB loan	20.9	20.9	5.9	20.9
DBSA loan	15.0	15.0	3.0	0.0
Shareholder loan	20.0	20.0	20.0	20.0
Other sources	23.4	6.8	0.9	4.9
Totals	300.0	223.7	97.1	92.9
Percentages		75.1%(1)	43.1%(2)	41.2%(2)

(1) As a percentage of the R300bn funding sourced
(2) As a percentage of the currently secured total

In support of

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In support of

Kusile and Medupi will be the third and fourth largest coal-fired power plants in the world, respectively…

Higher than Sandton City Towers

~113 m

Coal-fired power plants (MW)

1. Taichung (Taiwan, 7 1001)
2. Waigaoqiao (China, 5 000)
3. Kusile (South Africa, 4 800)
4. Medupi (South Africa, 4 764)
5. Zouxian (China, 4 540)
6. Kendal (South Africa, 4 374)
7. …
8. …

4x more investment than Gautrain

4x

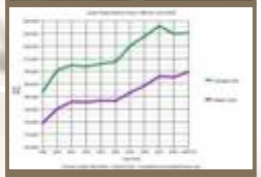
GAUTRAIN

Medupi

1 = 5 500 existing + 1 600 planned

Medupi and Kusile coal-fired power plants are massive in their scale of construction

In the construction of Medupi, Kusile and Ingula, Eskom will ensure that this contribution is aligned with SA macro economic principles

SA principle		Medupi, Kusile & Ingula planned contribution
A united, democratic and prosperous South Africa		BEE contribution: R21.1 billion BWO contribution: R 7.6 billion SME contribution: R7.3 billion Local Content: R63.3 billion
Leveraging the role of state-owned companies (SOCs) to set a foundation for growth and development of the economy		Electricity consumption is correlated to economic growth. Adding 10 897 MW of capacity supports SA's long-term growth objectives
A thriving economy connected to the world and integrated with the broader African continent		Contribution to economy ~R170 billion construction spend1
A sustainable economy, not harmful to the environment and committed to climate change mitigation initiatives		Use super critical technology (less CO2 emissions per kg coal than sub-critical) *FGD will be installed*
Eradication of poverty and unemployment		New jobs (Direct + Indirect) ~40 000 jobs created
Enhancing the potential of each citizen through an integrated education and skills development system		Training and skills development is a critical component of all of the new jobs that will be created

1 Total contribution of Medupi, Kusile and Ingula CDC construction projects

The completion of Medupi, Kusile and Ingula is important as it will contribute substantially towards the achievement of the six macro economic principles of South Africa

As such, the programme will have significant impact on local industry, skills, jobs, infrastructure and regional development

1 Local content

>50% of local content directly benefiting the SA economy

2 Local skills development

Rapid growth in SA's skills pool

3 Jobs

~40 000 jobs created, directly and indirectly

4 Infrastructure

Development of roads and railways

5 Regional development

Spend and invest-ment in local areas

SOURCE: Eskom Enterprises division and Medupi project, STATS-SA

1 Based on GDP in 2008

In support of

A large share of the Medupi, Kusile and Ingula spend will go to the local economy, thereby also benefitting local construction companies

%

	Composition of total project spend	Examples from Medupi, Kusile, and Ingula
Medupi	5/2 3/12 % Foreign; 5/2 3/12 % Local	 Main civils — **Main civils (MPS-JV): 84% of contract** are spent locally
Kusile	5/2 3/12 % Foreign; 5/2 3/12 % Local	 Main civils — **Main civils (KCW-JV): 65% of contract** are spent locally
Ingula	5/2 3/12 % Foreign; 5/2 3/12 % Local	 Access roads package — **Main civils (Grinaker-LTA): 100% of contract** are spent locally

SOURCE: Medupi, Kusile, and Ingula project management

2 Many skills are being developed as local content requirements kick-start whole new industries in SA

New fabrication and training facilities established

- Two new CNC Benders commissioned
- New welding training centre
- CNC header drilling machine

- **Training facilities** in Pretoria and in Wadeville

90% of major orders placed on mechanical equipment

Equipment	Local content
Air Cooled Condenser (ACC)	>90 %
Major pumps	>55 %
Heaters	>45 %
LP outer casing Unit 6	100 %
Feedwater tank	>80 %
Heaters Drain recovery pumps	>20 %




In support of

SOURCE: Medupi project management

2 The programme will fuel demand for relevant graduates and artisans and will grow the wide required skill base

Medupi would …

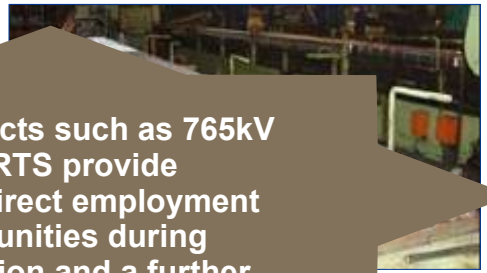
- … consume **43%** of a year's relevant **university graduation** (engineering, project planning, etc.)
- … deploy **48%** of a year's output of **artisans**
- … rapidly grow South Africa's **supply of engineers, artisans, R&D and project management experts**
- … develop a **wide range of additional skills** through Asgi-SA commitments

In support of

SOURCE: Eskom Enterprises division and Medupi project

Across Medupi, Kusile, and Ingula new employment opportunities will touch the lives of ~160 000 people

	Medupi	Kusile	Ingula
DIRECT			
On site construction staff	8 200	7 200	4 100
Supporting project staff	2 000	2 000	300
Coal mine expansion	2 000	2 000	
Transmission expansion	3 000	2 000	
Crocodile River expansion	700	600	100
Ongoing operations			
Subtotal	~19 000	~12 000	~4 500
INDIRECT			
Social services + local business	1 700	1 700	1 100
Total employed	20 700	13 700	5 600
x family multiplier (4/family)	X 4		
People directly impacted by Medupi, Kusile & Ingula	**~160 000**		



Other projects such as 765kV and RTS provide ~ 11 000 direct employment opportunities during construction and a further ~1 700 during operation

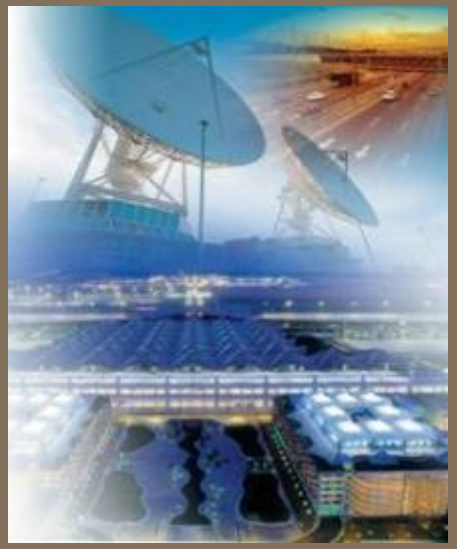
SOURCE: Eskom Enterprises division and Medupi project

Medupi, Kusile and Ingula will support local and national infrastructure

Eskom

National infrastructure

Local infrastructure



Area of impact	
 Roads	Bay to Lephalale and Lephalale bypass 22 km of new roads reinforcing of 3 bridges: >R500bn, 500 jobs
 Ongoing roads maintenance	...enance of local access roads: > R100m p.a.
 Freight forwarding	...ds Bay facility: R90m, 150 jobs
 Trains	...son train per day for limestone, 2 x 12 tank carriers per year of oil maintenance or rail lines: 100 jobs
 Catering and workforce supply	...ndry, maintenance security supplied to workforce: R2bn, 1 000 jobs
 Hotels	...to expand significantly
 Local transport	...nal buses at peak, increased taxis: ~500 jobs
 Vehicle maintenance	...extra vehicles maintained locally: 50 jobs
 Housing	...ses and accommodation units to be built by Eskom and suppliers: ~R4bn
 Water	...k from Crocodile River diversion pipeline from Kendal
 Sanitation	...age plant upgrade: R50m
 Social facilities	...impacted, increased policing, recruitment centre, ...e, social club, ICT centre. Ongoing work with stakeholder

In support of

REMEMBER YOUR POWER 49

SOURCE: Eskom Enterprises division and Medupi project

5 Each project will measurably impact the local towns through local spend & investment

Impact on local town's GDP from each project

Lephalale (Medupi)	95%
Delmas (Kusile)	25%
Ladysmith (Ingula)	7%

Typical local businesses and infrastructure created

Shops

Civil infrastructure

Schools

Transport

Other businesses and infrastructure created:

- Catering
- Laundry
- Building companies
- House maintenance
- Hotels
- Entertainment
- Training facilities
- Security
- Schools / education
- Policing
- Churches
- Medical care
- Banks & financial services

In support of

SOURCE: Eskom Enterprises division and Medupi project

Table of contents

In support of

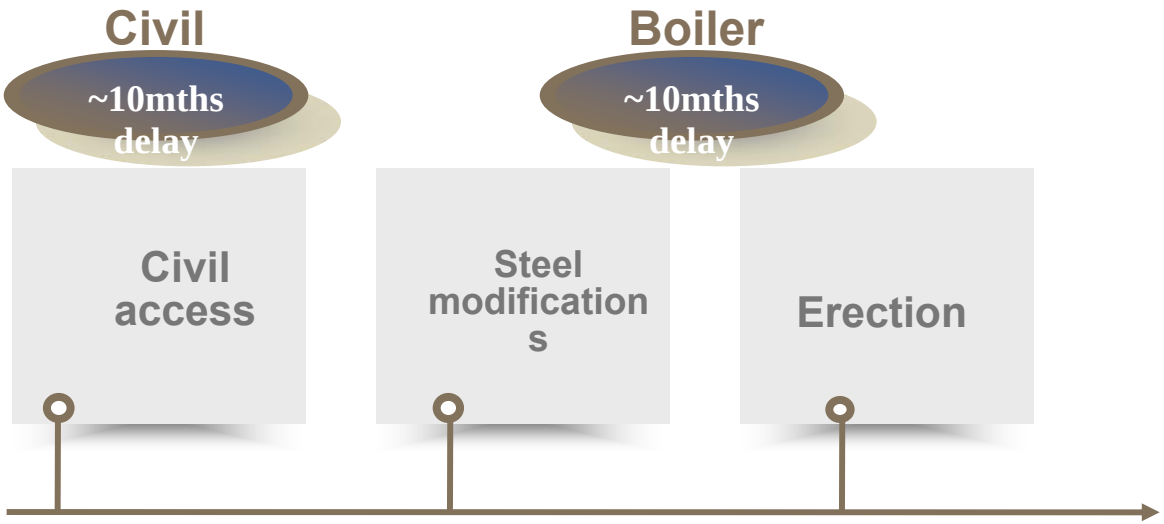
Build programme overview - Medupi

Project summary	• Greenfields Project - Lephalale (Limpopo Province) • 6 unit coal-fired power station • Planned capacity 4 764MW
Financial & economic impact	• Projected project cost to completion ~ R98.900 bn (excl. IDC) • Estimated 95% impact on Lephalale town GDP
Project development	• Construction commenced March 2007 • First Unit planned to generate power to the grid between May 2013 and September 2013 • Subsequent Units at 6 to 9 month intervals thereafter

In support of

IDC: Interest During Construction
GDP: Gross Domestic Product

Medupi has been delayed for various reasons, particularly related to the Unit 6 civil and boiler



delay

causes

- Unanticipated difficulty in levelling site foundation
- Boiler foundation design not frozen
- Issues with civil contractor performance

- Ongoing modifications to structural steel design delays manufacturing and erection timelines
- Manufacture of incorrect pieces leads to substantial re-work

- Poor tracking and logistics systems in terms of locating boiler material
- Boiler materials not supplied in order needed to support efficient erection
- Issues with boiler erection contractor performance

The boiler is essential for the overall timeline, though it is just one of many construction packages

Medupi consists of 38 packages

…

P01 Coal O…
P02 …
P03 Boiler
P04 Turbine
P05 LP Services
P06 Water T…
P07 Chimne… Silos
P08 Main Civils
P09 Technic… Building Equipment
P10 Enablin…
P11 Electric…
P12 LV Swi… Gear
P13 MV Switchgear
P14 Aux Transfo…
P15 Gen Tra…
P16 UPS
P17 C… & I…
P21 …
P22A Infrastructure & Ash dams & dumps

Major

- **Boiler**
- Turbine
- Main civil
- Accommodation
- Enabling works
- C&I
- LP services
- Ash dump infrastructure
- Terrace Coal and Ash
- Coal stockyard equipment
- Electrical power installation
- Chimneys and silos
- Water treatment
- 3rd Party inspection
- LV Switchgear

Infrastructure & …
P23 Diesel Generator
…oal Stockyard Equipment
…28 Ash Dump …quipment and Ash Overland
…1A Reservoirs
…31B Clarifiers
…Dust Handling Conditioning
…3 Terrace Coal and Ash
…5A Buildings - Critical
…B Buildings – Non-technical
P35C Buildings – Technical

…of which the boiler is the critical path

Delay on the critical path imposes the same delay on the whole project timeline

Build programme overview - Kusile

Project summary	• Greenfields Project - Delmas (Mpumalanga Province) • 6 unit coal-fired power station • Planned capacity 4 800MW
Financial & economic impact	• Projected project cost to completion ~ R121,000 bn (excl. IDC) • Estimated 25% impact on Delmas town GDP
Project development	• Construction commenced Mid 2008 • First Unit planned to be commissioned December 2014 • Subsequent Units 2 & 3 at 12 month intervals and Units 4, 5 & 6 at 8 months thereafter

In support of

REMEMBER YOUR POWER 49

IDC: Interest During Construction
GDP: Gross Domestic Product

Build programme overview - Ingula

Project summary	• Greenfields Project - Ladysmith (KwaZulu-Natal Province) • 4 unit pumped-storage power station • Planned capacity 1 352MW
Financial & economic impact	• Projected project cost to completion ~ R21.900 bn (excl. IDC) • Estimated 7% impact on Ladysmith town GDP
Project development	• Construction commenced Mid 2006 • First Unit planned to be commissioned January 2014 • Subsequent Units at 3-month intervals thereafter

In support of

IDC: Interest During Construction
GDP: Gross Domestic Product

Build programme overview - return to service

Project summary	• Refurbishment and return to service of previously moth-balled coal fired power stations in Mpumalanga. – Camden (8 units—total 1 600MW) – Grootvlei (6 units—1 200MW) – Komati (9 units—1 000MW)
Financial & economic impact	• Projected RTS cost to completion ~ R25.500 bn (excl. IDC)
Project schedule	• All 8 units at Camden power plant are now in commercial operation • 6 units, each rated at 200MW (total 800MW) have been commissioned at Grootvlei. • 6 units, each rated at 125MW, have been commissioned at Komati power station.

In support of

IDC: Interest During Construction

The first time in 22 years 3 months and 4 days that we have 6 units of Komati on load

The date is 9 February 2012

Build programme overview - Transmission

Project summary

- Transformers - 20 600 MVA:
  - 765kv (Planned: 12,000 MVA)
  - Cape Grid (Planned: 1,500 MVA)
  - Northern Grid (Planned: 3,500 MVA)
  - Central Grid (Planned: 3,600 MVA)
- Transmission Lines - 3,977.5 km planned/installed:
  - 765kv (1,689.9 km)
  - Northern Grid (1,253.6 km)
  - Cape Grid (621 km)
  - Central Grid (413 km)

Financial & economic impact

- Projected transmission cost to completion ~ R23.500 bn (excl. IDC)

Project schedule

- 765kV: December 2013
- Northern Grid: June 2015
- Central Grid: Mar 2015
- Cape Grid: Aug 2016

In support of

IDC: Interest During Construction

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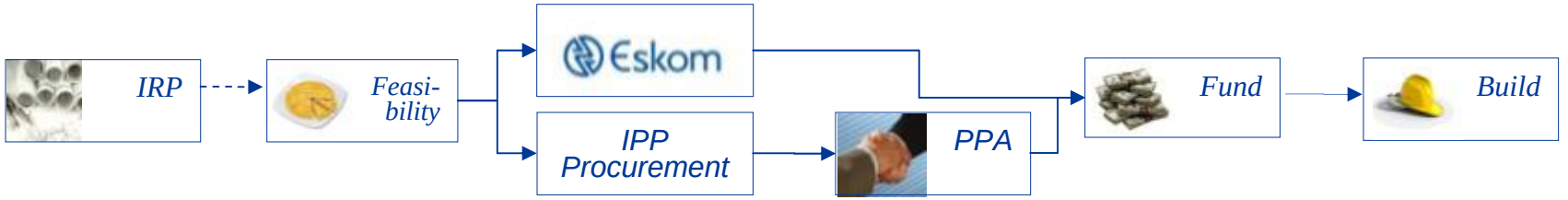
In support of

SA national planning process
- driven by Regulations on New Generation

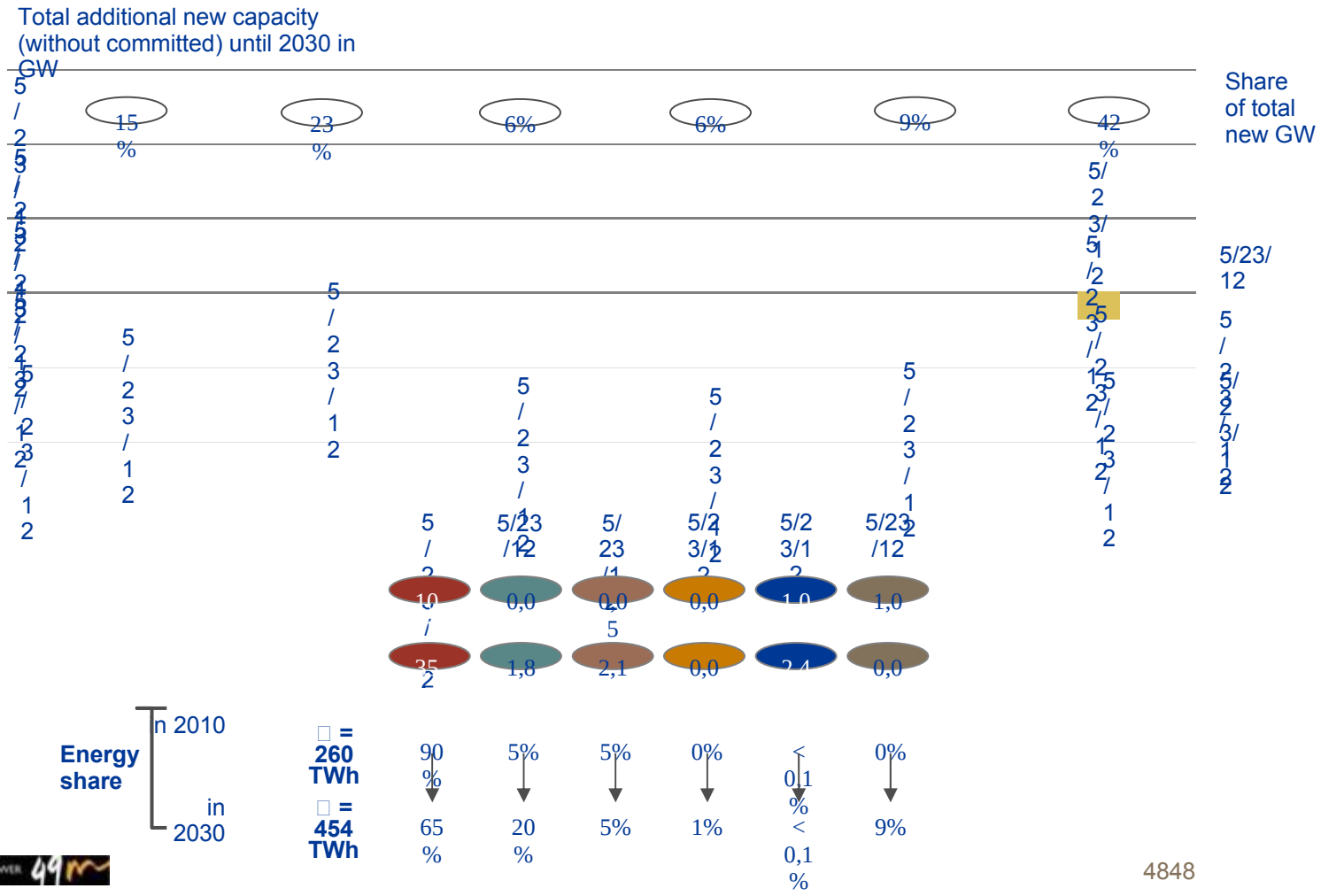


Background	The IRP determines which technologies will be built	A feasibility study is conducted and IRP capacity is allocated to the most suitable; IPPs or Eskom	Suitable IPPs are procured through the IPP procurement process	Buyer of electricity signs Power Purchase Agreements (PPAs) with power producer	IPPs often require PPAs prior to obtaining external funding. Such PPAs will require government backing	Building for Eskom or IPPs can only commence once investment decision has been taken
Responsibility	DoE	DoE - According to New Generation Regulations	DoE / Single Buyer Office	Minister must assign a buyer of each PPA	Eskom, IPPs	Eskom, IPPs
Status	Regulations state new generation capacity must be represented in the IRP to receive generation and distribution licenses or receive a Section 34 exemption from the minister	This process has not yet been executed and is required for subsequent planning actions	The IPP procurement process must be finalised to ensure participation of these producers	Currently, the Single Buyer Office is ring-fenced within Eskom to sign PPAs based upon the DoE procurement decision	Eskom may receive funding with government backing. Costs are recovered via the MYPD submissions electricity tariff	Construction of IRP projects may be delayed due to required upstream decisions

In support of

IRP outcomes

Policy-Adjusted IRP



In support of

Proposed timelines for MYPD3

(DPE, NT, DTI)

28 February 2013 15 May 3 June November 2012 15 March 20 July 15 February 15 July 2013 July 201

Submission Proposed NERSA MYPD3 publication application to SALGA

In support of

Long lead times for power generators & related infrastructure require timely firm commitments

		New build options						
	Coal (PF, FBC, imports, own build)	Nuclear	Import hydro	Gas – CCGT	Peak – OCGT	Wind	CSP	Solar PV
	MW	MW	MW	MW	MW	MW	MW	MW
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	300
2013	0	0	0	0	0	0	0	300
2014	5001	0	0	0	0	400	0	300
2015	5001	0	0	0	0	400	0	300
2016	0	0	0	0	0	400	100	300
2017	0	0	0	0	0	400	100	300
2018	0	0	0	0	0	4004	1004	3004
2019	250	0	0	2373	0	4004	1004	3004
2020	250	0	0	2373	0	400	100	300
2021	250	0	0	2373	0	400	100	300
2022	250	0	1 1432		805	400	100	300
2023	250	1 600	1 1832	0	805	400	100	300
2024	250	1 600	2832	0	0	800	100	300
2025	250	1 600	0	0	805	1 600	100	1 000
2026	1 000	1 600	0	0	0	400	0	500
2027	250	0	0	0	0	1 600	0	500
2028	1 000	1 600	0	474	690	0	0	500
2029	250	1 600	0	237	805	0	0	1 000
2030	1 000	0	0	948	0	0	0	1 000
Total	6 250	9 600	2 609	2 370	3 910	8 400	1 000	8 400

Final commitment in IRP 2012

F. Built, owned & operated by IPPs 2. Commitment necessary due to required high-voltage infrastructure, which has long lead time 3. Commitment necessary due to required gas infrastructure, which has long lead time 4. Possibly required grid upgrade has long lead time and thus makes commitment to power capacity necessary

In support of

In conclusion, since 2005 until today

- The new build programme is significant by any measure. Cost increases are understood and taken into account, lessons have been learnt and implemented for future projects and across existing projects
- Good progress has been made, but many serious risks will need to be carefully managed in the future. Strong mitigating measures have been and are being put in place to manage these risks
- The global financial crisis has affected all sectors of the economy, Eskom included. This led to a review of the build program taking into account
  - Financial contractions of the markets,
  - Resultant re-prioritisation of certain capacity projects and
  - Delaying the execution of some of the projects at certain times since 2005; full go ahead on Kusile was given in October 2010
- Macro-economic factors have negatively impacted the build programme:
  - CPA, and Cost of cover and other market forces
- Decisions are required on allocations of build for IRP 2010

Thank you

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