1

Zambia-Tanzania-Kenya Power Interconnector

Project Location	Kabwe (Zambia) to Iringa (Tanzania)
Owners & Project Sponsors	 Government of Zambia  Government of Tanzania
Implementing Partners	ZESCO  Tanzania Electric Supply Company
Regional Economic Community	 Common Market for Eastern and Southern Africa

Zambia-Tanzania-Kenya Power Interconnector

Project Description

- ✓The project entails interconnecting the power systems of Zambia, Tanzania and Kenya through the construction of high voltage AC transmission lines.
- ✓Project Routing: Kabwe-Pensulo-Kasama-Nakonde-Tunduma-Mbeya-Iringa-Singinda-Arusha-Isinya.
- ✓Total Distance: 2,344km
  - ✓Zambia (904km);
  - ✓Tanzania (1344km);
  - ✓Kenya (96km)

Zambia-Tanzania-Kenya Power Interconnector

Main objectives are to:

- ✓Enhance electricity Trade;
- ✓Improve security and reliability of electricity supply;
- ✓Foster socio-economic development and promote Regional Integration;

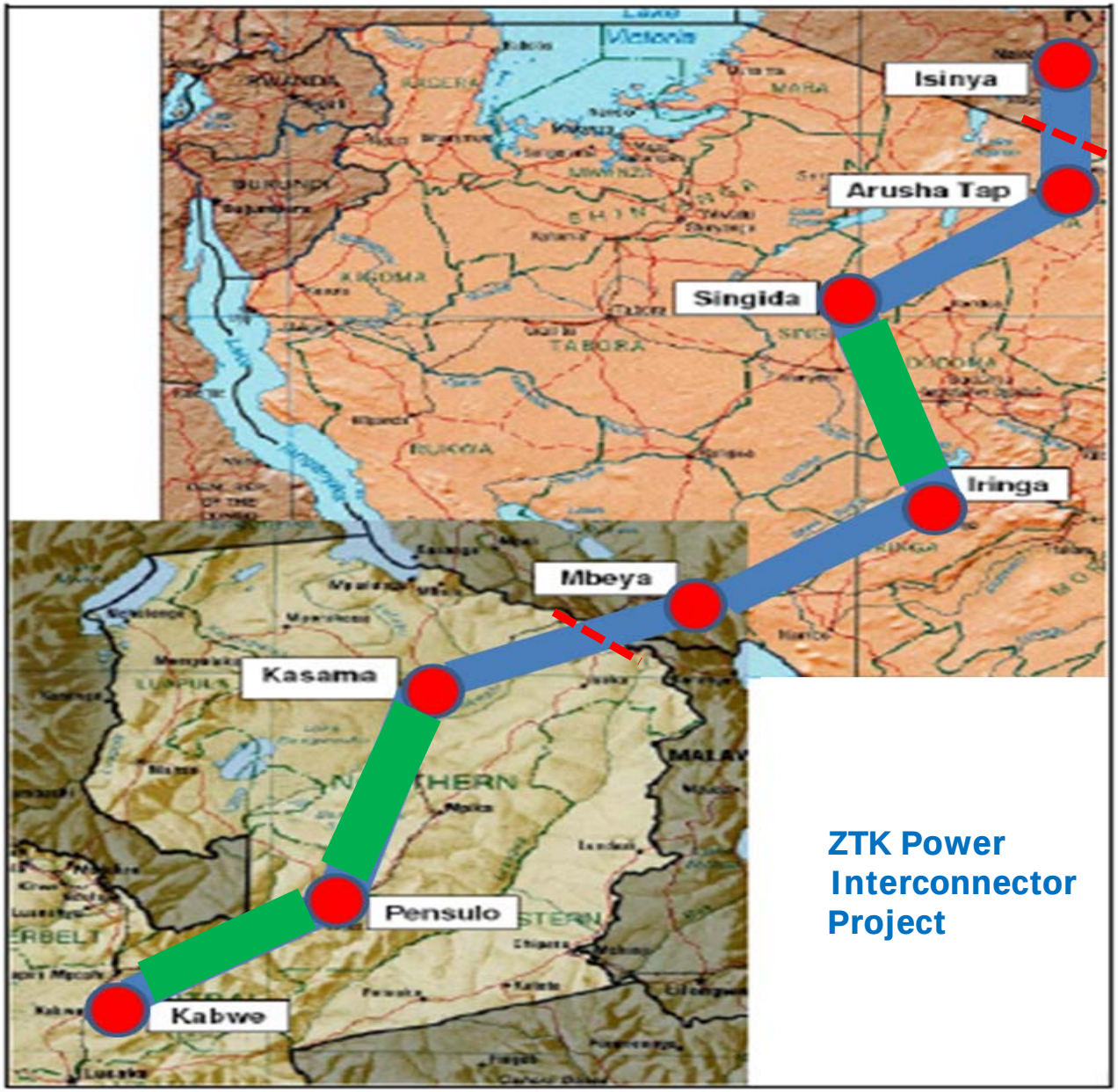
Zambia-Tanzania-Kenya Power Interconnector

Benefits

- ✓Create the largest power market on the Continent by connecting SAPP & EAPP thereby creating a Cape to Cairo power highway;

- ✓Contribute to direct economic development and job creation in Zambia, Tanzania and Kenya including the entire SAPP and EAPP.

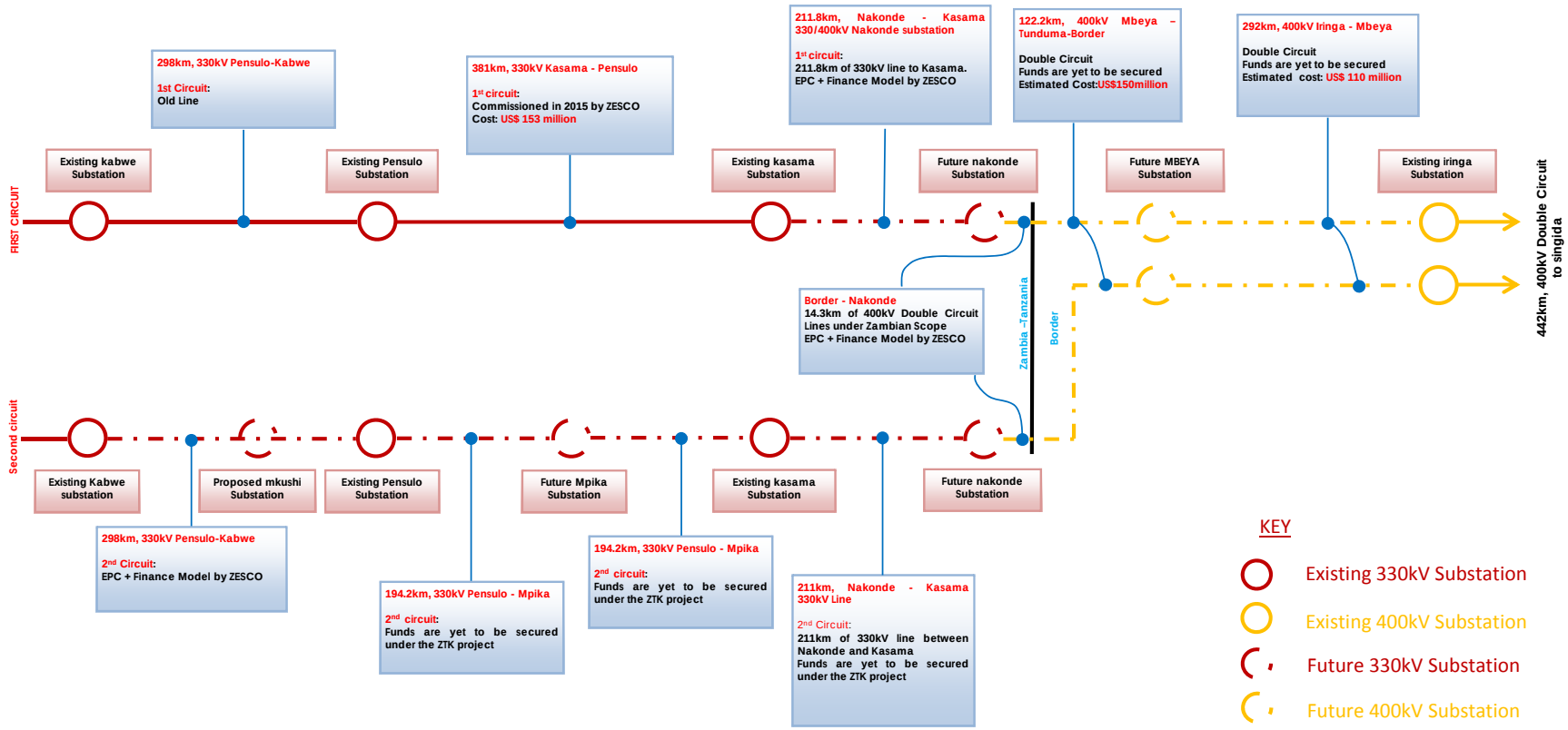
- ✓Create ICT super highway through the inclusion of the Optical Fibre Ground Wire (OPGW) on the towers between the two power pools of EAPP and SAPP


Isinya
Arusha Tap
Singida
Iringa
Mbeya
Kasama
Pensulo
Kabwe
ZTK Power
Interconnector
Project

Location

ZTK Power Interconnector

Zambia - Tanzania - Kenya Power Interconnector Project
Graphical Concept for the Kabwe Iringa Section



Zambia-Tanzania-Kenya Power Interconnector

Funding gaps

- ✓**Zambia (about US$200 million)**
- ✓**Tanzania (about US$260 million)**

Zambia-Tanzania-Kenya Power Interconnector

Implementation Strategy

- ✓ Each country shall Finance, Build, Own and Operate the transmission infrastructure within its boundaries;
- ✓ The Power Utilities will Operate and Maintain the infrastructure within their countries (ZESCO, TANESCO, KETRACO);
- ✓ Each country has established a Project Management Unit (PMU) to co-ordinate the development of the Project within its borders;
- ✓ PMU in Zambia has been entrusted with overall coordination. The Zambia PMU is the Office for Promoting Private Power Investment (OPPPI) in the Ministry of Energy; and
- ✓ The three Governments shall establish appropriate mechanisms for coordinating the interconnector operations and power trading post commissioning of the project.

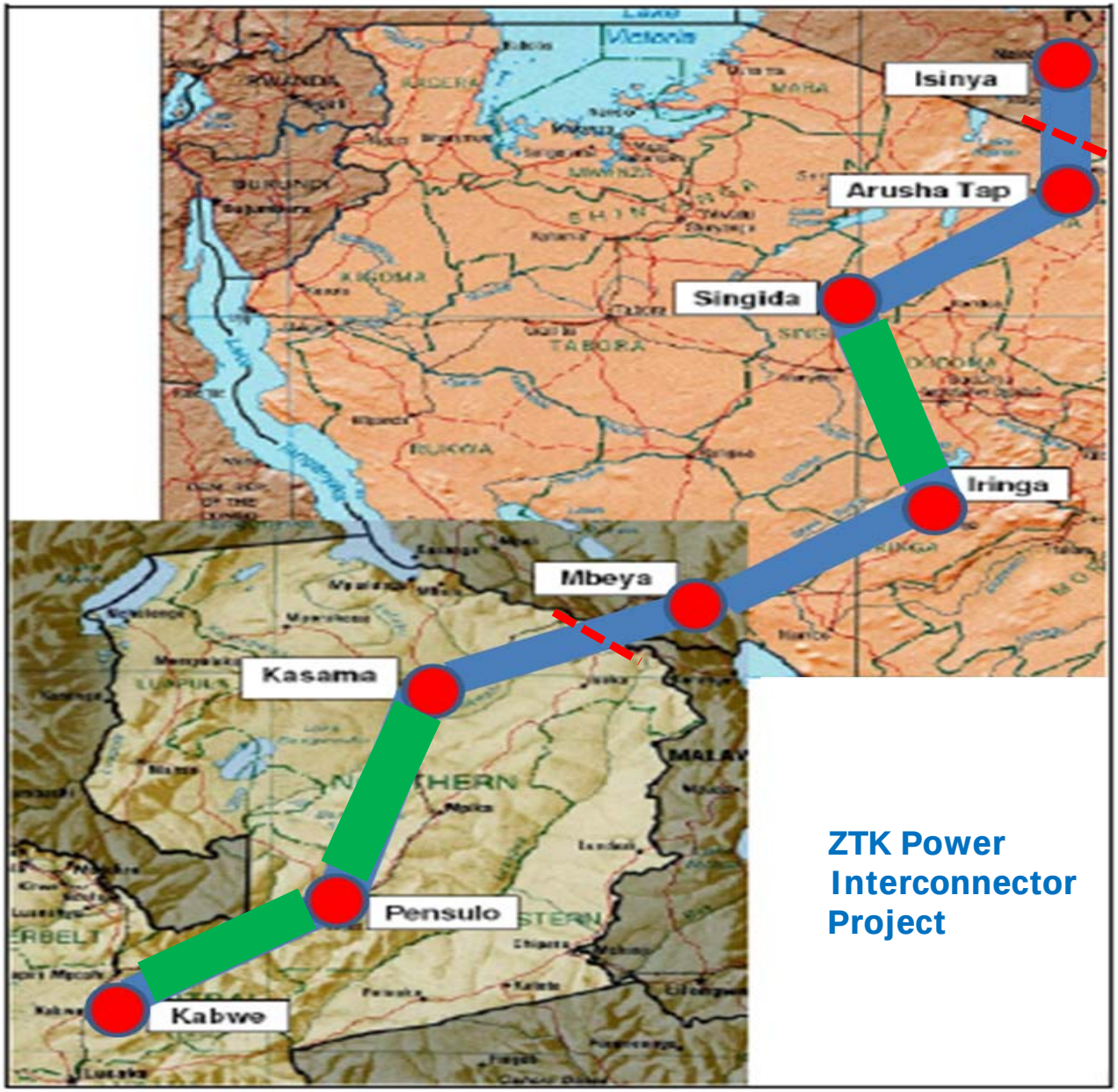
Zambia-Tanzania-Kenya Power Interconnector

Project Preparation Support

- ✓World Bank, NEPAD – IPPF, Norwegian Government, European Union, COMESA, KfW

- ✓Outputs
  - ✓Transaction Advisory Services and Reports
    - ✓Project structuring; Private sector/PPP Models considered
  - ✓Feasibility study reports,
  - ✓Complementary study reports on power markets, trading, power transfers and interconnections
  - ✓IGMOUs, TIGMOUs
  - ✓Resource mobilisation through Financiers' Conference (29-30 November, 2017 in Livingstone, Zambia)

STATUS

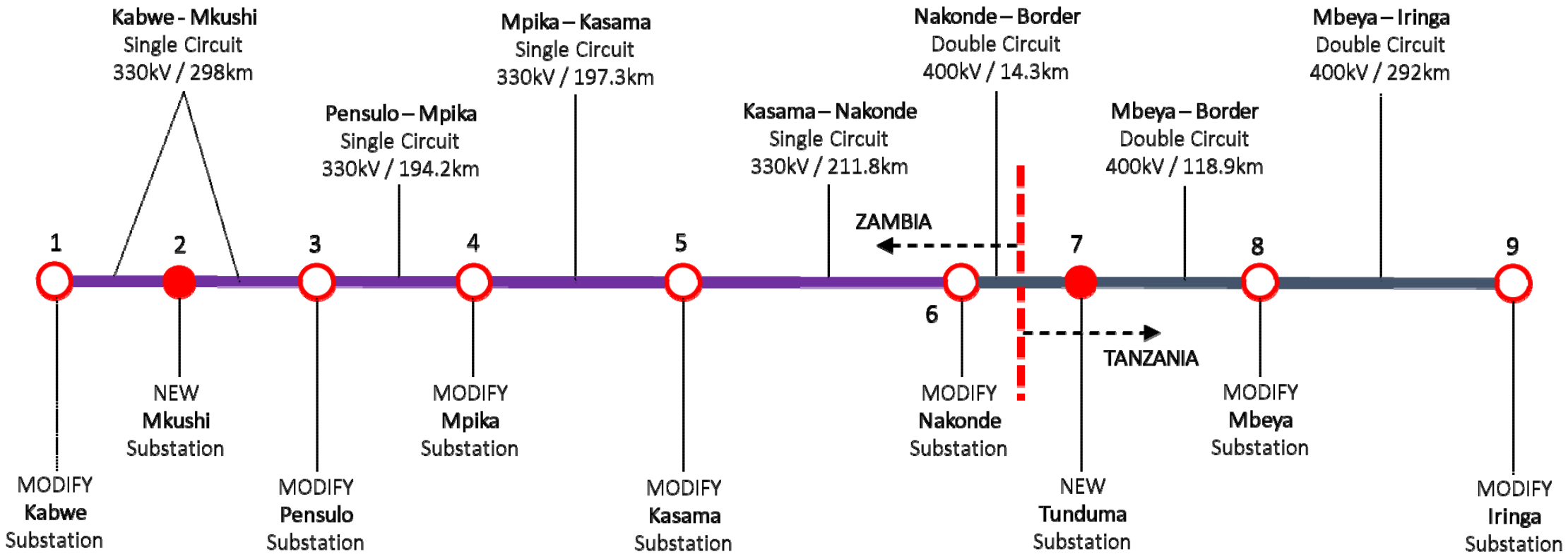

Isinya
Arusha Tap
Singida
Iringa
Mbeya
Kasama
Pensulo
Kabwe
ZTK Power
Interconnector
Project


LIBYA
EGYPT
SAUDI ARA
CHAD
SUDAN
ERITREA
YEMEN
EAPP
ETHIOPIA
CENTRAL AFRICAN REPUBLIC
CAMEROON
SOMALIA
KENYA
CONGO
GABON
DEMOCRATIC REPUBLIC OF THE CONGO
TANZANIA
ANGOLA
ZAMBIA
SAPP
ZIMBABWE
MOZAMBIQUE
BOTSWANA
NAMIBIA
SOUTH AFRICA
INDIAN OC

Technical Features

ZTK Power Interconnector

1,322km Transmission Lines + 9 Substations



Zambia: 908km (330kV) + 6 Substations

Tanzania: 414km (400kV) + 3 Substations

Business Model & Project Costs

ZTK Power Interconnector

- **Using a Public Financing Model**: TANESCO and ZESCO will procure and fund their sections of the interconnector via EPC contractors.
- An opportunity exists for the private sector to lease excess optical fibres ("dark fibres") from TANESCO and ZESCO.

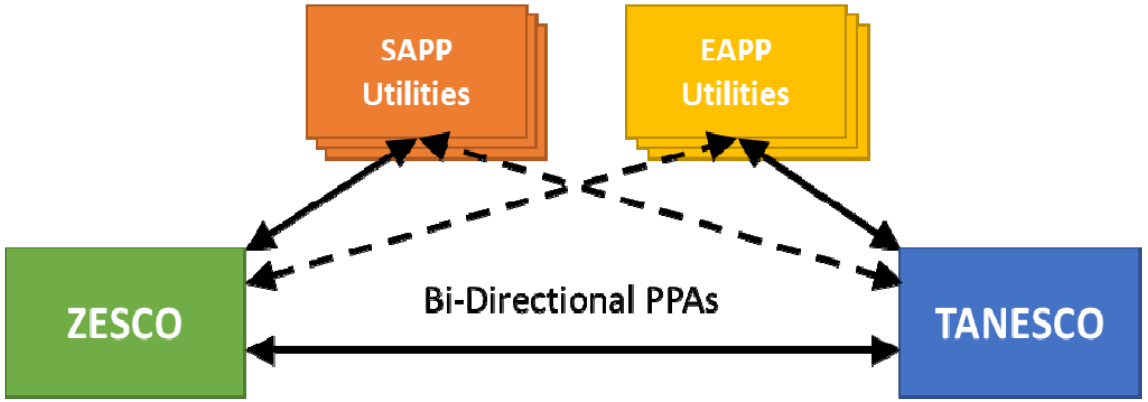
ITEMS	TOTAL (USD'000)	TANZANIA (USD'000)	ZAMBIA (USD'000)
LINES	167 593 000	52 442 000	115 151 000
SUBSTATIONS	118 081 000	71 796 000	46 285 000
SUB-TOTAL	**285 674 000**	**124 238 000**	**161 436 000**
ENVIRONMENTAL AND SOCIAL COSTS	29 124 000	17 952 000	11 172 000
TOTAL (2017 FEASIBILITY STUDY)	**314 798 000**	**142 190 000**	**172 608 000**
MBEYA – IRINGA (2012 TERMS)	110 000 000	110 000 000	-
GRAND TOTAL	424 798 000	152 190 000	172 608 000

Financial Analysis & Revenue Model

ZTK Power Interconnector

US$ MILLION	REAL TOTALS	DISCOUNTED REAL TOTALS (@10%)	ASSUMPTION USED IN 2017 FEASIBILITY STUDY
Total Benefits	2,902.8	798.1	[describe high level assumption]CR2
Capex	(314.8)	(265.7)	Total construction costs and associated social costs
Opex	(142.8)	(40.9)	$5.71 million per annum over 25 years.
Residual Value	250.3	18.3	Balancing figure
Net Benefit (Scenario 1)	**2,695.4**	**509.8**	NPV of $510m calculated using a real discount rate of 10%
Real IRR (Scenario 1)	25.9%		

After commissioning, TANESCO and ZESCO intend to enter into Power Purchase Agreements (PPAs) and Wheeling Agreements with various regional players in the EAPP and SAPP.



Slide 15

CR2 add high level desription

Carla Rooseboom, 12/1/2017

Funding Opportunities

ZTK Power Interconnector

- Governments of Zambia and Tanzania will raise long-term concessionary loans and grants from multilateral financing institutions, which will be supplemented by commercial loans if a funding gap exists.
- Loans will be passed onto TANESCO and ZESCO, by their respective Governments, with the necessary guarantees and counterpart funding.
- Financing using project bonds is a possibility once the Project has been commissioned.
- Project bonds would allow concessionary lenders to recycle their loans earlier (i.e. after 4 years when the Project is commissioned).
- Project bonds may also offer an opportunity to raise funding in local currencies that are also inflation linked which may be attractive to Zambian and Tanzanian institutional investors.

Environmental & Social Assessments

ZTK Power Interconnector

For ZAMBIA,

- the project routing is sparsely populated areas, with few sensitive sites
- Proposed line is mostly accessible with formal roads.
- Most impacts are either of low significance or insignificant in magnitude.
- The only impact of potentially high significance is the positive effect of increased power supply within the communities that will be fed by the line.

For TANZANIA,

- the negative impacts of the planned project are relatively modest.
- most of the line will run through low-density populated woodland with only scattered cultivation.
- Game and Forest Reserve have been avoided in the line routing
- minor negative impacts are envisaged for the resettling of households, and wildlife and nature conservation in the areas where the line crosses or runs close to protected areas.

In both Zambia and Tanzania, significant positive social impacts will arise from increased employment both during construction and more sustainably during line operation and maintenance.

ZTK Will Generate an Estimated 290,000 Job Years over Its Useful Life of 25 Years

26,000 JOB YEARS FROM PROJECT DEVELOPMENT, CONSTRUCTION, AND OPERATION

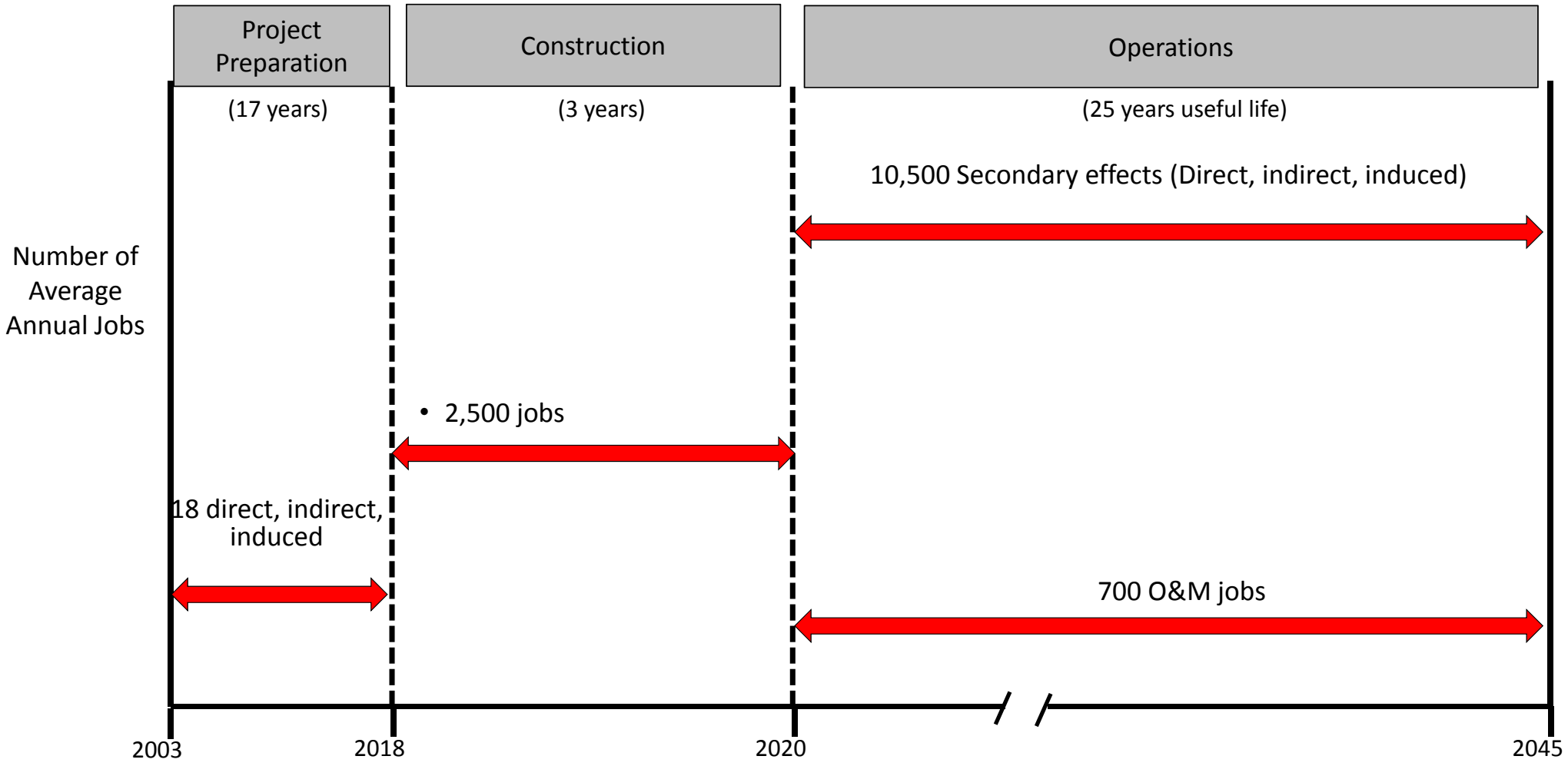
PHASE	Zambia			Tanzania			Kenya			TOTAL			
	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced	Direct	Indirect	Induced	Total
Project Preparation	105	16	92	31	7	7	22	3	28	158	26	127	311
Construction	1,158	111	2,006	526	1,498	1,894				1,684	1,609	3,900	7,193
Total One-Time	1,263	127	2,098	557	1,505	1,901	22	3	28	1,842	1,635	4,027	7,504
O&M (over 25 years)	3,600	350	6,225	1,125	3,175	4,000				4,725	3,525	10,225	18,475
Total Primary Effects	4,863	477	8,323	1,682	4,680	5,901	22	3	28	6,567	5,160	14,252	25,979

263,000 JOB YEARS FROM SECONDARY SPILL OVER EFFECTS ON THE ECONOMY

Country	Annual Electricity Supply (million US$)	Annual				Over Useful Life (25 years)			
		Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Tanzania	$104.4	2,031	6,171	1,894	10,096	50,775	154,275	47,350	252,400
Zambia	$7.5	122	160	143	426	3,050	4,000	3,575	10,625
Total		2,153	6,331	2,037	10,522	53,825	158,275	50,925	263,025

ZTK Generates An Estimated 13,700 Average Annual Jobs

(BASED ON PRELIMINARY ASSUMPTIONS)

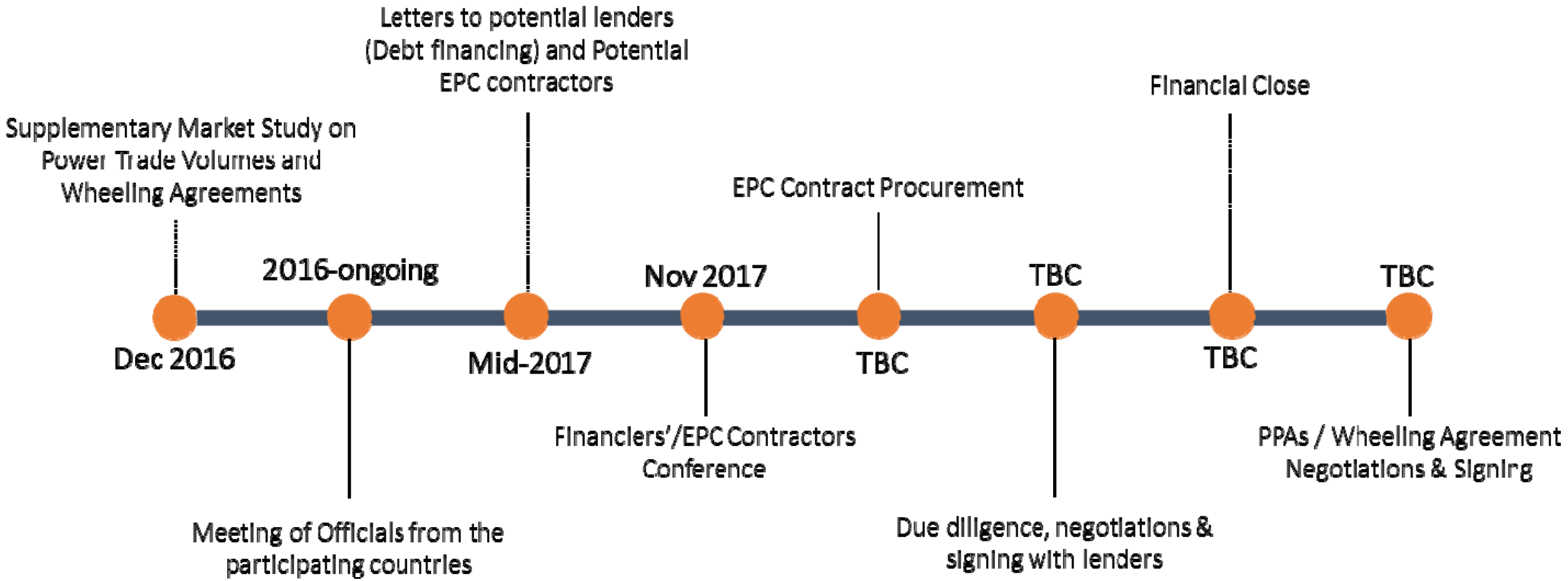


Required Job Skills & Potential Interventions to Maximize African Jobs

PROJECT PHASE	EXAMPLES OF OCCUPATIONS	EXAMPLES OF POTENTIAL INTERVENTIONS
Project Preparation 	• Project developers • Financial advisors • Engineers	• Require local content, hiring, and training in procurement documents • Provide in-country training
Project Construction 	• Construction supervisors • Engineers • Procurement experts • Safety directors	• Require contractors to hire locally and train employees • Provide peer-peer training • Provide tax incentives for local jobs and content
Project Operations and Maintenance 	• Plant operators • Mechanical operators • Maintenance and control engineers • Site safety specialists	• Provide incentives for local hiring/training • Track training and employment performance by key targets

Way Forward

ZTK Power Interconnector



Implementation Timeline

ZTK Power Interconnector