



USAID/NARUC

East Africa Regional Regulatory Partnership
Dar es Salaam, Tanzania

Development of Regional Power Trade in East Africa

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Where are we in

Market Development



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 - Previous work done on Regional Power Trade
- Institutional Framework
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 - Market Rules
- Road map and end Goal
- Challenges
- Way forward



Background of Power Trade



An East African Energy vision?

- Electricity to all

- Stable supply
- Affordable

- Expansion of

- Hydro
- Geothermal
- Photovoltaic/CSP solar power
- Wind power?
- Coal
- Nuclear

Economic development
Health, education

More on each country Vision
e.g ETH- Hydro, Kenya -50000MW coal, LNG, geothermal, Egypt GAS, Wind etc

- Regional perspective on electricity

- More interconnectors
- Start/More trade
- Stable supply
- Low costs

EAPP



EAPP Mission/Objectives

- Facilitate and secure power supply for Eastern Africa countries/members at the lowest cost.
- Develop a master plan and promote power exchange
- Optimize usage of existing and potential energy resources
- Reduce electricity cost in the region
- **Facilitate development of electricity market in the region**
 - Create a conducive investment environment for power generation and transmission integration projects in the region
 - Provide efficient co-ordination between various initiatives in the fields of power production, transmission as well as power exchanges in the region



Works done under EC Support (2009-2012)

- Mercado's Consultants Deliverables
 - Deliverable #11 Regional Market Design
 - Deliverable #13 Market Rules

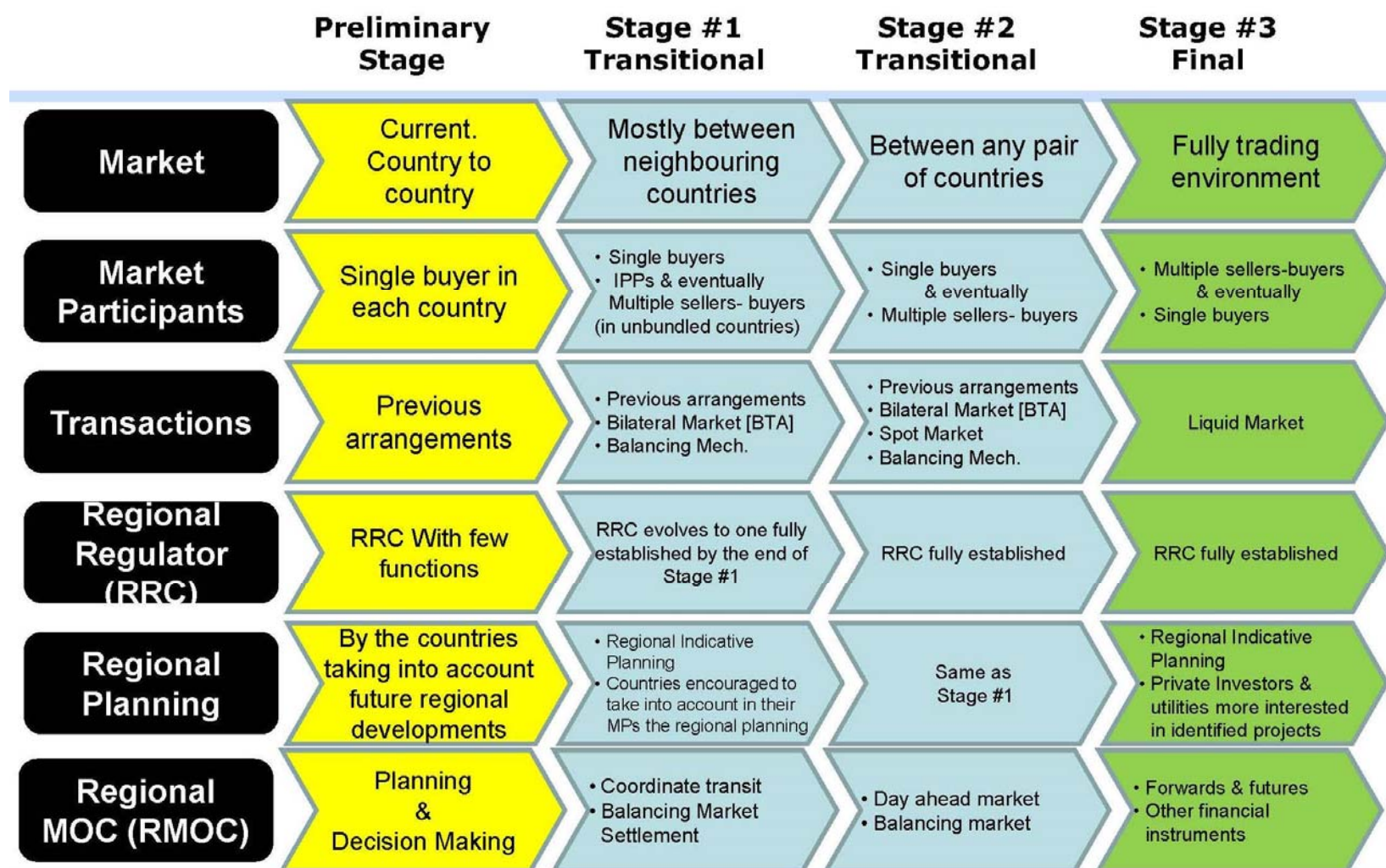


Conditions for Market Start (Mercado's Market Design)

- MOU/Treaty signed by all member states
- Any necessary national enabling legislation enacted
- Regulatory body commissioned, mandated and staffed; regulatory
- Market procedures agreed
- Market rules and grid code ratified and issued
- Licenses granted where required
- Contract templates ratified and issued
- RMOc procedures written and tested; IT systems tested and deployed, staff recruited and trained
- Utility systems and procedures written and tested, staff trained and deployed
- Metering systems on EAPP boundaries installed and communications tested



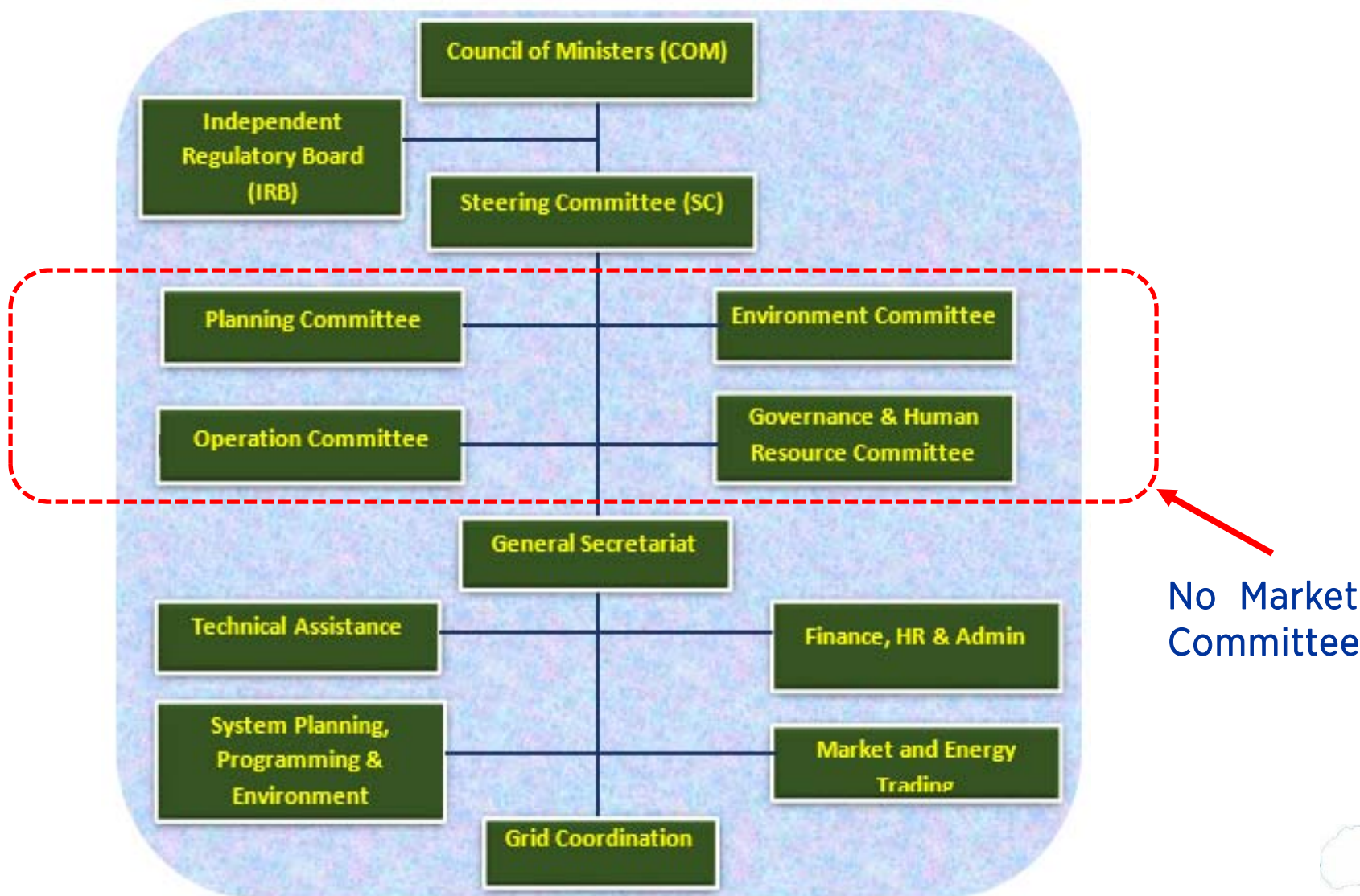
Market Road Map (Mercadoes)



Institutional Framework



EAPP Structure



Operationalization of Sub Committees

- All Subcommittees operationalized in December 2012 with the support of RNE/SIDA
- Technical Sub committees – Planning
 - Deals with all issues of Regional Coordination of Master Plan, Interconnections, projects etc.
- Technical Sub Committees – Operations
 - Deals with all issues of Regional Coordination of Systems Operations/ SCADA , Integration of RE into EAPP Grid
 - Also given the Mandate by (SCM) to act as the Market Committee (for Market Development)
- Technical Sub Committees – Environment
 - Deals with all issues related to Environmental impact of the interconnected system



Market Design Activities

- » Market Committee/Design
- » Market Rules
- » Economic Evaluation of Trade
- » Update of the Road Map



Background

- The Mercados document lists each EAPP member countries' market structure by identifying:
 - Legal Institutional and Regulatory
 - Supply of Electricity
 - Importation and Exportation
 - Regulatory Overview
 - Access to Power markets
 - Environmental Issues
- Based on such categorization, we were able to construct 3 types of typical market structure in the EAPP
 - **Deregulated**
 - **Semi Deregulated**
 - **Regulated**



■ Deregulated:

- Unbundled transmission system operator, with third party access, independent generation (IPP), parts of the retail market is competitive with independent wholesale power purchasers either for re-sale or for own use. IPPs and wholesale buyers are allowed access to the cross border interconnection

■ Semi deregulated:

- Bundled national vertical integrated company (VIC), owns major part of generation capacity, the entire transmission network and the distribution network. IPP access is allowed but the national utility is a single buyer. Third party access to the national transmission network but not to cross border interconnectors

■ Regulated:

- there is only one single vertically integrated company (VIC) which is a monopolist and no third party access or IPPs



Recommendation from Mercado's

- “It is recommended that in the initial phase of the EAPP, the trading entity in the bilateral market is the incumbent utility in integrated environments.
- Where the market is unbundled, the individual entities should be permitted to trade in the Regional Pool, i.e. generators including IPPs, distribution companies and qualifying large consumers.
- If the national market is single buyer, then the single buyer would clearly participate”



Type of Market: starting point

- The type of market criteria and principle to be done by Market Committee
- Current status of Power Regime and Exchanges in The Region
- Identification of Interconnectors to start Trade
- Initial Model and Target Model to be identified

- Short-term market
- This shall be primarily designed for the short-term trade between two selected EAPP member countries and:
 - Not affecting the cornerstones of the current power purchase agreements (PPAs) if any, and attempts to utilize the interconnector for more efficient trade
 - considering potential enlargement of the market in the medium run by adding more EAPP member countries
 - No real-time systems operations and Settlement

Design and Rules to be done in Parallel

- Starting Point (rules required to start the market
- Guidelines , rules and procedures be drafted

What Could be the realistic Road map

For discussion

Pilot
Projects

< 3 months

3% of all
power
traded

< 5 years

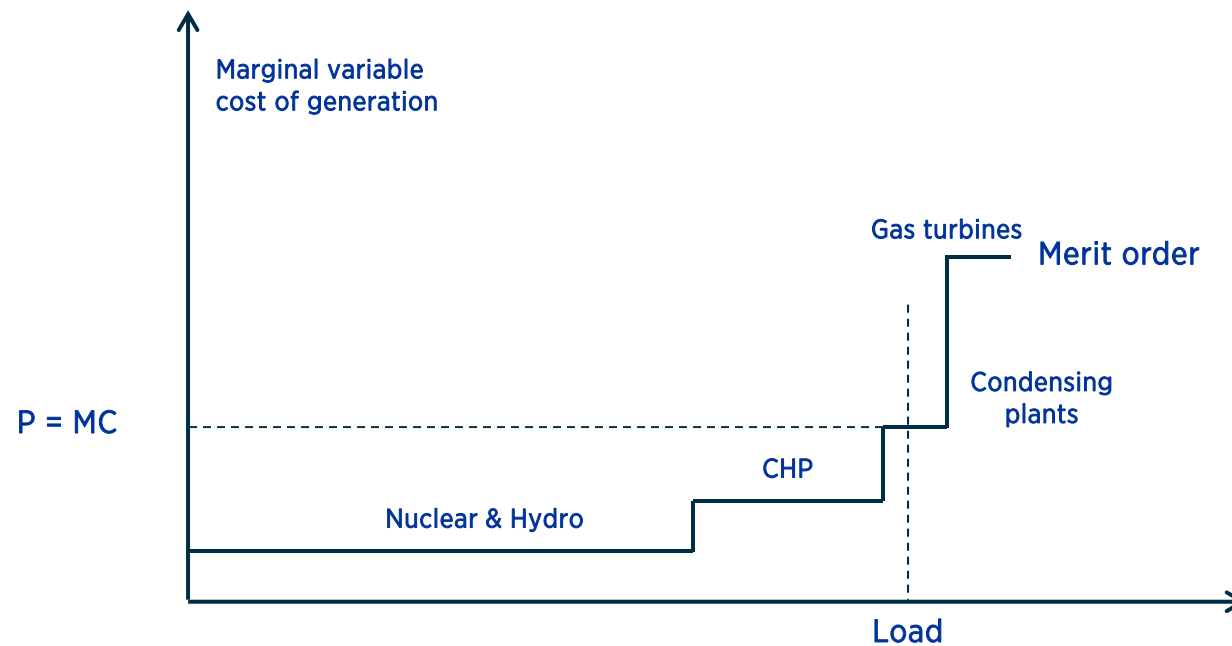
EAPP
Target
Model*

< 15 years

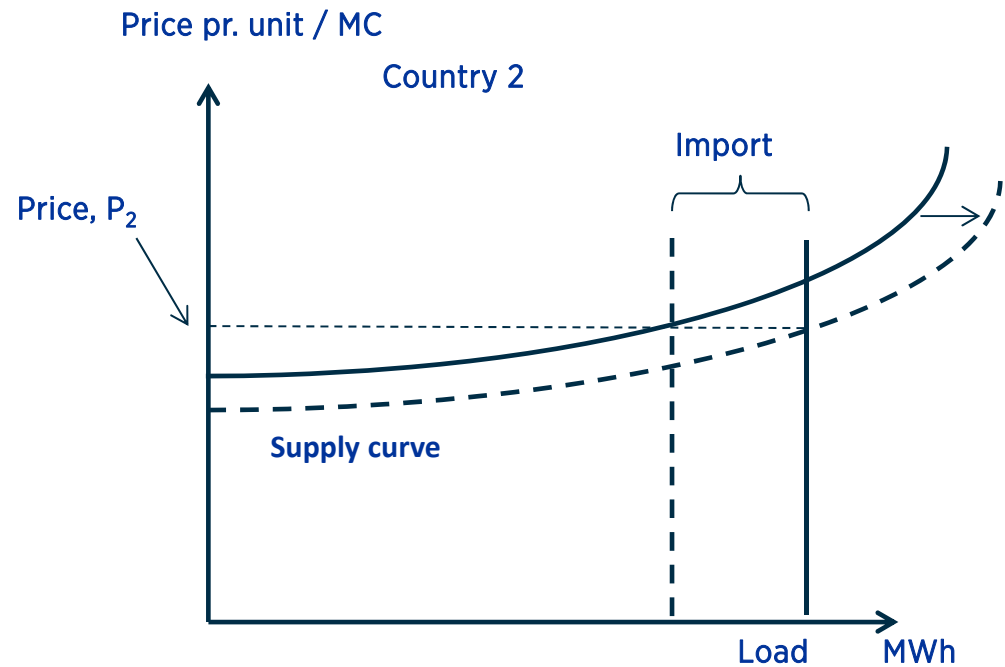
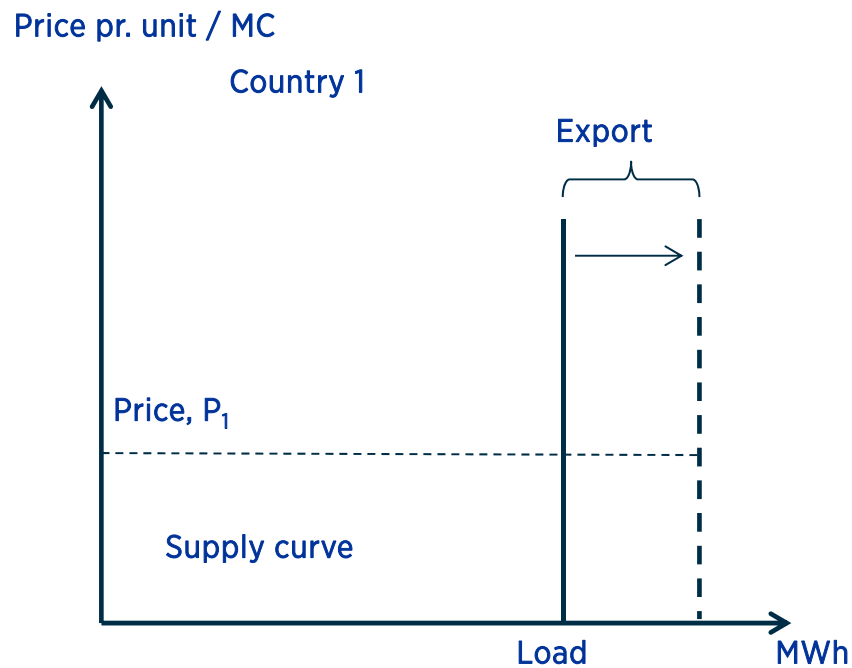
Market Design Criteria

- The criteria of economic efficiency used as a guiding principle in designing energy markets in EAPP
 - The overall criteria is used in Europe and the US and implemented as a guiding principle in energy legislation**
- The Committee to learn and apply the criteria through design of a short term market
 - Minimisation of cost: productive efficiency i.e Production costs have been minimized given total production
 - The idea of productive and allocative efficiency
 - Production Marginal Curve for all Generators in the considered region
 - Allocative (Demand curve): for all consumers in the region

Marginal Cost - Pricing Principle



Trade between 2 countries using MP Principle



Market Development

Initial Model

- Economic efficiency criteria
- Harmonised market rules between countries
- Short run day ahead market with identical price algorithm used at the power exchange
- MC pricing with calculation of a market equilibrium for each hour a day, i.e. 24 prices each day
- Management of exchange on interconnectors based on the principle of implicit auctioning of interconnector trade capacity

Target Model

- Day Ahead Market
- Future, intraday and balancing market and financial markets
- Update of the Road Map
- Balancing Energy
- Interconnector Third Party Access
- Wheeling

Interconnectors Selection

- Ethiopia -Sudan
- Kenya -Uganda
- SINELAC (DRC-Rwanda-Burundi)

Shadow market Operations

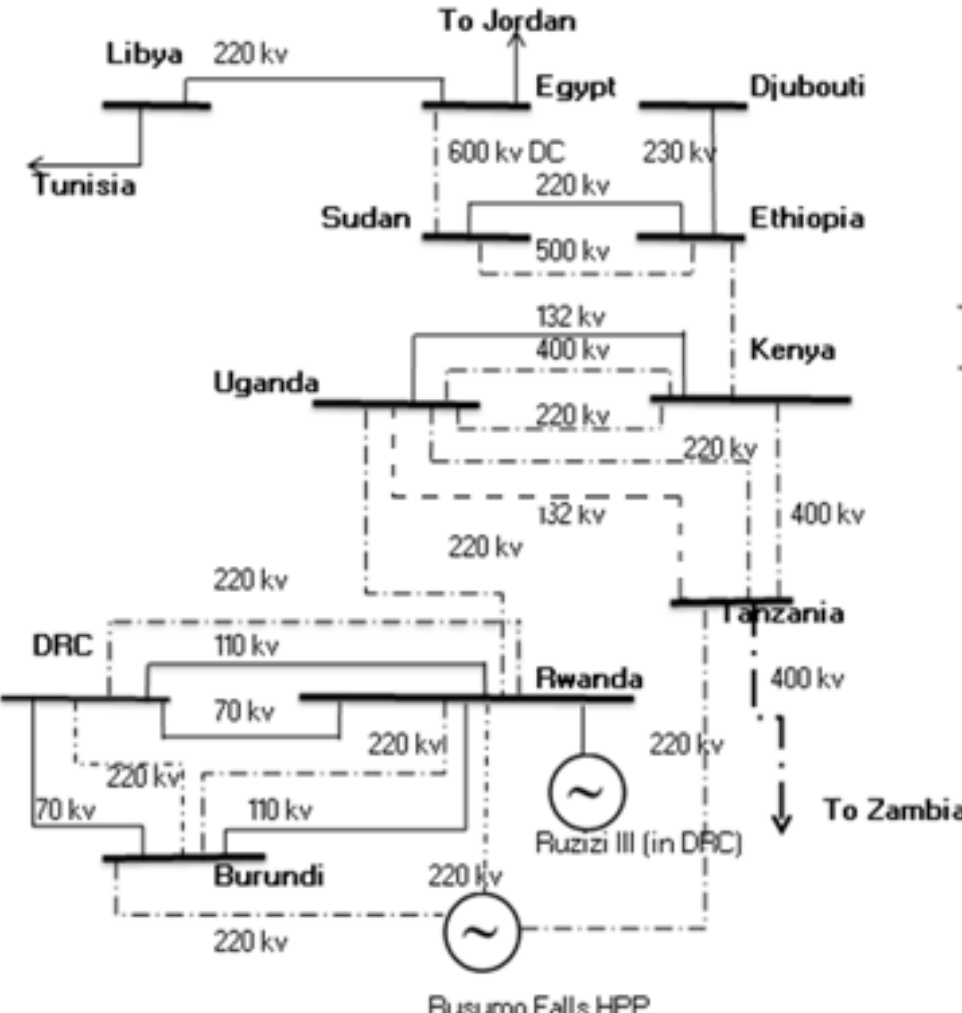
- » Interconnectors Selection
- » Pilot Organization/Operations
- » Market Rules
- » Economic Evaluation of Trade
- » Update of the Road Map



Current Status of Unbundling (Jan 2012)

Country	Type of Energy Regime	TSO	Generators	Distributors
Sudan	▪ Unbundled Just completed in 2010	▪ SETCO	▪ STPP (Gas)	▪ SEDCo.
			▪ Merowe (Hydro)	
			▪ Import EEPKO	
Ethiopia	▪ Bundled. Vertically integrated ▪ Considerations on unbundling and introduction of IPPs	▪ EEPKO	▪ EEPKO	▪ EEPKO
Kenya	▪ Unbundled ▪ Further unbundling being considered	▪ KETRACO	▪ KENGEN	▪ KPLC
			▪ IPPs	
			▪ Import -UETCL	
Uganda	▪ Unbundled	▪ UETCL	▪ ESKOM	▪ ESKOM
			▪ IPPs	
			▪ Import -KPLC	
Rwanda	▪ Bundled. Vertically integrated ▪ More changes being introduced in the sector. EWSA expected to be broken down into transmission and distribution in the next few months.	▪ EWSA	▪ EWSA	▪ EWSA
			▪ IPPs	
			▪ Import – SINELAC	
			▪ Import- DRC (Mururu I)	
Burundi	▪ Bundled. Vertically integrated	▪ REGIDESO	▪ REGIDESO	▪ REGIDESO
			▪ Import- SINELAC	
			▪ Import –DRC (Mururu I)	
DRC	▪ Bundled. Vertically integrated ▪ East and west are autonomous.	▪ SNEL	▪ SNEL	▪ SNEL
			▪ Import- SINELAC	

Interconnections in EAPP (SLD)



Existing

Future

NB: The 220 Kv link between Kenya and Uganda is designed for 400 KV. It is operated at 220 kv only initially.

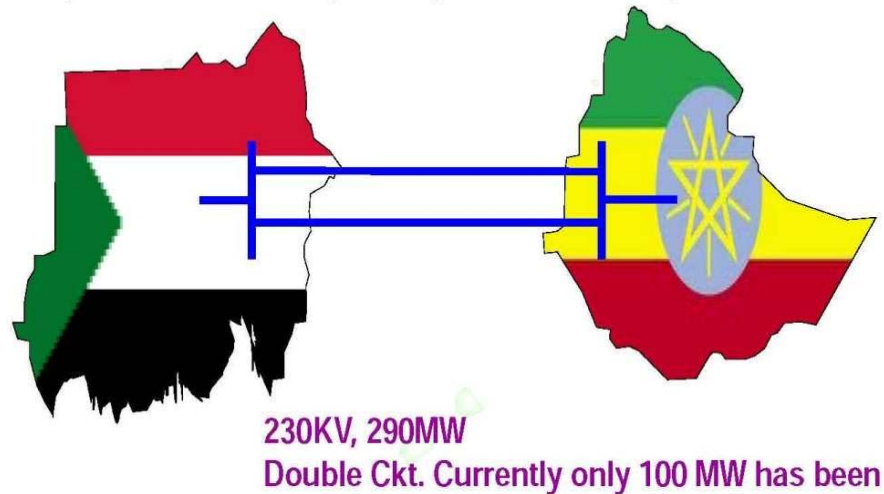
The Uganda-Tanzania 132 kv line is supplying border towns but is not synchronized to the Tanzanian system.



Interconnectors Selection

- Ethiopia –Sudan Interconnection

Ethiopia - Sudan (Completed 2012)



- Bilateral Contract -The capacity of the two lines is 400MW however the optimum power flow between the two lines is only 200MW. The contracted amount PPA is 100MW one way from Ethiopia to Sudan.



Current Rules

- Capacities
 - Approx. 2000 MW Peak Sudan
 - Approx. 1500 MW peak Ethiopia
- The PPA is the governing rule
 - Firm 100 MW
 - Price is fixed for three years
 - Non-firm is the same price
 - Weekly schedule and updated daily
 - Special price during emergency
 - We have also a monthly and annual schedule
 - There is different price for the annual schedule more than the firm power (Less Price)



Operation

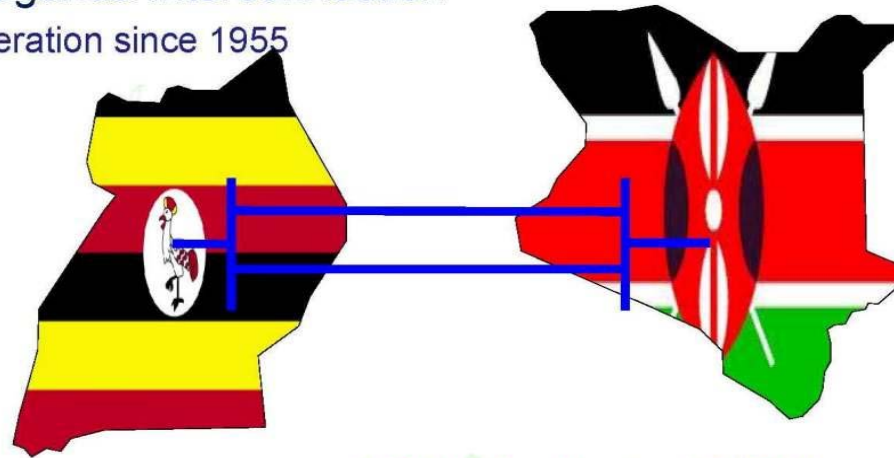
- The efficiency
 - AGC control the line flow and grids frequency
 - No frequent interruption
 - It will be more efficient if there is more interconnections with the neighboring countries
 - There is a plan to construct two lines 500 KV which extends to Egypt two lines 220 KV



■ Kenya – Uganda Interconnector

Kenya Uganda Interconnection

– In Operation since 1955



A 117km Double circuit 132kV
Transmission line interconnector runs
from Tororo (Eastern Uganda) to Lessos
(Western Kenya)

- The current version of the agreement was made in 2004 through experiencing many revisions. Double circuit line, 132KV running a total of 145 KM from Lessos in Kenya to Tororo in Uganda. The capacity of the two lines is 100MW.



■ Capacities

- Available Capacities Kenya – 1600MW Peak demand -1400MW
- Available Capacities Uganda – 620MW(100MW thermal) Peak demand -500MW

■ PPA

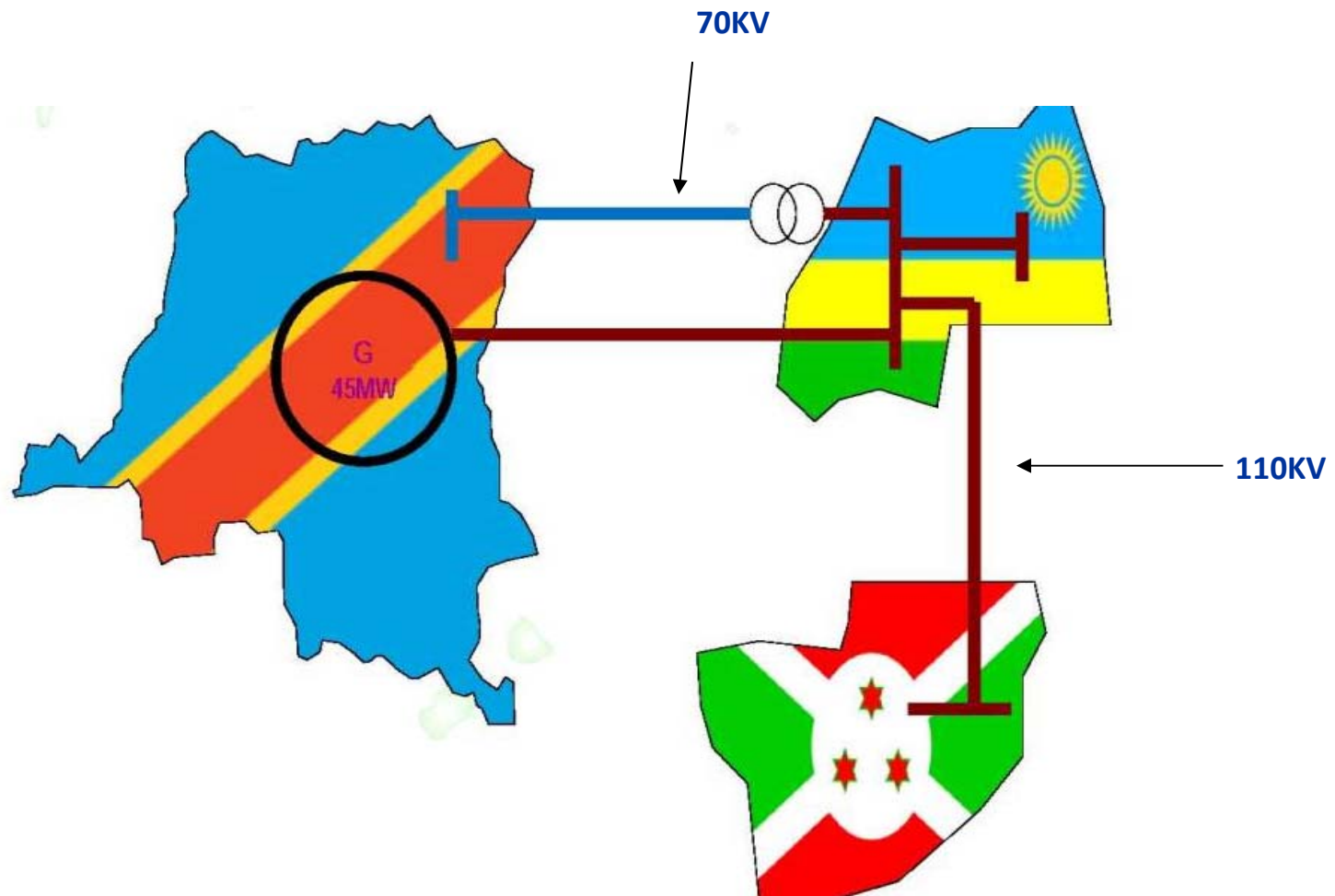
- Energy exchange agreement(up to 2014)
- +/-4MW band for tie line support.
- Outside the band-commercial energy sales declared and requested day ahead.
- Emergency support for short periods.
- No penalties for non compliance
- Fixed tariff same either direction
 - Energy and fuel cost component



- UETCL-has a fixed bulk supply tariff reviewed quarterly
- KPLC – fixed retail tariff reviewed after every three years, periodic adjustment for inflation.
 - pass through Fuel cost and forex
- Joint operational procedures
- Efficiency:
 - Similar costs for surplus capacity in both countries at signing
 - No flexibility to take advantage of changing circumstances
 - Agreement due for review.

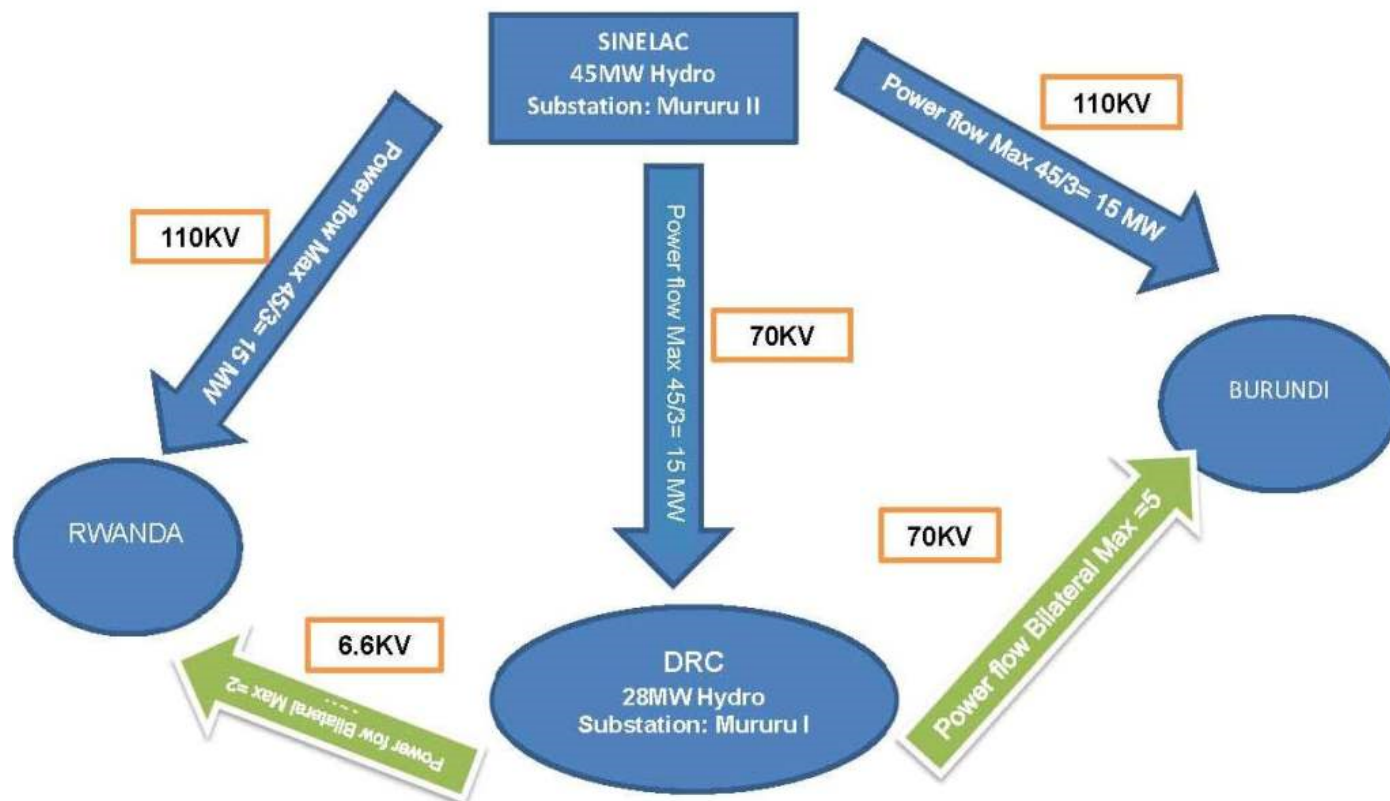


■ SINELAC



■ SINELAC

INTERCONNECTION: SINELAC – REGIDESO - EWSA—SNEL (East DRC)



Capacities

COUNTRY	INSTALLED CAPACITY	AVAILABLE CAPACITY	PEAK DEMAND
RWANDA	100 MW	90MW	87MW
BURUNDI	55MW	42MW	62MW
DRC(EAST)	29MW	29MW	37MW
SINELC	44MW	36MW	36MW



Energy Exchange & Operation

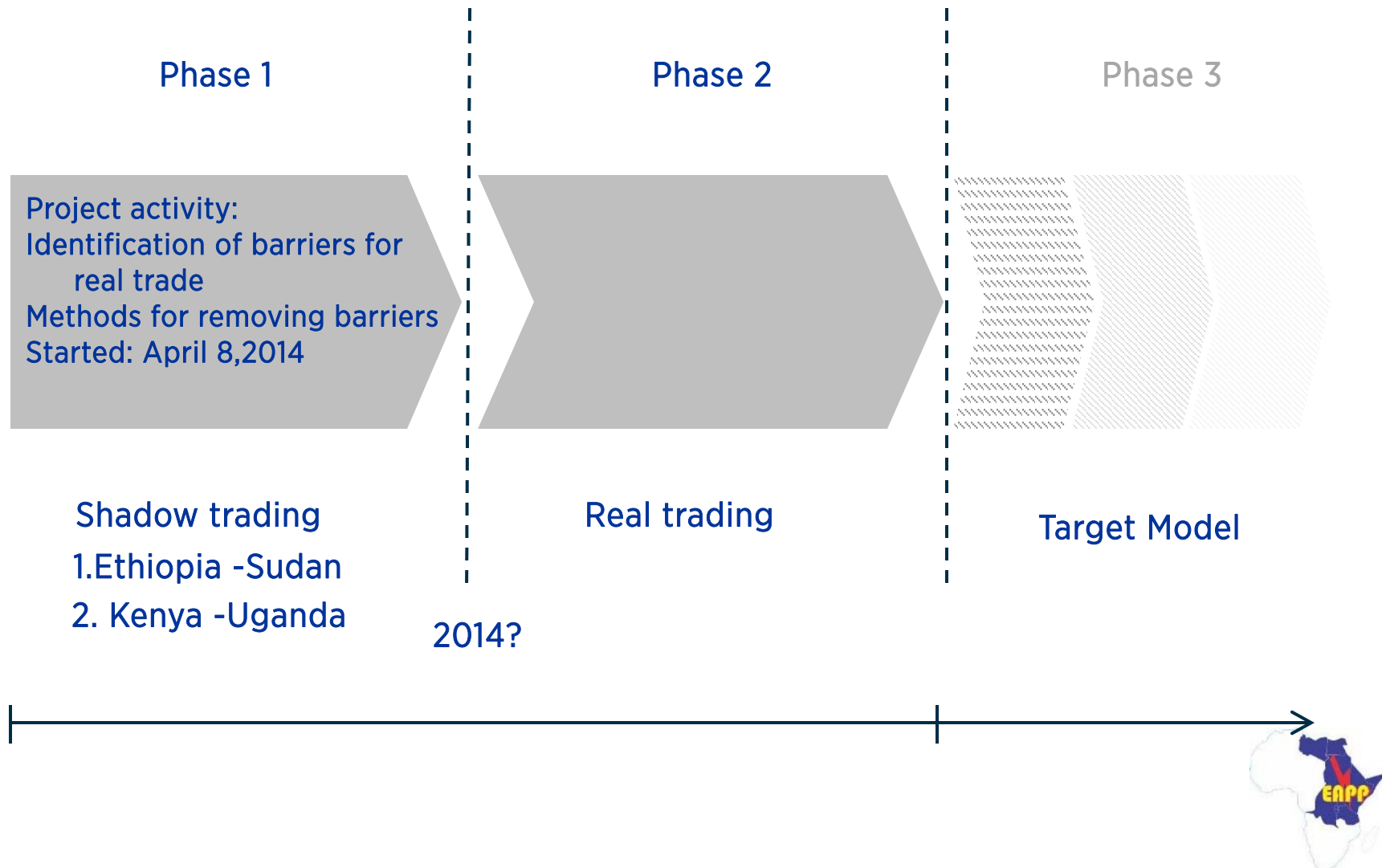
DRC / RWANDA	3.5 MW	PPA Agreement (5yrs) FIXED TARIFF
DRC / BURUNDI	3.5 MW	PPA Agreement (5yrs) FIXED TARIFF
SINELAC / EWSA- REGIDESO-SNEL (DRC)	36/3 MW	Regional Power Supply FIXED TARIFF

EFFICIENCY

- The system is inefficient as there is no spare capacity from all sources
- More than 30 % of the Generation is Thermal Power.



The short term trade pilot :Project covers Phase 1



Pilot Interconnectors

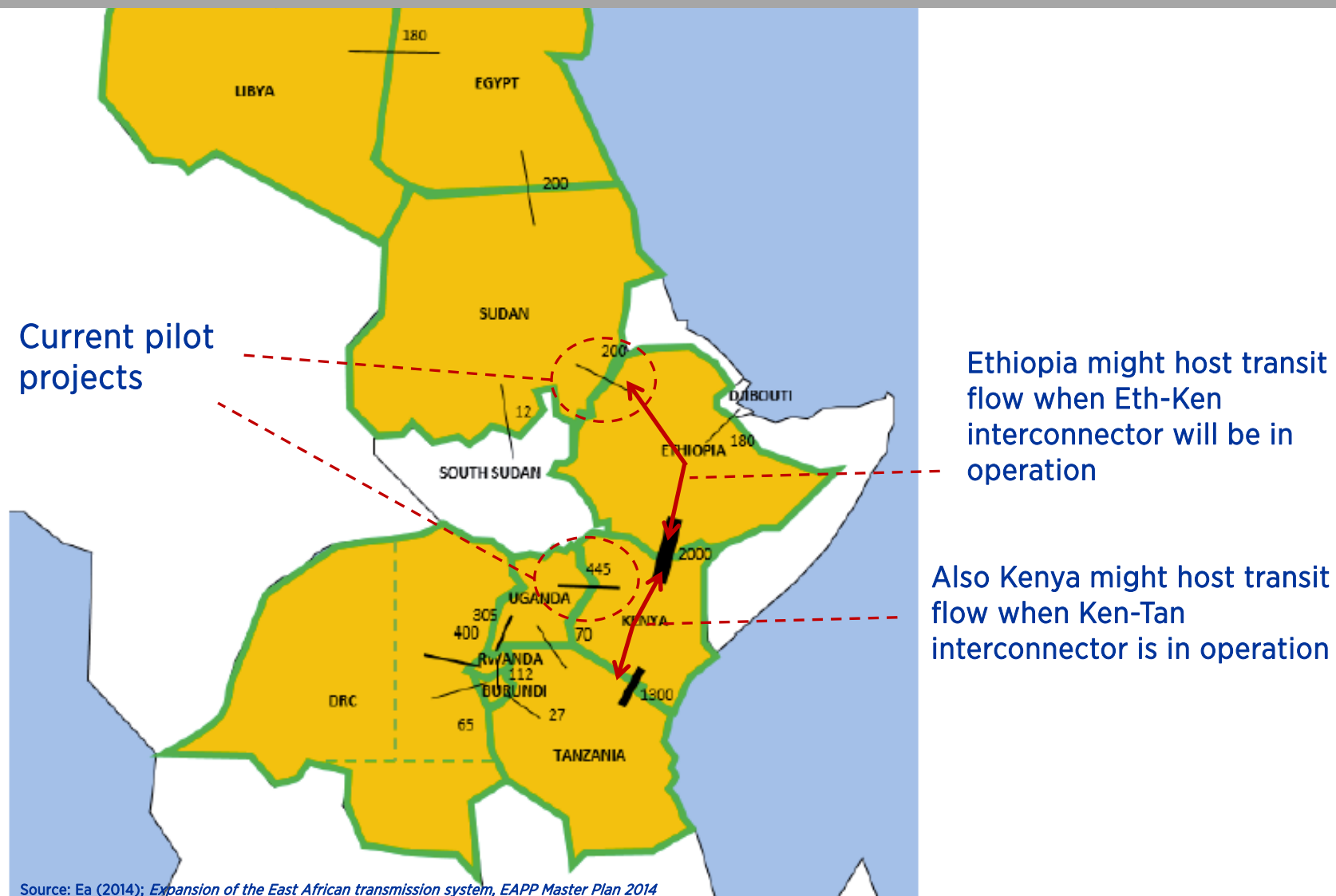
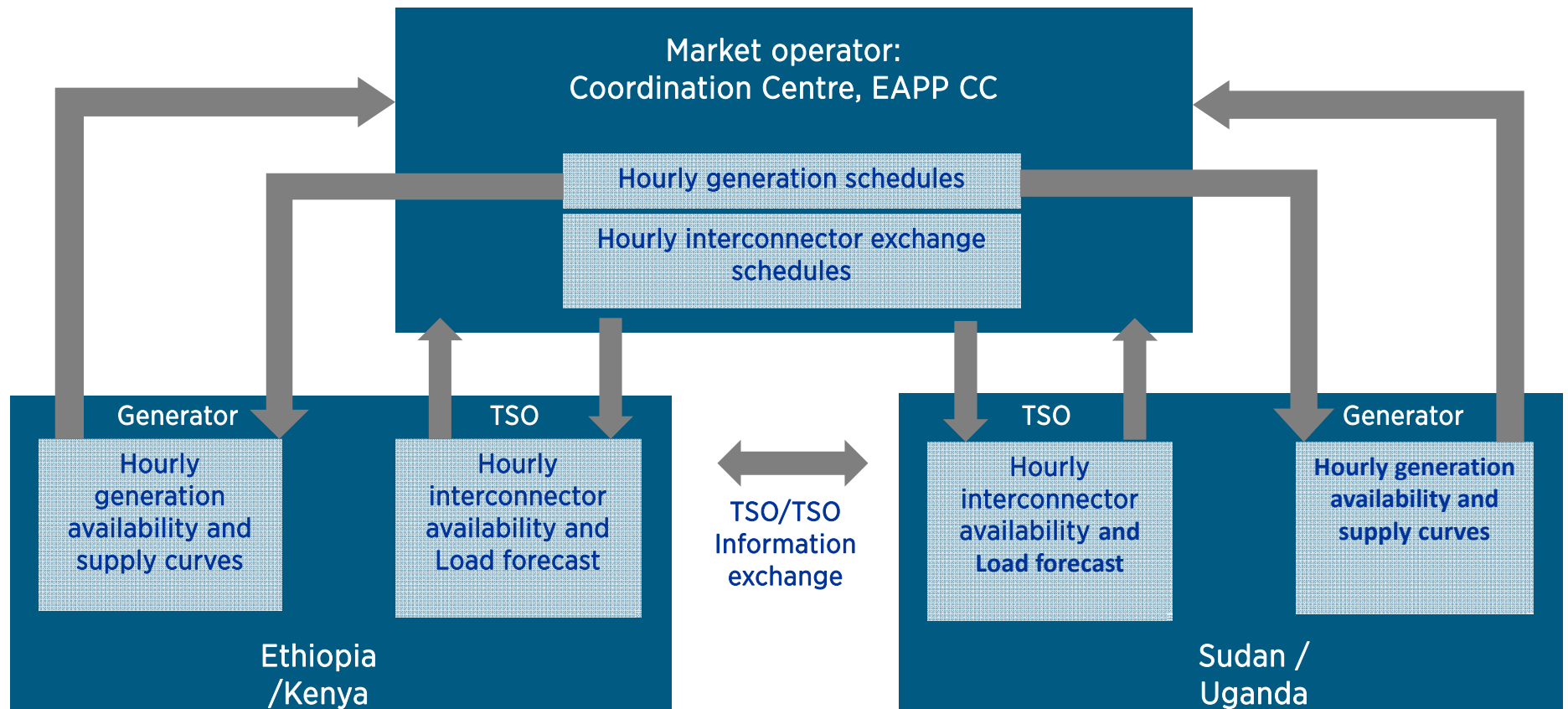


Figure 4. Current and committed (before 2020) interconnectors in East Africa. MW

Short term Trade: Reference Model

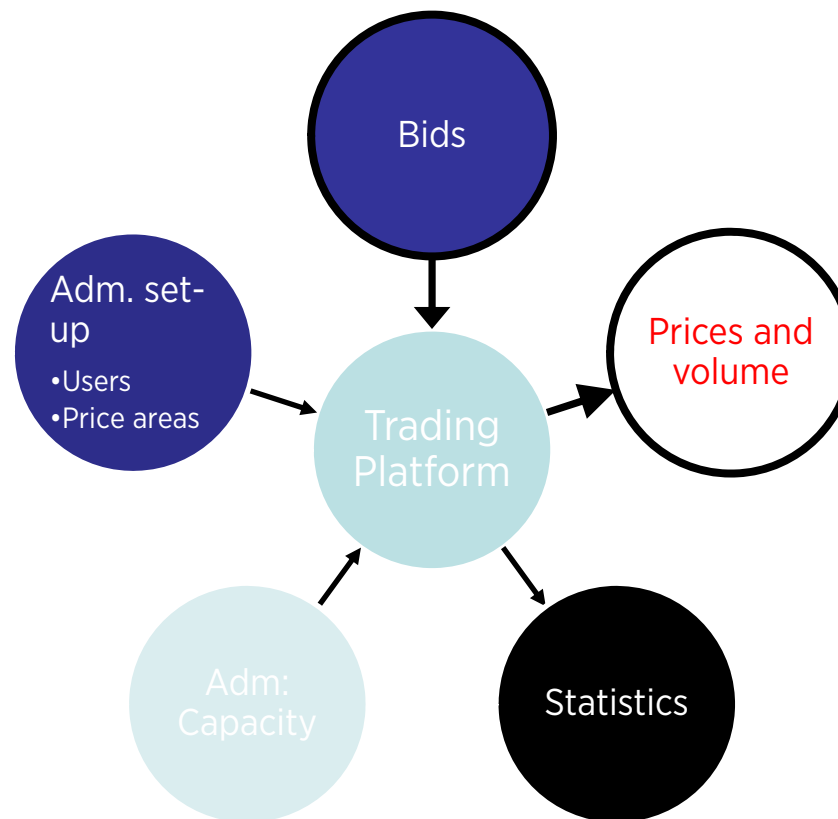


Market Principle

- Nord pool type of trade
 - Day ahead, hourly market
- Market based use of transmission lines
 - Can include all capacity or part of capacity (available after long term agreements)
 - Implicit auctions
- Participants
 - EAPP CC (Market Operations)
 - Bids from market participants, Price Areas – Countries (4)
 - Independent market operator (ATC)
- System developed and installed at EAPP
 - Implicit Auction Algorithm
 - Coded Done using GAMS/Visual Studio
- Initial Market rules to Govern this

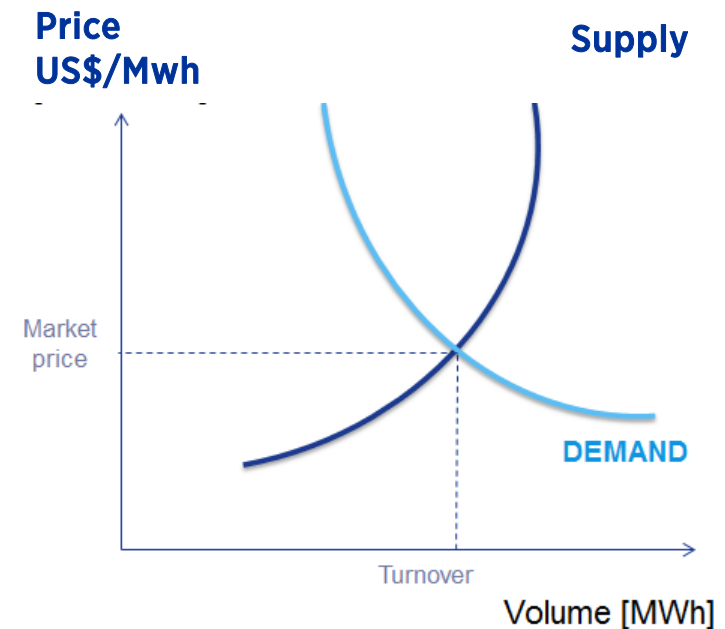


Biding Process overview



Only one type of bids

- Standard hourly bid
 - Volume
 - Price (based on SRMC)
 - Area
- Demand (+) or generation (-)



Estimating SRMCs

- Short run marginal cost (SRMC)
 - the short run marginal cost refers to the increase in variable cost of increasing output by one unit (MWh)
- Thermal plant
 - the incremental costs of oil, gas or coal of increasing output by 1 MWh
- Hydro plant with reservoir
 - avoided cost approach: by producing power by hydro we avoid to generate at a thermal plant. The avoided cost is the benefit of hydro, hence SRMC will be \$0 MWh
 - alternative cost approach: having MC-hydro at \$0 MWh does not take into consideration that hydro may as an alternative to substitute thermal generation in adjacent country being used to serve internal customers. The value of hydro power to internal customers is the MC of selling to the adjacent country
- Wind or Solar PV
 - -SRMC is 0 as the cost of input (wind, sun) is 0. In addition the output of electricity cannot be stored, hence the alternative cost approach has no meaning



Assumptions (IEA)

	Yearly Scheduled maintenance (weeks)	Forced outage (%)	Availability factor (%)	Construction time (years)	Technical lifetime (years)	Capital costs inc IDC (USD/kW)	Yearly Fixed O&M (USD/kW)	Variable O&M (USc/kWh)	Interests during construction
Steam Coal - SUBCRITICAL									
Steam Coal - SUPERCRITICAL				4	30	1800	45	0.37	26%
CCGT				4	30	2250	64	0.54	26%
Gas turbine				2	30	800	26	0.21	12%
MSD				2	30	457	20	0.17	12%
LSD				2	30	1588	22	0.18	12%
Nuclear				2	30	2444	10	0.08	12%
Geothermal				7	60	5560	125	0.00	51%
Hydro - large				*	30		43	0.31	*
Hydro - small				*	INF		46	0.33	*
PV - large				*	INF		61	0.43	*
CSP				1	25	2214	29	0.24	6%
Wind - onshore				1	25		205	3.41	6%
				1	20	2419	22	0.37	6%



Estimating SRMC/Prices (real training)

1	Plant	Techonology	Fuel	Capacity (MW)	Efficiency	Ops Year	O&M(\$/Mwh)	Fuel\$/GJ Fuel Input	Fuel\$/Mwh	Carbon (\$/MWh)	SRMC (\$/MWh)
2	Kipevu 1 Diesel	MSD	Diesel	60	40%	1999	1.82	17.92	161.58	0	163.40
3	Kipevu new GT	OCGT	NG	27	26%	1999	1.7	12.85	175.94	0	177.64
4	Olkaria 1	Geo	Heat	44	36%	1981	3.09	0	0.00	0	3.09
5	Olkaria 2	Geo	Heat	101	36%	2003	3.09	0	0.00	0	3.09
6	OrPower 4a	Geo	Heat	13	36%	2000	3.09	0	0.00	0	3.09
7	OrPower 4b	Geo	Heat	35	33%	2008	3.09	0	0.00	0	3.09
8	Iberafrica IPP	MSD	Gasoil	56	39%	1997	1.82	22.17	203.28	0	205.10
9	Tsavo IPP	MSD	Gasoil	74	41%	2001	1.82	22.17	195.10	0	196.92
10	Mumias	STPP	Bagasse	26	39%	2008	3.74	0	0.00	0	3.74
11	Aggreko IPP	MSD	Diesel	120	40%	2008	1.82	17.92	161.64	0	163.46
12	Olkaria Well Head	Geo	Heat	4	33%	2012	3.09	0	0.00	0	3.09
13	Rabai diesel IPP	MSD	Diesel	90	40%	2009	1.82	17.92	161.75	0	163.57
14	Iberafrica 3 IPP	MSD	Gasoil	52	39%	2004	1.82	22.17	202.35	0	204.17
15	Kipevu III Diesel	MSD	Diesel	115	40%	2011	1.82	17.92	161.75	0	163.57
16	Ngong	WPP	Wind	5	100%	2010	3.75	0	0.00	0	3.75
17	Eburru	Geo	Heat	2	100%	2012	3.09	0	0.00	0	3.09
18	Tana	HYDRO	Water - ROR	20	100%	1955	3.25	0	0.00	0	3.25
19	Small hydro	HYDRO	Water - ROR	11	100%	2010	3.25	0	0.00	0	3.25
20	Kamburu	HYDRO	Water - RESER	90	100%	1974	3.25	0	0.00	0	3.25
21	Gitaru	HYDRO	Water - ROR	216	100%	1998	3.25	0	0.00	0	3.25
22	Kindaruma	HYDRO	Water - ROR	44	100%	1968	3.25	0	0.00	0	3.25
23	Masinga	HYDRO	Water - RESER	40	100%	1981	3.25	0	0.00	0	3.25
24	Kiambere	HYDRO	Water - RESER	164	100%	1988	3.25	0	0.00	0	3.25
25	Sondu Miriu	HYDRO	Water - ROR	60	100%	2008	3.25	0	0.00	0	3.25
26	Turkwell	HYDRO	Water - RESER	105	100%	1991	3.25	0	0.00	0	3.25
27	Sangoro	HYDRO	Water - ROR	20	100%	2012	3.25	0	0.00	0	3.25
28	THIKA	MSD	Diesel	87	45%	2014	1.82	17.92	144.81	0	146.63

Typical Bids (Offers) for One price per hour

BidderID	Area	Day	Hour	Amount	Price
110	Ethiopia	6/1/2014	h00-01	30	130
110	Ethiopia	6/1/2014	h01-02	30	130
110	Ethiopia	6/1/2014	h02-03	30	130
110	Ethiopia	6/1/2014	h03-04	30	130
110	Ethiopia	6/1/2014	h04-05	30	130
118	Ethiopia	6/1/2014	h00-01	60	90
118	Ethiopia	6/1/2014	h01-02	60	90
118	Ethiopia	6/1/2014	h02-03	60	90
118	Ethiopia	6/1/2014	h03-04	60	90

Each line = 1 Bid



Typical Bids (Demand) for One price per hour

BidderID	Area	Day	Hour	Amount	Price
304	Ethiopia	6/1/2014	h00-01	-816.49	2000
304	Ethiopia	6/1/2014	h01-02	-766.86	2000
304	Ethiopia	6/1/2014	h02-03	-779.97	2000
304	Ethiopia	6/1/2014	h03-04	-787.12	2000
304	Ethiopia	6/1/2014	h04-05	-844.58	2000
304	Ethiopia	6/1/2014	h05-06	-997.79	2000
304	Ethiopia	6/1/2014	h06-07	-1258.28	2000
304	Ethiopia	6/1/2014	h07-08	-1225.31	2000
304	Ethiopia	6/1/2014	h08-09	-1220.36	2000

Each line = 1 Bid



Typical ATC for One price per hour

BidderID	Area from	Area to	Hour	Day	ATC
996	Ethiopia	Sudan	h00-01	6/1/2014	100
996	Ethiopia	Sudan	h00-01	6/1/2014	100
996	Ethiopia	Sudan	h00-01	6/1/2014	100
996	Ethiopia	Sudan	h00-01	6/1/2014	100
996	Ethiopia	Sudan	h00-01	6/1/2014	100
997	Sudan	Ethiopia	h00-01	6/1/2014	240
997	Sudan	Ethiopia	h00-01	6/1/2014	240
997	Sudan	Ethiopia	h00-01	6/1/2014	240
997	Sudan	Ethiopia	h00-01	6/1/2014	240
997	Sudan	Ethiopia	h00-01	6/1/2014	240

Each line = 1 Bid

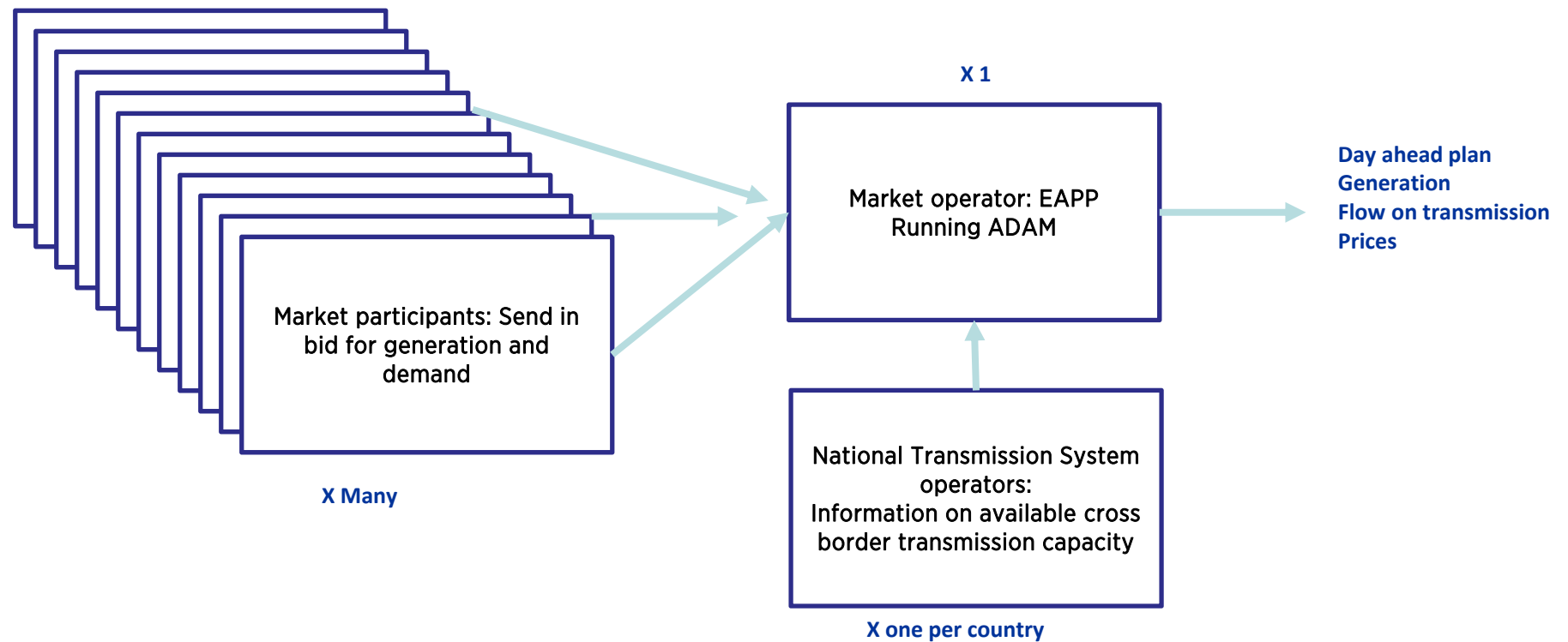


Bids

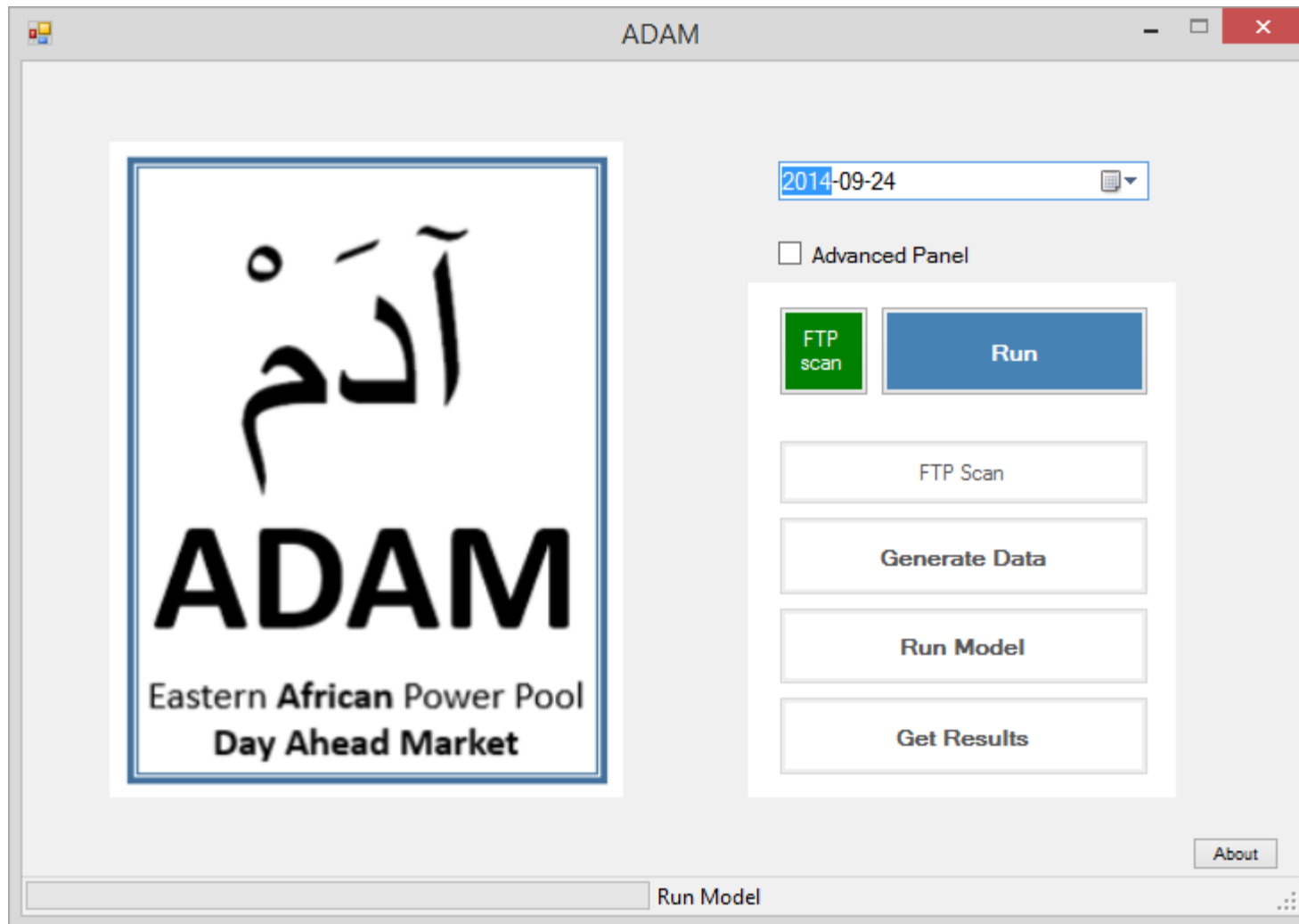
- Bidder has full flexibility with bids
 - Any number of bids per hour (price steps)
 - Generation = +
 - Demand = -
- Rules
 - Trade Lot: 0.1 MW
 - Tick Size: US\$ 0.1/MWh
 - Currency: US \$
 - Order Types: Hourly Orders
 - Lower technical Order Price Limit: US \$ 0 /MWh
 - Upper technical Order Price Limit: US \$ + 2000 /MWh (changed to 5% above the highest SRMC generator)



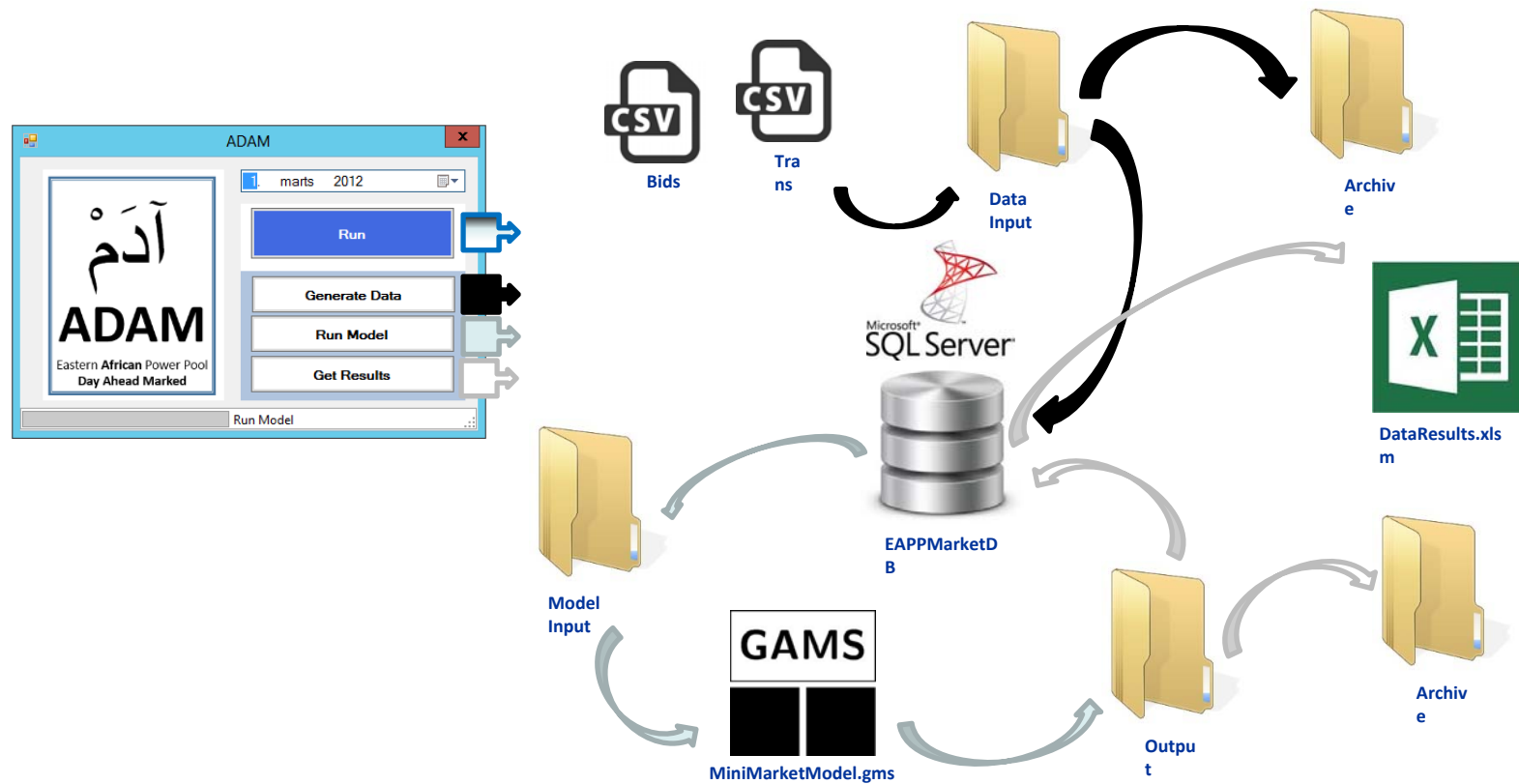
Operation



Trading Platform



ADAM -Application Process Overview

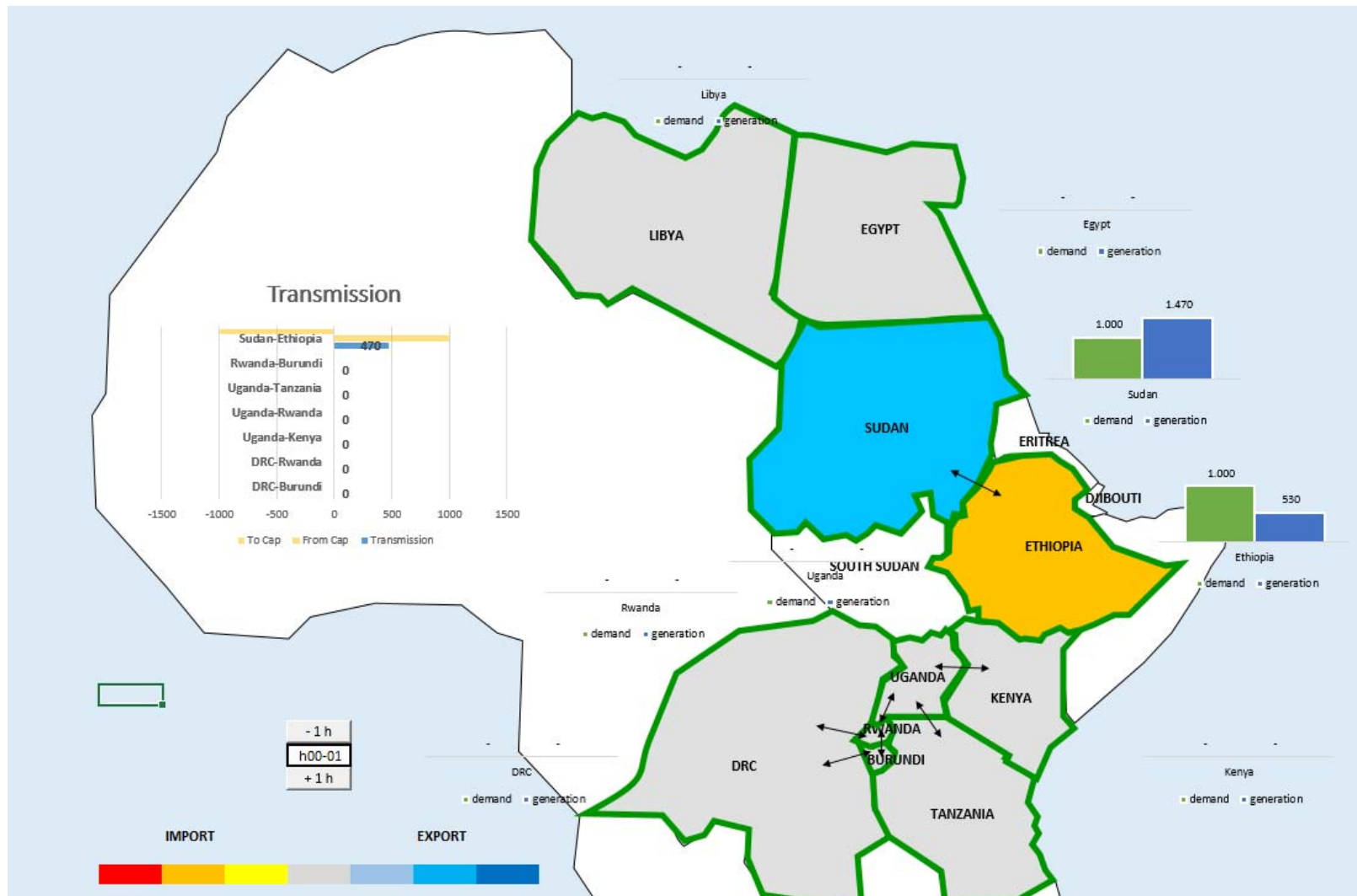


Market Rules for Short term market

- Submission of ATC by TSCO
 - 10.30 AM (GMT +3)
- Submission of Bids and Offers
 - By 1.00PM (GMT +3)
 - Buy and sell (Demand -ve, Sell +ve)
- ADAM calculations
 - 1.00 PM to 2.30PM
 - Sending Results by 2.30 PM

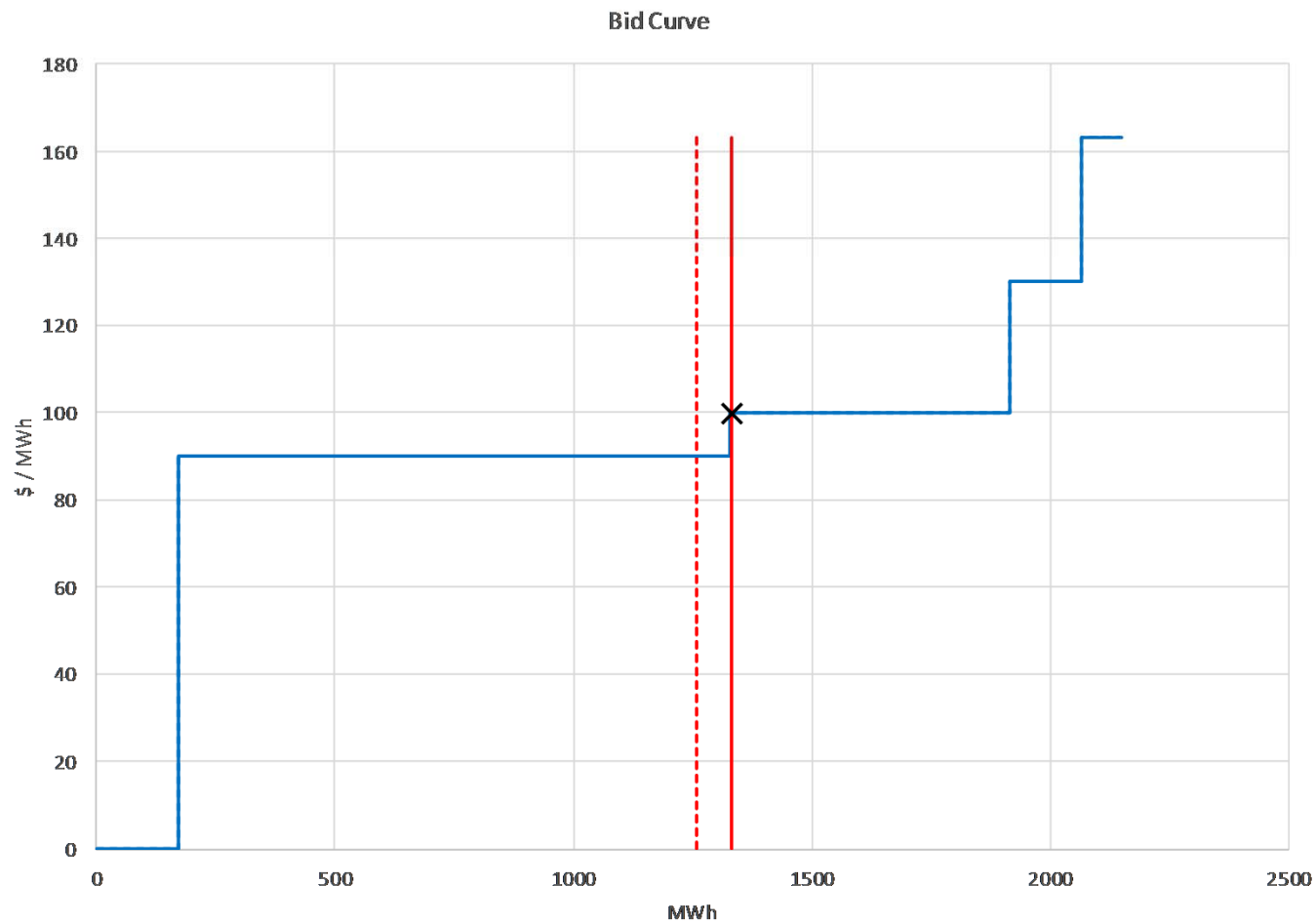


Market Results/ Typical Transmission Map



Typical Bid Curve

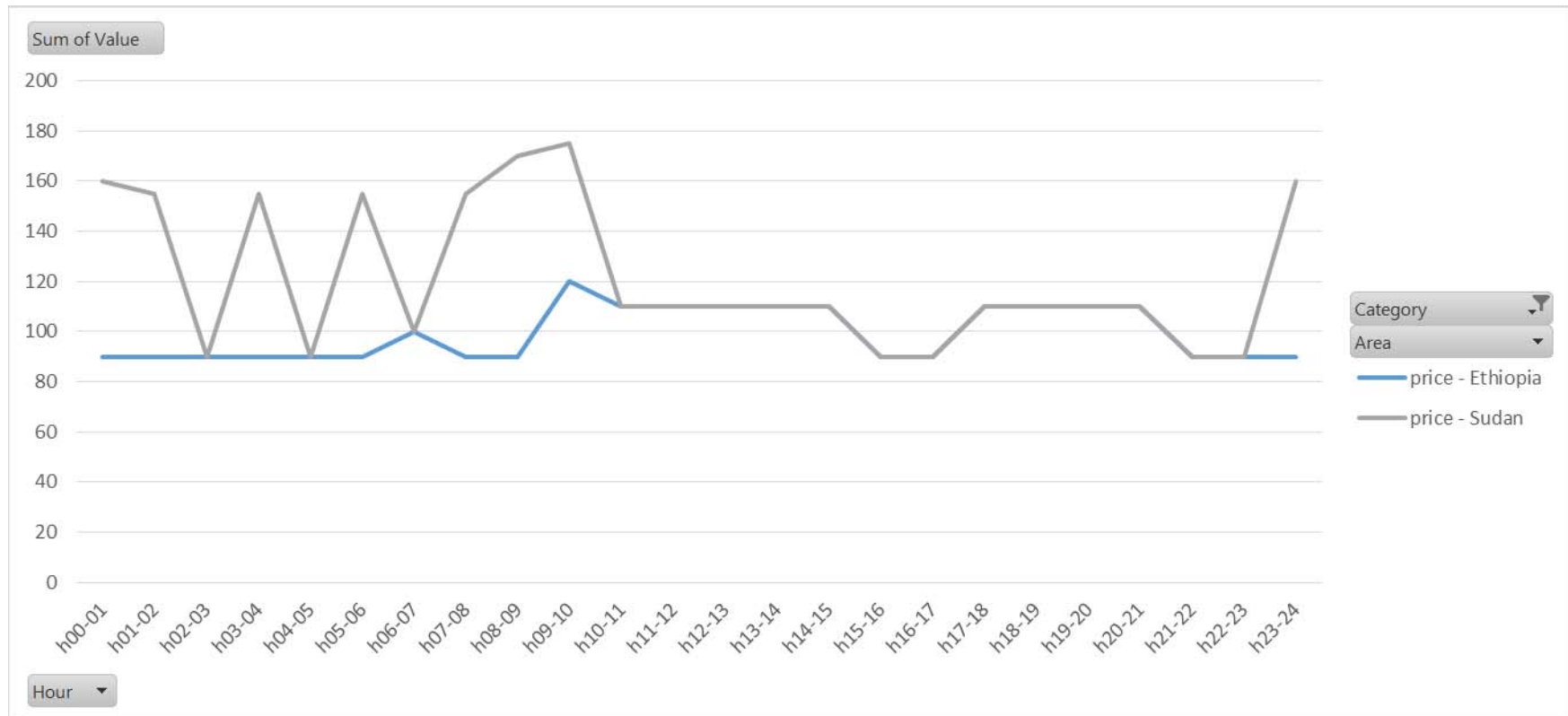
- 1 h	Update Chart
h06-07	Ethiopia
+ 1 h	



× Result Price — Supply Curve — Demand Curve



Typical Price Curve

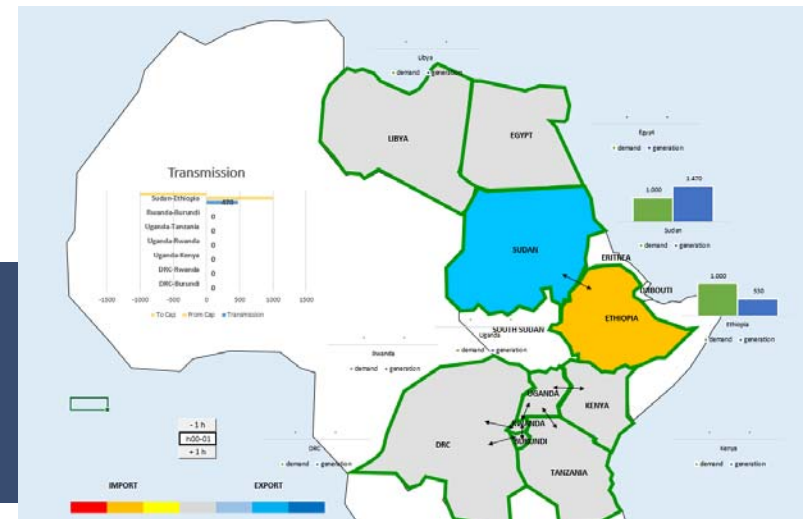


Market Results Reporting

- After very market run, the results are sent to Bidders in two formats,
 - The production Plan and
 - The expected maps i.e

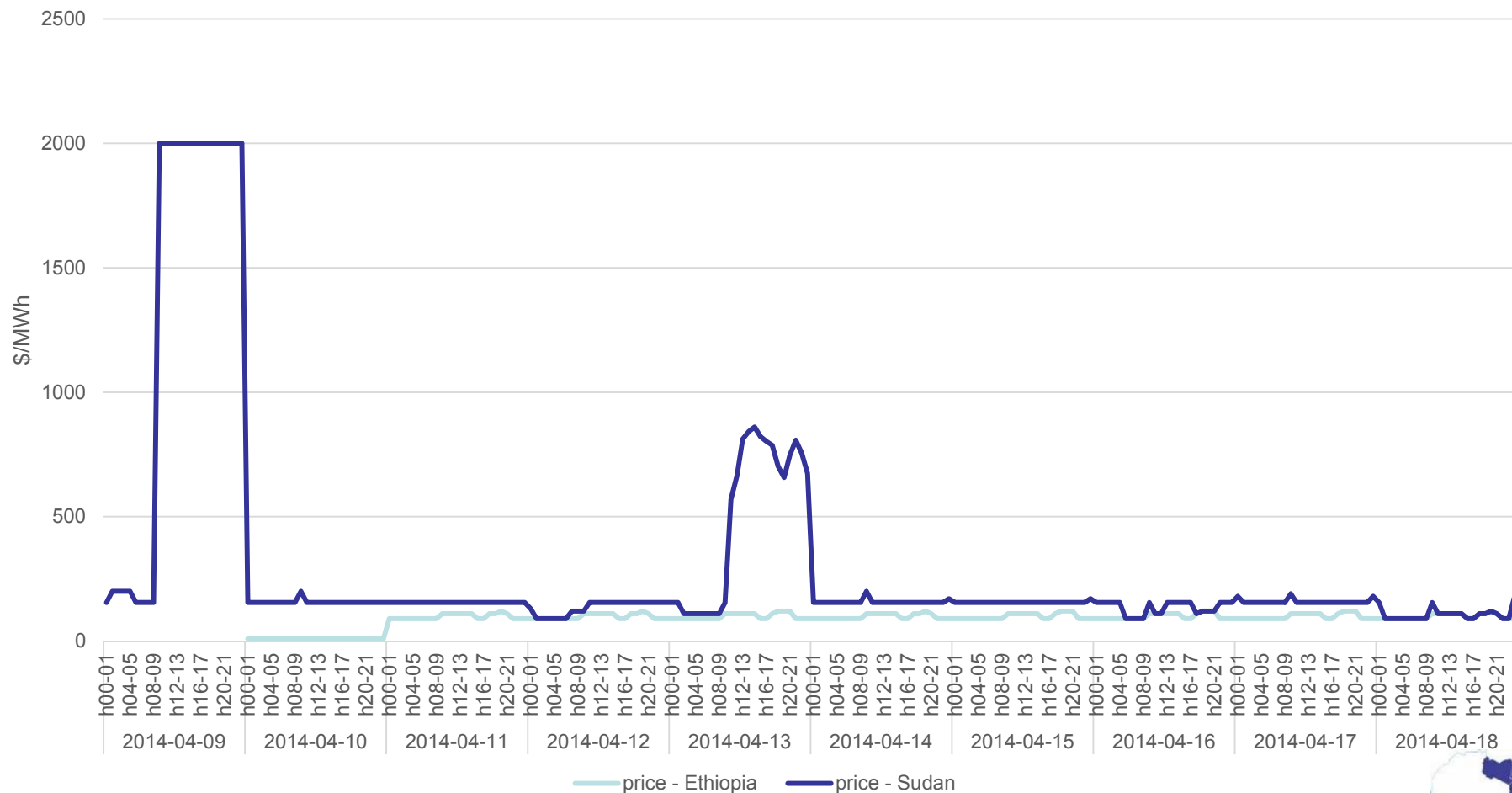
ADAM of 2014-07- Production Plan 12

Area	Bidder Name	h00-01	h01-02	h02-03	h03-04	h04-05
Ethiopia	Price [\$/MWh]	\$ 90.00	\$ 90.00	\$ 90.00	\$ 90.00	\$ 90.00
	Adama Wind - [MWh/h]	51	51	51	51	51
	Amerti Neshe - [MWh/h]	97	74.9	97	97	97
	Ashegoda - [MWh/h]	120	120	120	120	120
	Gilgel G. I - [MWh/h]	180	180	180	41.2	180
	Gilgel G. II - [MWh/h]	420	420			
	Tana Beles - [MWh/h]	48.5		432	460	332.2
	Total [MWh/h]	916.5	845.9	880	769.2	780.2



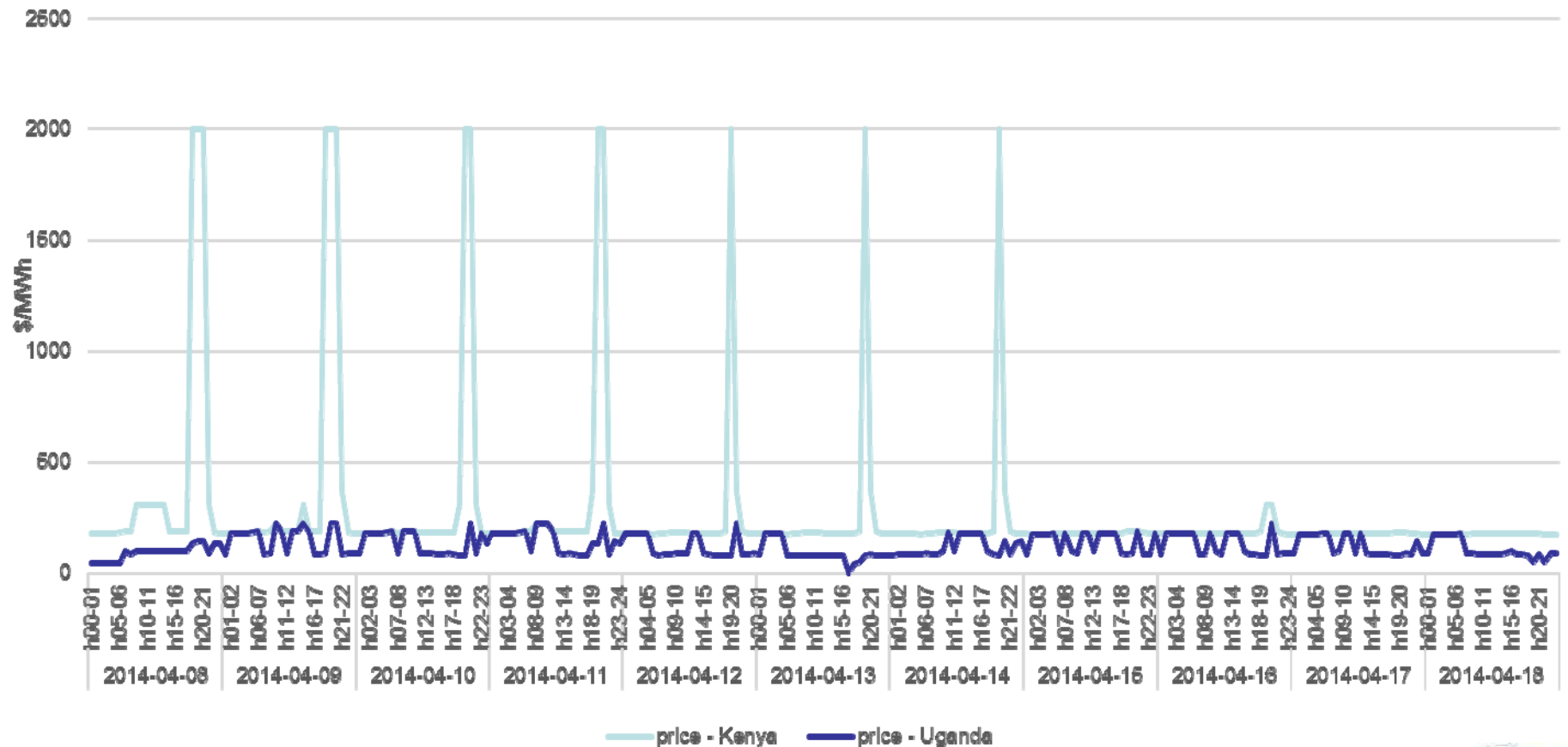
Real Hourly Prices up to April 18 2014

Area prices at EAPP for Ethiopia and Sudan



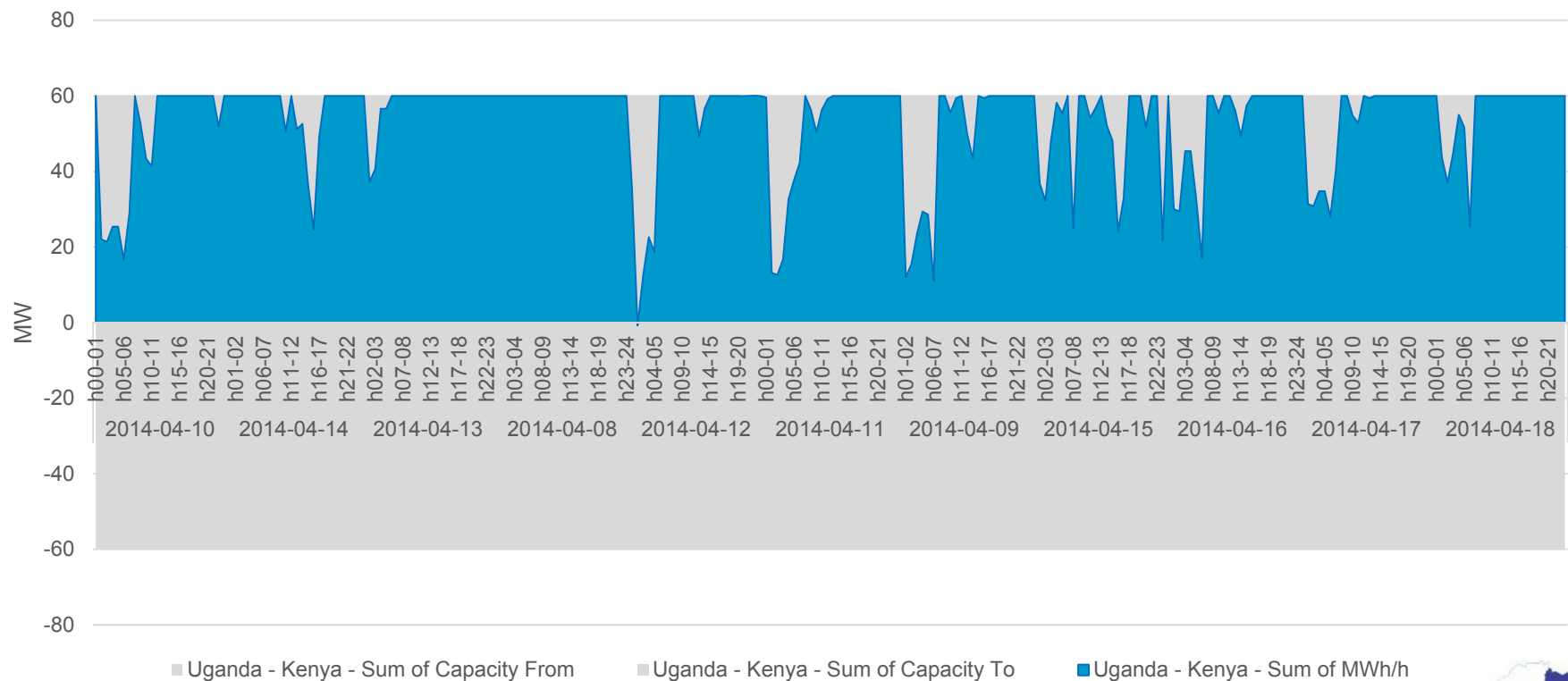
Hourly Prices up to April 18 2014

Area prices at EAPP for Kenya and Uganda



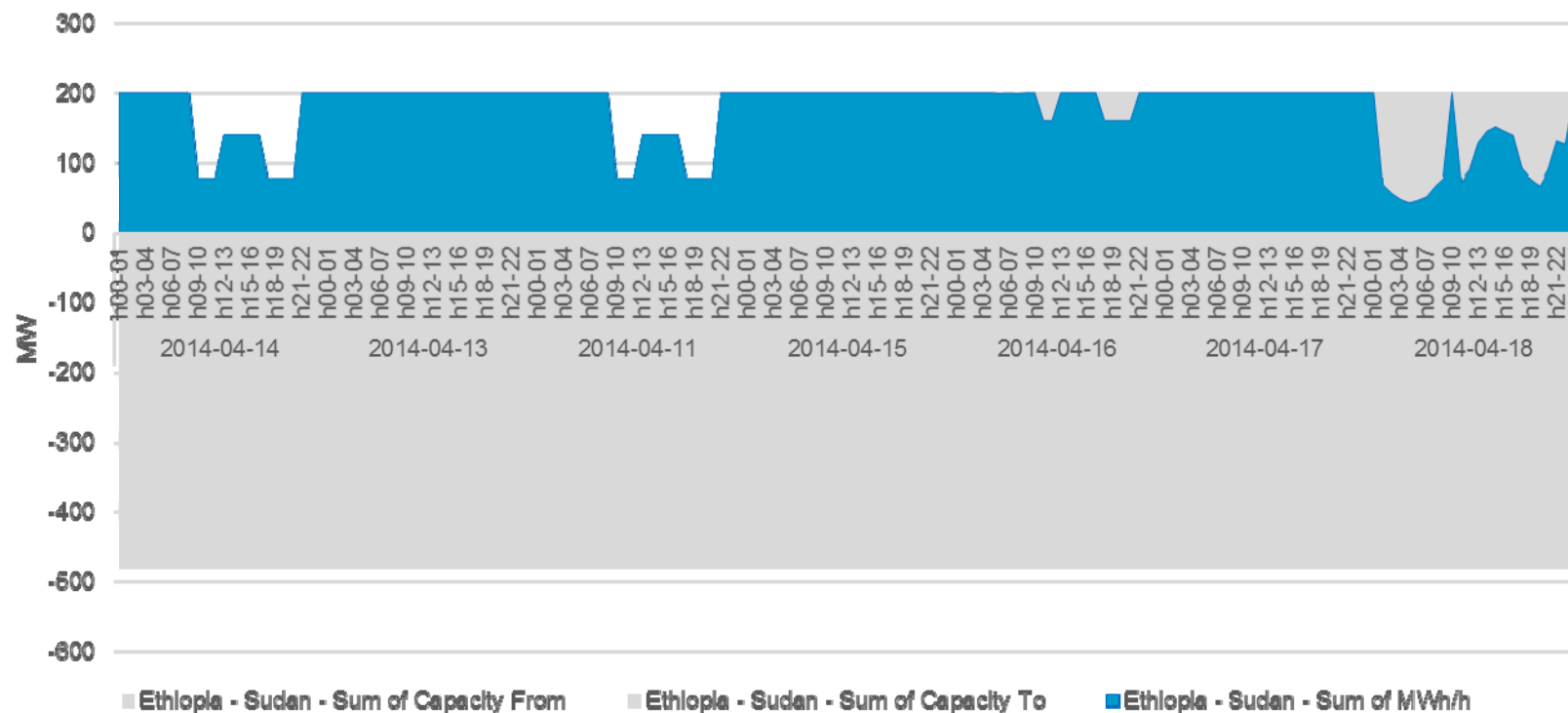
Real Hourly Interconnector Capacity up to 18th April

Spot exchange and available trade capacity between
Kenya and Uganda



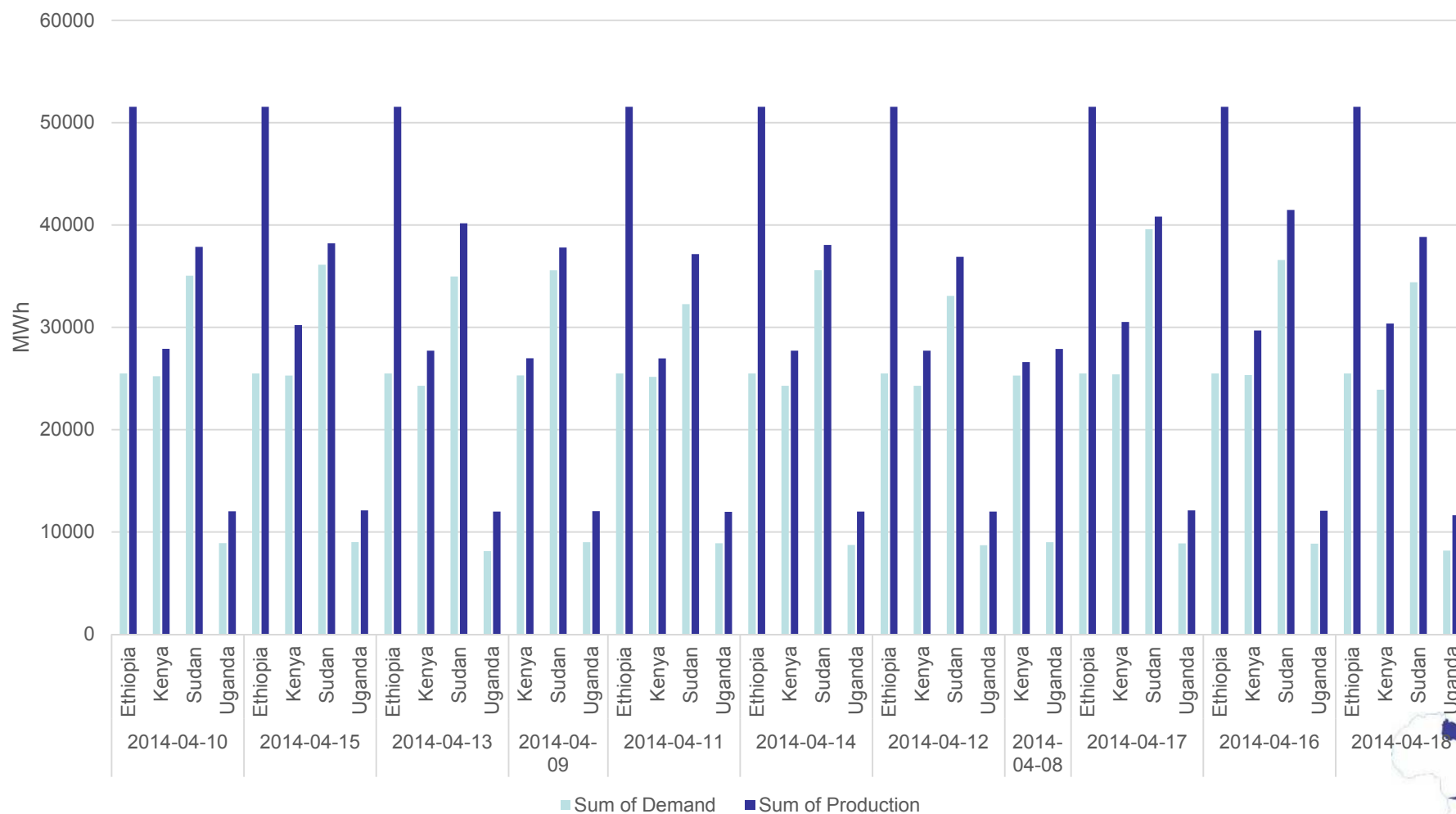
Hourly Interconnector Capacity up to 18th April

Spot exchange and available trade capacity between Ethiopia and Sudan



Generation Capacity and available Demand up to 18th April

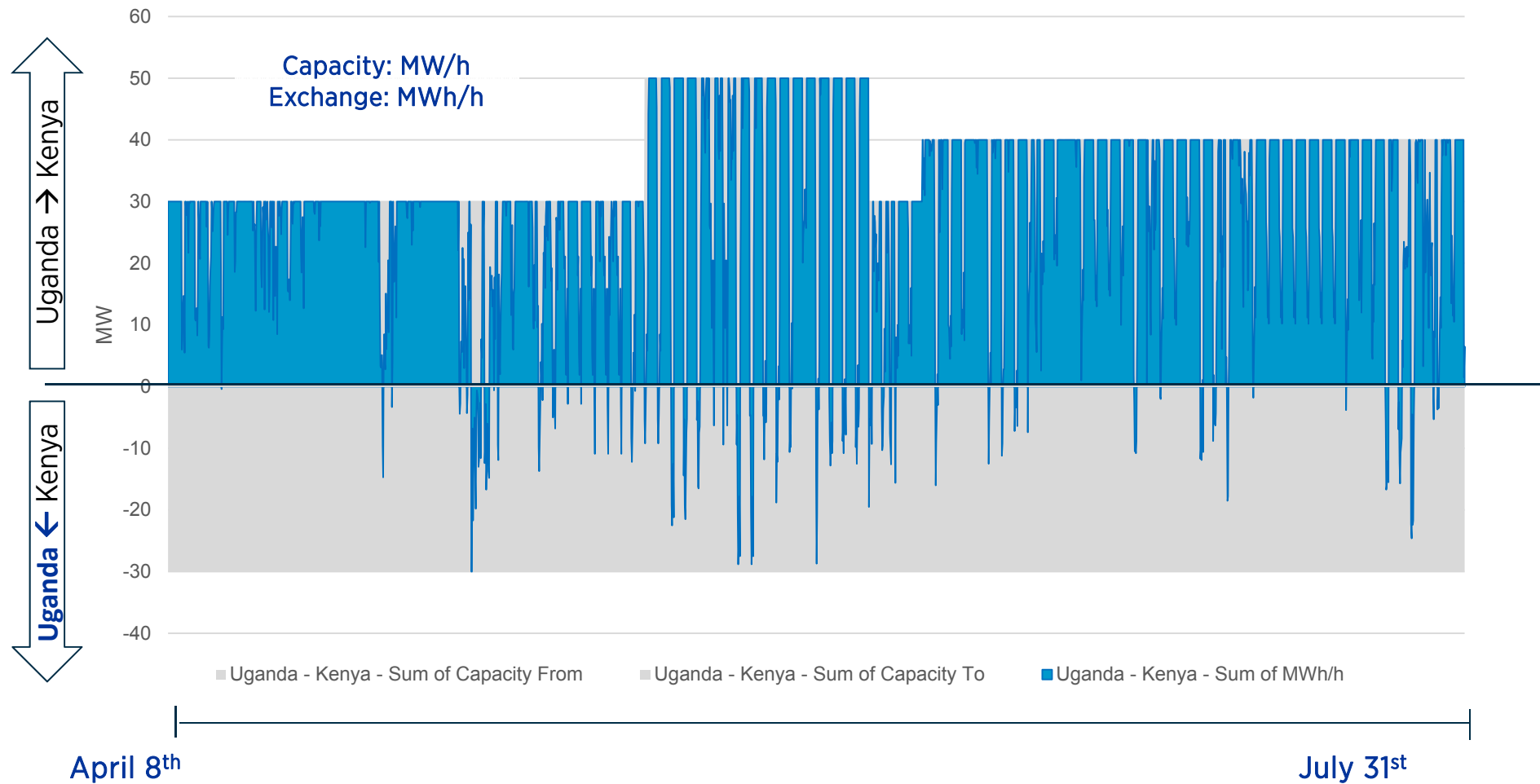
Generation capacity and Load forecasts



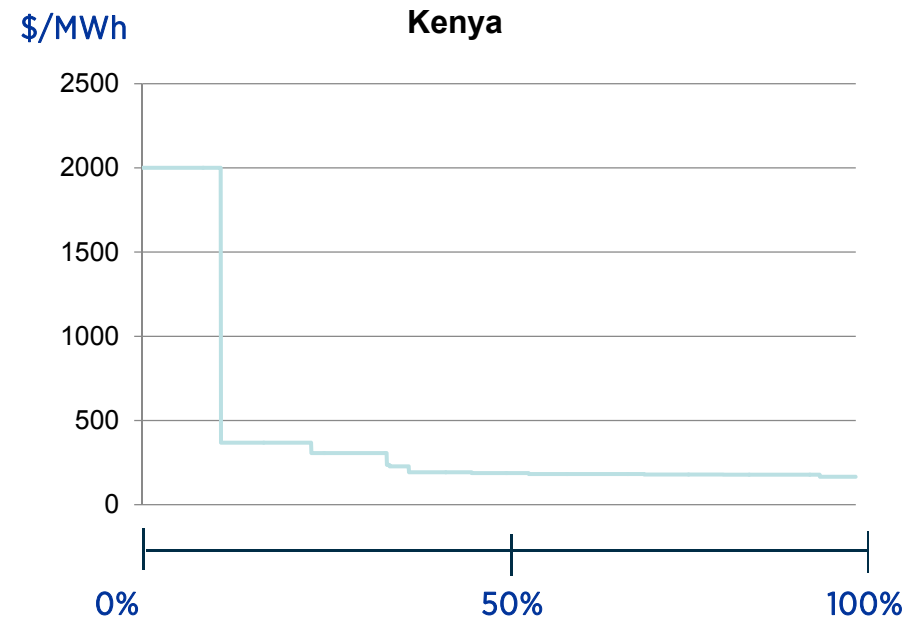
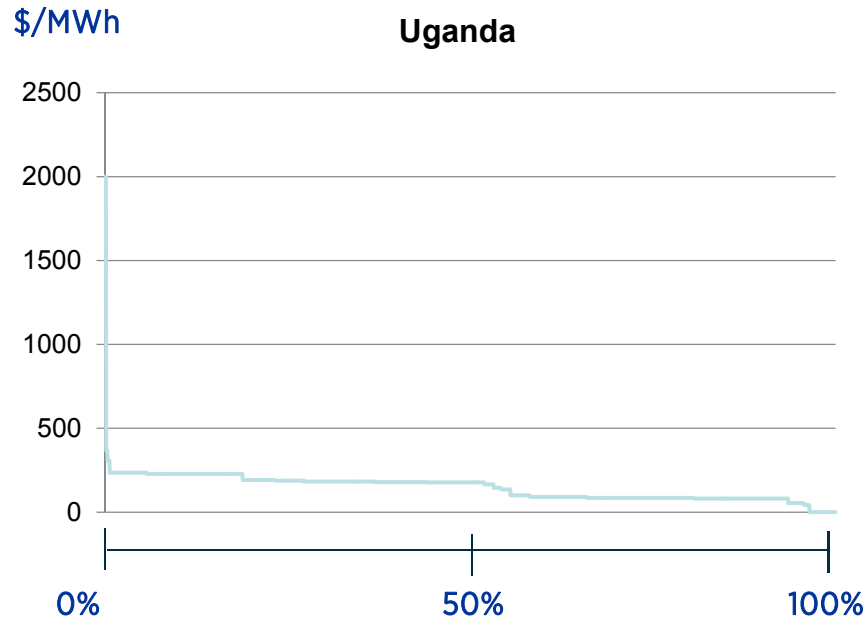
- Economic Evaluation of Trade
- (Done for Period April 8th to 31st July)



Day ahead pilot exchange and available trade capacity between Kenya and Uganda - hourly values



Day ahead pilot market prices in Kenya and Uganda – hourly values, April 8th to July 31st

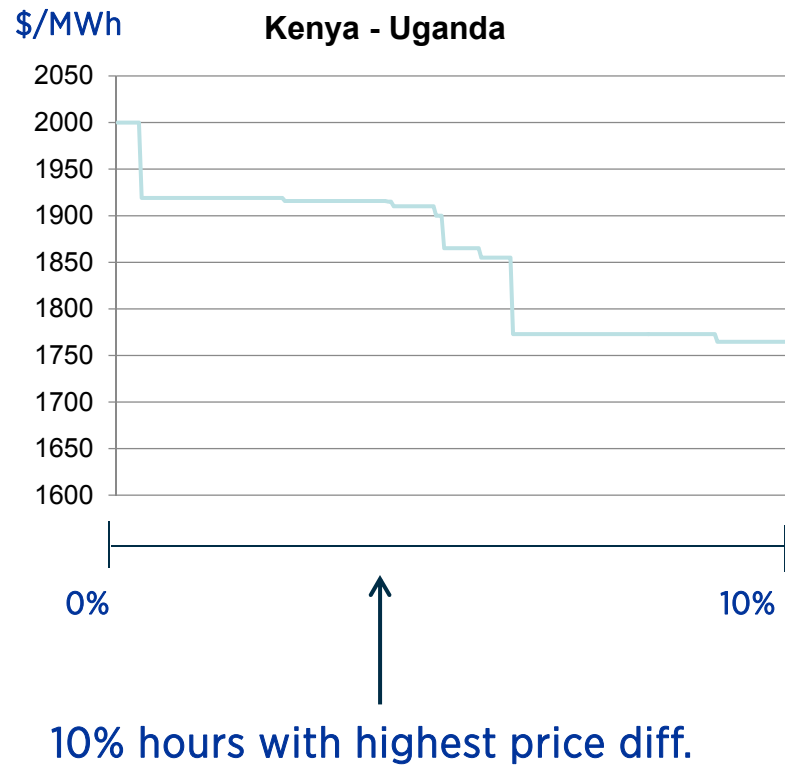


Price vary stable in Uganda → hydro with storage?

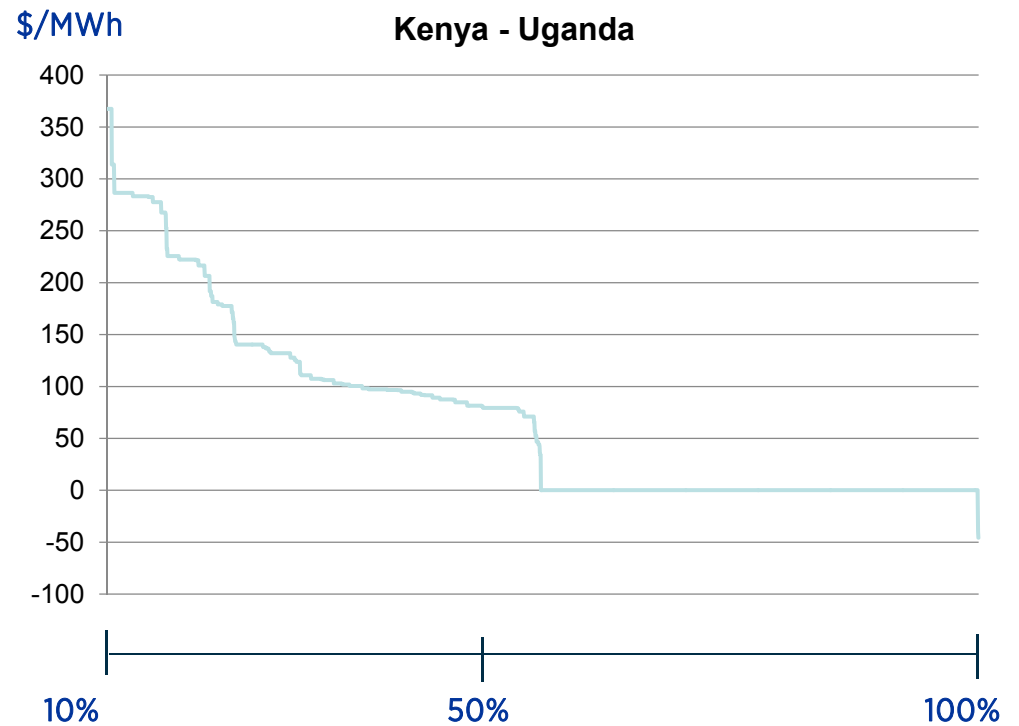
10% of hours price has been at max (\$2,000) in Kenya, indicate lack of gen, capacity

Duration curves: hourly values are sorted from the highest to the lowest

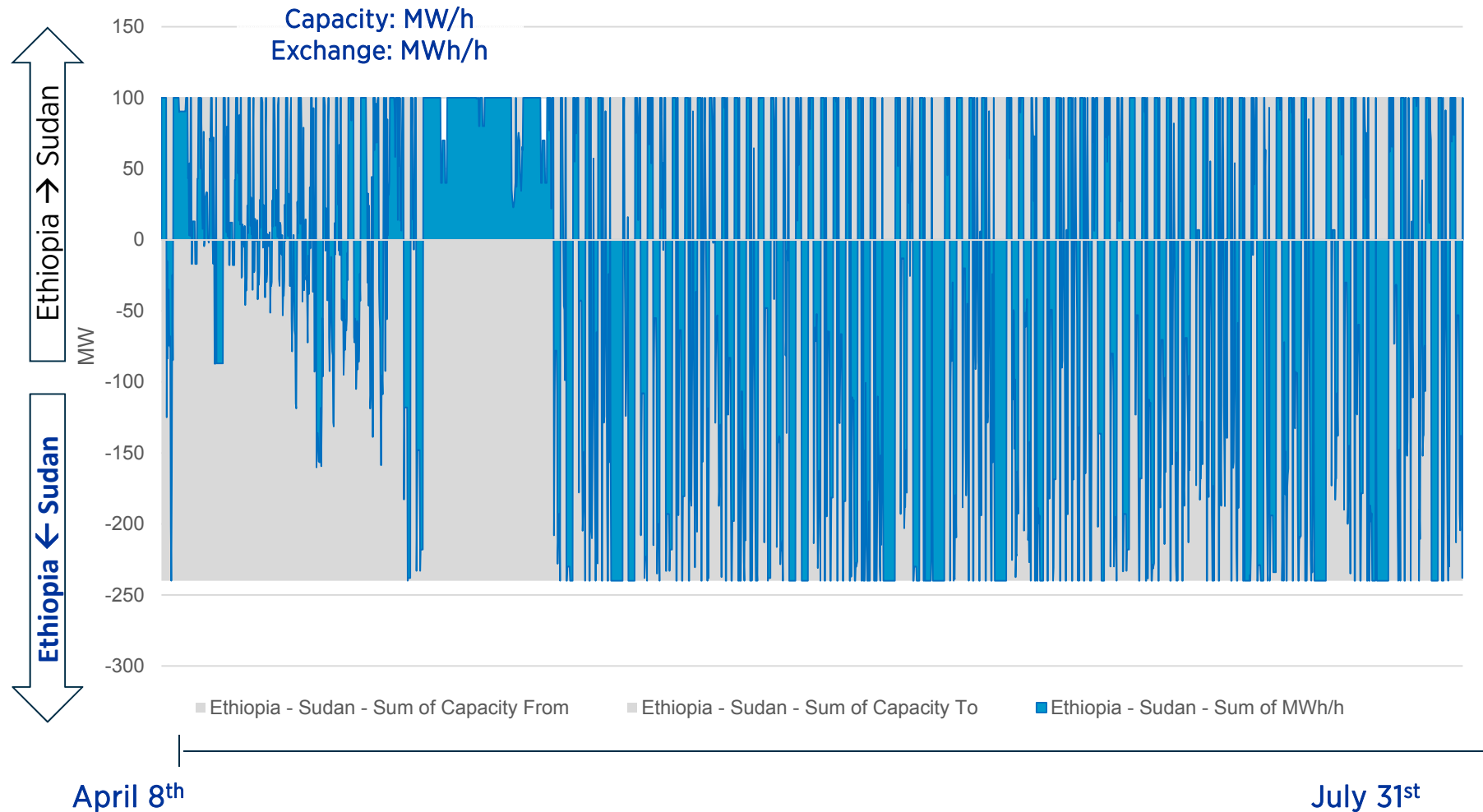
Day ahead pilot market price difference between Kenya and Uganda – hourly values, April 8th to July 31st



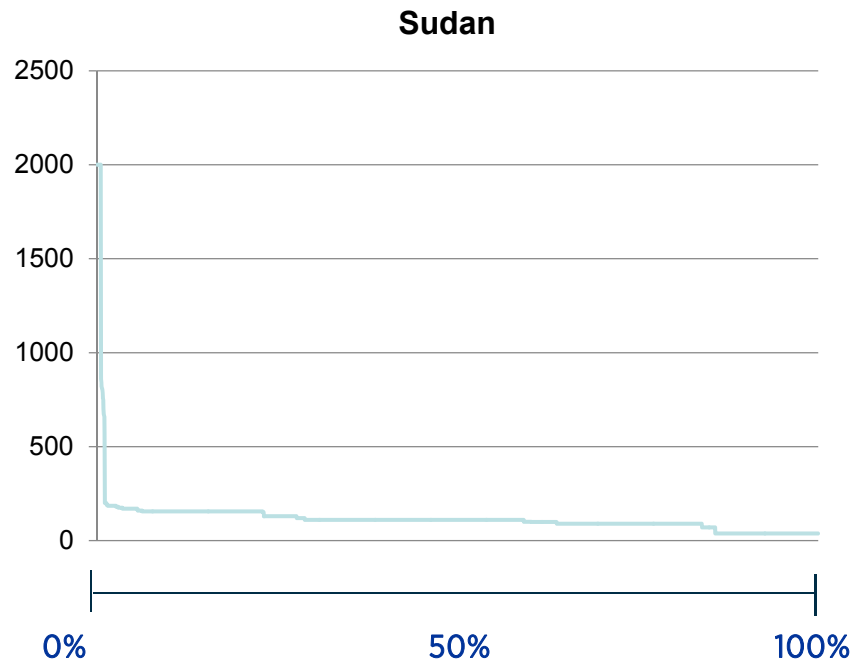
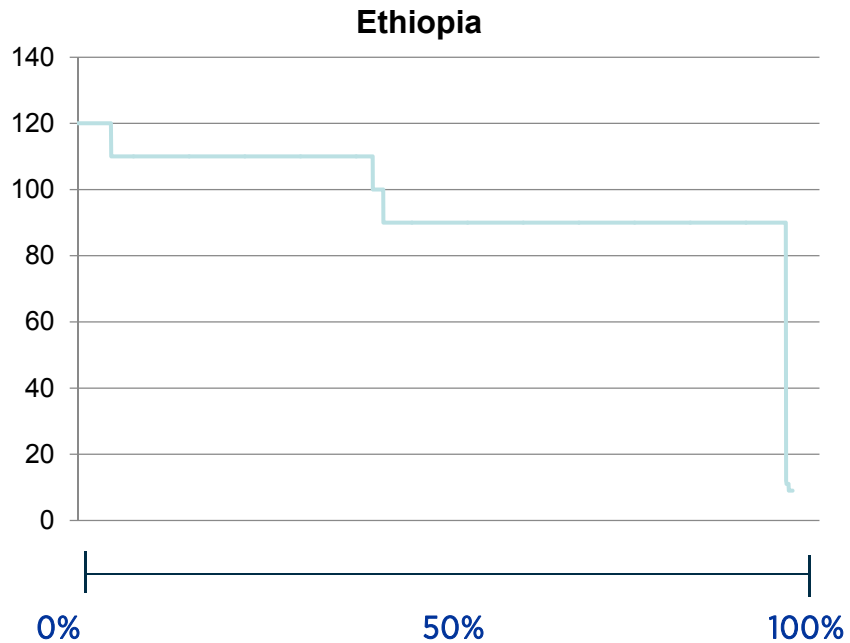
Price diff.= Price Kenya minus price Uganda



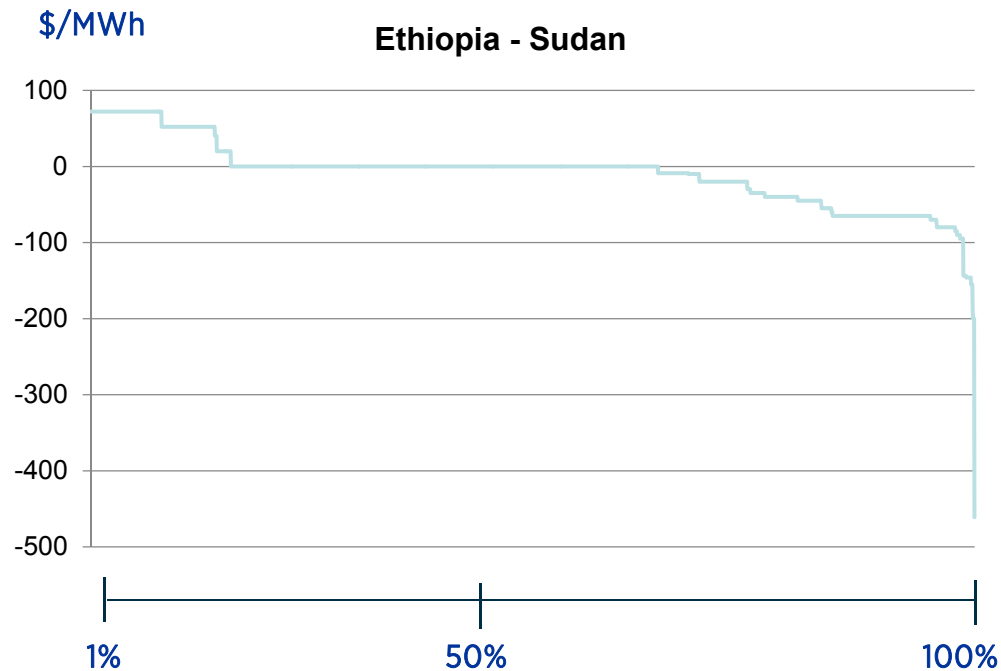
Day ahead pilot exchange and available trade capacity between Ethiopia and Sudan - hourly values



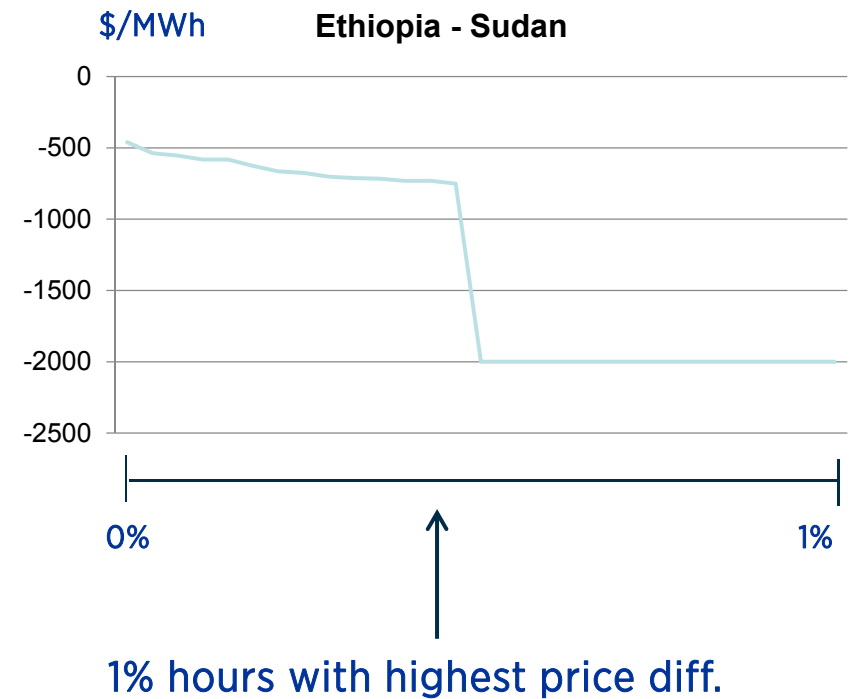
Day ahead pilot market prices in Ethiopia and Sudan – hourly values, April 8th to July 31st



Day ahead pilot market price difference between Ethiopia and Sudan – hourly values, April 8th to July 31st



Figures:
Price diff.= Price Ethiopia minus price Sudan



The real numbers from shadow trade

Country	Δ Cost, \$ (a)	Δ Revenue from export, \$ (b)	Transfer from adjacent country in case of export, \$ (c)	Δ Revenue paid for import, \$ (d)	Transfer to adjacent country in case of import, \$ (e)	Total net gain, \$
Kenya	-16,271,962	366,920	1,289	9,150,141	4,477,198	2,646,279
Uganda	5,548,411	9,150,141	4,477,198	366,920	1,289	8,077,272
Total	-10,723,551					10,723,551

Country	Δ Cost, \$ (a)	Δ Revenue from export, \$ (b)	Transfer from adjacent country in case of export, \$ (c)	Δ Revenue paid for import, \$ (d)	Transfer to adjacent country in case of import, \$ (e)	Total net gain, \$
Sudan	-1,252,857	15,248,750	2,944,800	10,052,670	2,627,080	6,766,657
Ethiopia	-11,251,116	10,052,670	2,627,080	15,248,750	2,944,800	5,737,316
Total	-12,503,973					12,503,973

Savings! (Cost Reduction)


- If we had traded in real-time, we could have saved US \$10Million in KE-UG and US\$12 in ET-SU
- Showdown market Continuing until the real market is achieved



Market Rules

What have we developed as rules, procedures and guidelines?

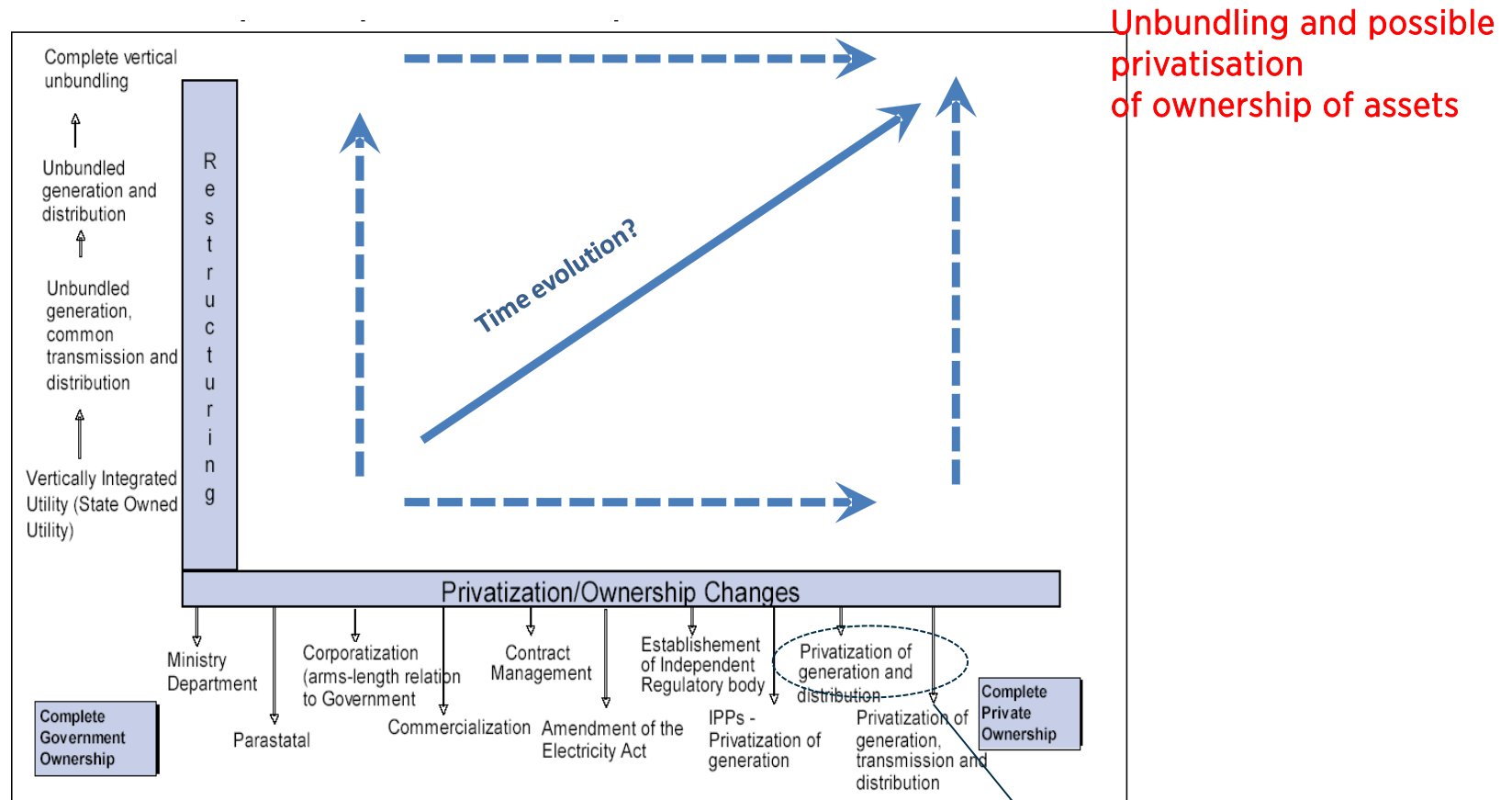
Guidelines	<p>Guidelines: high-level guidelines which shall be agreed as principles. They inherently suggest that they shall be widely applied across time, stakeholders and geography.</p>	Examples <ul style="list-style-type: none">▪ Cross border capacity shall be allocated to all IPPs in a non-discriminatory manner. This can be via first come first serve, auctions etc.
Rules	<ul style="list-style-type: none">▪ Rules are the final binding documents that stakeholders can enter contractual agreement with. They are derived from the guidelines, but can be different across time, geography and stakeholder	<ul style="list-style-type: none">▪ For cross border capacity between country A and Band B IPP C1 shall fulfil X, y, Z to participate in the capacity auction
Procedures	<p>Procedures are for specific daily routines that follow the guidelines/rules but craft out the daily conduct of the stakeholders.</p> <p>This could be different across time, geography and stakeholder as long as they adhere to the principles of the guidelines</p>	<ul style="list-style-type: none">▪ All TSOs shall send their request for cross border capacity between country A and B at 10.30AM before operation stating....

- 
- Three draft documents developed by the market Committee
 - Guidelines
 - Rules
 - Procedures
 - IRB requested to take this to the next level



Road Map and End Goal

To reach a stage a meaning full (economic efficient) market,
institutional restructuring has to take place

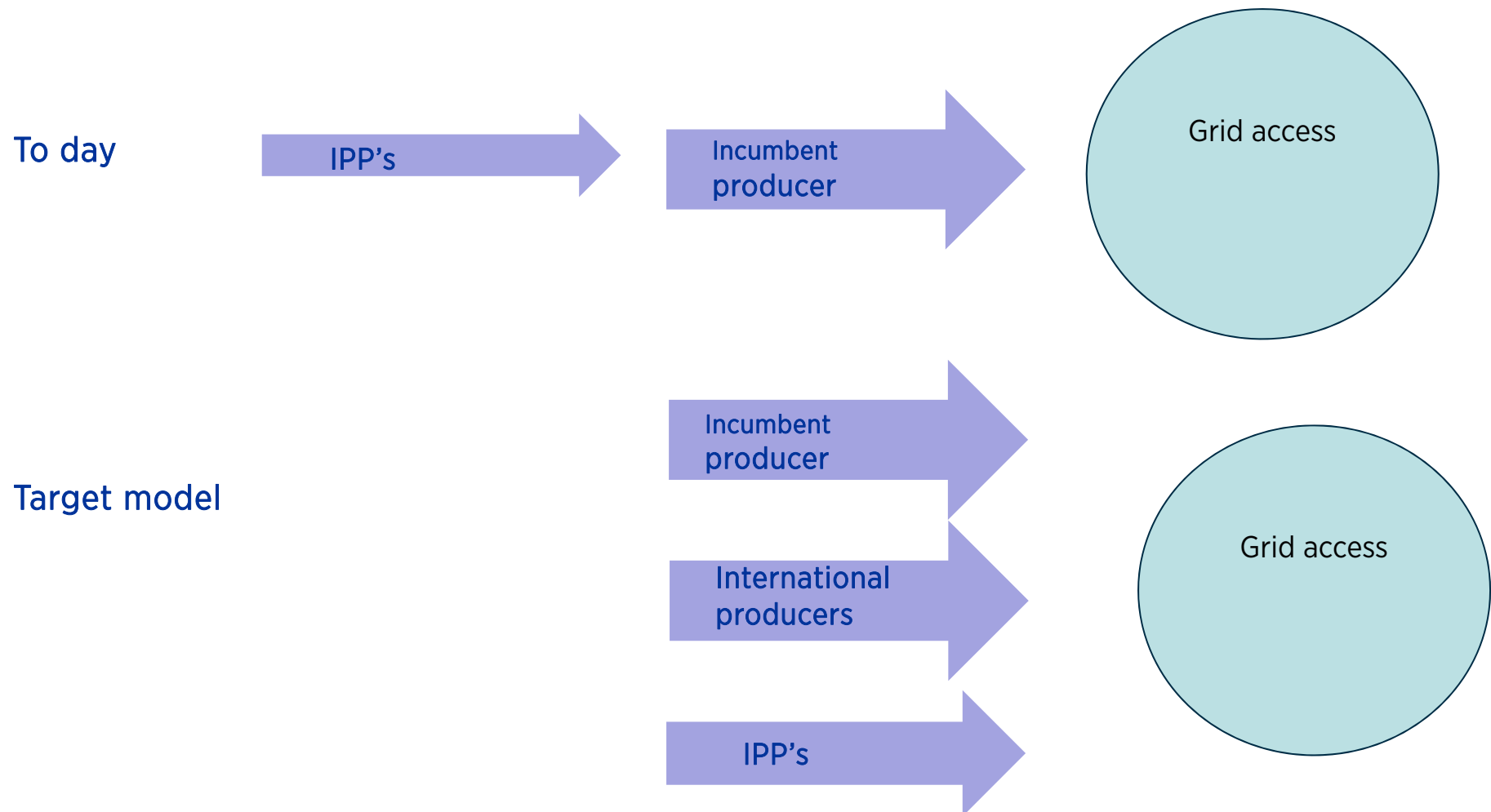


Source: Mercados (2010), DELIVERABLE 7:
DEVELOPMENT OF REGIONAL STRATEGIC ROAD MAP TO 2025

Privatisation of
infrastructure may
not be a way to go

Access to the grid

- Equal access to the grid (=market place) for all market players



Summary

- Institutional restructuring or structural reforms in terms of ownership un-bundling and /or privatization of generation and sales activities
- Reforms of rules for generation, cross border exchange of power and settlement prices, etc. (market design reform)
- The update of the road map

Near Term Expectations (2014-2015)

- Convert pilot trade to real physical trade
- Employ tools applicable to the short term trade: (platform, market operation and regulation rules, etc)
- Operations TSC and PS and IRB get active in detailed preparatory issues as interconnection projects are nearing completion, Review and adoption of market rules etc
- Projects marketing based on master plan update (Interconnections)

Road Map

For discussion

Pilot
Projects

< 3 months

3% of all
power
traded

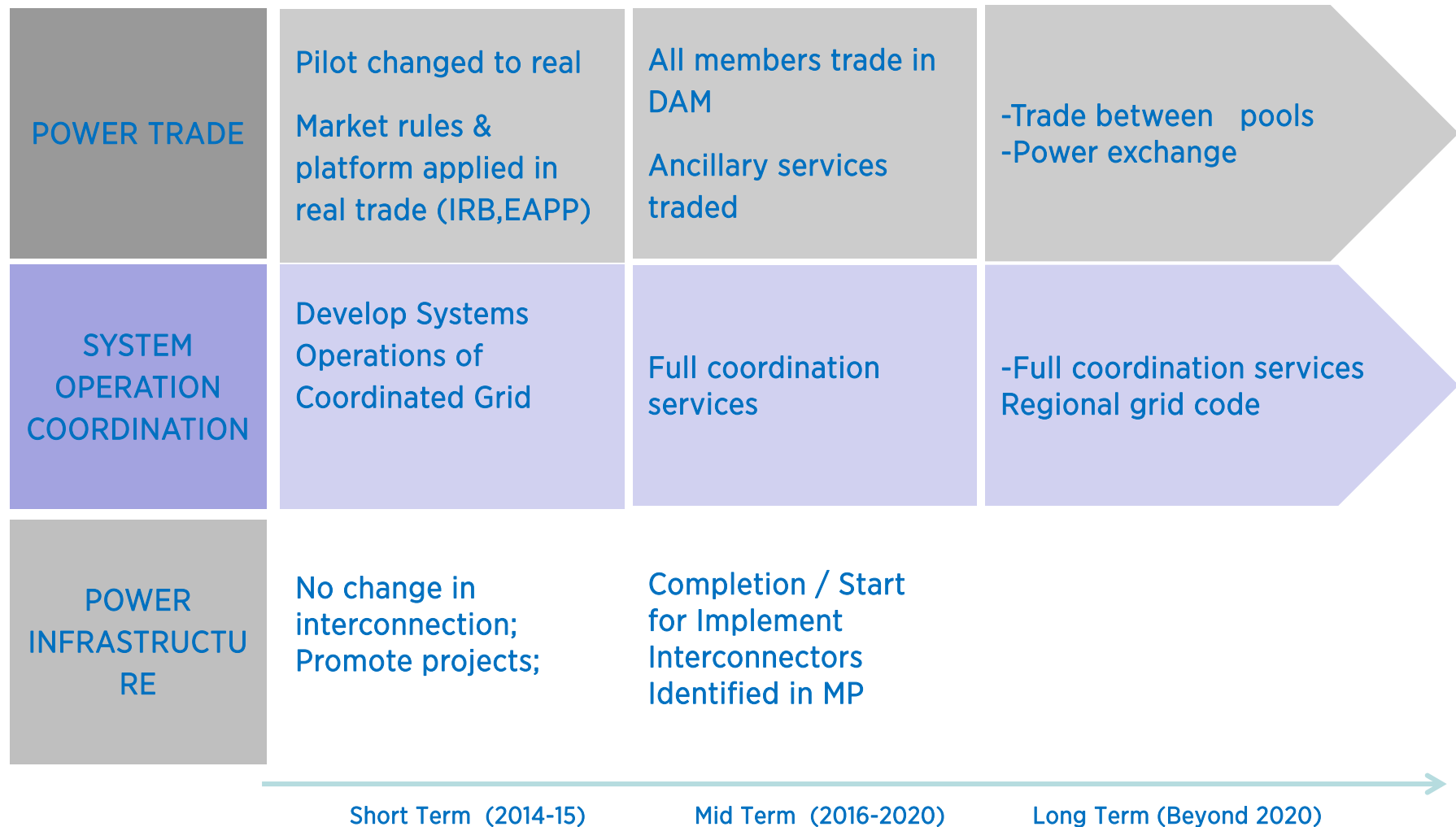
< 5 years

EAPP
Target
Model*

< 15 years

We are here !**

Update of the Road Map (based on Expectations)



Challenges

- Infrastructure
 - Completion of Interconnectors
 - infrastructure development and operation (system expansion, operation, environment, market)
 - SCADA , AGC , Trading Platform
- Legal and Regulatory environment improvement
 - Gradual removal of barriers to trade
- Capacity Building



More info



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Addis Ababa
Ethiopia



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