

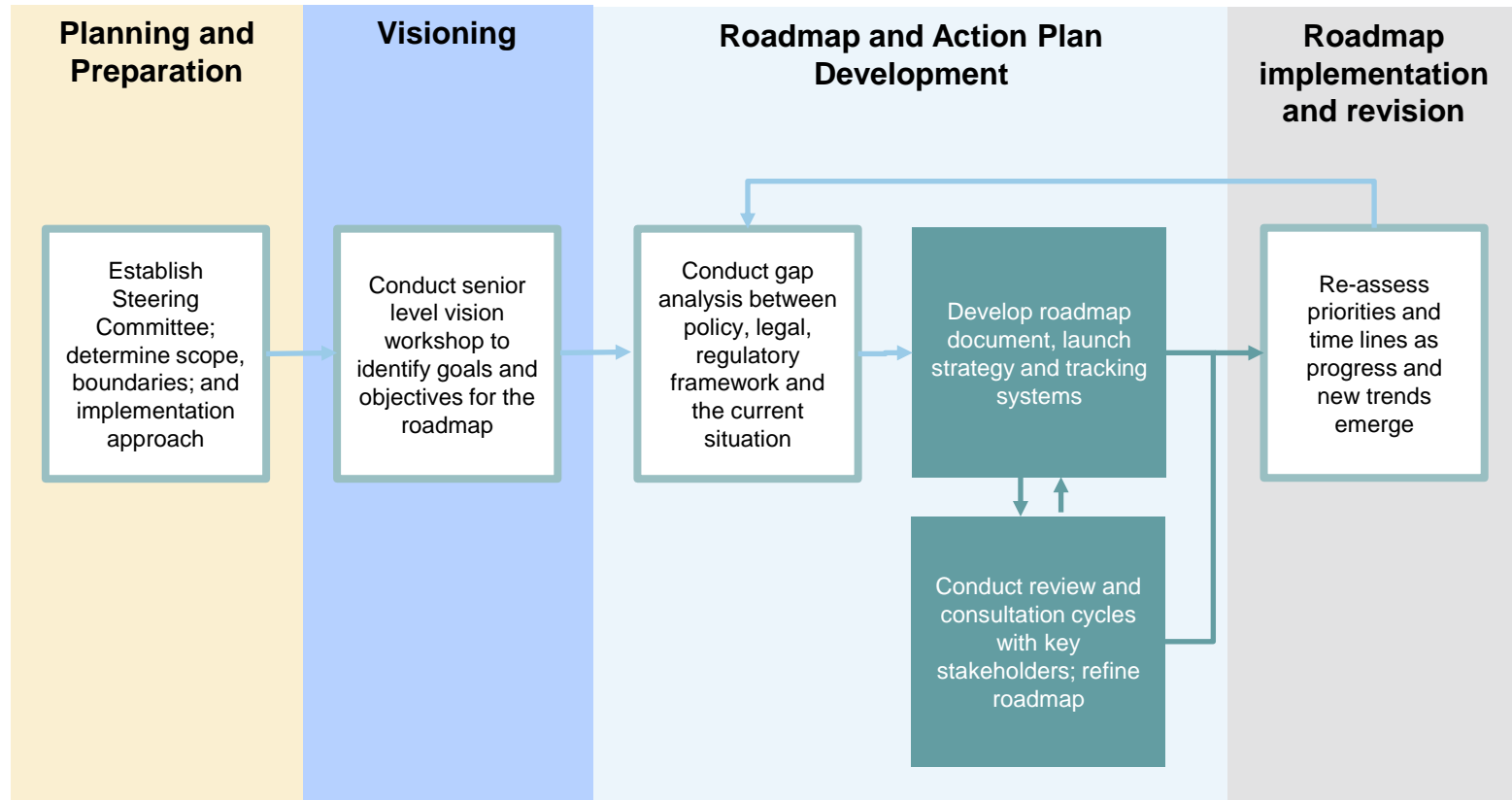
# Roadmap for the Reform of the Electricity Sector

8<sup>th</sup> September 2017

Electricity Sector Roadmap Launch

# Roadmap Development Process

The roadmap process consists of four steps



# Roadmap to deliver GoSL Vision and Goals

***“To create an enabling environment for the provision of modern energy services for increased productivity, wealth creation and improved quality of life of all Sierra Leoneans”***

- **Generation targets met through private sector involvement**



- **Electrification shall be achieved via integrated on-grid/off-grid approach**

- **Additional renewable sources will optimise the energy mix**



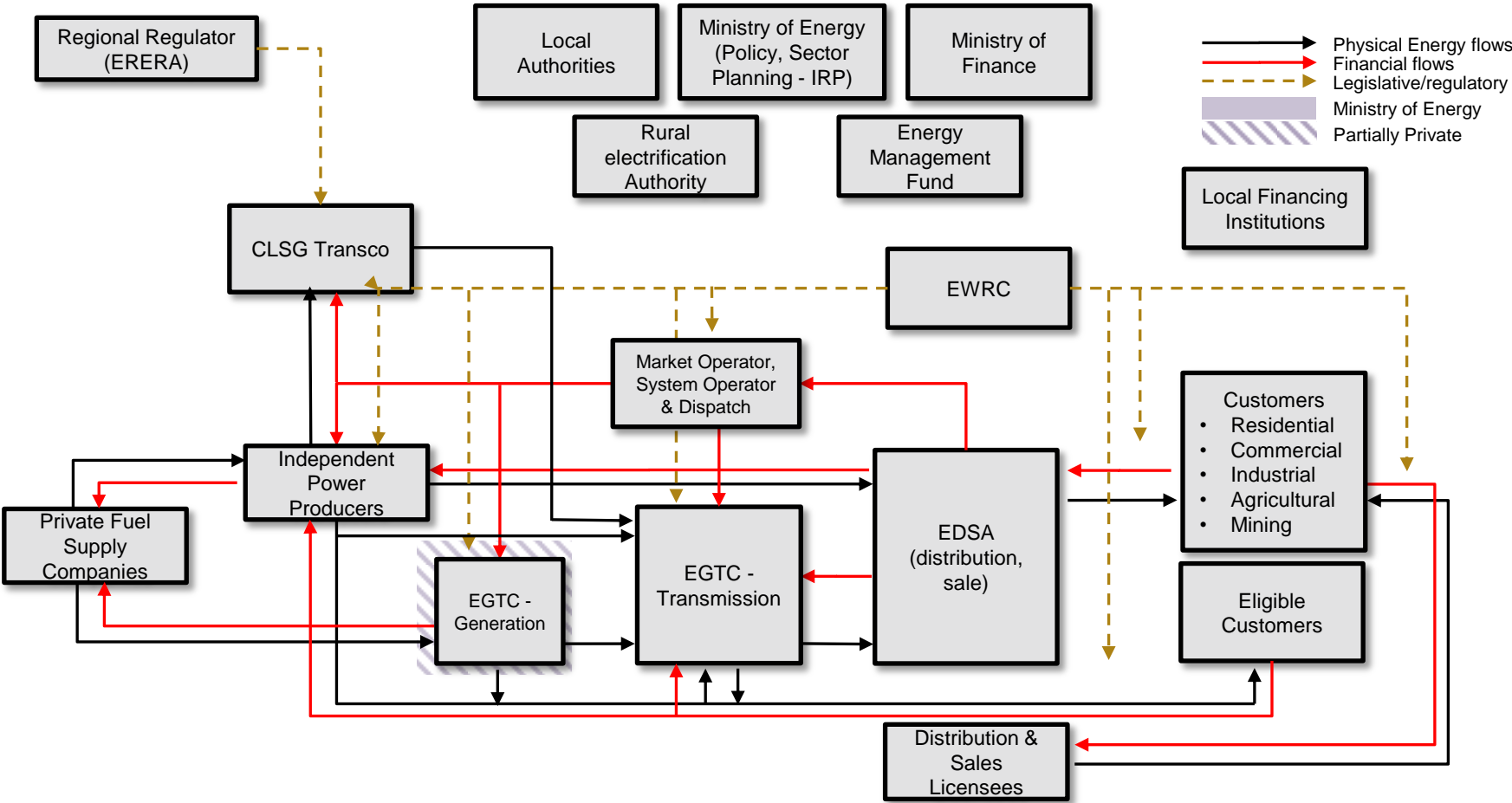
- **Transmission & Distribution network upgraded, strengthened and expanded**

- **Pathway toward financial sustainability will be established**

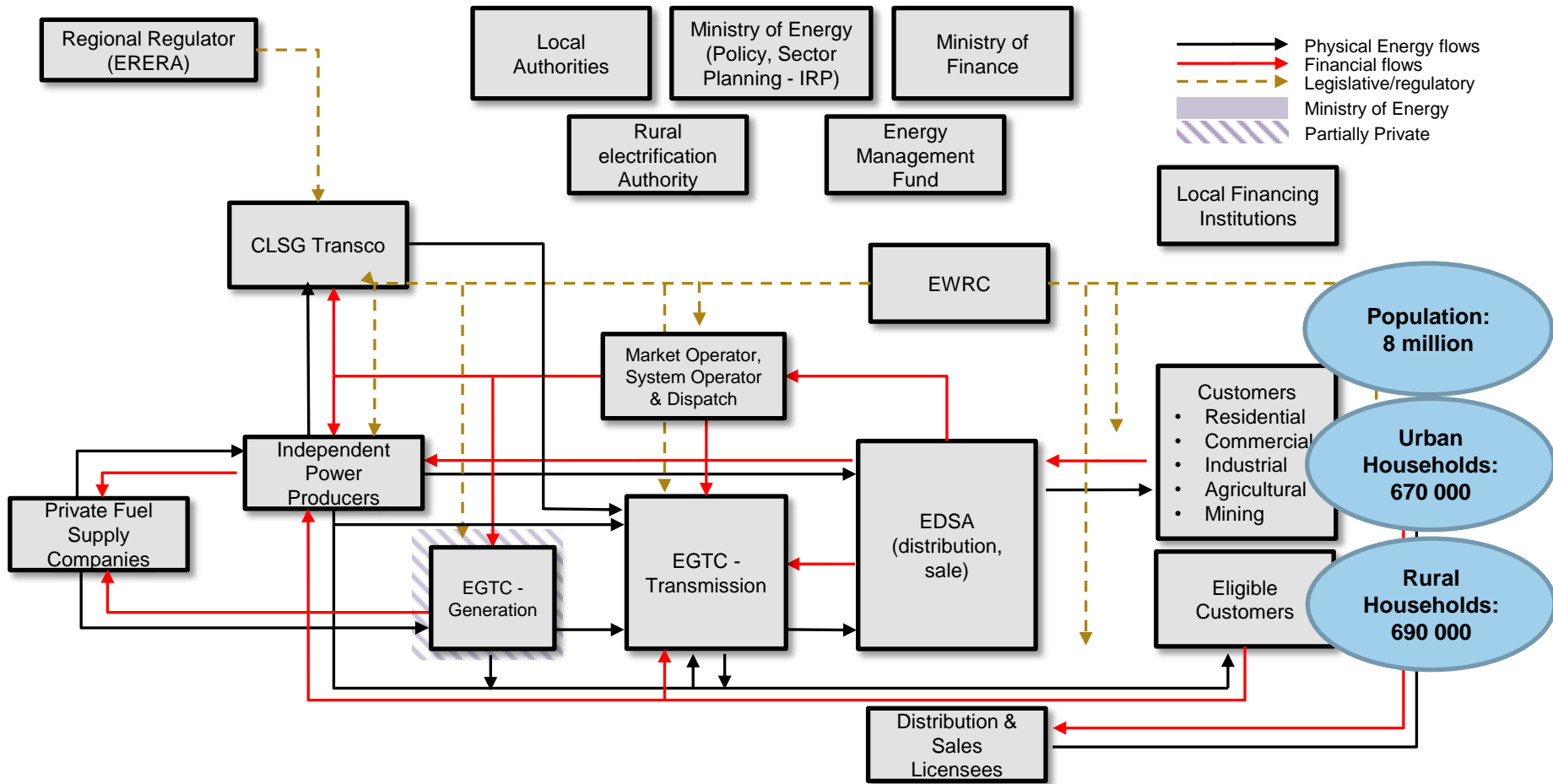


- **Integration within West Africa Power Pool imminent**

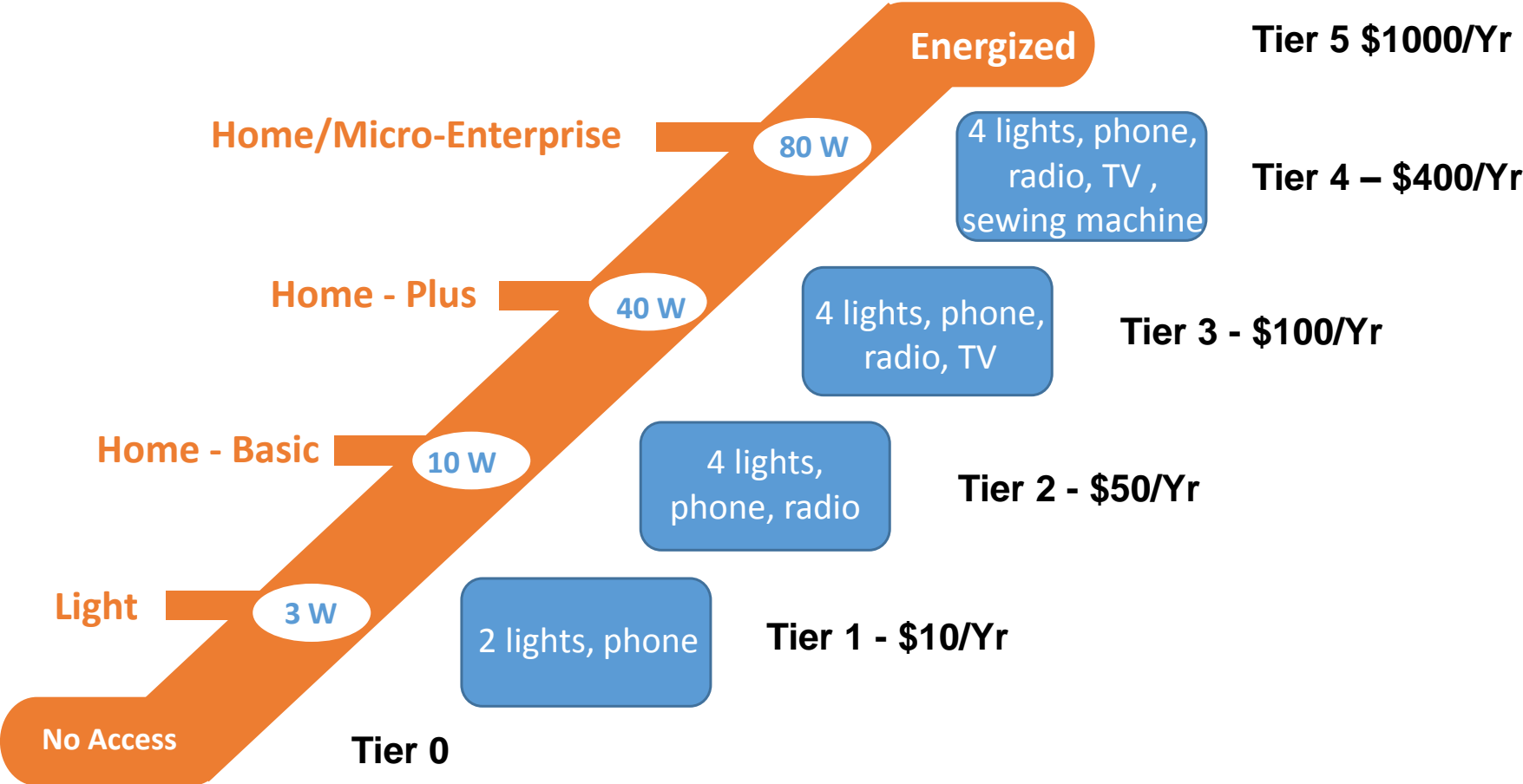
# Basic Commercial Structure of the Electricity Sector in 2030



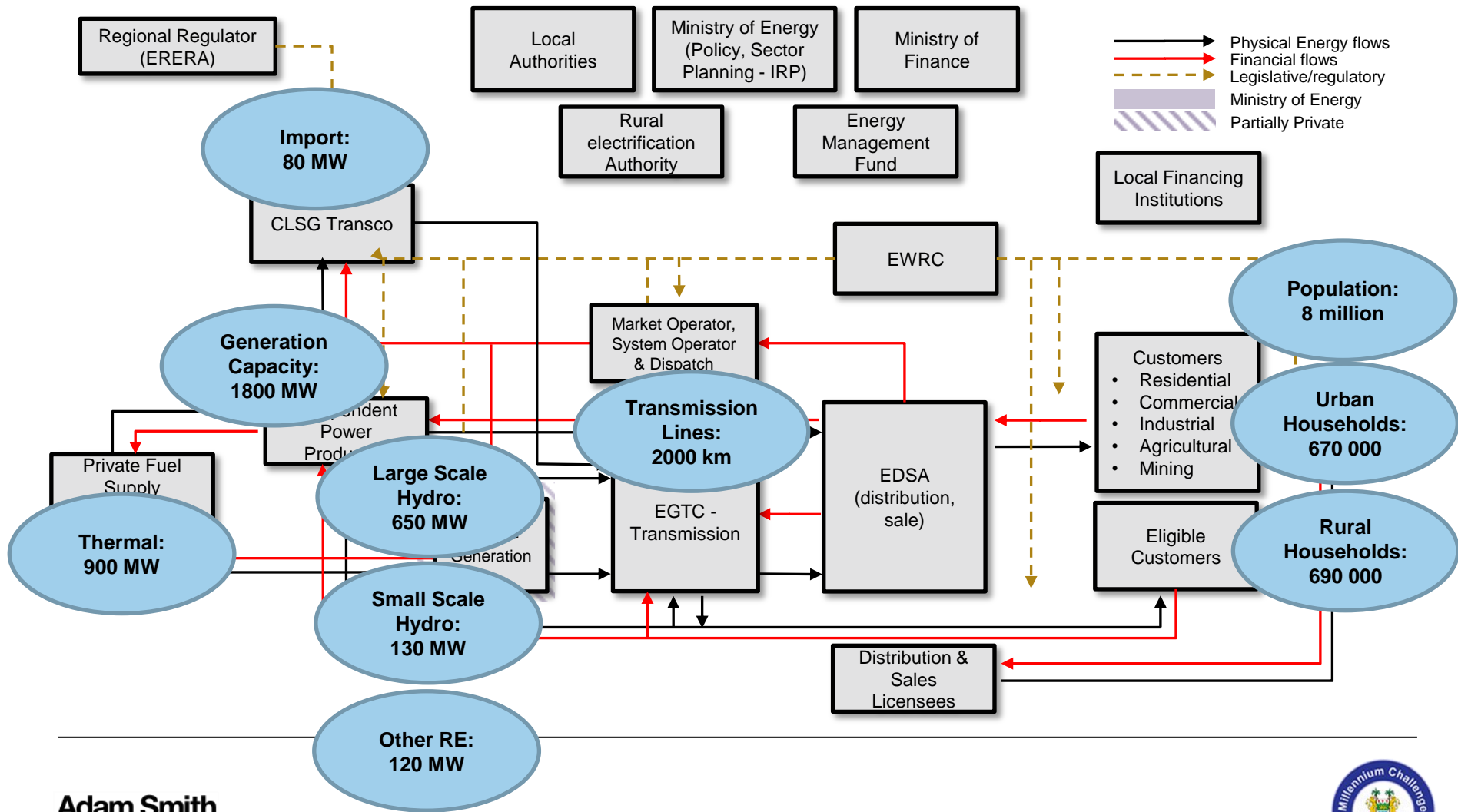
# Aiming at Universal Access in 2030



# Put the poor population on the first steps of the energy ladder



# 1800 MW Generation Capacity + 80 MW import + 2000 km transmission lines in 2030



# Transmission system in 2030 – 225 kV and 161 kV + 66 kV

## Colour Code

Green 161 kV  
200 km

Blue 225 kV  
1200 km

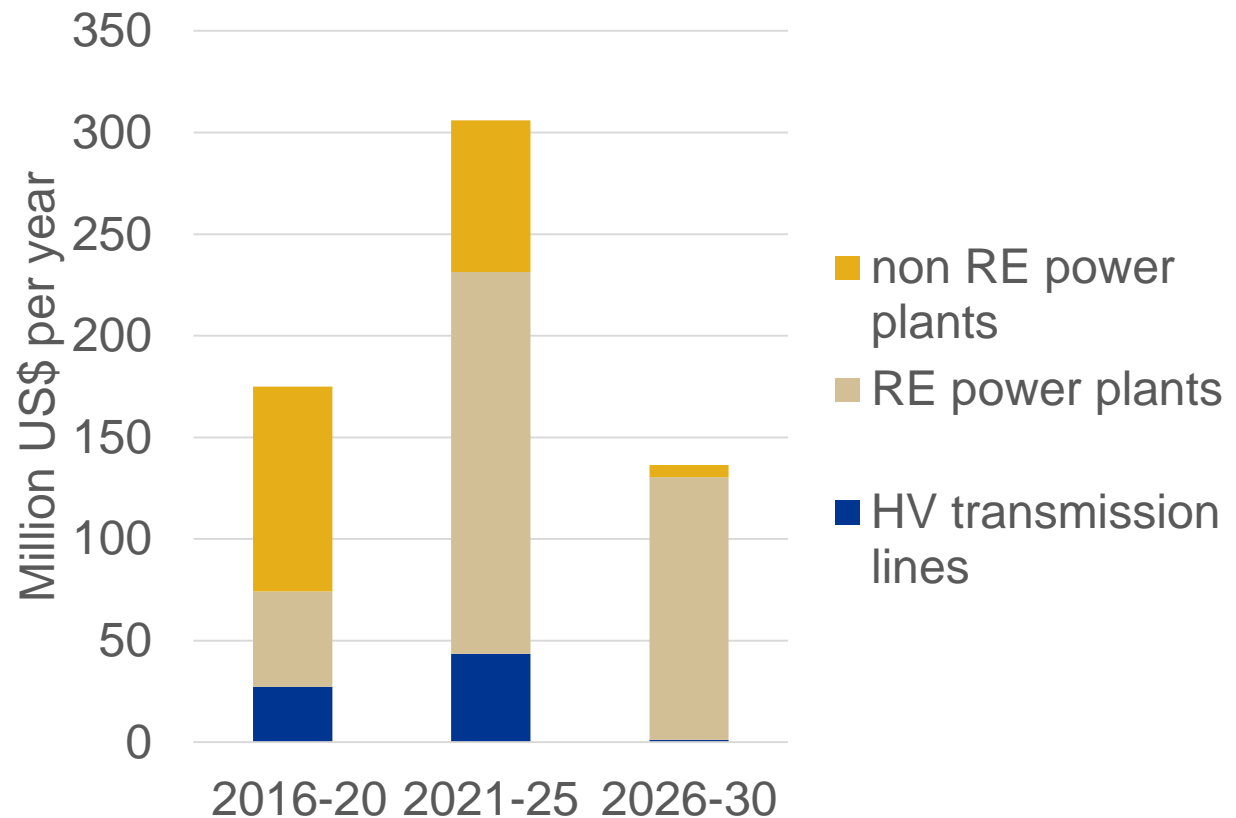
Red 66 kV  
800 km





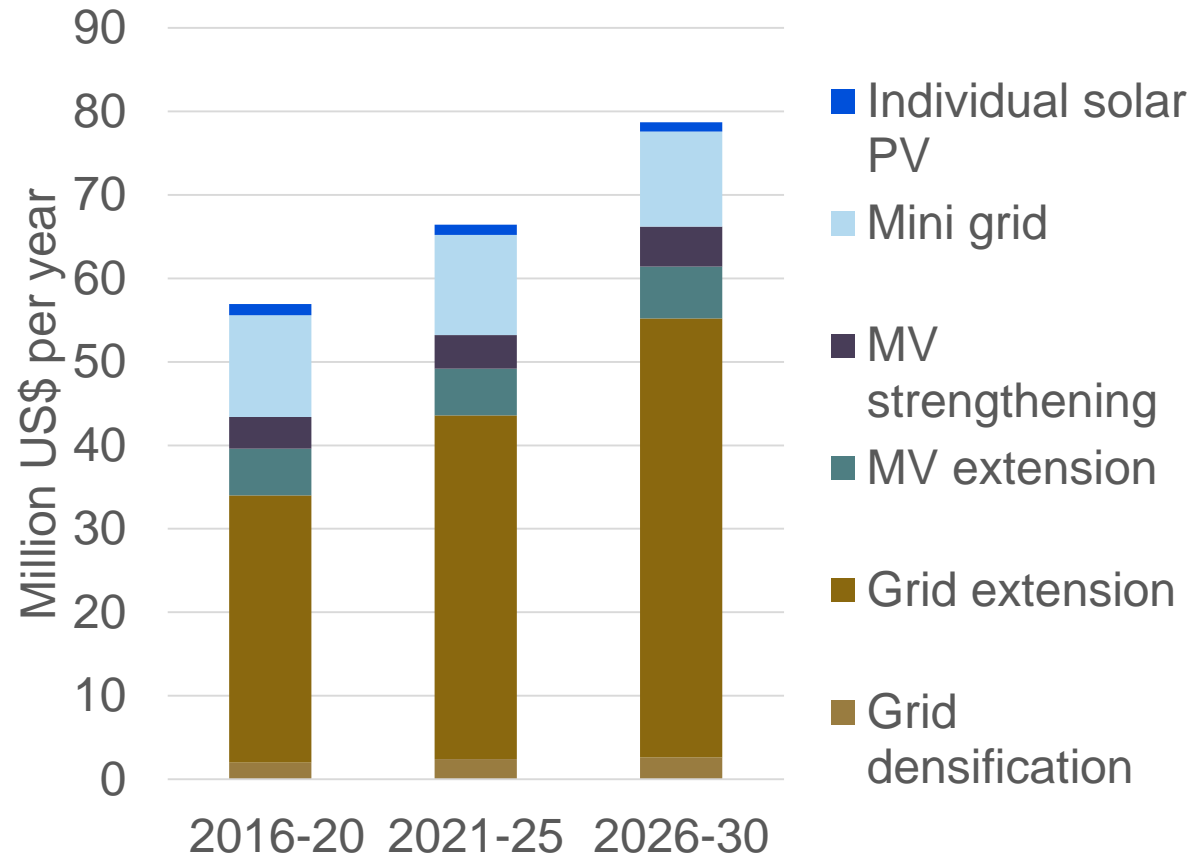
# Annual financing requirement for Generation and Transmission

The total financing requirement for Generation and Transmission amounts to **US\$ 3 billion** worth an average \$200 million per year

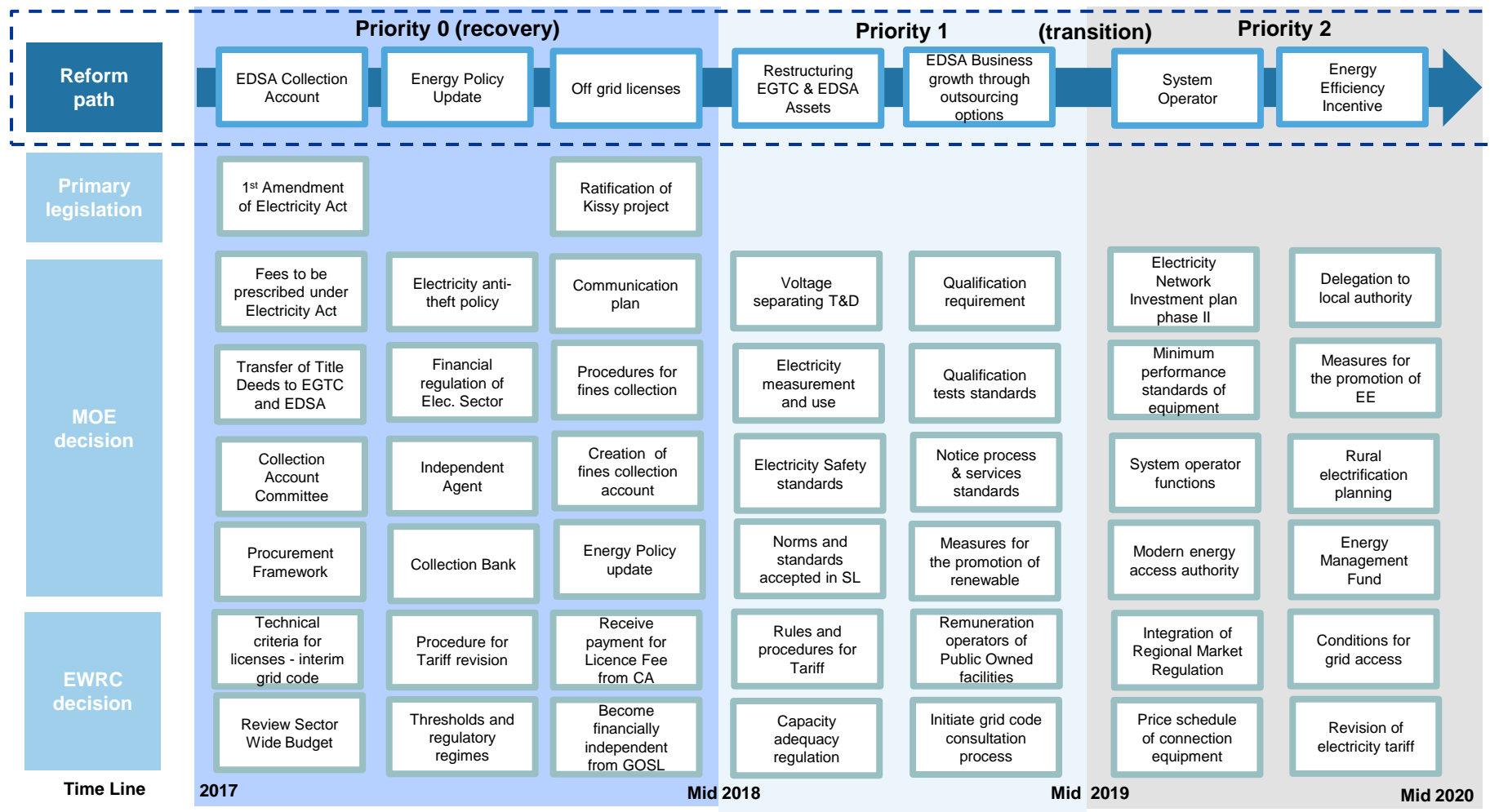


# Annual financing requirement for Electricity Access

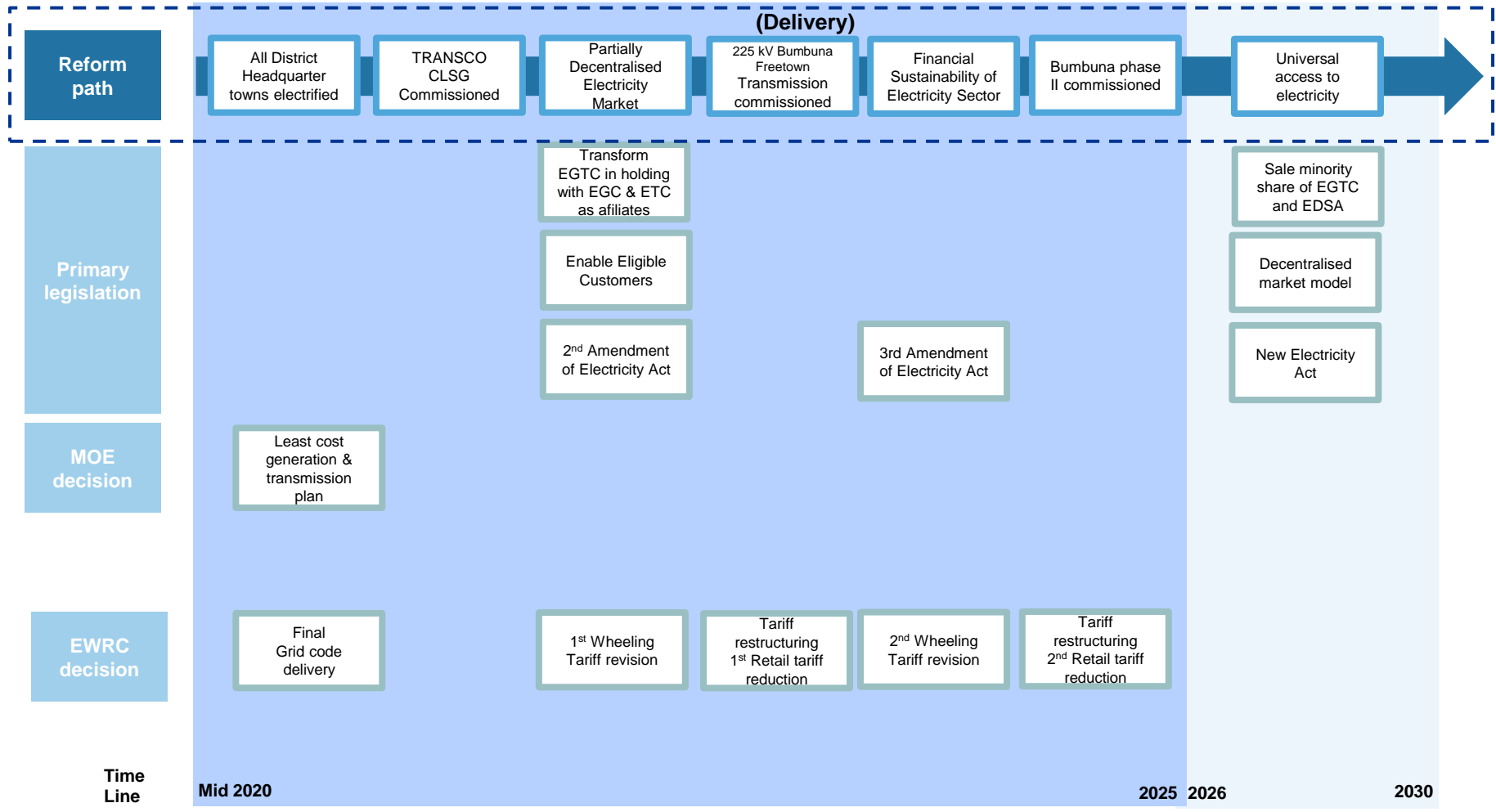
The total financing requirement for Electricity Access amounts to **US\$ 1 billion** worth an average \$70 million per year



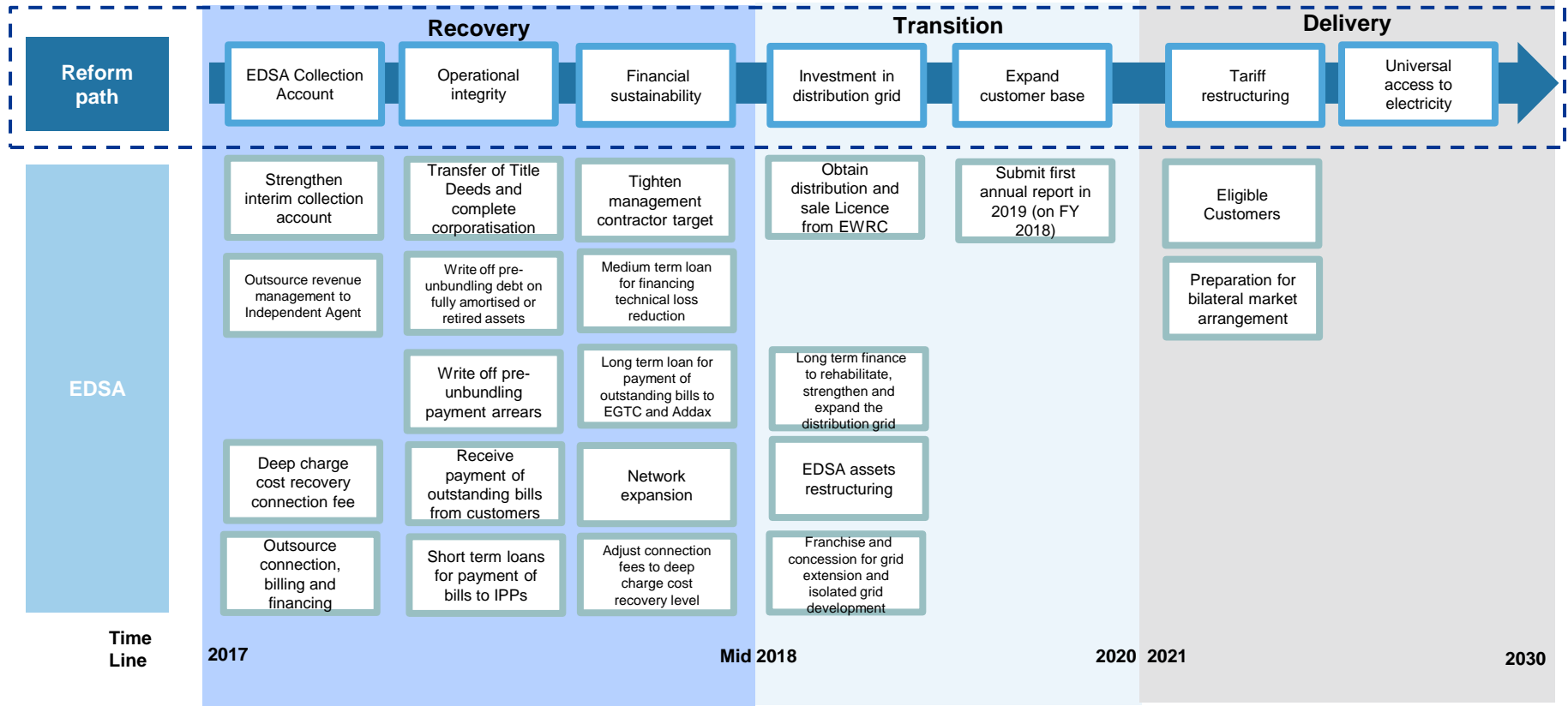
# Draft Short Term Roadmap for reform of the Electricity Sector



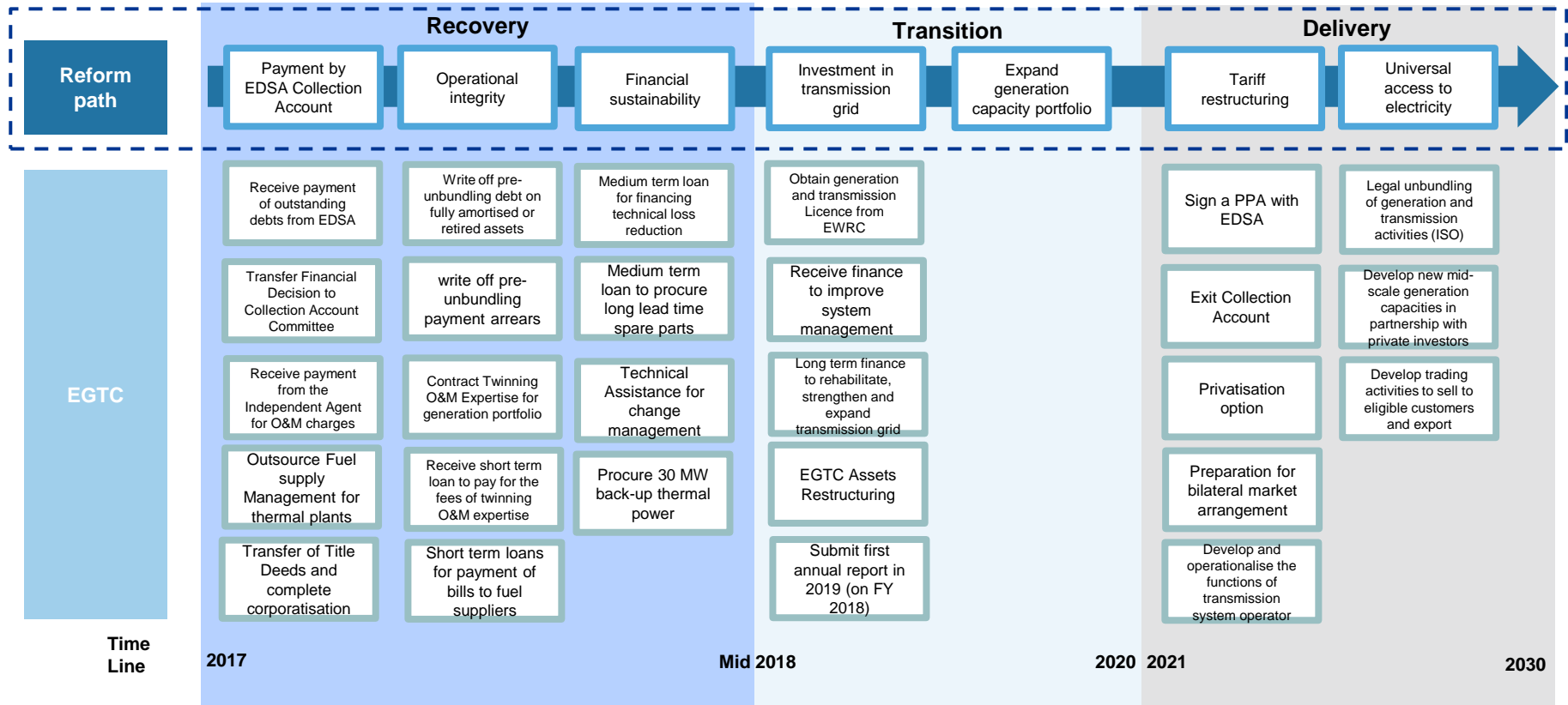
# Draft Medium to Long Term Roadmap for reform of the Electricity Sector



# Draft Roadmap for EDSA



# Draft Roadmap for EGTC

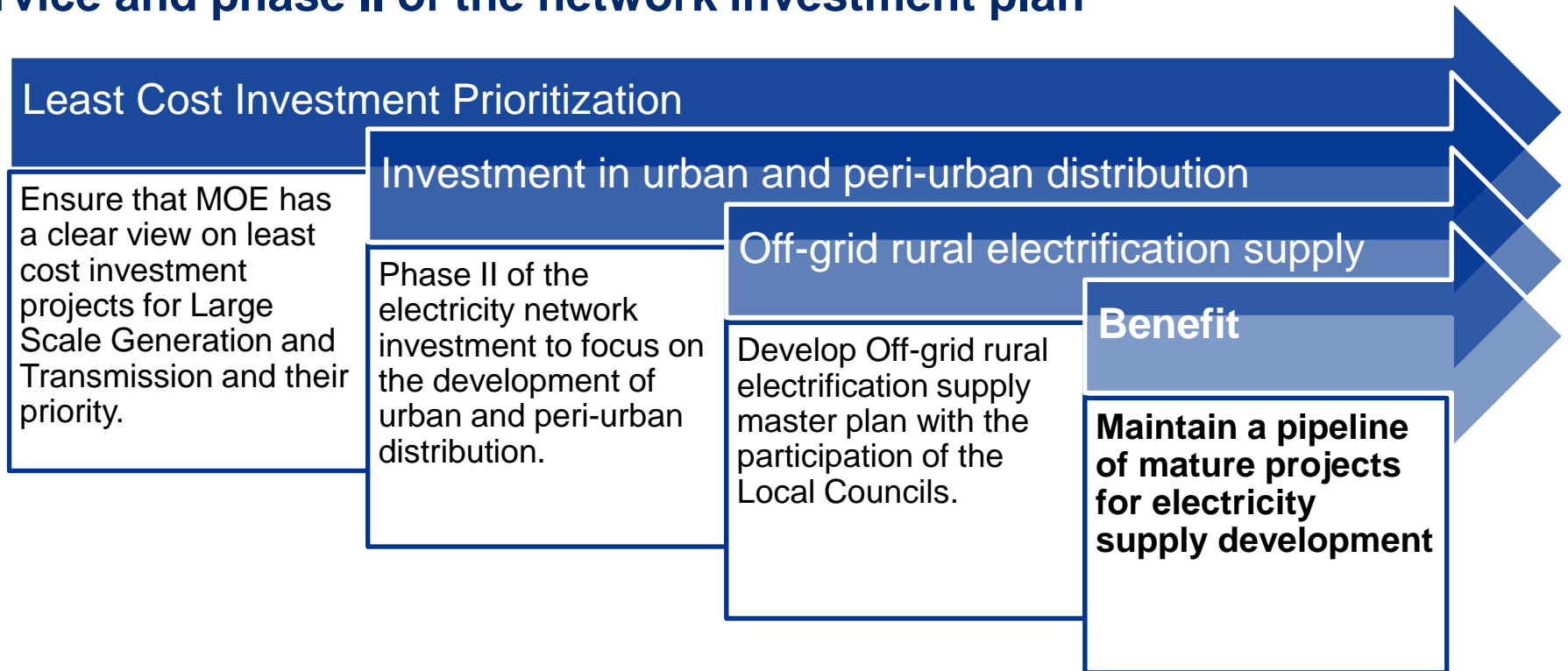


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# 12 Key Milestones in the Roadmap for Reform of the Energy Sector

# 1. Planning

The planning effort should focus on the off-grid electricity supply public service and phase II of the network investment plan





## 2. Procurement

**A carefully defined procurement framework facilitates the conversion of the planned electricity infrastructure into contracted facilities**

### **Price-driven procurement approach**

- **Used for small generation capacity**
- The GoSL sets the price, and the corresponding volume evolves depending on the respective cost-potential curve:
- Renewable Energy Feed-in-Tariff policy for capacity between 0.5 MW and 3-5 MW (unsolicited)

### **Volume-driven procurement approach**

- **Used for larger generation capacity**
- The GoSL predetermines the volume and the price develops according to the existing resource conditions and technology costs.
- Solicited or unsolicited procurement process for capacity between 3-5 and 50 MW
- Bilateral negotiation with preferred bidder for capacity above 50 MW

### **Benefit**

- **compromise between competitive price discovery, transaction cost and delivery time**

### 3. Electrification of large rural towns

**In large rural towns, isolated grid concessionaires will be contracted to develop the on-grid electricity supply service**

**Eligible towns are those where there is insufficient generation capacity and where the existing portfolio of clients is small but with a significant growth potential**

**This option will include the transfer of the decentralised public assets owned by EGTC and EDSA to concessionaire until the expiration of the concession**

**When two towns responding to this criteria are geographically within a small distance the same concession agreement should cover the two towns**

E.g. Bo and Kemena, Makeni and Magburaka, Port Loko and Lunsar

**Benefit: Joint development of generation and distribution in a financial sustainable way from outset**

## 4. Electrification of small rural towns, villages

**In small rural towns, an off-grid PPP contractor should be selected to develop a mini grid and organise the public service of electricity supply**

Eligible towns are those where there is currently no electricity supply public service and the number of potential customers is limited

The same off-grid contractor would be in charge of taking over the electricity supply service using the public-owned mini-grids that are being developed by UNOPS with the financial support of DFID and the oversight of the Ministry of Energy

This option is recommended for the following six rural districts:  
Kailahun, Pujehun, Bonthe, Moyamba, Kambia and Koinadugu

Benefit: Implement the development of cost effective and sustainable electricity supply service in areas unreached by the grid

# 5. Sustainable Business model for EDSA

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**EDSA shall retain responsibility for expanding the on-grid electricity services and will outsource investment to the private sector**

- **Where there is sufficient generation capacity in a good state of operation and EDSA holds a sizable portfolio of customers**
    - Freetown and Lungi
  - **Four investment outsourcing options for EDSA**
    - i. Outsourcing the finance of grid efficiency improvement
    - ii. Outsourcing the finance of grid strengthening or extension in view of securing continuity and quality of supply to all and initially, to customers willing to finance the infrastructure investment
    - iii. Outsourcing the connection of new customers and commercial functions to the existing grid
    - iv. Outsourcing the line extension and connection of willing-to-pay new customers located at a distance from the existing grid
  - **Benefit: Sustainable growth model for EDSA**
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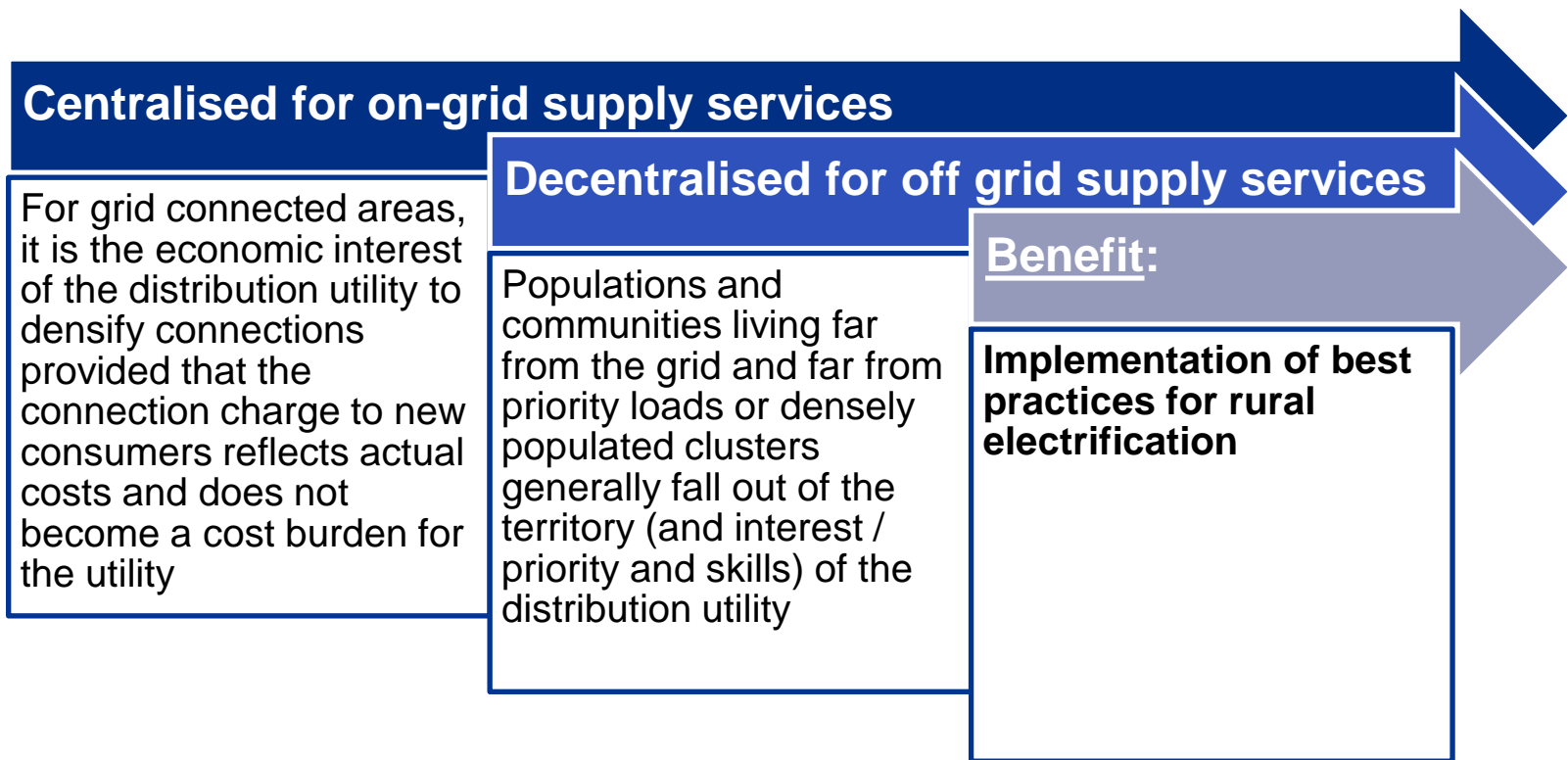
# 6. Generation Capacity Adequacy

**The market arrangement and procurement process shall lead to timely generation capacity adequacy and shall avoid renting emergency power**

- There is currently insufficient capacity adequacy in the power system of Sierra Leone
- Sierra Leone is using « emergency power rental » as the only practical « safety net » mechanism for generation capacity adequacy  
Currently high cost power rental in Sierra Leone during 6-month dry season only
- The IPP procurement process will ensure that there is sufficient capacity to meet the demand
- Benefit: suppression of emergency power rental

# 7. Rural Electrification market arrangements

**A split market emerges as the best option with respect to ability to reach appropriate customers even in rural area and provide appropriate amount of electricity to those customers**



# 8. Renewable Energy

**The capability of the market arrangement to capture renewable energy at various scales for additional power generation is a critical issue**

- **The contribution of small scale unit size renewable generator into the generation mix should not be neglected**
  - Features like **priority access to the grid** for renewable electricity and,
  - **feed-in tariff** are recommended policy instruments
- **The decision on specific renewable energy policy support instruments would follow a policy update in order to merge and straighten**
  - the Energy Policy 2009, the Policy Letter 2016, the Renewable Energy Policy 2015 and the Energy Efficiency Policy 2015
- **Benefit: Rapid development of low cost renewable energy capacity with private investment**

# 9. Integration with the regional electricity market

**A Transmission System Operator (TSO) will manage the interconnector as another part of system operation and an interchange agreement will be reached with the system operators on the other end of the interconnector**

## Advantage

- The System Operator has maximum flexibility to use the interconnector to maintain system security and reliability

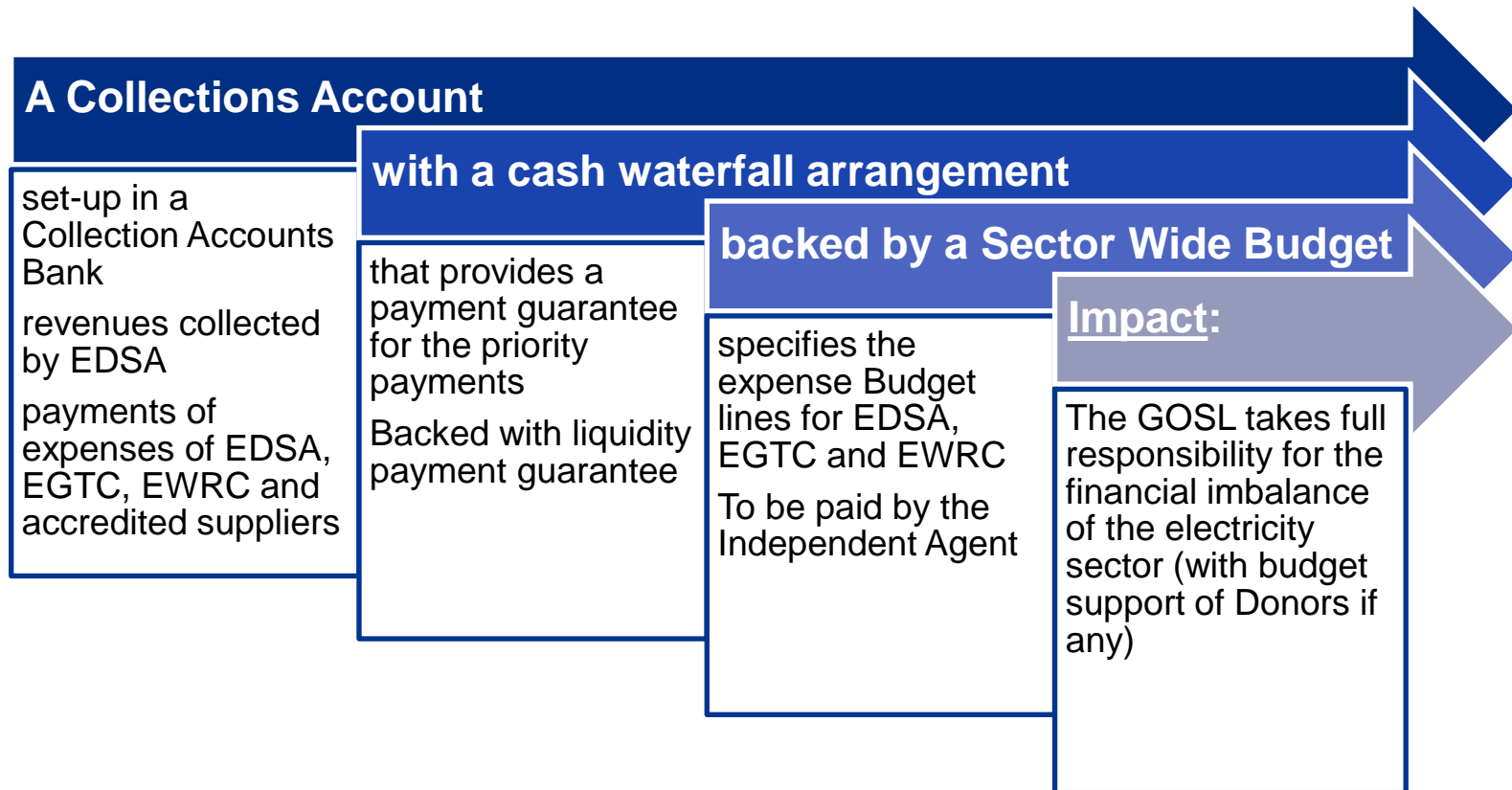
## Benefits

- to increase levels of energy security
- to defer or avoid construction of new power plants by sharing power
- to balance the load and the demand for power
- to reduce electricity reserve requirements
- to increase access to finance for projects developed by smaller, less creditworthy utilities

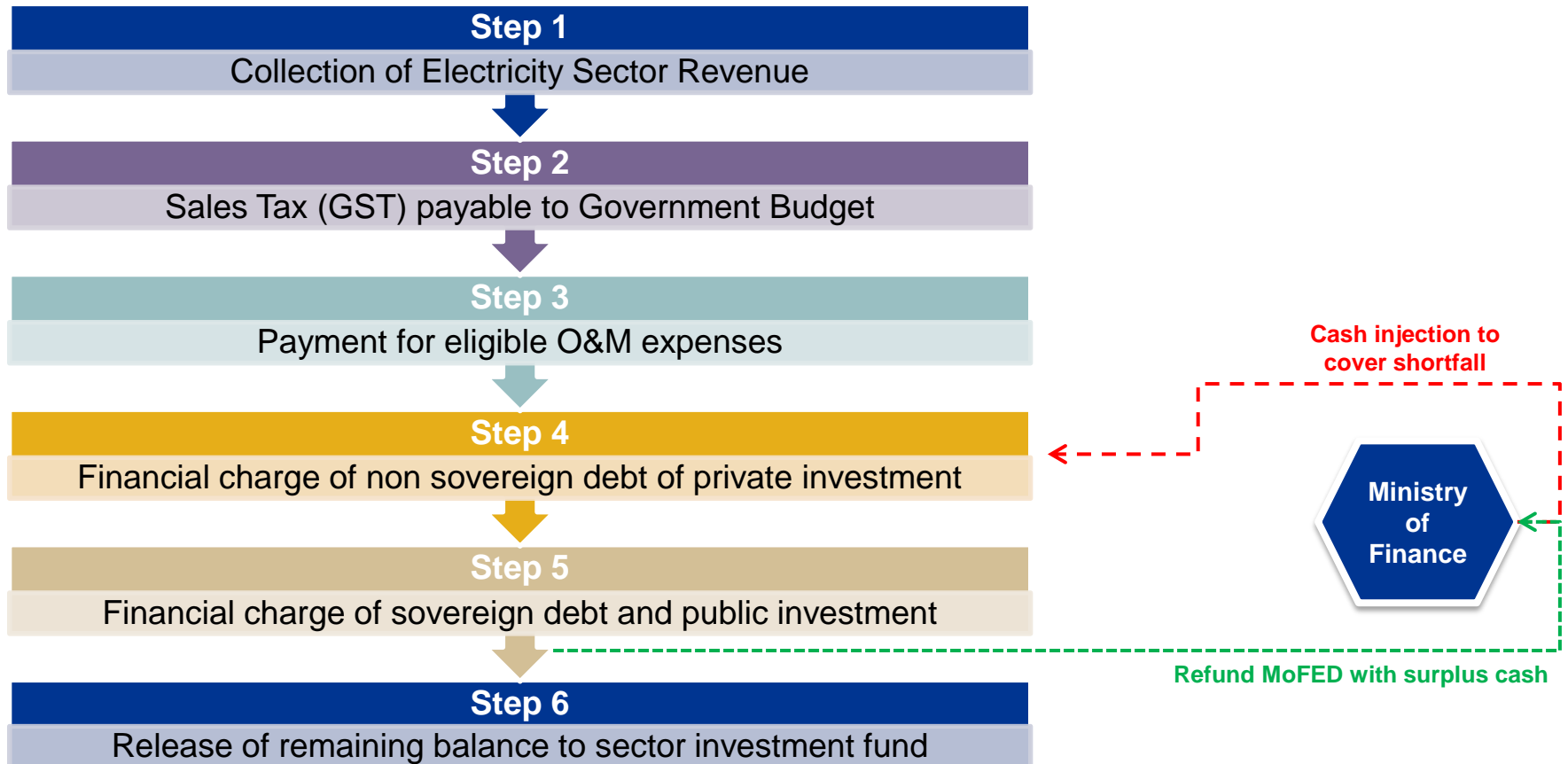


# 10. Attracting Private investment

How to attract private investment in unbundled market structure where the retail price is controlled by the government ?



# Principle of cash waterfall arrangement



# 11. Financial sustainability

The deficit of the electricity sector is mostly structural and only partly operational

## Reduction of operational deficit in the short term through:

- Reduction of technical losses
- Reduction of commercial losses

## Reduction of structural deficit in the medium term through:

- Sufficient low cost generation capacity (e.g., Bumbuna II)
- Secured low cost generation capacity through the Transco CLSG interconnector
- Sufficient transmission capacity between Bumbuna II and Freetown (commissioning of the 225kV Bumbuna to Waterloo transmission line).

Benefit: Eradication of government subsidies

# 12. Tariff restructuring

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**Tariff restructuring is an ultimate but delicate goal of the reform process and will bring more distributional equity in the sector**

- **by ensuring that costs and benefits of change are distributed in a fair manner across all customer segments and that affordability is safeguarded**
- **Currently the slope of the tariff function is negative**
  - Small consumers pay less per unit
  - Large consumers pay more per unit
- **In a restructured tariff, the slope will become positive**
  - Non social small consumers pay more
  - Large consumers pay less
- **Benefit: Eradication of cross-subsidies and transition to a competitive decentralised market**

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# Recommended Actions

# Recommended Actions: EDSA

## Actions during recovery period (up to mid 2018)

- 1.1 Implementation of Collection Account
  - Immediately strengthen the Interim Collection Account (under control of MOFED).
  - An Independent Agent will manage the Collection Account and waterfall payment priority (implementation of the fully fledged collection account).
- 1.2 Negotiate connection fee increase up to deep charge cost recovery level
- 1.3 Complete the transfer of assets from NPA including “title deeds” and the corporatisation process
- 1.4 Write off pre-unbundling debt on fully amortised or retired assets
- 1.5 Write off pre-unbundling payment arrears
- 1.6 Receive payment of outstanding bills from customers since the unbundling
- 1.7 Receive short term loans from MOFED for payment of bills to IPPs

# Recommended Actions: EDSA (continued)

## Actions during recovery period (up to mid 2018)

- 1.8 Tighten Management contractor target:
- Reduce commercial loss
  - Enforce anti-theft policy including penalty payment
  - Improve collection efficiency
  - Fast track staff assessment and conduct staff right sizing
  - Develop improved workforce training programmes
  - Develop a meter inspection programme
  - Strengthen operations and fault repair
  - Develop technical loss reduction investment programme
- 1.9 Adjust connection fees to deep charge cost recovery level

# Recommended Actions: EGTC

## Actions during recovery period (up to mid 2018)

- 1.1 Receive payment of outstanding debts from EDSA
- 1.2 In the immediate short-term continue to operate the interim PPA signed with EDSA
- 1.3 When the interim collection Account becomes operational, be treated at par with any other IPP under the arrangements of the Account or any other source of payment
- 1.4 Receive payment from the Independent Agent for O&M charges (during its time under the collection account arrangement, EGTC will receive payment from its authorised costs and no longer from invoicing EDSA)
- 1.5 Outsource Fuel Supply Management for thermal plants
- 1.6 Complete the transfer of asset property including “title deeds” and the corporatisation process
- 1.7 Write off pre-unbundling debt on fully amortised or retired assets
- 1.8 Write off pre-unbundling payment arrears
- 1.9 Contract Twinning O&M Expertise for EGTC generation portfolio
- 1.10 Receive short term loan from MOFED to pay for the fees of twinning O&M expertise
- 1.11 Receive short term loan from MOFED for payment of bills to fuel suppliers
- 1.12 Receive medium term loan from MOFED for financing technical loss reduction programme (electricity loss, fuel loss, lubricant loss and any other consumable)



# Recommended Actions: EGTC (continued)

## Actions during recovery period (up to mid 2018)

- 1.13 Receive medium term loan from MOFED to procure long lead time spare parts and rehabilitate workshops
- 1.14 Contract Technical Assistance programme for change management and re-engineering of EGTC functions and processes
- Fast track staff assessment and conduct staff right sizing following assets restructuring
  - Develop staff training programme targeting critical assets
- 1.15 Procure 10 MW back-up thermal power capacity in replacement of emergency power (additional tranches of 10 MW over the next two years)

# Recommended Actions: EWRC

## Actions during recovery period (up to mid 2018)

- 1.1 EWRC prepares an operational and development plan and budget forecast
- 1.2 Invoice EDSA and EGTC for licence fees and levies
- 1.3 Receive payment from the Independent Agent for levies
- 1.4 Staff recruitment and capacity building
- 1.5 Capacity building on urgent regulatory functions
- 1.6 Continue with the development of off-grid regulation / mini-grid regulation
- 1.7 Continue with the development of technical criteria for Licences for generation, transmission, distribution, captive load supply and the provision of related services
- 1.8 EWRC to fast track an interim grid code and set-up a consultative process for establishing the grid code of Sierra Leone
- 1.9 Continue with the development of Guidelines, Rules and Principles for tariff setting
- 1.10 Procedures for determining and revising tariffs for the sale and purchase of electricity, for grid access and for the transit of electricity
- 1.11 Submit first annual report in 2017 (on 2016 FY) as per SLEWRC Act obligation

# Recommended Actions: Ministry of Energy (MoE)

## Actions during recovery period (up to mid 2018)

- 1.1 Oversight of the emergency recovery plan for the electricity sector
- 1.2 Capacity strengthening programme in the planning, engineering and monitoring unit
- 1.3 Establish organisational change management team and programme at MoE, focused on the people side of the change process - culture change, leadership, communications, internal and external engagement processes
- 1.4 Recruit an external project management leader with strong experience in business transformation and re-engineering, as well as an expert in communications
- 1.5 Decision on the completion of the unbundling of NPA assets to EGTC and EDSA and dissolution of NPA.
- 1.6 Policy on financial regulation of the electricity sector
- 1.7 Design the Collection Bank (jointly with MOFED)
- 1.8 Design the Independent Agent managing the Collection Account (jointly with MOFED)
- 1.9 Procurement framework guidelines
- 1.10 Formulate a roadmap scorecard
- 1.11 Energy policy update
- 1.12 Policy on strengthened actions on Electricity theft

# Recommended Actions: Ministry of Energy (MoE)

## Actions during recovery period (up to mid 2018)

- 1.13 Procedures for collecting and administering fines resulting from an offence to the provisions of the Electricity Act and those arising from false declarations
- 1.14 Decision on the fees to be prescribed under the Electricity Act
- 1.15 Feed-in tariff policy

## Recommended Actions: Ministry of Finance and Economic Development (MoFED)

### Actions during recovery period (up to mid 2018)

- 1.1 Design the Collection Bank (jointly with MOE)
- 1.2 Design the Independent Agent managing the Collection Account (jointly with MOE)
- 1.3 Perceive a tax for the use of Bumbuna dam (as a result of repayment of concessional and top-up debt from State budget and not from the accrued value of generation output of the dam)
- 1.4 Create a collection account for fines resulting from the violation of the provisions of the Electricity Act and false declarations
- 1.5 Set-up financing instrument for paying bill arrears by public institutions (Ministries, hospitals, schools, military facilities, national printing house)
- 1.6 Grant short term loan to EDSA for financing IPP payment and to EGTC for Fuel payment
- 1.7 Grant medium term loans to EDSA and EGTC for financing short payback technical loss reduction programme (EDSA and EGTC)
- 1.8 Grant medium term loan to EGTC for financing procurement of long lead time spare parts and for rehabilitating workshops
- 1.9 Grant long term loan to EDSA for financing outstanding debt to EGTC and Addax
- 1.10 Tax relief on Heavy fuel oil for licensed generators and solar PV products

## Recommended Actions: Independent distribution & supply – IPP’s – Eligible Customers

Lead stakeholder	Actions
<b>Independent Distribution Licensees</b>	<ul style="list-style-type: none"> <li>• Independent distribution licensees shall be authorised               <ul style="list-style-type: none"> <li>• for isolated grids (Bo and Kemena, Makeni and Magburaka, Port Loko and Lunsar, Koidu),</li> <li>• for clusters of mini-grids</li> </ul> </li> </ul>
<b>Independent Supplier Licensees</b>	<ul style="list-style-type: none"> <li>• Independent sales licensees shall be authorised for supplying electricity through individual off-grid technologies</li> </ul>
<b>Eligible Customers</b>	<ul style="list-style-type: none"> <li>• Eligible customers shall be authorised in restrictive conditions:               <ul style="list-style-type: none"> <li>○ it must be a new customer (non EDSA existing customer) or a new load</li> <li>○ contracting a new generation capacity (not already committed generation capacity)</li> </ul> </li> </ul>
<b>Independent Power producers (IPP)</b>	<ul style="list-style-type: none"> <li>• Accredited IPPs receive payment from EDSA through the Collection account</li> <li>• Non Accredited IPPs receive payment               <ul style="list-style-type: none"> <li>○ from licensed distributor ( e.g. isolated grids and mini-grids) outside the collection account or</li> <li>○ from eligible customers or</li> <li>○ directly from MoFED (for emergency power plant rental)</li> </ul> </li> </ul>

## Recommended Actions: Local Councils, PPPU and Steering Committee

Lead stakeholder	Actions
<b>Local Councils</b>	<ul style="list-style-type: none"><li>• Planning of local public service off-grid electricity supply</li><li>• Contracting authority for concession or other Public Private Partnership contracts for provision of local electricity supply service</li></ul>
<b>Public Private Partnership Unit</b>	<ul style="list-style-type: none"><li>• Development of a sector wide budget</li><li>• Development of an operation manual of the collection account</li><li>• Tender package for the procurement of Collection Bank and Independent Agent</li><li>• Establishment of the Collection Account Committee</li></ul>
<b>Steering Committee</b>	<ul style="list-style-type: none"><li>• Coordination of the emergency recovery plan for the electricity sector</li></ul>

# Recommended Actions: Parliament

## Actions

- Ratification of 128 MW Western Area Generation Project (Phase 1: 57 MW)
- 1st Amendment of Electricity Act
  - authorisation of Collection Account
  - conditions for transferring distributed assets of EGTC (isolated generators) and of EDSA (isolated distribution grids) to locality authorities for them to organise the local electricity distribution service
  - inflation adjustment of fines
  - authorisation of Eligible Customers in restrictive conditions
- Tariff Levy for regulation and rural electrification



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# Questions?

# Thank You