

CAPITAL EXPENDITURE PROPOSAL OF SBU-T



Para 5.3.5 of the National Electricity Policy notified by the Ministry of Power, Government of India, under Section 3 of the Act vide Resolution No.23/40/2004-R&R (Vol.II) dated 12.2.2005 provides as under:


“5.3.5 To facilitate orderly growth and development of the power sector and also for secure and reliable operation of the grid, adequate margins in transmission system should be created. The transmission capacity would be planned and built to cater to both the redundancy levels and margins keeping in view international standards and practices. A well planned and strong transmission system will ensure not only optimal utilization of transmission capacities but also of generation facilities and would facilitate achieving ultimate objective of cost effective delivery of power”.

Transmission Planning

- The growth of transmission system must be ahead of generation both in time and capacity to avoid congestion or bottling up of power.
- Efficient operation of transmission system in terms of providing reliability, avoidance of disturbance, maintaining voltage level and reducing transmission losses requires continuous strengthening of transmission system.

Transmission Planning Objectives

- Provide 24 x 7 power supply to all consumers with n-1 and n-1-1 and n-2 reliability.
- With Open Access in transmission, the role of transmission has changed from a mere infrastructure to an enabler in operation of a competitive power market.
- Investments are made with **prudence and benefits are socialized.**

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- The power requirement of the state has been increasing rapidly in the past decades.
 - The maximum demand has crossed 4000 MW in 2016 (27-April-2016).
 - The demand is expected to rise to 4,900MW within the next five years

Forecasted Electrical Energy Requirement in MUs-

EPS 19

PAM Baseline Scenario

	2017	2018	2019	2020	2021	2022	2023	2030
Kerala	23,929	25,008	25,991	27,061	28,226	29,481	30,802	41,062

SUR Model Baseline

	2017	2018	2019	2020	2021	2022	2023	2030
Kerala	25,106	26,262	27,681	29,247	30,951	32,802	34,759	50,222

comprehensive transmission development scheme named TRANSGRID 2.0 has been developed to relieve the system of its present constraints, building sufficient import capability for the future, facilitate complete power evacuation from generating stations within the state, to reduce transmission losses to the possible maximum while fully meeting power demand of the state. The project requires a total investment plan of about Rs. 6,375Cr within 5 years


□ Present statistics (SBU-T handles 66KV and above)

Transmission System statistics				
No	Item	Unit	Quantity (as on 31-3-2019)	Quantity (as on 30-9-2019)
1	400 kV Lines	Ckt-km	855.96*	947.96**
2	220 kV Lines	Ckt-km	2855.98	2910.98
3	110 kV Lines	Ckt-km	4662.28	4803.28
4	66 kV Lines	Ckt-km	2134.44	2100.64
5	33KV lines	Ckt-km	2006.54	2082.69
6	400 kV Substations	Nos	5* + 1	5* + 1
7	220 kV Substations	Nos	22	22
8	110 kV Substations	Nos	157	162
9	66KV Substations	Nos	74	70
10	33 KV Substations	Nos	153	158
11	Total transmission capacity (MVA)	MVA	20820.90	20933.40
*PGCIL owned **Madakkathara-Malaparambu 400KV line addition				

Provisions in KSERC (Terms and Conditions for determination of Tariff) Regulations, 2018

“54. Capital investment plan. – (1) The transmission business/licensee shall along the petition for Aggregate Revenue Requirements for the Control Period submit to the Commission for its approval, a detailed capital investment plan, financing plan and physical targets. Such investments may be undertaken for strengthening and augmenting the intra-State transmission system for meeting the requirement of power evacuation, load growth, reduction in transmission losses, improvement in quality of supply, reliability, metering, etc., for the Control Period, in accordance with the ‘Guidelines for In-principle Clearance of Capital Investment’ specified at Annexure-IV.”

KSEBL submitted the CIP along with MYT ARR petition on 31-10-2018.



As per Regulation 10(2) of the KSERC(Terms and Conditions for determination of Tariff) Regulations, 2018 issued by Hon'ble Commission, every generating business/company or transmission business/licensee or distribution business/licensee or State Load Despatch Centre shall file, on or before the Thirtieth day of November 2019, the Mid-term Performance Review (MPR) which shall comprise the truing up for the financial year upto 2018-19 and midyear performance review for the year 2019-20 and the revised forecast for the year 2020-21 and 2021-22 on account of unexpected variations if any on controllable and uncontrollable parameters.

Accordingly the mid year performance review for the year 2019-20 and the revised forecast for the years 2020-21 and 2021-22 of SBU-T submitted on

Capital Investment Plan

Objectives	Features
Growing Demand	Higher Volume Target
Reliability & Quality	New technology
Loss reduction	Narrow Towers, HTLS, GIS, SAS
Capacity Utilization	Dedicated teams
RE Integration / RPO	

Multi Year Capital Expenditure Plan 2018-19 to 2021-22

- SBU-T has evolved a multi year capital expenditure plan which is grouped as follows:
 - **Ongoing projects & New projects costing less than Rs.10Cr**
 - **Normal capital works (above 10Cr) proposed in the control period 2018-19 to 2021-22**
 - **Transgrid works.**
 - **SLDC related capital works.**

The capital expenditure projected for the control period

Sl.No	Work	2018-19	2019-20	2020-21	2021-22	Total
SBU-T						
1	Ongoing projects plus new small works	804.12	568.73	196.28	254.26	1823.39
2	New Capital Works above 10Cr	0	662.59	421.83	41.65	1126.07
3	Transgrid Works	0	362.57	2073.84	260.96	2697.37
	Total	804.12	1593.89	2691.95	556.89	5646.85
SLDC						
4	Ongoing projects plus new small works	14.72	7.14	0	0	21.86
5	New projects	12	53	12	212.45	289.45
	Total	26.72	60.14	12	212.45	311.31
	Total CAPEX for SBU-T & SLDC	830.84	1654.03	2703.95	769.34	5958.16

Transgrid 2.0 Projects

Sl.No	Name of Project	Cost (in Cr.)		COD	
		DPR	Revised	DPR	Actual/Expected
1	Aluva	182.67	131.34	2019-20	2019-20
2	Kaloor	179.9	138.81	2019-20	2019-20
3	Kothamangalam & Chithirapuram	398.86	364.47	2020-21	2020-21
4	Kottayam, Thuravur & Ettumanoor	541.67	541.67	2020-21	2020-21
5	Chalakydy	71.42	79.58	2020-21	2020-21
6	Kunnamkulam	130.3	134.41	2020-21	2020-21
7	Manjeri	51.1	38.87	2020-21	2019-20
8	Thalasseri	157.03	170.47	2020-21	2020-21
9	Kunnamangalam	91.9	77.25	2020-21	2020-21
10	Eranad	552	595.77	2020-21	2020-21
11	NRHTLS	79.57	69.3	2020-21	2020-21
12	Kolathunadu	260.96	287.35	2021-22	2021-22
13	Sabari Package	248	248	2021-22	2021-22
14	Vengallur GIS & TLSP Phase II	204.18	204.18	2021-22	2021-22
15	Vizhinjam 220/110 kV GIS sub	71	71	2021-22	2021-22

Aluva Package

Revised Project cost is Rs.131.34 Cr

Date of COD: 2019-20

Necessity

- *Aluva is a major load centre now fed by Kalamassery at 110kV level and partly supported by 66kV line from Pallivasal. Considering the load growth, the present feeding will not be sufficient.*

Note:

Additional details requested by the commission has been submitted.

Benefits of Package

- *This line will provide redundancy as well as enable KSEBL to import more power from the interstate PGCIL substation.*
- *The estimated cost of the project is Rs.168 Cr and is expected to be commissioned in 2019-20.*
- *Relieves loading of Kalamassery S/s by feeding downstream stations and provides backup.*
- *Power evacuation from Pallivasal Extension Scheme (60 MW) HEP*

Project Components

Construction of

(a) 11.10Km 220KV DC line from 440kV Cochin East (Pallikara) PGCL substation to Aluva

(b) Construction of 220 KV GIS at Aluva

Kaloor Package

Revised Project cost is Rs.138.81 Cr

Date of COD: 2019-20

Necessity

- *Kaloor and Edappally substations are presently fed by Kalamassery – Kaloor 110kV double circuit feeder. With the present load growth, this line will reach its full capacity by 2018-19.*

Benefits of Package

- *Increase the reliability of supply*
- *Enhances the flexibility in operation and avoids total black out in case of feeder failures.*
- *System loss will be reduced by 10.71 MW (energy savings of 52 MU) per year.*

Project Components

- *220kV GIS is at the existing Kaloor substation premises with a capacity of 360MVA.*
- *4.5 km of 220/110 kV MCMV line along the existing RoW of 110 kV Brahmapuram– Kalamassery 1 & 2 feeders up to Thuthiyur and through UG cable from Thuthiyoor to Kaloor.*

Kothamangalam and Chithirapuram Package

Revised Project cost is Rs.364.47Cr

Date of COD: 2020-21

Necessity

- *This station is a vital transmission nodal point catering the power requirement of load centers like Kothamangalam, Perumbavoor, Aluva, Muvattupuzha, Koothattukulam etc. The station also serves as the backup power supply to Idamalayar power house in an emergency situation through a 66kV SC feeder. Station Minimum voltage level breaches to 56kV.*

Benefits of Package

- *To provide secure and reliable transmission system for evacuating 500 MW from under construction/Planned projects in Idukki.*

Project Components

- (a) 220kV substation at Kothamangalam
- (b) 220kV Sub station at Chithirapuram
- (c) Upgradation of 66kV Pallivasal Aluva line to 220/110kV MCMV line
- (d) Construction of 220/110kV MCMV line from Karukadom to Kothamangalam

Kottayam Upgradation Package

Project cost is Rs. 541.67 Cr

Date of COD 2020-21

Necessity

- ❑ *To Increase Kerala's transfer capability and import power from PGCIL 400kV Grid*
- ❑ *To strengthen the Power evacuation from the existing network of Kottayam & Alappuzha region.*
- ❑ *Addressing (N-1) constraints in Ettumanoor SS and Thravur SS*

Benefits of Package

- ❑ *Increase the reliability of supply*
- ❑ *Strengthening of the transmission system in Kottayam District and the Northern side of Alappuzha District.*

Kottayam Upgradation Package -Project Components

- **Substations**

- 400 kV GIS substation at Kottayam,
- 220kV GIS at Ettumanoor,
- 220kV AIS at Thuravur.

- **Interconnecting lines**

- 27.6 km 220/110 KV MCMV line from Kottayam to Thuravoor
- 6.5 km 220/110 KV MCMV line from Kottayam to Ettumanoor
- 3.8 km 220kV double circuit LLO from Pallom-Ambalamugal o to Kottayam Substation
- 4.8 km 110kV DC line in Kuravilangad – Vaikom – Ettumanoor line route

Chalakydy 220kV AIS & North-South Interlink Package (Phase I)

Revised Project cost is Rs.79.58 Cr

Date of COD 2020-21

Necessity

- *No redundant and dependable back up support to Chalakydy substation, which receives power from Sholayar, Porigalkuthu and Idamalayar HEPS.*
- *The central and southern regions of Thrissur district, including feeding substations, will face black out in the case of major disturbances in the line.*

Benefits of Package

- *Create back up power to Thrissur district*
- *Evacuating Power from proposed high capacity ISTS Projects.*
- *establishing of one important transmission line connecting the Central and Northern part of Kerala for uninterrupted transmission of power flow*

Project Components

Up gradation of existing 110kV AIS to 220kV AIS at Chalakydy in Thrissur District with station capacity 2x100 MVA Transformer and 4 x 220 kV feeder bays

Konnakuzhy-Chalakydy 220/110kV line (NSIP Phase 1 Project A) : Upgrading existing Poringal - Chalakydy 110kV DC Transmission line to 220/110kV MCMV Transmission line in Thrissur District (LILO from Madakkathara – Lower periyar)

Kunnamangalam 220kV GIS

Revised Project cost is Rs.77.25 Cr

Date of COD 2020-21.

Necessity

- *Kozhikode and nearby areas now fed from Nallalam 220kV S/S. No backup supply to Kozhikode in case of failure of Nallalam supply. Kunnamangalam will serve as back up source to Kozhikode with 220kV feeding from Areekode Kaniyampetta Line.*

Benefits of Package

- *Improve reliability and quality of transmission system and relieves transmission congestion at Kunnamangalam town & Kozhikode area.*
- *Reduction in transmission losses*
- *Act as alternate feeding source to Kozhikode and nearby areas during shutdown/emergency situation at 220kV Nallom*

Project Components

Upgradation of existing 110kV AIS to 220kV GIS at Kunnamangalam in Kozhikode District with station capacity 2x100 MVA Transformers and 2 x 220 kV feeder bays

Upgrading portion of existing 110kV Agastyamuzhi - Kunnamkulam DC Transmission line to 220/110kV MCMV Transmission line istrict (LILO to Areekode - Kaniyampetta)

Manjeri 220kV AIS & Lines

Revised Project cost is Rs. 38.87 Cr

Date of COD: 2020-21.

Necessity

- Severe power supply problems in Malappuram district (areas fed from Manjeri, Nilambur, Edakkara & Pookkottumpadam S/s) due to overloading of transmission lines.
- No alternatives available in case of failure of SC feeder catering to the above S/s.

Benefits of Package

- Enhance the reliability of the System
- Integral development of the transmission system in the eastern part of the Malappuram District especially Manjeri, Nilambur and Edakkara areas.
- Better load sharing in Madaakkathara - Arekode DC Feeder
- Peak load loss reduction (7.2 MW)

Project Components

- Construction of new 220 kV Air Insulated Substation at Manjeri
- 220kV LILO arrangement to Manjeri substation

Thalasseri 220/110 kV GIS

Revised Project cost is Rs. 170.47 Cr

Date of COD 2020-21.

Necessity

- *Interruptions at 220kV Orkattery Substation, the feeding substation to 110kV Thalasseri Substation, causes system instability in Thalasseri regions.*
- *Energy Demand fast developing town ship of Thalasseri and adjacent areas are rapidly increasing.*

Benefits of Package

- *This will improve the availability and reliability of supply in the Thalasseri regions.*
- *Reduction in transmission losses –Peak load loss reduction 26.2 MW*
- *110kV feeders can satisfy N-1 criteria to have system stability in the region*

Project Components

- Construction of 220/110kV Gas-Insulated-Substation (GIS).
- Construction / Up gradation of 66kV SC line to 220/110kV DC line using narrow base MCMV Towers from Mundayad to Thalassery.

220kV GIS Substation, Kunnamkulam & Wadakkanchery - Kunnamkulam

220kV DC line

Revised Project cost is Rs. 134.41 Cr Date of COD 2020-21.

Necessity

- ***In case of power disturbances from Madakkathara or any disturbances occurred to the Central costal region line, including Guruvayur, causes black out as there are no redundant and dependable back up supporting lines.***

Benefits of Package

- ***Reduction of transmission congestion and improves power reliability and stability. Reduces transmission losses.***
- ***Evacuation of power between Southern and northern region.***
- ***Direct connectivity from 2000 MW HVDC and 220kV Malapparamba/Nallalam sub station***
- ***The load on 110kV bus at Madakkathara SS released to great extend.***

Project Components

- ***Upgradation of existing 110kV AIS to 220kV GIS at Kunnamkulam in Thrissur District with station capacity 2x100 MVA Transformers and 2 x 220 kV feeder bays***
- ***Upgrading existing Wadakkanchery - Kunnamkulam 66kV SC Transmission line to 220kV DC Transmission line in Thrissur District (LILO to Madakkathara - Malapparamba/Nallalam) using HTLS Drake equivalent conductor – Route Length 22.8 km .***

Ernad Lines Package

Revised Project cost is Rs. 595.77 Cr

PSDF Grant is Rs. 333.93 Cr

Date of COD 2020-21.

Necessity

- Constraints are experienced for importing power to Areacode from Mysore .
- Transmission constraints are experienced in down stream network especially in Kannur and Kasaragod district
- Severe low voltage profile creates constraints to power transfer.

Benefits of Package

- Provides a robust highway from 400kV from North to South of Kerala facilitating bulk power transfer either way.
- Mitigates congestion in the 400kV ISTS Mysore Areacode tie line.
- Enables Power evacuation capability power from 2000MW HVDC Station to northern part of Kerala
- Peak load reduction by 23.3MW(Energy savings of 112.9 MU)

Project Components

- 400/220k V MCMV transmission line between Madakkathara and Areakode
- 220/110k V MCMV transmission line between Kizhissery and Nallam

NRHTLS

Revised Project cost is Rs. 69.3 Cr

Date of COD 2020-21.

Necessity

- *Stranded generation at Kakkayam HEP due to inadequate power evacuation capacity of the existing Kakkayam – Nallalam line.*

Benefits of Package

- *Enhancing the loading capacity of the lines without changing the tower or upgrading the transmission voltage level.*
- *Lines towards Kannur from Kakkayam HEP can be switched off without loss of generation.*
- *More power flow towards northern region of Kozhikode*

Project Components

- Up-rating Kakkayam - Nallalam 110kV line (45km).
- Up-grading Nallalam – Chevayur - Westhill – Koyilandy - Mepayur 110kV Single Circuit line in to Double Circuit line (32km).

KOLATHUNADU LINE STRENGTHENING PACKAGE

Revised Project cost is Rs. 239.77 Cr Date of COD:2021-22

Necessity

- **Kasaragode district now fed from thorough 220kV DC feeder from Kanhirode(Kannur) to Mylatti.**
- **No back up 220kV Source available for Kasaragode district in case of failure of Kanhirode - Mylatti feeder**

Benefits of Package

- *To import power from Solar power station at Ambalathara ,*
- *b) To provide alternate 220KV corridor between Kannur and Kasargod Districts and*
- *c) To improve power system stability within Kannur and Kasargod districts.*
- *d) To meet the incident demand and to reduce the system losses so as to keep the*
- *transmission system reliable and secure at par with the international standards*
- *220/110 kV Multi Circuit Multi Voltage system is needed from Mylatty to Kanhirode*

Project Components

- Construction of 220 kV double circuit line on 220/110 kV MCMV towers from Kanhirode to Mundayad.
- Construction of 220kV /110kV Multi circuit Multi voltage (MCMV) line from Mundayad (Kannur District) to Mylatty (Kasaragod District).

SABARI LINES & SUBSTATION PACKAGE

Project cost is Rs. 248 Cr

Date of COD: 2021-22

Necessity

- *Pathanamthitta, Kozhenchery and Ranni are fast developing thereby increasing the power demand growth exponentially.*
- *Considering the Power demand growth, stability of power supply in Pathanamthitta district and an alternate route for power evacuation for Kakkad belt ,it is highly necessary to construct a 220/110 kV substation at Pathanamthitta*

Benefits of Package

- *Offers Pathanamthitta a 220kV substation with connectivity to Sabarigiri-Edamon line and Edappon substation, satisfying N-1 criteria*
- *Ensure power system stability and full utilisation of power houses in the Kakkad belt.*
- *Loss reduction of 4MW in the system*

Project Components

- **Construction / Upgradation of 220/110kV line using narrow base MCMV Towers**
- **Construction of New 220/110KV Gas Insulated Substation at Pathanamthitta**
- **Construction of New 220/110KV Gas Insulated Substation at Kakkad**

220kV VIZHINJAM GIS SUBSTATION

Project cost is Rs. 71 Cr

Date of COD: 2021-22

Necessity

- **Very high increase in power demand anticipated due to development of Vizhinjam area with the completion of the International seaport.**

Benefits of Package

- **This station will ensure a secure and reliable network satisfying N-1 criteria in this area and there will be a good relief in the loading of the existing feeders.**
- **Meet the future power requirement in the southern part and the coastal area of Thiruvananthapuram District.**
- **Considerable increase in voltage profile**

Project Components

- **Upgradation of the existing 66kV, Vizhinjam substation to a 220kV GIS substation**

110/11kV GIS & 220/110kV GIS, VENGALLUR MALAPPURAM DISTRICT & THRISSIVAPERUR LINE STRENGTHNING PACKAGE

Project cost is Rs. 204.18 Cr

Date of COD: 2021-22

Necessity

- *The loading pattern in the existing 110/11kV AIS Tirur, having capacity of 52.5MVA {2x20MVA + 1x12.5MVA} has reached its safe loading limits and hence either the station capacity need to be enhanced nor new substation has to be built in to cover up the future power demand.*
- *LFS report of the Power System Engineering Department has revealed that the average loading on 2x20MVA and 1x12.5MVA existing transformers at Tirur 110kV AIS were 70% and 53% respectively in the year 2015, which has now increased to 85% and 75% respectively.*
- *The proposed scheme will also mitigate the high loading of the 110kV DC feeder from 220kV Substation Areekode to Keezhissery. Under the non-availability of this scheme any failure / fault in the above 110kV corridor or at 220kV Substation Areekode can plunge Malappuram and adjoining areas into black out state.*

Benefits of Package

- *This project is proposed to build necessary downstream side infrastructure to evacuate power from PGCIL HVDC station at Mannuthy*
- *offering a stable, reliable and alternate power transmission and distribution network in the Malappuram District*
- *Coastal power corridor to the Northern Kerala from central and southern regions {Aluva-North Paravur-Kodungallur-Irinjalakuda-Kunnamkulam-Vengallur}*

110/11kV GIS & 220/110kV GIS, VENGALLUR MALAPPURAM DISTRICT & THRISSIVAPERUR LINE STRENGHTNING PACKAGE

Project Components

- **Construction of 110/11kV GIS at Vengallur, Malappuram district**
- **Construction of 42km 220/110kV MCMV transmission line from Kunnamkulam Substation in Thrissur district to Vengallur**
- **Construction of 220/110kV GIS at Vengallur**

Normal Capital works proposed (Rs Cr)

No.	Project
1	Linking between 110kV Kanhangad – Cheruvathuer feeder to 220kV S/s Ambalathara
2	Upgradation of 66kV Palakkad Medical College Substation and line
3	110 kV GIS Project Vennakkara
4	Construction of Palakkad- Malampuzha 110kV Line
5	110kV Substation Pattambi
6	Mannuthy 110 kV AIS Project
7	Upgradation of 66kV Substation Ettumanoor to 110kV
8	Upgradation of 66kV Substation, Kuravilangadu and Koothattukulam-Kuravilangadu to 110 kV
9	Upgradation of 66kV Substation Koothattukulam to 110 kV
10	Upgradation of 66KV Kothamangalam- Kothttukulam Feeder to 110 KV
11	Upgradation of 66kV SC Pala-Ettumanoor feeders to 110kV
12	Upgradation of 66kV Substation Anchal to 110kV and Upgradation of 66kV SC Edamon –Anchal-Ayur line to 110kV DC
13	Up gradation of 66kV Substation, Karunagappally and 66kV SC Sasthamcotta-Karunagapally line to 110kV DC
14	Construction of 110kV Substation, Chithara
15	Interlinking 110kV GIS Substation, Kollam and 110kV Kottiyam Substation
16	110kV GIS substation at Kowdiar, Thiruvananthapuram
17	Upgradation of 66kV Substation Palode to 110kV
18	66kV Substation, Ambalavayal and 66kV DC line from 66kV Kaniyambetta-Sulthanbathery feeder in 110kV Parameters
19	110kV Substation, Chemperi and line
20	Upgradation of Kunnamangalam _ Thamarasserry line to 110kV

Normal Capital works proposed (Rs Cr)

No.	Project
21	Upgradation of Kuthumunda to 110kV GIS
22	Upgradation of Mankada S/s to 110kV
23	Upgradation of 66kV Substation, Mankavu to 110kV
24	Upgradation of 110kV SC/DC line to 220/110kV MC MV line from Mylatty s/s to Vidyanagar
25	110kV Substation, Pulikkal
26	110kV Substation, Seethangoli
27	Upgradation of 33 kV Substation Thambalamanna to 110 kV & 110 kV Agasthiamuzhy - Thambalamanna (S/c, UG cable)
28	220KV Substation Kottayi
29	Upgradation of Pudukkad to Kattoor 66kV SC Line to 110kV DC Line
30	Conversion of Ollur Viyyur feeder to 110 kV
31	Upgradation of 66kV Pallom-Ettumanoor feeder and associated substations to 110kV
32	Construction of 110kV substation Vazhoor
33	Upgradation of 66kV Substation Kuttanadu to 110kV
34	Upgradation of 66kV PUNNAPRA-ALAPPUZHA DC Feeder to 110 kV
35	110kV Switching Cum Substation at PANTHALACODE
36	Upgradation of 66 kV TVT No. I & II feeders
37	Renovation and modernisation 110kV GIS Substation, Malappuram
38	LILO on 110kV Edarikode- Tirur to Parappanangadi S/s
39	Construction of 110kV GIS Substation , Vengaloor
40	Construction of new 110kV DC line from Kayamkulam to Karunagapally

The capital expenditure projected for the control period

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SBU-T						
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	Total	804.12	2017.92	1715.51	1346.91	5884.46
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	Total CAPEX for SBU-T & SLDC	830.84	1654.03	2703.95	769.34	5958.16

CAPEX SBU-T (MORE THAN ₹10 CR)



CAPEX SBU-T (More than ₹10 Cr)

- **Linking between 110kV Kanhangad – Cheruvathuer feeder to 220kV S/s Ambalathara**
Project Cost: 36.06 Cr *Date of COD: 2019-20*
Revised Project Cost: 8.17 Cr *Expected Date of COD: 2020-21*

- **Upgradation of 66kV Palakkad Medical College Substation and line**
Project Cost: 23.1 Cr *Date of COD: 2019-20*
Revised Project Cost: *Expected Date of COD:*
 - *Project will be taken up after commissioning of Vennakkara GIS SS*

- **110 kV GIS Project Vennakkara**
Project Cost: 36.6 Cr *Date of COD: 2019-20*
Revised Project Cost: 44.6 Cr *Expected Date of COD: 2020-21*

CAPEX SBU-T (More than ₹10 Cr)

□ Construction of Palakkad- Malampuzha 110kV Line

Project Cost: 14.38 Cr

Revised Project Cost: 14.38 Cr

Date of COD : 2019-20

Expected Date of COD: 2020-21

□ 110kV Substation Pattambi

Project Cost: 25.5 Cr

Revised Project Cost: 25.5 Cr

Date of COD : 2019-20

Expected Date of COD : 2020-21

□ Mannuthy 110 kV GIS Project

Project Cost: 26.3 Cr

Revised Project Cost: 11.6 Cr

Date of COD : 2019-20

Expected Date of COD : 2020-21

□ *GIS SS changed to AIS*

CAPEX SBU-T (More than ₹10 Cr)

- Upgradation of 66kV Substation Ettumanoor to 110kV

Project Cost: 20.8 Cr

Date of COD : 2019-20

Revised Project Cost: 7.7 Cr

Expected Date of COD : 2020-21

- **GIS SS included in TRANSGRID, delay in completing GIS SS**

- Upgradation of 66kV Substation, Kuravilangadu and Koothattukulam-Kuravilangadu to 110 kV

Project Cost: 21.65 Cr

Date of COD : 2021-22

Revised Project Cost: 21.65 Cr

Expected Date of COD: 2021-22

- Upgradation of 66kV Substation Koothattukulam to 110 kV

Project Cost: 15.01 Cr

Date of COD: 2019-20

Revised Project Cost: 13.27 Cr

Expected Date of COD : 2020-21

CAPEX SBU-T (More than ₹10 Cr)

- **Upgradation of 66KV Kothamangalam- Kottttukulam Feeder to 110 KV**

Project Cost: 14.67 Cr

Date of COD: 2019-20

Revised Project Cost: 24 Cr

Expected Date of COD: 2020-21

- **Due to space constraints and public objections special type towers are to be used. Delay in tender finalization**

- **Upgradation of 66kV SC Pala-Ettumanoor feeders to 110kV**

Project Cost: 15.75 Cr

Date of COD: 2019-20

Revised Project Cost: 24.5 Cr

Expected Date of COD: 2020-21

- **Delay in tender finalization**

- **Upgradation of 66kV Substation Anchal to 110kV and Upgradation of 66kV SC Edamon –Anchal-Ayur line to 110kV DC**

Project Cost: 42.66 Cr

Date of COD: 2019-20

Revised Project Cost: 28.85 Cr

Expected Date of COD: 2019-20

CAPEX SBU-T (More than ₹10 Cr)

- **Up gradation of 66kV Substation, Karunagappally and 66kV SC Sasthamcotta-Karunagapally line to 110kV DC**

Project Cost: 18.20 Cr

Date of COD: 2019-20

Revised Project Cost: 16.5 Cr

Expected Date of COD: 2019-20

- **Construction of 110kV Substation, Chithara**

- **Non availability of suitable land**

- **Interlinking 110kV GIS Substation, Kollam and 110kV Kottiyam Substation**

Project Cost: 63.23 Cr

Date of COD: 2021-22

Revised Project Cost: 63.23 Cr

Expected Date of COD: 2021-22

CAPEX SBU-T (More than ₹10 Cr)

- **110kV GIS substation at Kowdiar, Thiruvananthapuram**

- **Non availability of suitable land**
- **Alternate options being considered**

- **Upgradation of 66kV Substation Palode to 110kV**

Project Cost: 18.45 Cr

Date of COD: 2019-20

Revised Project Cost: 19.75 Cr

Expected Date of COD: 2021-22

- **66kV Substation, Ambalavayal and 66kV DC line from 66kV Kaniyambetta-Sulthanbathery feeder in 110kV Parameters**

Project Cost: 13.49 Cr

Date of COD: 2020-21

Revised Project Cost: 15.24 Cr

Expected Date of COD: 2020-21

CAPEX SBU-T (More than ₹10 Cr)

- **110kV Substation, Chemperi and line**

Project Cost: 27.77 Cr

Revised Project Cost: 19.00 Cr

Date of COD: 2019-20

Actual Date of COD: 30/05/2020

- **Upgradation of Kunnamangalam _ Thamarasserry line to 110kV**

Project Cost: 18.06 Cr

Revised Project Cost: 18.06 Cr

Date of COD:2019-20

Expected Date of COD: 2022-23

- **Upgradation of Kuthumunda to110kV GIS**

Project Cost: 33.98 Cr

Revised Project Cost: 15.75 Cr

Date of COD: 2021-22

Expected Date of COD: 2022-23

- **GIS SS changed to AIS**

CAPEX SBU-T (More than ₹10 Cr)

- **Upgradation of Mankada S/s to 110kV**

Project Cost: 14.65 Cr

Revised Project Cost: 15.75 Cr

Date of COD: 2019-20

Expected Date of COD: 2020-21

- **Upgradation of 66kV Substation, Mankavu to 110kV**

Project Cost: 13.56 Cr

Revised Project Cost 14.44 Cr

Date of COD: 2019-20

Expected Date of COD: 2020-21

- **Upgradation of 110kV SC/DC line to 220/110kV MC MV line from Mylatty s/s to Vidyanagar**

Project Cost: 29.43 Cr

Revised Project Cost: 31.96 Cr

Date of COD: 2019-20

Expected Date of COD: 2019-20

CAPEX SBU-T (More than ₹10 Cr)

- **110kV Substation, Pulikkal**

Project Cost: 14.68 Cr

Revised Project Cost: 24 Cr

- **Delay in Procurement of Land**

- **110kV Substation, Seethangoli**

Project Cost: 11.59 Cr

Revised Project Cost: 13.41 Cr

- **Preliminary steps to get land started**

- **Upgradation of 33 kV Substation Thambalamanna to 110 kV & 110 kV Agasthiamuzhy -Thambalamanna (S/C, UG cable)**

Project Cost: 33.25 Cr

Revised Project Cost: 33.25 Cr

Date of COD: 2020-21

Expected Date of COD: 2021-22

Date of COD: 2019-20

Expected Date of COD: 2021-22

Date of COD: 2019-20

Expected Date of COD: 2020-21

CAPEX SBU-T (More than ₹10 Cr)

- **220KV Substation Kottayi**

- **Dropped**

- **Upgradation of Pudukkad to Kattoor 66kV SC Line to 110kV DC Line**

Project Cost: 13.91 Cr

Date of COD: 2020-21

Revised Project Cost: 13.91 Cr

Expected Date of COD: 2020-21

- **Delayed due to Case Pending at Honorable High Court**

- **Conversion of Ollur Viyyur feeder to 110 kV**

Project Cost: 16.72 Cr

Date of COD: 2020-21

Revised Project Cost: 16.72 Cr

Expected Date of COD: 2021-22

- **Possible only after upgradation of 66kV SS of Thrissur cooperation**

CAPEX SBU-T (More than ₹10 Cr)

- **Upgradation of 66kV Pallom-Ettumanoor feeder and associated substations to 110kV**
Project Cost: 69.54 Cr *Date of COD: 2020-21*
Revised Project Cost: 61.4 Cr *Expected Date of COD: 2021-22*
- **Construction of 110kV substation Vazhoor**
Project Cost: 14.4 Cr *Date of COD: 2020-21*
Revised Project Cost: 12.3 Cr *Expected Date of COD: 2021-22*
- **Upgradation of 66kV Substation Kuttanadu to 110kV**
Project Cost: 15.16 Cr *Date of COD: 2020-21*
Revised Project Cost: 14.2 Cr *Expected Date of COD: 2021-22*

CAPEX SBU-T (More than ₹10 Cr)

- **Upgradation of 66kV PUNNAPRA-ALAPPUZHA DC Feeder to 110 kV**

Project Cost: 17.54 Cr

Date of COD: 2020-21

Revised Project Cost: 21 Cr

Expected Date of COD: 2021-22

- **110kV Switching Cum Substation at PANTHALACODE**

Project Cost: 25.16 Cr

Date of COD: 2020-21

Revised Project Cost: 25.16 Cr

Expected Date of COD: 2021-22

- **Upgradation of 66 kV TVT No. I & II feeders**

Project Cost: 60.03 Cr

Date of COD: 2021-22

Revised Project Cost: 60.03 Cr

Expected Date of COD: 2021-22

CAPEX SBU-T (More than ₹10 Cr)

- **Renovation and modernisation 110kV GIS Substation, Malappuram**

Project Cost: 62.02 Cr

Date of COD: 2020-21

Revised Project Cost: 38.5 Cr

Expected Date of COD: 2022-23

- **GIS converted to AIS (shifted to new control Period)**

- **LILO on 110kV Edarikode- Tirur to Parappanangadi S/s**

Project Cost: 14.96 Cr

Date of COD: 2020-21

Revised Project Cost: 17.16 Cr

Expected Date of COD: 2020-21

- **Delay due to waterlogging in line survey areas**

- **Construction of 110kV GIS Substation, Vengaloor**

Project Cost: 46.39 Cr

Date of COD:2020-21

CAPEX SBU-T (More than ₹10 Cr)

- Construction of new 110kV DC line from Kayamkulam to Karunagapally

Project Cost: 41.65 Cr

Date of COD: 2021-22

- Construction of 110/11 kV Vengara SS

Project Cost: 28.24 Cr

Date of COD: 2021-22

- Construction of 110kV SS Adivaram

Project Cost: 16.89 Cr

Date of COD: 2020-21

CAPEX SBU-T (More than ₹10 Cr)

- **Construction of 110 kV SS Kadampuzha**

Project Cost: 23.53 Cr

Date of COD: 2020-21

- **Upgradation of Mavelikara Pallom 66kV DC**

Project Cost: 41.8 Cr

Date of COD: 2021-22

- **Construction of 110kV DC line from 66kV SS Kattapana to 66 kV Peerumedu**

Project Cost: 40.7 Cr

Date of COD: 2021-22

CAPEX SBU-T (More than ₹10 Cr)

- Upgradation of 66kV Sasthankotta Chavara DC line

Project Cost: 21.85 Cr

Date of COD: 2021-22

- Upgradation of 66kV Edappon Kozhenchery SC line and associated Bays

Project Cost: 20.65Cr

Date of COD: 2021-22

- Construction of 110kV SS Thiruvali

Project Cost: 13.41 Cr

Date of COD: 2020-21

CAPEX SBU-T (More than ₹10 Cr)

- **Construction of Thimiri SS**

Project Cost: 20.87 Cr

Date of COD: 2021-22

- **Construction of Munnar SS and associated lines**

Project Cost: 22.13 Cr

Date of COD: 2021-22

- **Kuthungal Nedugandam line**

Project Cost: 16 Cr

Date of COD: 2021-22

CAPEX SBU-T (More than ₹10 Cr)

- **Aluva Kothamangalam Line**

Project Cost: 42.49 Cr

Date of COD: 2021-22

- **110kV SS Murikkasery**

Project Cost: 11.6 Cr

Date of COD: 2021-22

CAPEX SLDC

Sl.No	Name of Project	Expected Date of Completion	Remarks
1	SAMAST		Awaiting for sanction from PSDF
2	Reliable communication and Data Acquisition Project	15.05.2022	Ongoing



THANK YOU