MINUTES OF THE MEETING
OF
THE 79TH FORUM OF REGULATORS (FOR)

Date: 22nd April, 2022
Venue: Conference Hall, Upper Ground floor, CERC

Shri P.K. Pujari, Chairperson, CERC/FOR welcomed all the participants to the 79th meeting of the FOR. He also introduced and welcomed Shri Harpreet Singh Pruthi, Secretary, FOR/CERC, who assumed office recently. The list of participants is placed at **Appendix–I.**

Thereafter, the agenda items were taken up for discussion

AGENDA 1: CONFIRMATION OF THE MINUTES OF THE 78TH FOR MEETING HELD FROM MARCH 3RD TO 5TH, 2022

1. Deputy Chief (RA), CERC, updated the Forum on the minutes of the FOR 78th meeting and action taken and requested for approval of the minutes.

2. While the Forum confirmed the minutes on all agenda items, the issue of nomination to the USAID supported study tour on Financial derivatives and BESS was discussed and it was decided that after opportunity is given to those Chairpersons who have not attended any training program supported by FOR in the past, preference will be given to those Chairpersons who will be demitting office earliest, irrespective of whether they have attended such programs earlier. The FOR Secretariat was directed to finalise nominations in the study tour accordingly.

3. Thereafter, the Forum approved the Minutes.

AGENDA 2: ACCOUNTS RELATED ISSUES

a) Budget of FOR for FY 2022-2023:

1. Deputy Chief (RA), CERC apprised the Forum on the salient features of the FOR budget, including the projected income & expenditure and projected deficit (on cash basis) for the F.Y. 2022-2023.
2. The Members of the Forum were apprised that over the past 2(two) years, there has been an accumulation of funds to the tune of Rs.5.25 Crore (on cash basis),

as most the meetings and training programs were held virtually due to COVID-19 pandemic. Based on review of the income and expenditure and reserves position, the Forum decided to reduce membership fee of FOR for the FY 2022-2023 from Rs 4 lakh per annum to Rs 1 lakh per annum.

3. Chairperson, CERC/FOR suggested that the reduction (from Rs.4 lakh per annum to Rs.1 lakh per annum) would be for the F.Y. 2022-2023 only for effective utilization of the accumulated funds. It was agreed that unless otherwise decided, the membership fee of Rs.4 lakh per annum shall be restored from the F.Y. 2023-2024 onwards.
4. Deputy Chief (RA) also apprised the Members of the Forum regarding the request received from Chairperson, Joint Electricity Regulatory Commission (J&K and Ladakh), for including the Chairpersons / Members of the JERCs in foreign study tours. After discussion, the Forum decided that FOR Secretariat may initiate a proposal for conducting foreign study tours only for the Chairpersons/Members of CERC and JERCs as a separate program funded by the Forum's own funds.
5. Accordingly, the budget was approved by the Forum.

b) Re-appointment of the Auditor for the F.Y. 2021-2022:

1. The Forum approved the re-appointment of M/s AVAN & Associates, Chartered Accountants, New Delhi (empanelled with the C&AG of India) as Auditors of FOR for the F.Y. 2021-2022 (i.e. 3rd year of their tenure).

c) Re-appointment of the Tax Consultant for the F.Y. 2021-2022:

1. The Forum approved the re-appointment of M/s R.K. Raman & Co., Chartered Accountant, New Delhi as the Tax Consultant to file the Income Tax Return and Tax Audit Report of FOR for the F.Y. 2021-2022 (i.e. 3rd year of their tenure).

d) Re-appointment of the GST Consultant for the F.Y. 2022-2023.

1. The Forum approved the re-appointment of M/s Sharma Kathuria & Co., Chartered Accountants, New Delhi as the GST Consultant to file the GST returns of FOR for the F.Y. 2022-2023 (i.e. 2nd year of their tenure).

e) Opening of new savings bank account of FOR with Punjab National Bank, Connaught Place, New Delhi:

1. Deputy Chief (RA), CERC apprised the Forum that Union Bank of India (UBI), Connaught Place, New Delhi (current bankers of FOR) had informed that they will not be able to extend the existing scheme (viz. with Rs.50,000/- as the minimum savings bank account balance and autosweeps/ flexi deposits of Rs.5,000/- & multiples of Rs.5,000/-) to FOR, as after the merger of erstwhile Corporation Bank with UBI, the said scheme is valid only for their individual customers, and FOR being a Corporate Body, the scheme cannot be extended to FOR. Further, it was also informed that the existing scheme of FOR will be converted to maintain Rs.10 lakh as the minimum savings bank account balance and auto-sweeps/flexi deposits would be for Rs.5 lakh & multiples of Rs.5 lakh.
2. Deputy Chief (RA), CERC further apprised that the aforesaid existing scheme is available with Punjab National Bank, Connaught Place, New Delhi, who are also the bankers of CERC.
3. Deputy Chief (RA), CERC clarified that the surplus funds of FOR are already being invested into the auto-sweeps/flexi deposits and as CERC is also availing similar facilities in PNB, it would be convenient if the FOR also has an account with PNB.
4. After discussions, the Forum agreed to the proposal for the opening of the new bank account with PNB, Connaught Place, New Delhi. The Forum also duly approved the **"Resolutions"** required for the opening of the new bank account & authorization of officials to operate the new bank account with PNB; applying for the net banking facility (only for the purpose of viewing bank statements and making statutory payments, like TDS, Income Tax & GST) with PNB and closing of the bank account with UBI.

AGENDA 3: AMENDMENT TO SECTION 10(23BBG) OF THE INCOME TAX ACT, 1961

1. Deputy Chief (RA), CERC apprised the Forum on the request received from Secretary, Tamil Nadu Electricity Regulatory Commission, for amendment in

Section 10(23BBG) of the Income Tax Act, 1961, with regard to the inclusion of the State Electricity Regulatory Commissions and Joint Electricity Regulatory Commissions, along with Central Electricity Regulatory Commission, to avail benefit of exemption under the said section.

2. Deputy Chief (RA) apprised that in the past, similar requests were also received from a few other SERCs based on which CERC/FOR had corresponded with the Central Board of Direct Taxes, Ministry of Finance & Ministry of Power, to seek exemption for the SERCs & JERCs. A few SERCs have already got the exemption benefit under section 10(46) of the Income Tax Act, 1961 for a period of 5 years and with a provision for renewal.
3. The Members of the Forum observed that it is a cumbersome process to re-apply for exemption under section 10(46) of the Income Tax Act, 1961, after every five years. Hence, the Members proposed that FOR Secretariat may make a request to the Ministry of Finance (MoF) on behalf of all the SERCs & JERCs for permanent exemption.
4. The Forum approved the proposal and advised FOR Secretariat to take further steps to send a request to the Ministry of Finance, Government of India in this regard.

AGENDA 4: MOU BETWEEN FOR AND CER, IIT KANPUR

1. Deputy Chief (RA), CERC apprised the Forum that in year 2017, FOR had signed a MoU with IIT Kanpur for conducting various capacity building programs for Chairpersons/Members and officers of ERCs. Further, CER, IIT Kanpur was also a part of the PSR program (under the cooperation between Government of India and Government of UK), wherein the FOR Regulatory Webtool was designed and developed. As the PSR Program was ending on 31st March 2022, the Regulatory Tool was formally approved by the FOR and the FOR had also approved the proposal that CER, IIT Kanpur would maintain the Regulatory webtool for the FOR thereafter. Accordingly, CER - IIT Kanpur suggested amendment to the existing MoU so that they can formalize maintaining the Regulatory Tool from 1st April 2022. They also submitted a financial proposal for maintaining the FOR Regulatory webtool for a period of one year.

2. Accordingly, a new MOU for a period of 5 years has been proposed wherein CER, IIT Kanpur will undertake identified programs/activities such as Capacity Building Programs (CBP), Global Regulatory Perspective (GRP) programs for Commissioners of the ERCs, Regulatory Research Camps (RRC), Regulatory Certification Program (RCP) as also maintaining the Regulatory Tool (Database & Dashboard).
3. The Forum discussed the MOU and also the financial proposal and suggested that the costs for the said program may be incurred from the funds being received from the Ministry of Power, Government of India considering that this tool has been developed under the PSR program. In case funds are not received from Ministry of Power, the payment may be made from Forum's own funds.
4. The Forum approved the Draft MOU in principle and directed that the draft be finalized after obtaining approval of Chairperson, CERC/FOR.

AGENDA 5: CURRENT POWER SHORTAGE AND CENTRAL GOVERNMENT ADVICE TO IMPORT 10% COAL REQUIREMENT - REFERENCE FROM UPERC.

1. Chairperson, UPERC informed the Forum about the issue pertaining to technical feasibility for the old plants to adhere to the coal blending directions, shortage of wagons for the transportation of coal from port to hinterland, high cost of imported coal vis-à-vis domestic coal and pass through of the cost of imported coal used for generation.
2. The FOR deliberated on the matter in detail and noted that several technical issues and challenges that may be faced by the power plants in blending of domestic coal with imported coal. It was agreed by the FORUM that each SERC may examine the State specific conditions and take action as appropriate to address the technical issues and challenges due to the blending of imported coal.

AGENDA 6: STUDIES UNDER THE PSR PROGRAM

1) ***Study on "Analysis of Key Factors Impacting Electricity Tariffs in India".***
2) ***Study on "Analysis of Historical Trend of Electricity Tariffs".***

1. The Ministry of Power, in partnership with the UK's Foreign, Commonwealth & Development Office had undertaken a technical assistance program titled "Supporting Structural Reforms in the Indian Power Sector (Power Sector Reforms Program)". KPMG (in India) is the lead implementation agency for this program along with ABPS Infrastructure Advisory and CER, IIT Kanpur.
2. Deputy Chief (RA), CERC appraised the FORUM that under this program the first study on "Analysis of electricity tariffs and impact of various factors (controllable and non-controllable) over the last 5 years which affects cost of supply" had been approved by the Forum in the 70th FOR Meeting held on 31.01.2020.
3. The said study in which the PSR team had lent their assistance has already been approved by the FOR during its previous meetings and the report has been published.
4. On the second study on "Analysis of Historical Trend of Electricity Tariff", the representatives of ABPS Infrastructure Advisory and KPMG made a detailed presentation of the State-wise analysis of change in ACoS during the last 7 years (i.e., from FY 2014-15 to FY 2020-21) in 8 States of Karnataka, Madhya Pradesh, Uttarakhand, Bihar, Kerala, Jharkhand, Assam & Odisha **(Annexure-I)**.
5. Member (AG), CERC observed that there is no contribution of power purchase cost in the case of Kerala for past seven years from FY 2014-15 to FY 2020-21 whereas for other States, the increase in power purchase cost is almost 60-70%. Chairperson, KSERC clarified that for the period under consideration, the power consumption has hardly increased and almost all the requirement for the State has been met through their own installed hydro generation plants, which are completely depreciated, since the State has received normal rainfall during this period. He reiterated that the State's procurement from the central generating stations was very less during the period.

6. Member (AG), CERC, also observed that the presentation only highlighted the cost of supply of power. He added that the study does not highlight the past historical trends of change in tariff, the change in cross subsidy and the gap between ACoS & ARR for the States under consideration for the study. He suggested that the analysis should be more focused on the tariff for the past 7 years.
7. Director CER-IIT Kanpur made a presentation on the States of Gujarat, Haryana, Andhra Pradesh & Uttar Pradesh, informing that considerable reduction in fixed cost and participation in short term power market has helped the State of Gujarat to keep the CAGR of ACoS at a lower level **(Annexure-II).** He observed that the States considered in the study can reduce their power purchase cost by better short-term and long-term demand forecasting, efficient recovery of power purchase cost through FCA, by selling the surplus power to the short-term market or through bilateral arrangement, or through banking option.
8. Member (AG), CERC suggested that for better understanding of the historical trends of tariff for the States considered for the study, the ABR/ACoS ratio should be included in the report.
9. With the above suggestions, the Forum approved the study.

AGENDA 7: ARTIFICIAL INTELLIGENCE IN REGULATORY BODIES

1. The petitions and cases handled by the Regulatory Commissions are voluminous, requiring multi-stage processing, which is time consuming. Hence, CERC in order to better managing the court cases at least initially has taken the initiative to use Artificial Intelligence (AI) and has deployed the in-house developed Regulatory Experts System Tools (REST).
2. Deputy Chief (MIS), CERC made a detailed presentation on the implementation of IA in CERC, with detailed process flow of the REST software and tool **(Annexure-III)** and gave a live demonstration of the working of the tool.

3. Chairperson CERC observed that a lot of work needs to be carried out for full-fledged operation of the Tool. He added that CERC is making efforts to ease the processes with the use of IT. He also informed that market surveillance shall be a key function of the CERC in the near future where collection and analysis of real time data from multiple sources for monitoring will be a challenge and therefore, efficient use of IT and AI would be important.

AGENDA 8: CROSS SECTORIAL COLLABORATIVE REGULATION BETWEEN TELECOM REGULATOR AND ELECTRICITY REGULATOR

1. Chairperson, CERC welcomed Chairperson, TRAI and other officials of TRAI to the FOR meeting and informed the Forum that further to the discussion on the recommendations of the FOIR Working Group on "Cross Sectoral Collaborative Regulation between Telecom Regulator and Electricity Regulators" in the 78th FOR meeting of the FOR held during 03rd - 05th March at Kolkata, a meeting was subsequently held on 22nd March, 2022 at CERC between officials of CERC and TRAI on various action points drawn from the recommendations submitted by the working group. It has been agreed that TRAI and CERC would be working together for developing a policy framework for infrastructure sharing and incentivizing such sharing.
2. In continuation to the above, TRAI vide their email dated 01.04.2022 had requested CERC that the identified action points may be taken up at an appropriate Forum so that the collaborative mechanism between two sectors can be strengthened.
3. Thereafter, Advisor, TRAI made a detailed presentation **(Annexure-IV)** on the identified points where the TRAI envisages cooperation from the electricity Regulators.
4. After detailed discussion, the Forum agreed on various points as under:

   a) Point No.1: Monetizing assets of Power utility companies - For sharing of revenues earned by Transmission and Distribution utilities through Telecom business, implementation of regulations in line with CERC Regulation (Sharing of Revenue Derived from Utilization of Transmission Assets for Other Businesses), 2020 by the State Regulators.

The FOR members informed that regulations on revenue sharing between the distribution utilities and the consumers for income other than the core business already exist in most of the States. It was agreed similar regulations indicating the percentage of revenue which may be shared between the distribution utilities and the consumers, may be considered by the regulators of all such States where no such sharing regulations exist.

b) Point No.2: One Distribution utilities One Bill One Payment mechanism - Establishment and implementation of mechanism at Distribution utilities level to enable issue of single clubbed bill and single payment for large number of small cells each of which is installed on individual pole and having individual meter.

FOR members agreed that if the poles of the Distribution utilities are properly identified with asset registry and metered connection is issued for each telecom cell installed on individual identified pole, it shall be possible for establishment of a mechanism for issuance of a single order for multiple connections, for issuance of single composite bill for multiple meters (with details of individual metering) and for payment of such composite bill. It was agreed that the telecom service provider may approach the concerned State Commission, if required, for this purpose.

c) Point No.3: Industrial tariff for Telecom service provider; Installation of Prepaid smart meters at telecom sites; Allowing electricity consumption at each telecom site to be aggregated and offset with green power generated at other locations.

The Forum observed that it may not be possible to offset energy consumed by the Telecom service provider with green energy. The Forum suggested that the Telecom operators may approach the respective State Electricity Regulatory Commissions for creation of a separate tariff slab or category for the energy consumed by Telecom operators. The Forum observed that it is possible to install Prepaid smart meters at telecom sites.

d) Point No.4: As Telecom service providers are mandated to meet quality of service parameters prescribed by TRAI, they have to ensure that the mobile sites are not shut down due to prolonged power outages and therefore, the Distribution utilities should provide area wise information on their website about the planned outages and future maintenance schedule.

The Forum observed that preventive maintenance is carried out by the distribution utilities as per their schedule as published. However, in many cases it is not possible to strictly adhere to the schedule due to operational difficulties at the ground level and due to the need of undertaking emergency maintenance.

e) Point No.5: As per CBDT Circular dated 30th June, 2021, companies are paying 0.1% TDS on the Distribution utilities bill payments, whereas some Distribution utilities are yet to upgrade their payment portals to accept bill net of TDS resulting in double payment by companies. The Distribution utilities should either seek exclusion from CBDT for TDS applicability upon electricity payments or seek some moratorium period to upgrade their system.

The Forum suggested that it would be appropriate if the matter is taken up by TRAI with CBDT.

5. Chairperson, TRAI thanked all the members of the Forum for the support extended to TRAI, which will enable easy and cost effective roll out of the 5G network throughout the country.

AGENDA 9: APPLICABILITY OF GST ON COURT & TRIBUNAL

1. The Members of the Forum raised the issue of payment of GST on the fee levied by the ERCs and sought guidance from Chairperson, CERC as to the practice followed by CERC. In response, Chief (RA), CERC informed the Forum that CERC had received a clarification from the Ministry of Finance in this regard.

2. At the request of the Forum members, Chairperson, CERC agreed that the FOR Secretariat shall share the aforesaid letter with all the Forum members.

AGENDA 10: ANY OTHER ITEM

1. Chairperson, Tripura ERC proposed that once a Chairperson of the Forum demits office, he or she be invited as a special invitee in the next FOR meeting and the cost of his or her travel and accommodation may be borne by the FOR.
2. Appreciating the sentiment, the Forum approved the proposal.

CONCLUSION:

Secretary, CERC/FOR thanked all the members of the Forum for participating in the meeting. He also thanked the officials of the FOR Secretariat for coordinating and organizing the meeting.

The Meeting ended with a vote of thanks to the Chair.

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/ APPENDIX – I /

LIST OF PARTICIPANTS OF THE 79TH MEETING

OF

FORUM OF REGULATORS (FOR)

FRIDAY, 22ND APRIL, 2022.

S. No.	NAME	ERC
01.	Shri P.K. Pujari Chairperson	CERC / FOR – in Chair.
02.	Justice (Shri) C.V. Nagarjuna Reddy Chairperson	APERC
03.	Shri Shishir Sinha Chairperson	BERC
04.	Justice (Shri) Shabihul Hasnain 'Shastri' Chairperson	DERC
05.	Shri R.K. Pachnanda Chairperson	HERC
06.	Shri D.K.Sharma Chairperson	HPERC
07.	Shri Lokesh Dutt Jha Chairperson	JERC for UTs of J&K and Ladakh
08.	Shri Preman Dinaraj Chairperson	KSERC
09.	Shri Sanjay Kumar Chairperson	MERC
10.	Shri P. W. Ingty Chairperson	MSERC
11.	Shri Khose Sale Chairperson-cum-Member	NERC
12.	Shri Viswajeet Khanna Chairperson	PSERC
13.	Shri K.B. Kunwar Chairperson	SSERC
14.	Shri M. Chandrasekar Chairperson	TNERC

15.	Shri T. Sriranga Rao Chairperson	TSERC
16.	Shri D. Radhakrishna Chairperson	TERC
17.	Shri Raj Pratap Singh Chairperson	UPERC
18.	Shri H.M. Manjunatha Member (Legal)/Officiating Chairperson	KERC
19.	Shri Gajendra Mohapatra Member (Legal)/Officiating Chairperson	OERC
20.	Shri Vinod Deshmukh Member (Judicial)	CSERC
21.	Ms. Jyoti Prasad Member (Law)	JERC (for State of Goa & UTs)
22.	Shri Mukul Dhariwal Member	MPERC
23.	Shri M.K. Jain Member (Tech.)	UERC
24.	Shri Harpreet Singh Pruthi Secretary	CERC/FOR
25.	Dr. Sushanta K. Chatterjee Chief (RA)	CERC
SPECIAL INVITEES		
26.	Dr. P.D. Vaghela Chairperson	TRAI
27.	Shri Arun Goyal Member	CERC
28.	Shri Pravas Kumar Singh Member	CERC
29.	Shri V. Raghunandan Secretary	TRAI
30.	Shri Proteek Chakraborty Chief (Finance.)	CERC
31	Shri Rajiv Sinha Principal Advisor	TRAI
32.	Shri Sanjeev Kumar Sharma Advisor	TRAI
33.	Shri N. Pradeep Kumar Deputy Director (Gen.)	KERC
34.	Ms Vaishali Rana, Dy Chief (MIS)	CERC
35.	Shri Udit Mathur	DFID, UK
36.	Dr. Anoop Singh	CER, IIT, Kanpur

37.	Shri Ramit Malhotra	KPMG
38.	Shri Suresh Gehani	KPMG
39.	Shri Midhat Laskar	KPMG
40.	Shri Archit Arora	KPMG
FOR SECRETARIAT		
41.	Ms. Rashmi Somasekharan Nair Dy. Chief (RA)	CERC
42.	Shri Sanjeev Tinjan Asst. Chief (RA)	CERC
43.	Shri Rajiv Srivastava Asst. Secy.	CERC/FOR
44.	Shri Ravindra Kadam Advisor (RE)	CERC
45.	Shri Saurabh Principal Research Officer	CERC
46.	Shri Manavendra Pratap Research Officer	CERC
47.	Shri Kushal Pal Research Officer	CERC
48.	Ms. Shreya Jad Research Associate	CERC
49.	Shri Nilesh Diwan Accounts Officer	SAFIR
50.	Shri Sushil Kumar Arora Administrative Officer	SAFIR
51.	Shri Davinder Kumar	IT Cell, CERC
52.	Ms. Bhuvana	Executive (Admn.), FOR Sectt
53.	Shri Rajat Srivastava	Assistant, FOR Sectt
54.	Shri Anirudh	IT Cell, CERC

Annexure-I

UK Government

Study on Analysis of Historical Trend of Electricity Tariffs

May 2022

PSR PROGRAMME | Supporting Structural Reforms in the Indian Power Sector

CER Centre for Energy Regulation

Contents

Rationale and Objective

Rationale

- Retail supply tariffs are designed to recover the cost incurred across the entire value chain i.e., generation, transmission, distribution and retail supply.
- Tariff depends on multiple factors (i.e., cost of fuel and transport, cost of generation, transmission and distribution, taxes and cess, etc.) which varies from state to state.
- Keeping this in view, the study on **"Analysis of Historical Trend of Electricity Tariffs"** has been undertaken to assess the impact of these factors on electricity tariffs for the period FY 2014-15 to FY 2020-21.

Objectives

To assess change in electricity tariffs and identify key factors impacting the same

To identify measures required to reduce electricity tariffs

The study was carried out under the Technical Assistance Programme, titled "Supporting Structural Reforms in the Indian Power Sector" (Power Sector Reforms Programme) implemented by UK Government's Foreign, Commonwealth and Development Office (FCDO), in partnership with the Ministry of Power (MoP) and Ministry of New and Renewable Energy (MNRE), Government of India. KPMG is the lead implementing partner for this technical assistance programme and has undertaken this study in association with ABPS Infrastructure Advisory Pvt. Ltd.

Selection of States for the study

- During the 70th meeting of FOR, six states (Assam, Bihar, Karnataka, Kerala, Madhya Pradesh and Odisha) were shortlisted for the study.
- In addition to the above, two more states (Jharkhand and Uttarakhand) were identified to ensure representation across regions.
- These states accounted for ~21% of the total electricity consumption[1] in the country (in FY-20).

Note:

1. Gross Energy Sold, Source: PFC Report on Performance of State Power Utilities 2019-20.

Overview of Electricity Consumption in study states

Domestic and agriculture consumers are highly cross-subsidized by C&I consumers (FY21)

State	Approved Sales (in MU)	Domestic		Commercial		Agriculture		Industrial[4]		Others	
		Sales	Revenue	Sales	Revenue	Sales	Revenue	Sales	Revenue	Sales	Revenue
Karnataka	61,826	23%	22%	12%[3]	17%	**35%**	27%	17%	21%	13%	12%
Madhya Pradesh	57,890	28%	27%	7%	11%	**43%**	37%	18%	21%	4%	4%
Bihar	26,498	**64%**	61%	12%	13%	4%	4%	13%	15%	6%	7%
Kerala	23,957	**50%**	36%	15%	24%	2%	1%	28%	34%	6%	6%
Uttarakhand	12,540[2]	25%	20%	11%	13%	2%	1%	**55%**	59%	7%	7%
Jharkhand	9,894	**59%**	57%	9%	9%	3%	2%	28%	30%	1%	2%
Assam	7,815	**50%**	42%	18%[3]	22%	1%	1%	17%	18%	14%	17%

State	Approved Sales (in MU)	LT		HT		EHT	
		Sales	Revenue	Sales	Revenue	Sales	Revenue
Odisha	22,126[2]	**58%**	50%	19%	22%	23%	27%

Source: Respective tariff order issued by state electricity regulatory commission.

Note:

1. Category wise revenue is inclusive of govt. subsidy as per tariff order issued by respective state commission.
2. For majority of states, agricultural and domestic consumers contribute to the most of sales except for Odisha and Uttarakhand. For the state of Uttarakhand, industrial consumers are the major contributor in total sales (55%).
3. For the states of Assam and Karnataka, both LT commercial and HT commercial consumer categories have been included in the commercial consumer category while estimating sales and revenue mix.
4. For industrial consumer category, both LT industrial and HT/HT and EHT industrial consumer categories have been included while estimating sales and revenue mix.
5. Approved revenue and sales figures have been considered for the above analysis

Cross-subsidization by C&I consumers is higher than 120%[1] for 6 out of the 8 study states (FY21)

State	Commercial	Industrial	
		LT	HT
Karnataka	**146%**	**124%**	119%[2]
Madhya Pradesh	**144%**	**145%**	108%
Bihar	110%	**148%**	118%[2]
Kerala	**143%**	110%	109%
Uttarakhand	**115%**	109%	110%[2]
Jharkhand	104%	**124%**	109%
Assam	**118%**	82%	108%[2]

State	LT	HT	EHT
Odisha	87%	**120%**	**120%**

Source: Respective tariff order issued by state electricity regulatory commission.

Note:

1. As per National Tariff Policy, the cross-subsidy levels should be within +/- 20%.
2. Cross subsidy by HT and EHT industrial consumers has been considered for the states of Assam, Bihar, Karnataka, and Uttarakhand as provided in the respective tariff orders.
3. Category wise revenue is inclusive of govt. subsidy as per tariff order issued by respective state commission.
4. Approved revenue and sales figures have been considered for the above analysis

Change in ACoS: State-wise analysis

Change in ACoS[1] for 3 states during last 7 years was higher than All-India average (%)

All units in Rs./kWh unless mentioned

State/ Component	ACoS FY 2014-15[5]	ACoS FY 2020-21[5]	Change (% increase)
Karnataka (KN)	5.56	7.79	2.23 (40%)
Madhya Pradesh (MP)	4.84	6.51	1.66 (34%)
Uttarakhand (UK)	4.16	5.53	1.37 (33%)
Bihar (BH)	5.71	6.94	1.23 (21%)
Kerala (KR)	5.28	6.43	1.15 (22%)
Jharkhand (JH)	5.30	6.39	1.09 (21%)
Assam (AS)	7.02	7.87	0.85 (12%)
Odisha (OD)	4.48	4.79	0.31 (7%)
Overall ACoS[2]	**5.16**	**6.72**	**1.56 (30%)**
All India average ACoS	**5.21[3]**	**6.83[4]**	**1.62 (31%)**

Higher than all India average change in ACoS

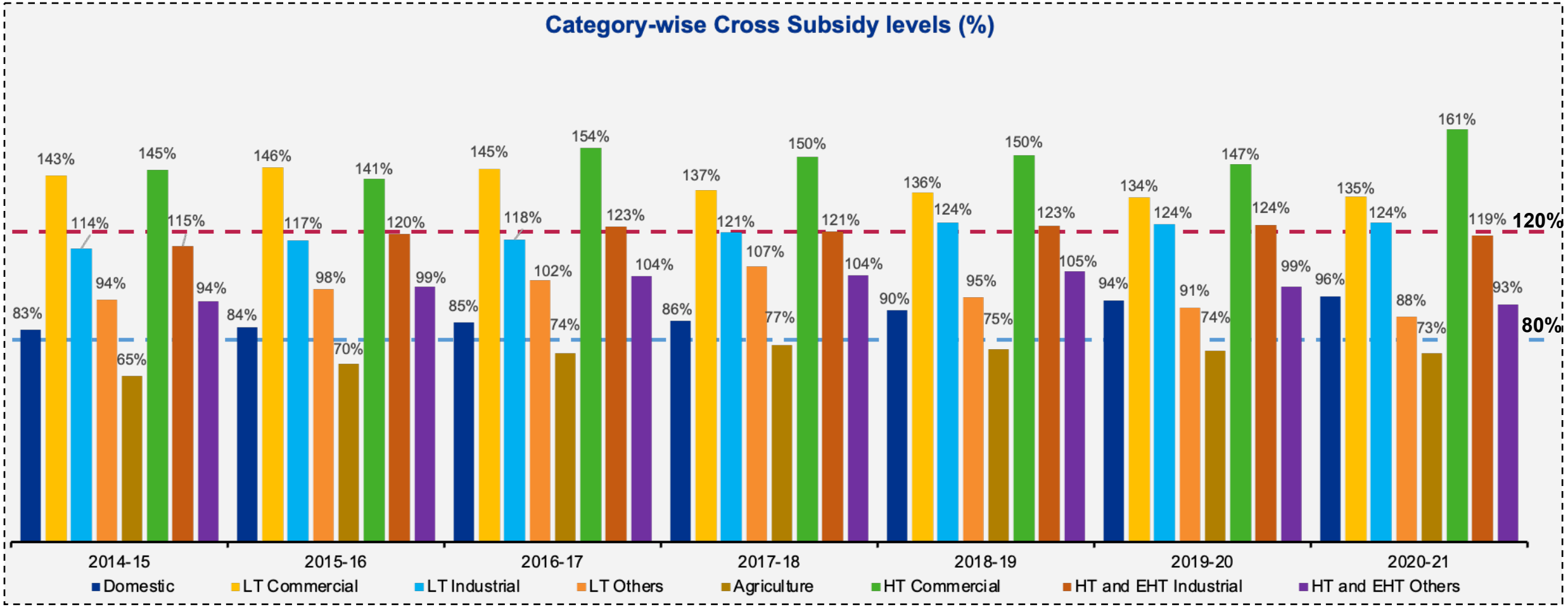
Lower than all India average change in ACoS

Note:

1. Change in ACoS is in percentage terms.
2. Overall ACoS for a year is computed by dividing the summation of net aggregate revenue requirement for 8 states (in Rs. Cr.) by the total of energy sales for 8 states (in MUs).
3. Source: PFC Report on performance of state power utilities from FY 2013-14 to FY 2015-16.
4. Source: Electricity Regulatory Information Access and Analytics Platform (Regulatory Tool). The following states are not included in computing all India ACoS for FY 21 due to unavailability of data- Andhra Pradesh, Arunachal Pradesh, Jharkhand, Rajasthan, Tamil Nadu, Telangana and West Bengal.
5. Approved ACoS figure has been considered for both FY 15 and FY 21 for each state

Karnataka: Cross Subsidy trend for last 7 years (1/3)

- Cross-Subsidy levels for both HT commercial and domestic categories have increased over the last 7 years. However, cross-subsidy levels of LT commercial category have witnessed a minor reduction during the same period.



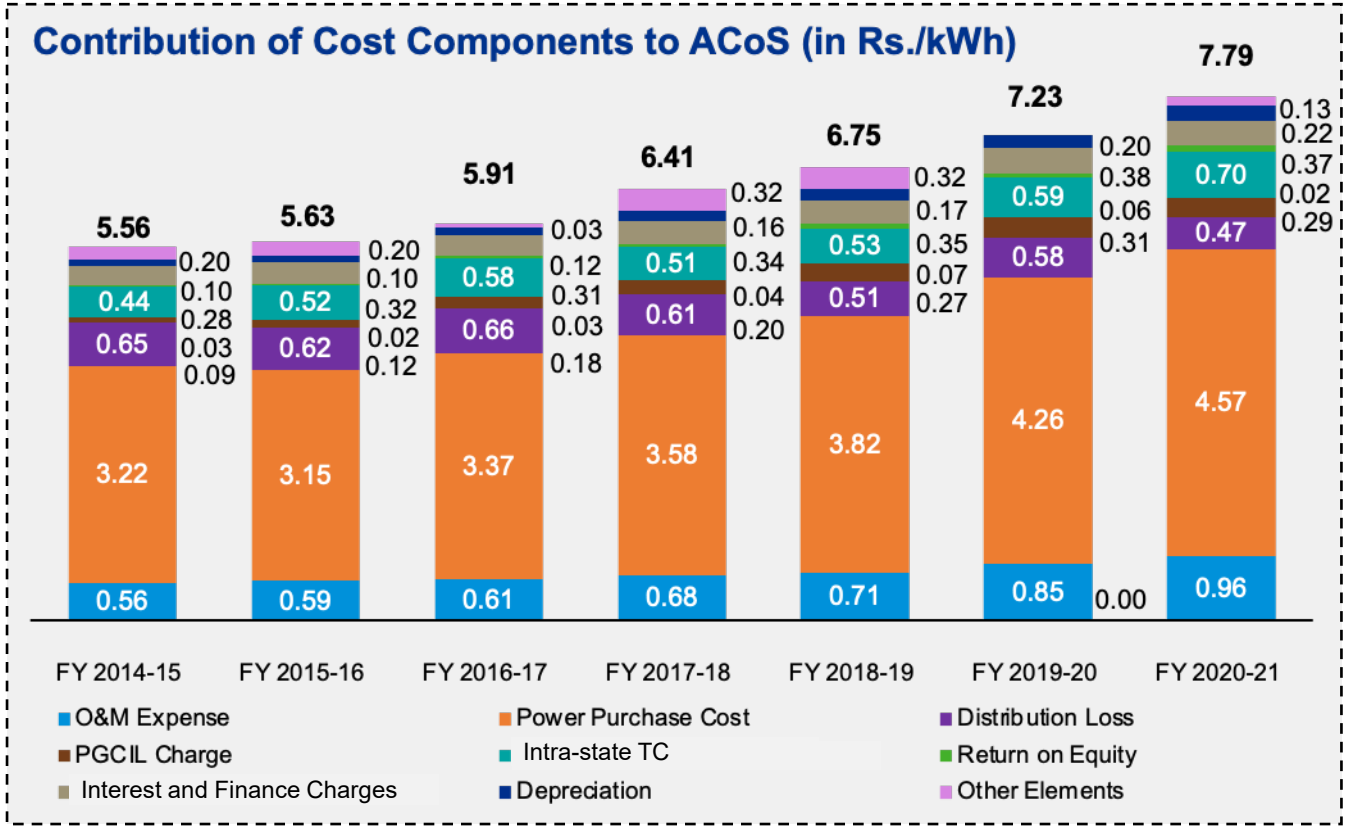
Source: Respective tariff orders issued by KERC.

Note:

1. Govt of Karnataka provided subsidy only to BJ/KJ customers and Agricultural customers (Irrigation Pump<10 HP). Category-wise revenue is including subsidy to BJ/KJ and Agricultural (IP<10) consumers.

Karnataka: Overall Summary (2/3)

- Karnataka Electricity Regulatory Commission (KERC) has consistently issued ARR tariff orders over the last 7 years.
- The latest true-up order was issued by the commission for FY 2019-20.
- The approved ACoS has increased by INR 2.23/kWh over the last 7 years.
  - Increase in ACoS is mainly on account of increase in power purchase cost contributing 60% to the overall increase in ACoS.
  - O&M expenses, intra-state transmission charges, PGCIL charges and depreciation have increased in the last 7 years.
  - Distribution loss and other elements[1] have reduced during the same time period.



Particulars	FY16	FY17	FY18	FY19	FY20	FY21	CAGR
Date of Issuance of Tariff Order - KERC	2nd Mar 2015	30th Mar 2016	11th April 2017	14th May 2018	30th May 2019	4th Nov 2020	
Increase in approved ACoS (%)	1.21%	5.01%	8.53%	5.23%	7.08%	7.82%	6.72%
% increase in ABR	1.36%	3.57%	6.98%	5.53%	7.82%	9.98%[3]	6.75%
% increase in ABR (including Govt Subsidy[2])	2.24%	7.61%[4]	8.53%[4]	4.94%	6.98%	8.47%	7.30%

Source: Respective tariff orders issued by KERC

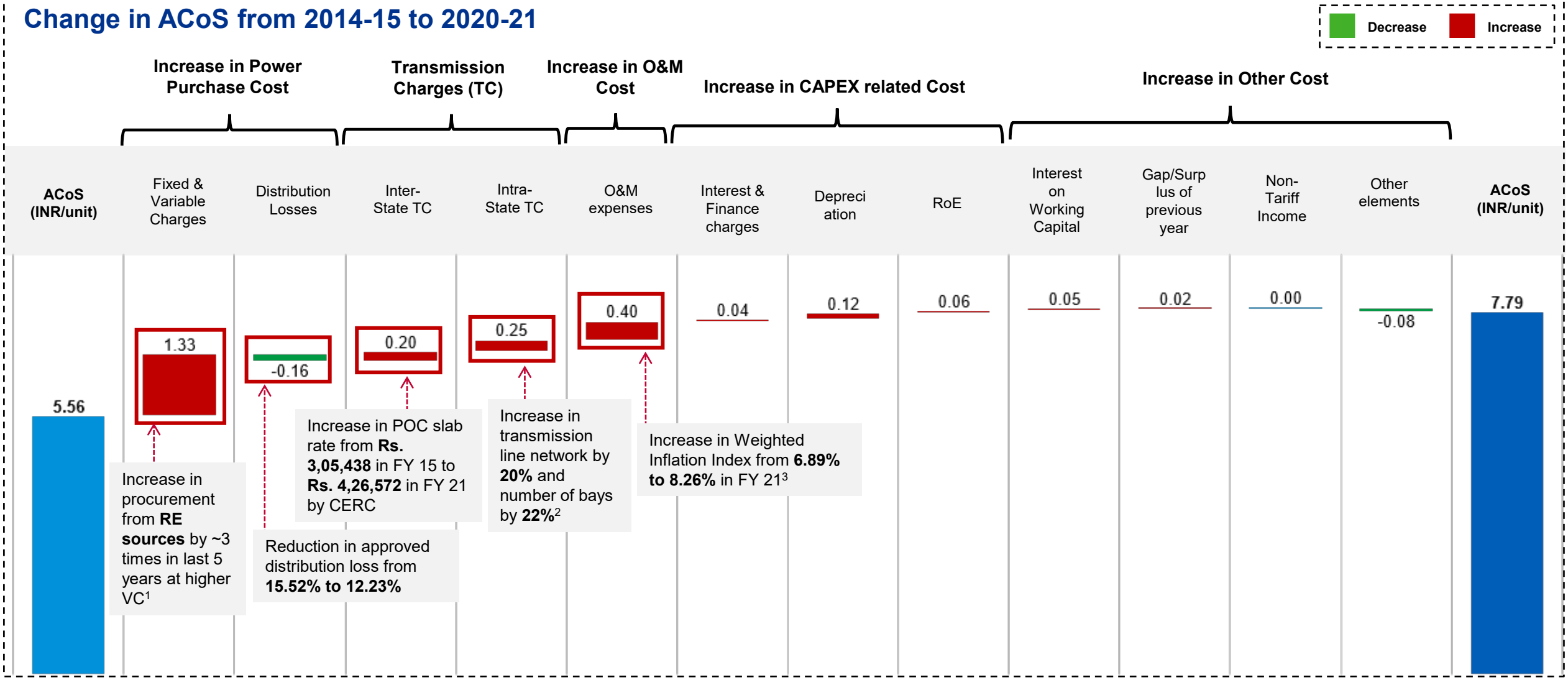
Note:

1. Other elements consists of gap/surplus of previous years, other income, funds towards consumer education, regulatory assets to be recovered, penalty and other adjustment, interest on working capital, non-tariff income, interest on CSD.
2. Govt of Karnataka is providing subsidy to BJ/KJ and IP consumers. ABR including govt subsidy is total revenue including revenue from BJ/KJ and IP consumers.
3. Higher % increase in ABR without govt subsidy as compared to ABR with govt subsidy mainly on account of reduction in number of IP installation for GESCOM from 4.2 lakhs to 4 lakhs in FY 21.
4. Higher % increase in ABR with govt subsidy in FY 17 and FY18 on account of increase in IP installation for BESCOM (from 7.3 lakhs to 8.5 lakhs) and increase in IP installation for HESCOM from 7.1 lakhs to 7.3 lakhs respectively.

State- wise analysis: Karnataka (3/3)

ACoS increased by INR 2.23/kWh over the last 7 years

Change in ACoS from 2014-15 to 2020-21

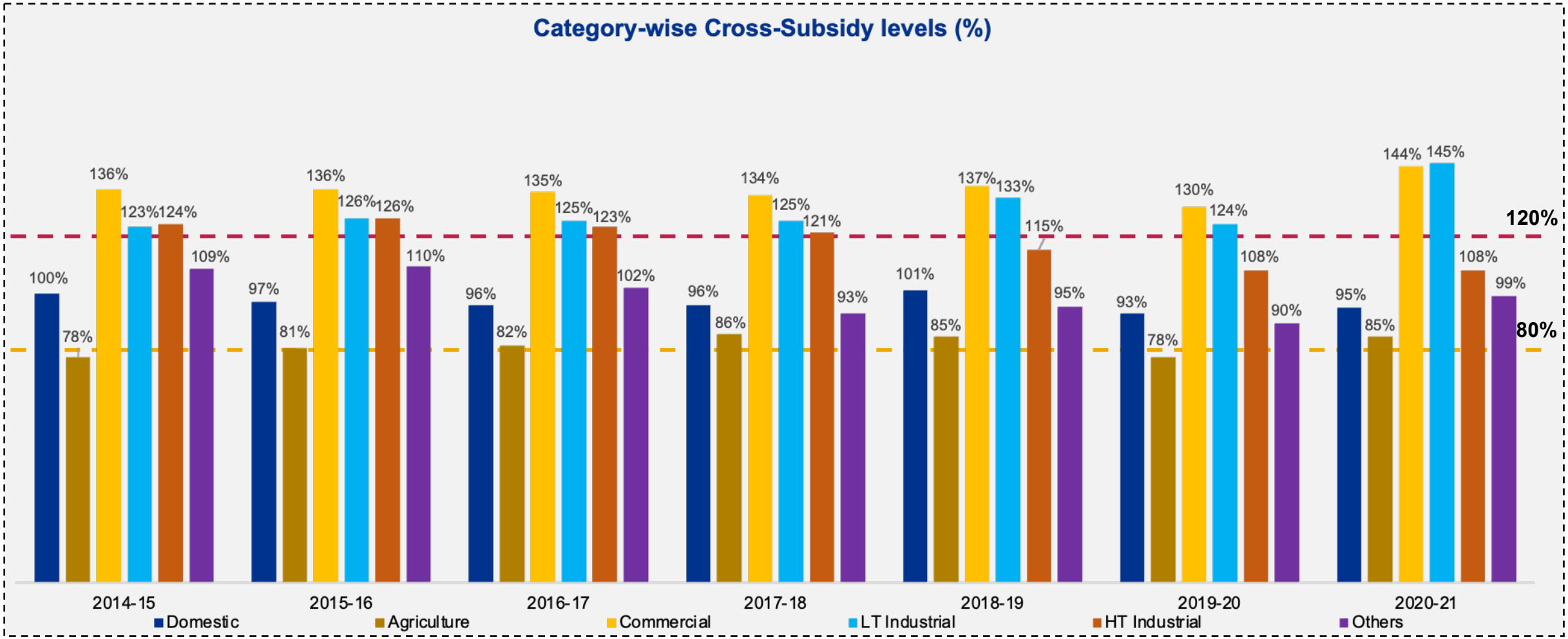


Note:

1. Inc. in quantum of power purchase from RE sources from 6.5 BUs to 17.6 BUs (21% energy share) @ high VC Rs. 3.9 – Rs. 4.4/kWh (avg PPC- Rs. 3.0-Rs. 3.5./kWh).
2. Transmission line length increased from 32,689 km in FY 15 to 39,145 km in FY 21 and number of bays increased from 20,239 in FY 15 to 24,698 in FY 21.
3. Weighted Inflation Index is estimated considering the historical values of CPI and WPI in the ratio of 80:20

Madhya Pradesh: Cross Subsidy trend for last 7 years (1/3)

- Commercial and LT industrial consumers have been the major cross-subsidizing categories for the state across the years.



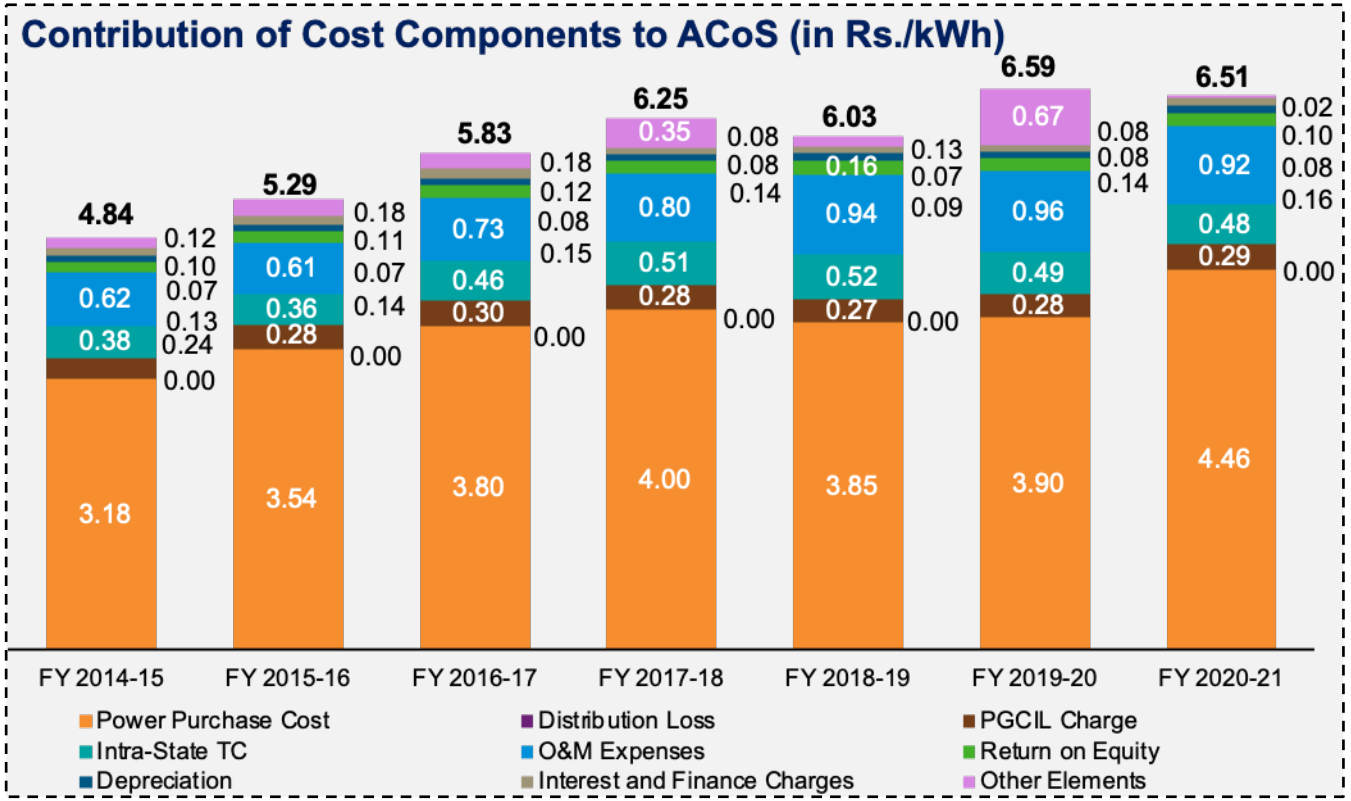
Source: Respective tariff orders issued by MPERC

Note:

1. Category wise revenue is excluding tariff subsidy component.

Madhya Pradesh: Overall Summary (2/3)

- Madhya Pradesh Electricity Regulatory Commission (MPERC) has been issuing tariff orders at regular intervals allowing commensurate tariff hike over the years leading to no revenue gap in the state.
- The latest true-up order was issued by the commission for FY 2020-21.
- The approved ACoS has increased by INR 1.66/kWh over the last 7 years. This is mainly due to increase in:
  - Power Purchase cost[1]- Contributed 77% to the change in ACoS on account of reduction in surplus power.
  - O&M Expense – Contributed 18% to the change in ACoS on account of growth in employee expenses[2] due to implementation of 7th pay commission and increase in Dearness Allowance (DA)



Particulars	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	CAGR
Date of Issuance of Tariff Order	17th April 2015	05th Apr 2016	31st Mar 2017	3rd May 2018	8th Aug 2019	17th Dec 2020	
Increase in approved ACoS (%)	9.1%	10.4%	7.1%	(3.4%)	9.2%	(1.3%)	5.0%
% increase in ABR	9.1%	10.4%	7.1%	(3.4%)	9.2%	(1.3%)	5.0%
% increase in ABR (including subsidy)	9.1%	10.4%	7.1%	(3.4%)	9.2%	(1.3%)	5.0%

Source: Respective tariff orders issued by MPERC

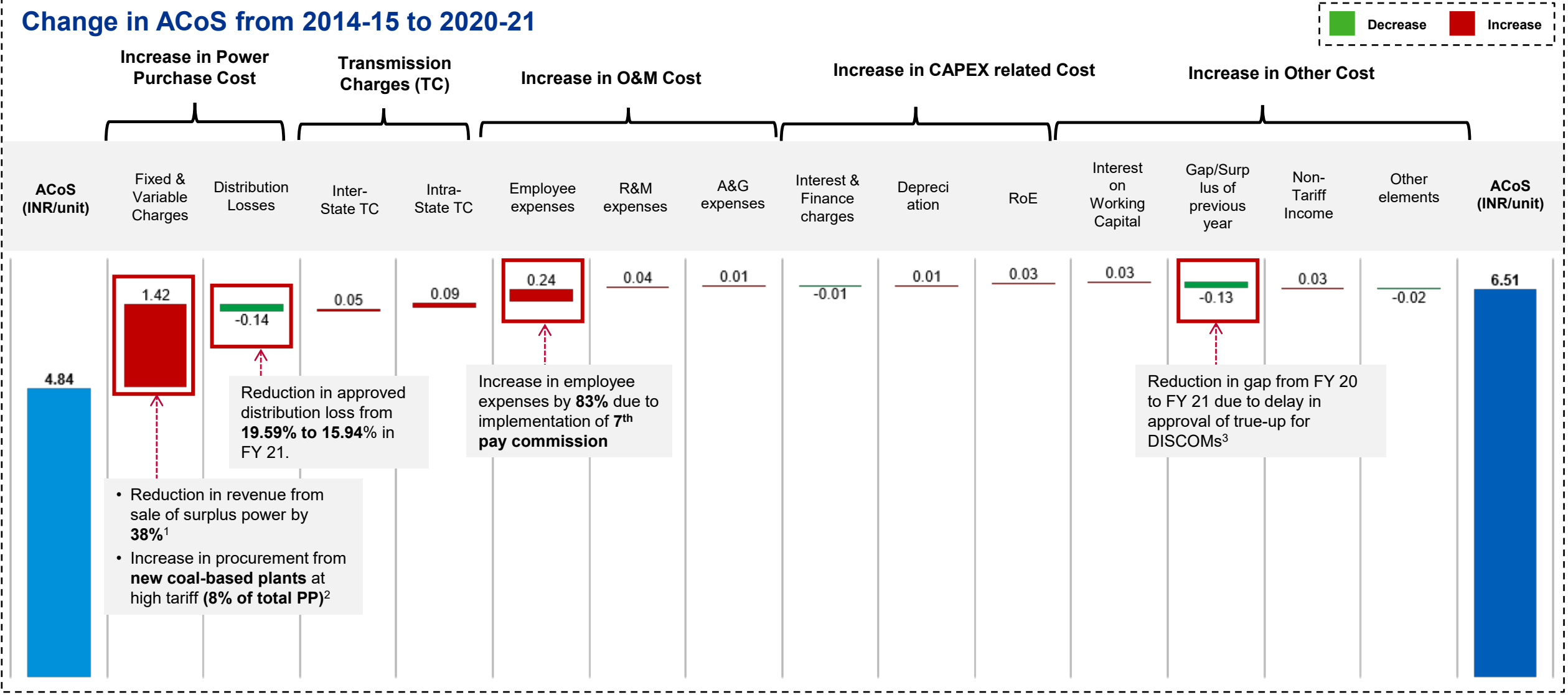
Note:

1. Power purchase cost has been computed including revenue from sale of surplus power.
2. Employee expenses in the state has increased from Rs. 0.48/kWh in 2014-15 to Rs. 0.72/kWh in 2020-21.

State- wise analysis: Madhya Pradesh (3/3)

ACoS increased by INR 1.66/kWh over the last 7 years

Change in ACoS from 2014-15 to 2020-21

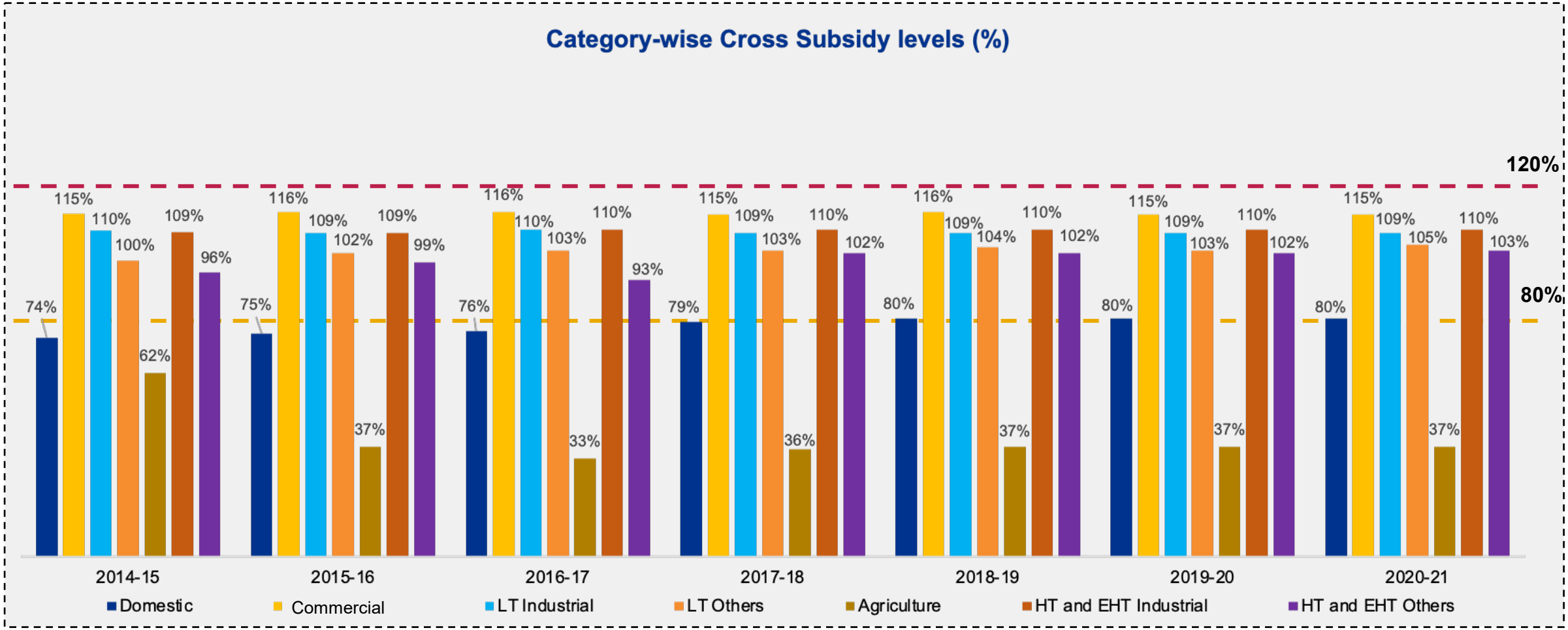


Note:

1. Surplus energy available for sale outside the state of MP has reduced from 24 BUs to 15 BUs mainly on account of increase in sales.
2. Increase in procurement from SGTPS and NTPC Mouda Unit 1 & 2 in 2017-18 at high VC (Rs. 2.42/kWh and Rs. 2.49/kWh resp, avg VC in 2016-17- Rs. 1.85/kWh) from nil to 6.3 BUs.
3. The existing gap (FY 21) includes true up of ARR only for MP Transco for FY 2017-18 (Rs. 522.45 Crore).

Uttarakhand: Cross Subsidy trend for last 7 years (1/3)

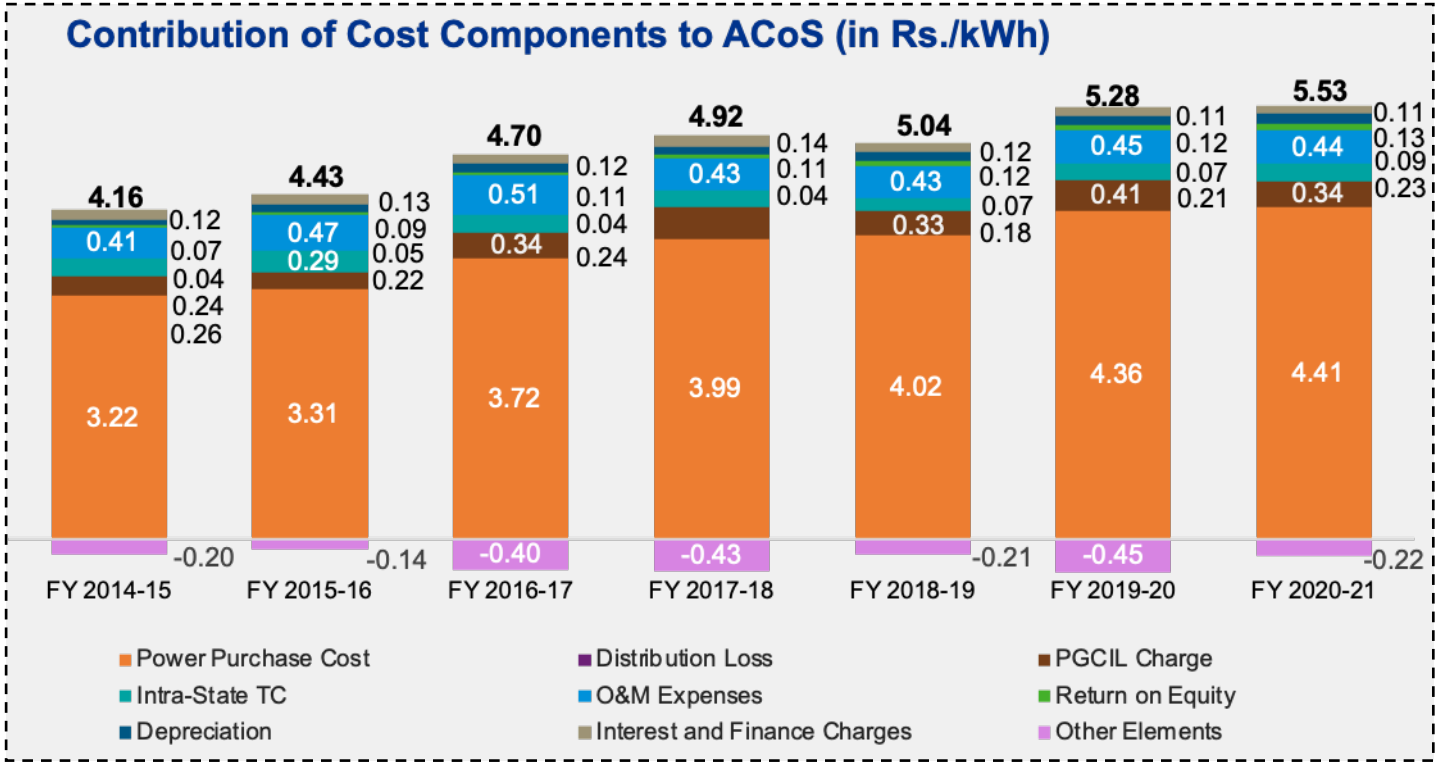
- Commercial and HT and EHT industrial consumers have been the major cross-subsidizing categories for the state across the years.



Source: Respective tariff orders issued by UERC.
Note:
1. Category wise revenue is excluding tariff subsidy component.

Uttarakhand: Overall Summary (2/3)

- Uttarakhand Electricity Regulatory Commission (UERC) has ensured timely revision of tariff allowing commensurate tariff hike over the years leading to no revenue gap in the state.
- The latest true-up order was issued by the commission for FY 2020-21.
- The approved ACoS has increased by INR 1.37/kWh over the last 7 years:
  - Significant change (~87%) in ACoS due to increase in power purchase cost
  - Increase in PGCIL charges, depreciation, O&M Expenses and ROE is offset by reduction in intra-state transmission charges, interest cost, and other elements component



Particulars	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	CAGR
Date of Issuance of Tariff Order	11th Apr 2015	05th Apr 2016	29th Mar 2017	21st Mar 2018	27th Feb 2019	18th Apr 2020	
Increase in approved ACoS (%)#	6.5%	6.0%	4.7%	2.6%	4.7%	4.7%	4.9%
% increase in ABR	6.0%	6.0%	4.7%	2.9%	5.1%	5.5%	5.0%
% increase in ABR (including subsidy)	6.0%	6.0%	4.7%	2.9%	5.1%	5.5%	5.0%

Source: Respective tariff orders issued by UERC

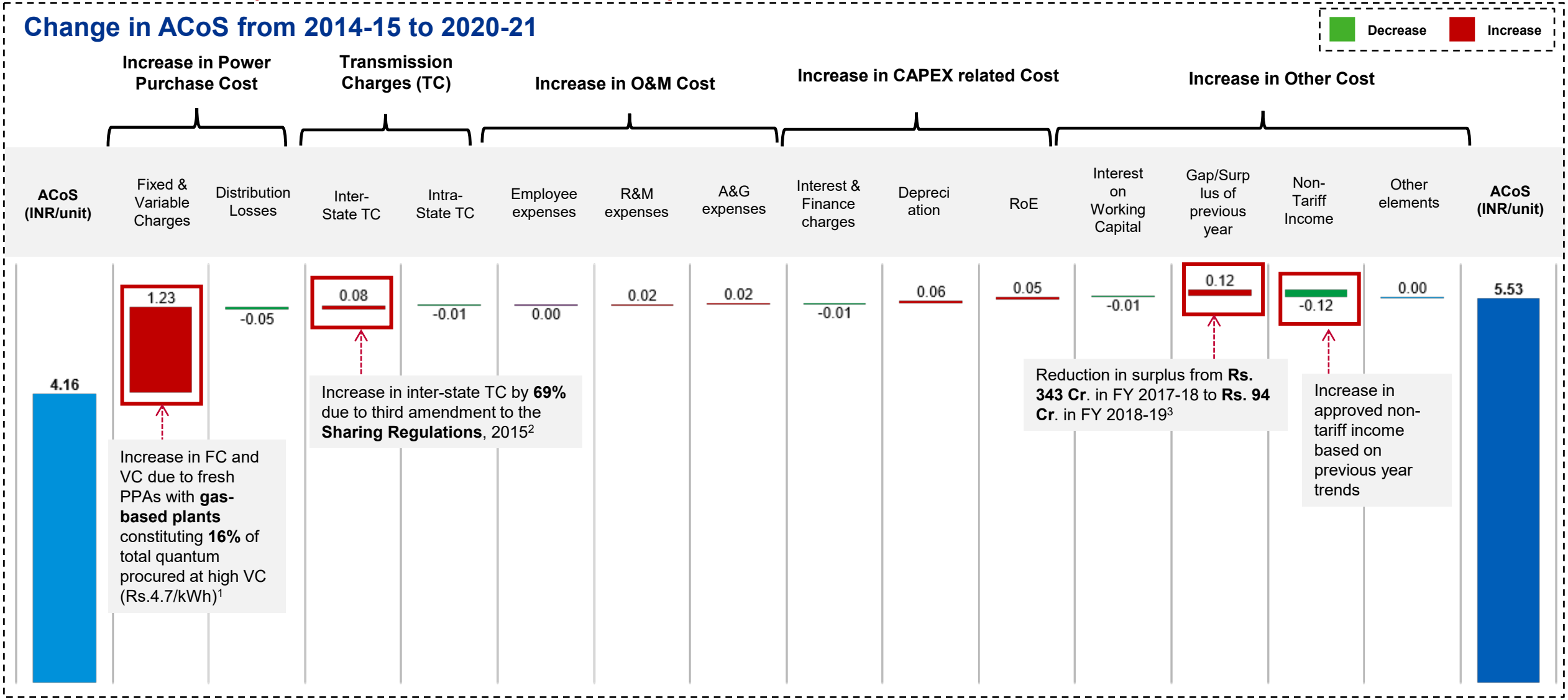
Note:

In 2015-16, commission approved a revenue gap of INR 305 Crore to be recovered through revision in tariff. Increase in ABR (in %) is greater than increase in ACoS during the last 3 years due to some surplus amount approved as the exact impact of all the tariff rationalization measures could not be estimated at the stage of tariff revision.

State- wise analysis: Uttarakhand (3/3)

ACoS increased by INR 1.37/kWh over the last 7 years

Change in ACoS from 2014-15 to 2020-21

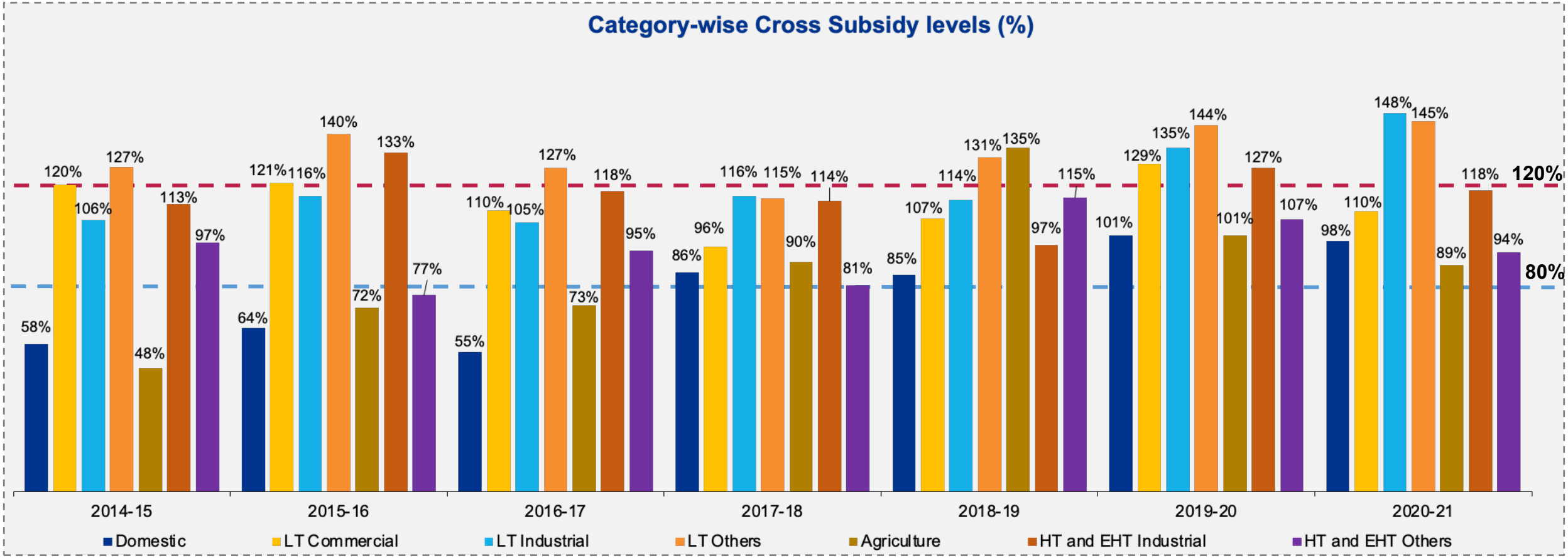


Note:

1. Fresh PPAs with gas-based plants (Sravanthi and Beta CCPP)
2. Increase in escalation considered by SERC (**4%** in FY 2015-16 against **3%** in FY 2014-15) as per Sharing Regulations, 2015
3. Reduction in surplus due to past year adjustment (material cost variance) of FY09 to FY16 @ **Rs. 122 Cr/year** which was passed on from FY 2016-17 to FY 2018-19 and reduction in revenue from addl. sales. (after sharing) and NTI.

Bihar: Cross Subsidy trend for last 7 years (1/3)

- Significant increase in revenue for agriculture consumers as compared to sales in FY 2018-19 due to abolishment of the unmetered sales[1] by the commission
- Cross subsidization by HT and EHT industrial categories has reduced significantly in FY 2018-19 due to tariff rationalization approved by the commission.



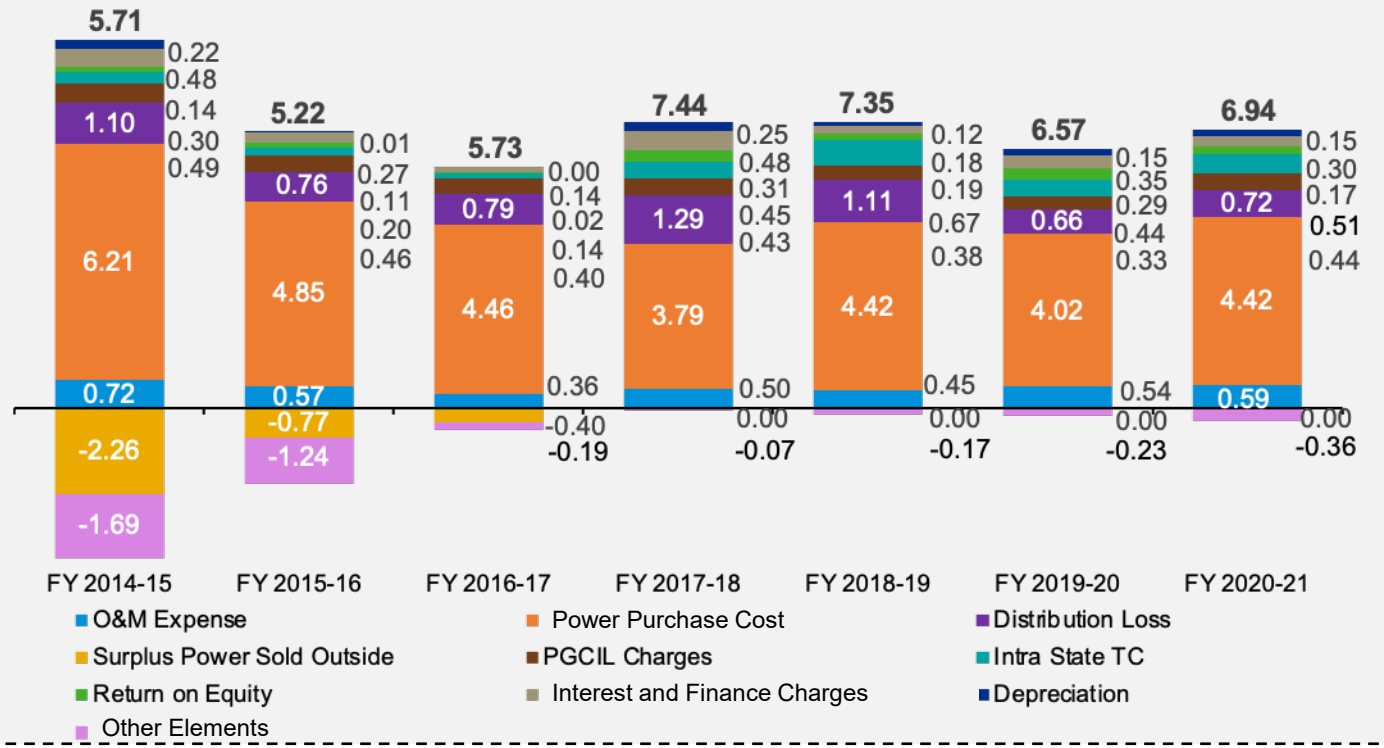
Source: Respective tariff orders issued by BERC.

Note: 1. The commission abolished the unmetered sub-category of IAS-II (Govt Tube well) category with effect from 01.04.2018. As a result, the sales to IAS-II category increased by 68.5%, while the revenue increased by 196% in FY 2018-19 as compared to FY 2017-18. For IAS-I (Private Tube wells) the sales increased by 114%, while the revenue increased by 22 times in FY 2018-19 as compared to previous year.

Bihar: Overall Summary (2/3)

- Bihar Electricity Regulatory Commission (BERC) has ensured timely issuance of tariff order and true-up orders over the years. The latest true-up order was issued by the commission for FY 2020-21.
- The approved ACoS has increased by INR 1.23/kWh over the last 7 years.
  - Significant change in ACoS mainly on account of reduction in revenue due to sale of surplus power.
  - Reduction in other elements[1] (by 84% due to reduction in surplus from previous years) contributed significantly to the overall change in ACoS.
  - Increase in intra-state transmission charges contributed 16% to the overall change in ACoS.
  - Power Purchase Cost, distribution losses, PGCIL charges, depreciation and interest charges have reduced over the last 7 years.

Contribution of cost components to ACoS (in Rs./kWh)



Particulars	FY 16[2]	FY 17	FY 18	FY 19	FY 20	FY 21	CAGR
Date of Issuance of Tariff Order	16th Mar 2015[2]	21st Mar 2016[3]	24th Mar 2017	21st Mar 2018	25th Feb 2019	20th Mar 2020	
Increase in approved ACoS (%)	(8.7%)	9.9%	29.8%	(1.2%)	(10.6%)	5.6%	5.9%[5]
% increase in ABR	(4.7%)	(7.0%)	72.6%[4]	(0.8%)	(3.1%)	(2.8%)	6.5%
% increase in ABR (including subsidy)	(9.6%)	9.7%	33.9%	(0.8%)	(3.1%)	(2.8%)	8.5%

Source: Respective tariff orders issued by BERC

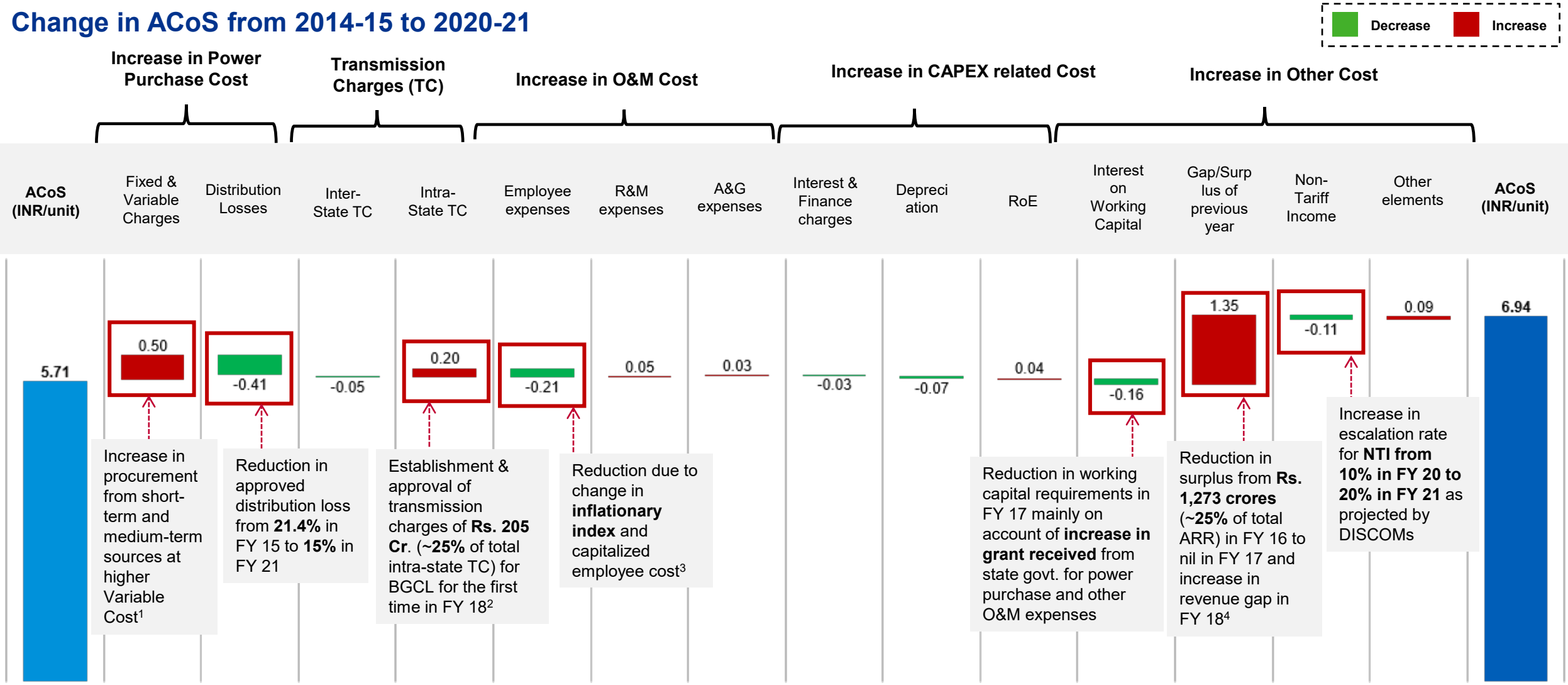
Note:

1. Other elements include non-tariff income, income tax, contingency reserve, gap/surplus of previous year. Reduction in surplus from Rs 1,273 Cr due to 2006-07 to 2012-13 TUP to nil in FY17.
2. The commission has approved a revenue gap of about Rs.177 Crore for both the DISCOMs, which the commission believes can be met by improving the operational performance by the DISCOMs
3. The commission has approved a revenue gap of Rs. 354 Crore in FY 2016-17 to be met through surplus from previous year's truing up exercise.
4. Significant increase in ABR due to reduction in resource gap assistance by the state government from Rs. 2,391 during FY 2016-17 to nil during FY 2017-18. The commission decided to recover the gap partly by increasing tariff rates and remaining to be met by improving operational performance by the DISCOMs.
5. Higher annual increase in ABR (8.5%) as compared to ACoS (5.9%) as the commission approved a revenue gap of about Rs. 177 Crore (ABR-Rs. 5.6/kWh) in FY15 whereas in FY21 the commission approved a surplus of Rs. 18 Crore (ABR- Rs. 6.94/kWh)

State- wise analysis: Bihar (3/3)

ACoS increased by INR 1.23/kWh over the last 7 years

Change in ACoS from 2014-15 to 2020-21

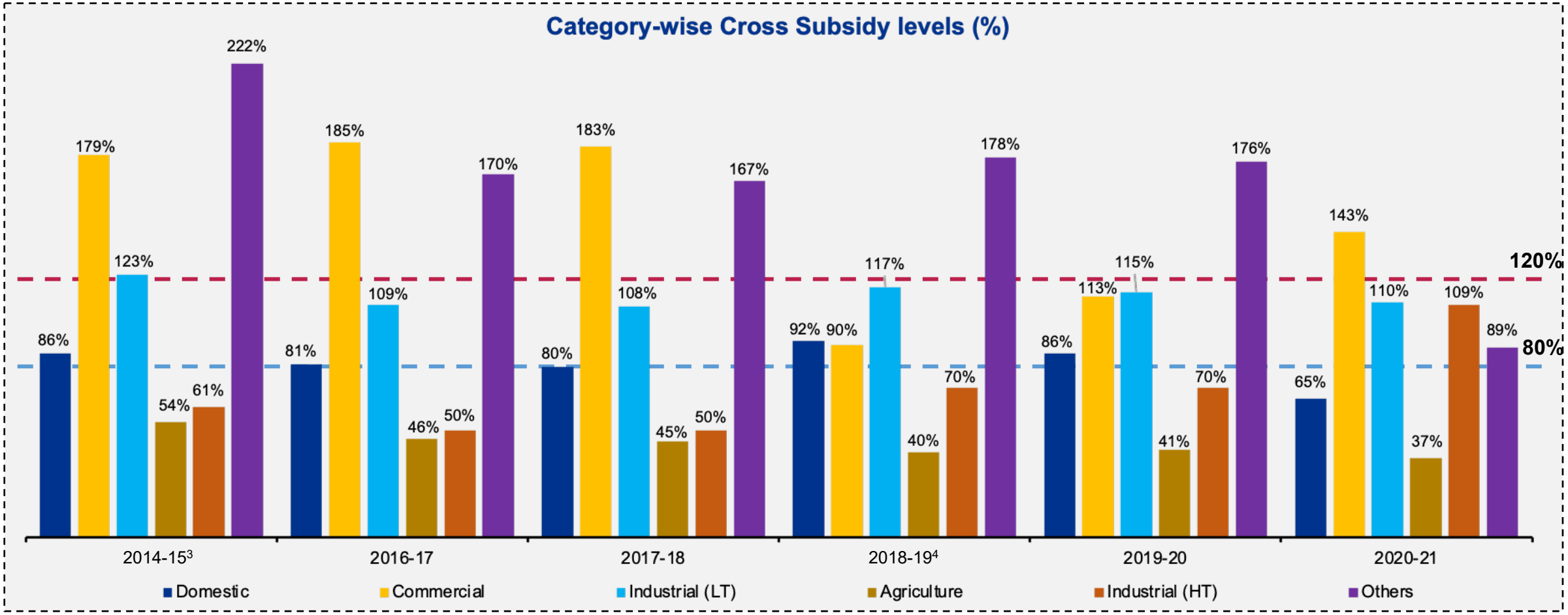


Note:

1. Increase in procurement from PFC Medium term (2.5% of total PP) at high costs (Rs. 4.2/kWh; avg. cost Rs. 3.73/kWh) in FY 21.
2. BGCL filed petition in Jan' 2017 for the first time for determination of ARR and Transmission tariff for FY 18 including CAPEX for construction activities of 400/220 KV and 220/132 KV GIS stations including Fathua 400 KV GIS.
3. In FY 17, EE were calculated based on escalation of actual employee cost in FY 15 on inflationary index of 5.25% and subtracting capitalized employee cost. In FY 16, capitalized employee cost was Nil & inflationary index of 8.24% was used for escalation on employee cost approved in APR of FY 15.
4. Increase in revenue gap in FY 18 due to FY 16 TUP mainly on account of increase in power purchase cost based on actuals.

Kerala: Cross Subsidy trend for last 7 years (1/3)

- Cross-Subsidization by commercial[1], LT industrial, and other consumers[2] has reduced over the years. However, the cross-subsidy levels have increased for HT industrial category consumers.



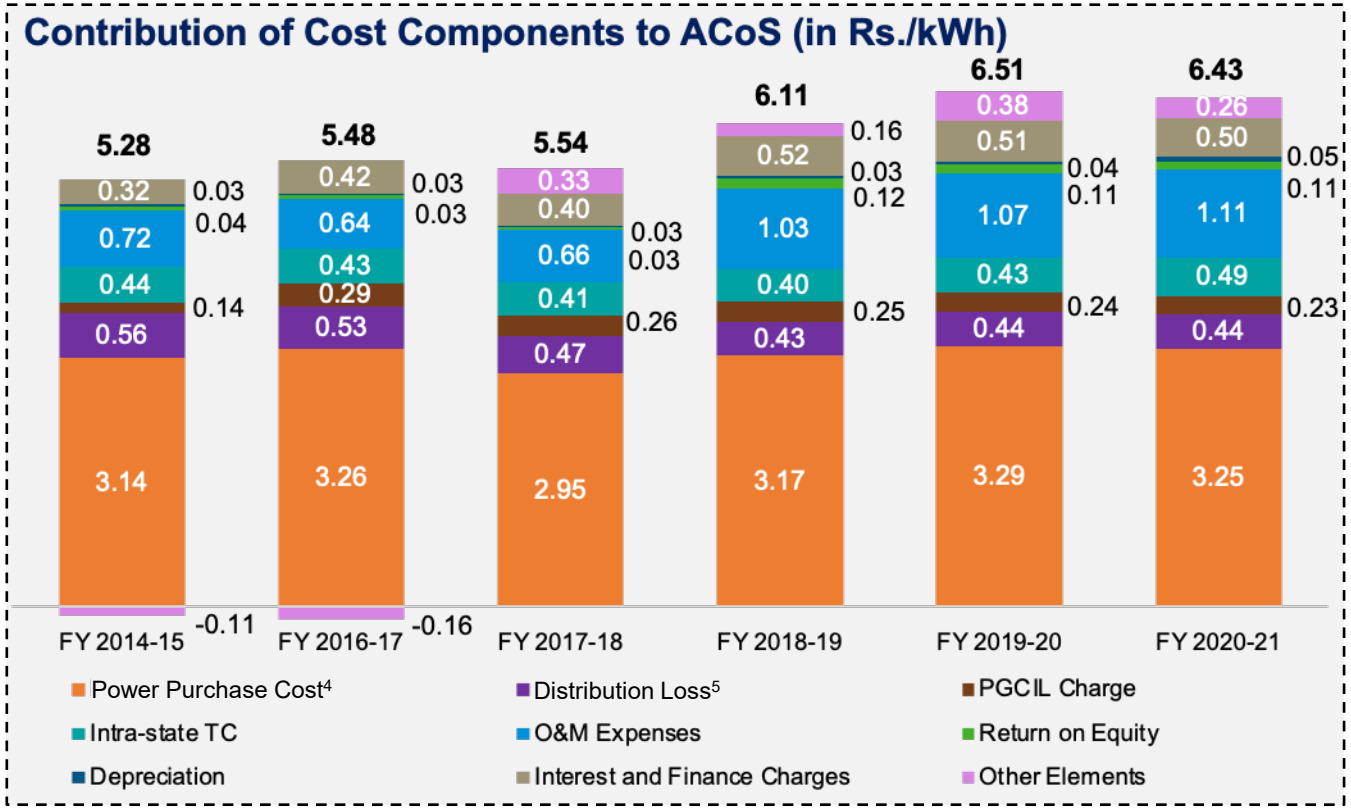
Source: Respective tariff orders issued by KSERC.

Note: Category wise revenue does not include tariff subsidy component. No subsidy component has been considered for tariff determination process.

1. For commercial category, ABR has reduced from Rs. 9.45/kWh in FY15 to Rs. 9.22/kWh in FY 21.
2. Others consumer include Railway Traction, bulk supply and non-payment groups. The ABR has reduced from Rs 11.73/kWh in FY 15 to Rs 5.71/kWh in FY 21 for others category.
3. For FY 15, approved revenue is not available for all consumer categories.
4. For FY 19, revenue at existing tariff has been considered.

Kerala: Overall Summary (2/3)

- Kerala State Electricity Commission (KSERC) issued a tariff order in April 2017 for FY 17 and FY 18. Thereafter, the commission issued MYT order for the control period FY 19 to FY 22 in July 2019.
- The latest true-up order was issued by the commission for FY 2017-18.
- The approved ACoS has increased by INR 1.15/kWh over the last 7 years
  - Change in ACoS is mainly due to increase in O&M expenses and other elements contributing 34% & 32% to the overall change in ACoS respectively.
  - Increase of other elements from INR -0.11/kWh to INR 0.26/kWh on account of recovery of cumulative revenue gap of INR 3,100 Cr from FY 2019 to FY 2022[3].



*Surplus power sold outside state is Nil across the years

Particulars	FY 16[1]	FY 17	FY 18	FY 19[1]	FY 20[1]	FY 21[1]	CAGR
Date of Issuance of Tariff Order - KSERC	NA	17th Apr 2017		8th Jul 2019			
Increase in approved ACoS (%)	NA	NA	(7.75%)	10.43%	6.58%	(1.24%)[2]	4.08%
% increase in ABR	NA	NA	(9.13%)	10.17%	7.57%	(7.93%)	3.37%
% increase in ABR (including subsidy)	NA	NA	(9.13%)	10.17%	7.57%	(7.93%)	3.37%

Source: Respective tariff orders issued by KSERC

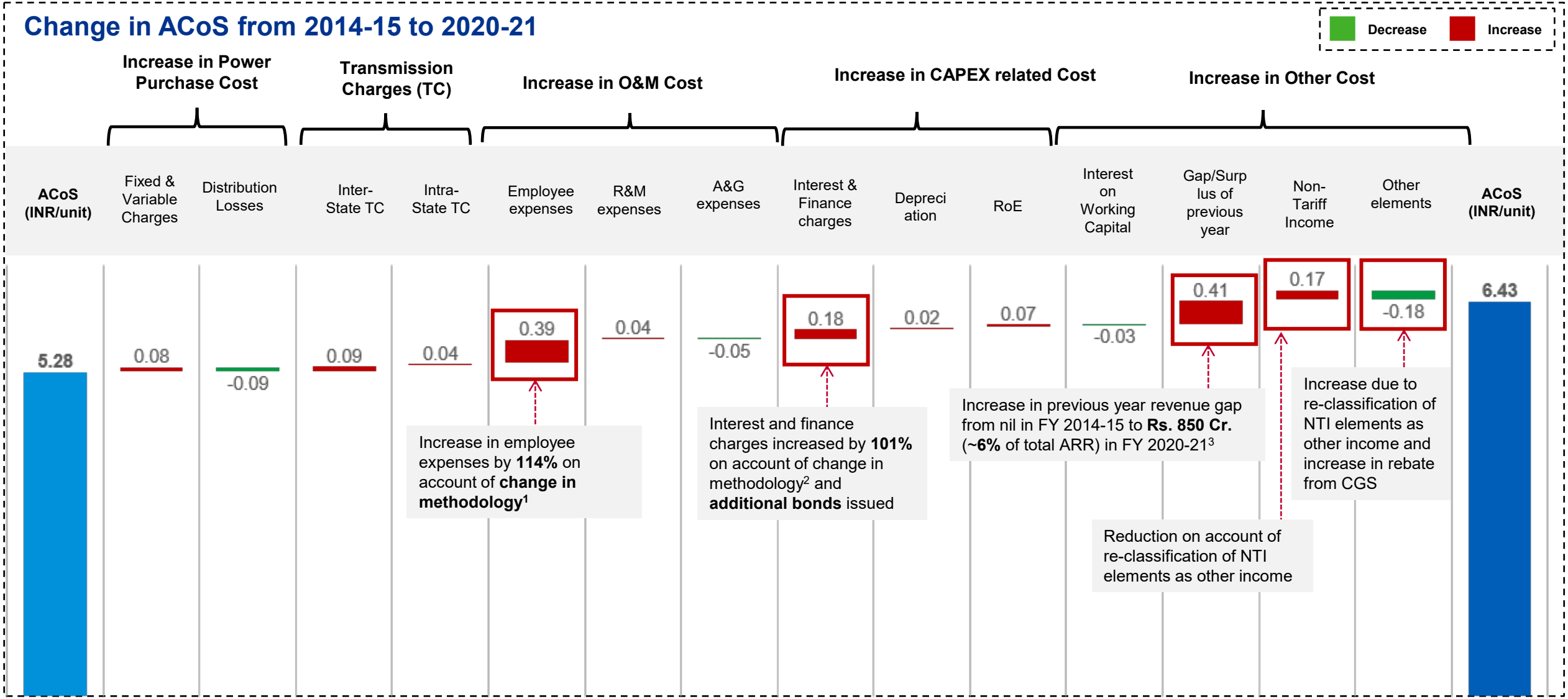
Note: Other elements include Interest on working capital, Gap/Surplus of previous year, Non-tariff income, Interest on CSD, Other income

1. The commission has not issued any tariff order for FY 16. They have also not issued retail tariff order for FY 17, FY 19 & FY 21. The values for these years have been considered from MYT order for the control period from FY 19 to FY 22. In this MYT order the commission approved retail tariff for FY 20 only.
2. The commission has approved a revenue gap of Rs 945 Cr. in 2020-21 in its MYT Order released in July 2019, no tariff revision has been done to meet this revenue gap in MYT Order.
3. The commission approved a gap of Rs. 5,693 Cr. during the TUP FY 17. Out of this gap, recovery plan of only Rs. 3,100 Cr was provided in MYT order (to be recovered across a period of 4 years from FY 22).
4. Power purchase cost includes revenue from sale of surplus power.
5. Contribution of distribution losses to ACoS has been estimated taking into account the reduction in power purchase at state periphery assuming no distribution loss.

State- wise analysis: Kerala (3/3)

ACoS increased by INR 1.15/kWh over the last 7 years

Change in ACoS from 2014-15 to 2020-21

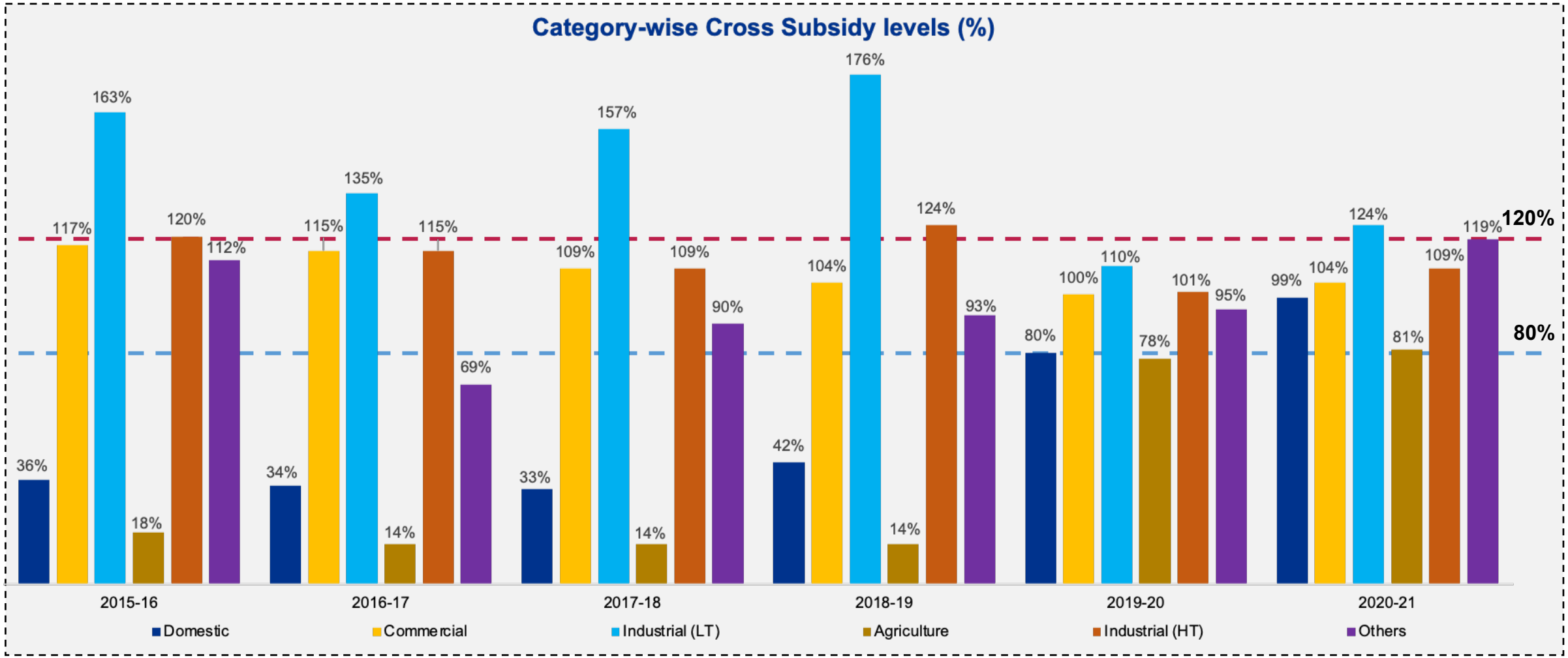


Note:

1. In FY 2015, the employee expenses were estimated based on CPI/WPI indices. Starting FY16, these expenses were estimated based on O&M expense norms
2. In FY2015, the commission has capitalized Rs 334 Cr of interest and finance expenses whereas in FY21 no interest and finance expenses were capitalized due to change in approach, basis tariff regulations 2014.
3. The commission approved accumulated revenue gap Rs. 5,693 Cr during FY 2016-17 TUP based on actuals. Out of this gap, recovery plan of Rs. 3,100 Cr was provided in MYT order (to be recovered across a period of 4 years from FY 2019-22).

Jharkhand: Cross Subsidy trend for last 6 years (1/3)

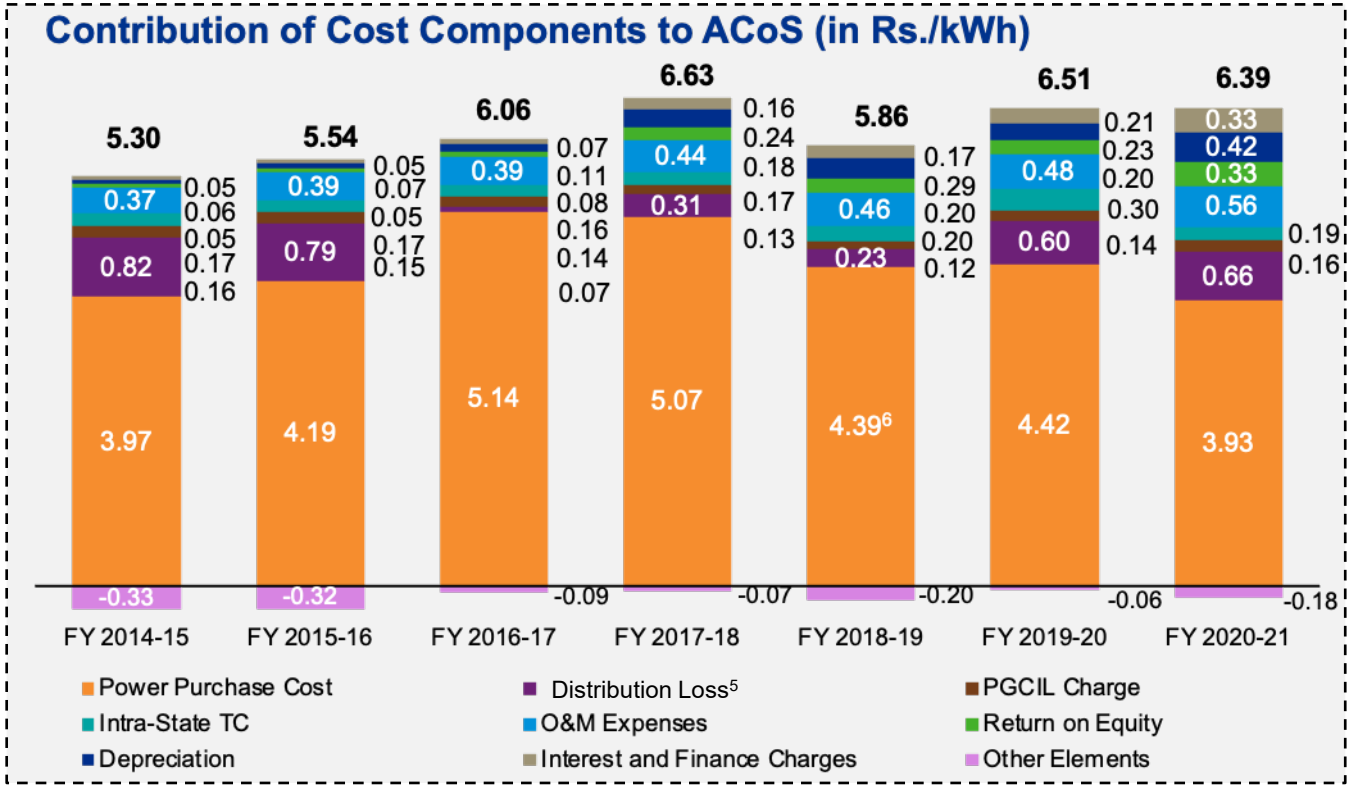
- Cross-Subsidization by industrial (LT) consumers has reduced significantly starting FY 2019-20.
- Starting FY 2019-20, the commission has approved rationalization of tariff which led to increase in tariff for agriculture and domestic category consumers minimizing cross-subsidization by industrial consumers.



Source: Respective tariff orders issued by JSERC.
Note: Category wise revenue does not include tariff subsidy component. No subsidy component has been considered for tariff determination process.

Jharkhand: Overall Summary (2/3)

- Jharkhand State Electricity Regulatory Commission[1] has consistently issued tariff orders allowing tariff hike over the last 7 years except during FY 18 and FY 21.
- Latest true-up order was issued for FY 2018-19.
- The approved ACoS has increased by INR 1.09/kWh over the last 7 years.
  - Increase in ACoS is mainly on account of increase in depreciation, interest & finance charges, ROE, and O&M expense
  - Power purchase cost has reduced marginally over the last 7 years
- Significant increase in ABR as compared to ACoS in FY 17 due to increase in approved subsidy[2] and tariff hike.
- Increase in ABR (3.31%) despite reduction in ACoS during FY 21 due to revenue surplus of INR 136 Cr. approved by the Commission in FY 21



Particulars	FY16	FY17	FY18	FY19	FY20	FY21	CAGR
Date of Issuance of Tariff Order - JBVNL	14th Dec 2015	21st June 2017	27th Apr 2018	27th Apr 2018	28th Feb 2019	1st Oct 2020	
Increase in approved ACoS (%)	4.40%	9.49%	9.41%	-11.71%	11.09%	-1.73%	2.92%
% increase in ABR	NA[3]	-0.37%	53.14%[4]	-11.69%	7.94%	3.31%	8.48%
% increase in ABR (including subsidy)	NA[3]	19.08%	15.99%	-11.69%	7.94%	3.31%	6.35%

Source: Respective tariff orders issued by JSERC

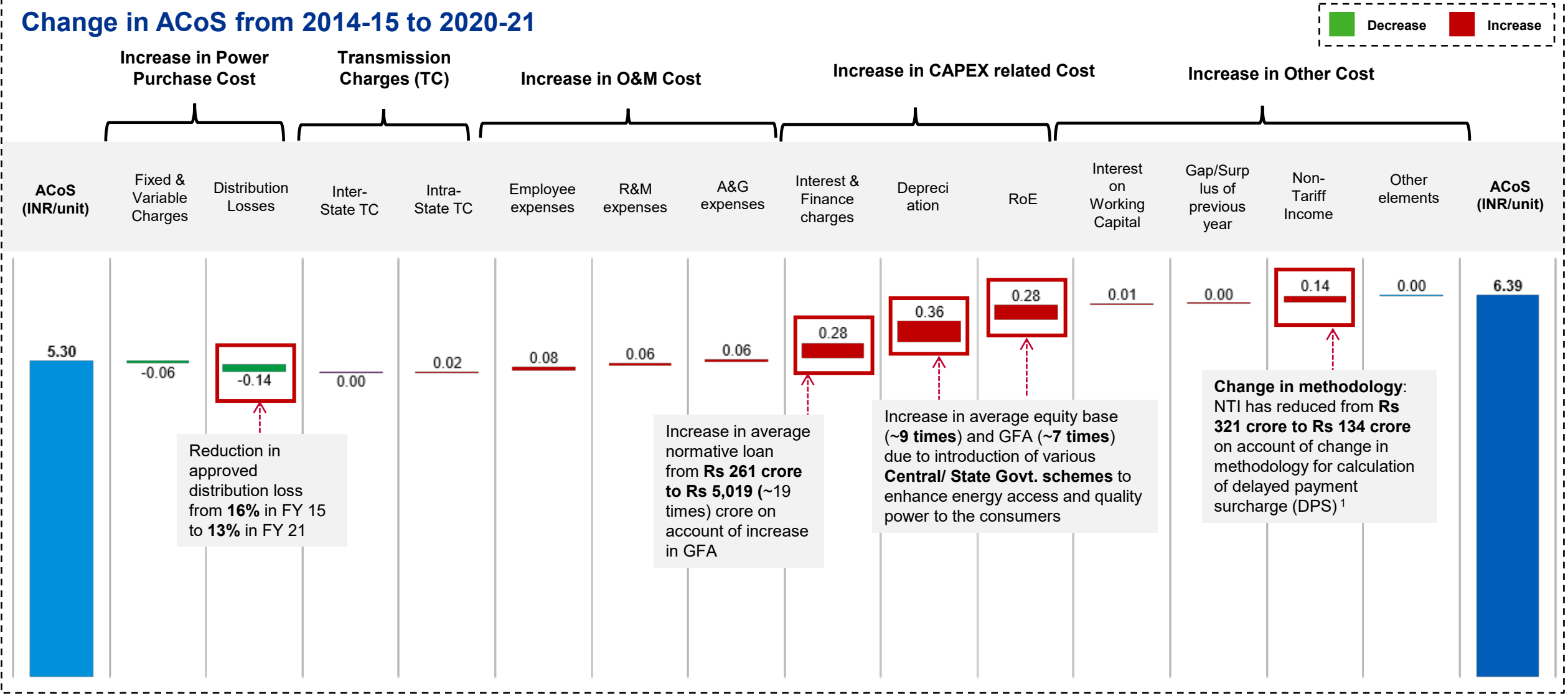
Note:

1. JBVNL started operations on 6th Jan 2014, after the unbundling of the erstwhile Jharkhand State Electricity Board (JSEB)
2. Govt. subsidy has increased from Rs 375 Cr. in FY 16 to Rs. 1200 Cr in FY 17 (UDAY subsidy); Revenue gap approved by the commission reduced to Rs 705 Cr in FY 17 from Rs 1,905 Cr.
3. The Commission had issued first ARR tariff order of JBVNL for FY 16. Therefore, for FY 2014-15 APR values have been considered.
4. In FY 18, higher increase in ABR is due to revision in tariff without considering the subsidy component on account of DBT.
5. Contribution of distribution losses to ACoS has been estimated taking into account the reduction in power purchase at state periphery assuming no distribution loss.
6. Reduction in PPC in FY19 as compared to previous year due to reduction in procurement from Barh II (high-cost plant) and reduction in per unit average rate of RE power (basis energy sold)

State- wise analysis: Jharkhand (3/3)

ACoS increased by INR 1.09/kWh over the last 7 years

Change in ACoS from 2014-15 to 2020-21

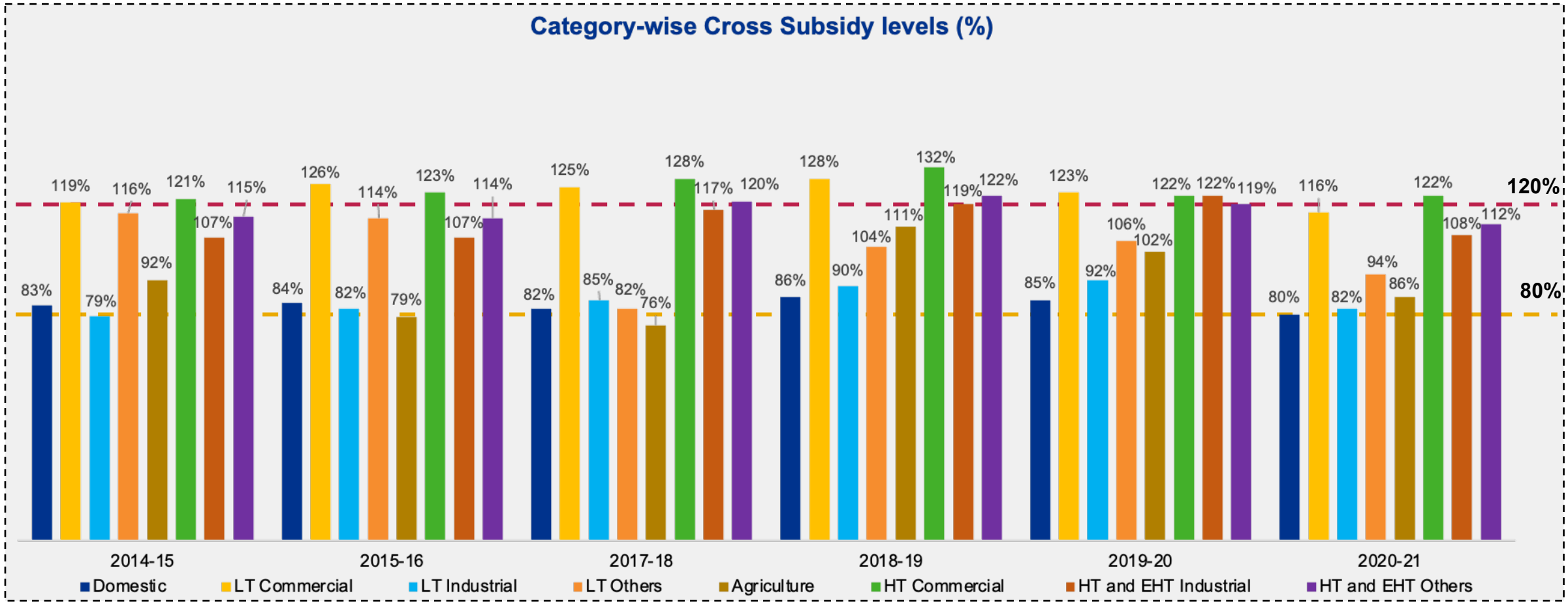


Note:

1. Starting FY 17, NTI was computed by deducting interest on outstanding receivables from DPS whereas earlier interest was not deducted from DPS in line with the judgement of Hon'ble APTEL dated 12.07.2011 in case No. 142 & 147 of 2009.

Assam: Cross Subsidy trend for last 7 years (1/3)

- Commercial (HT and LT) have been the major cross-subsidizing categories for the state across the years.



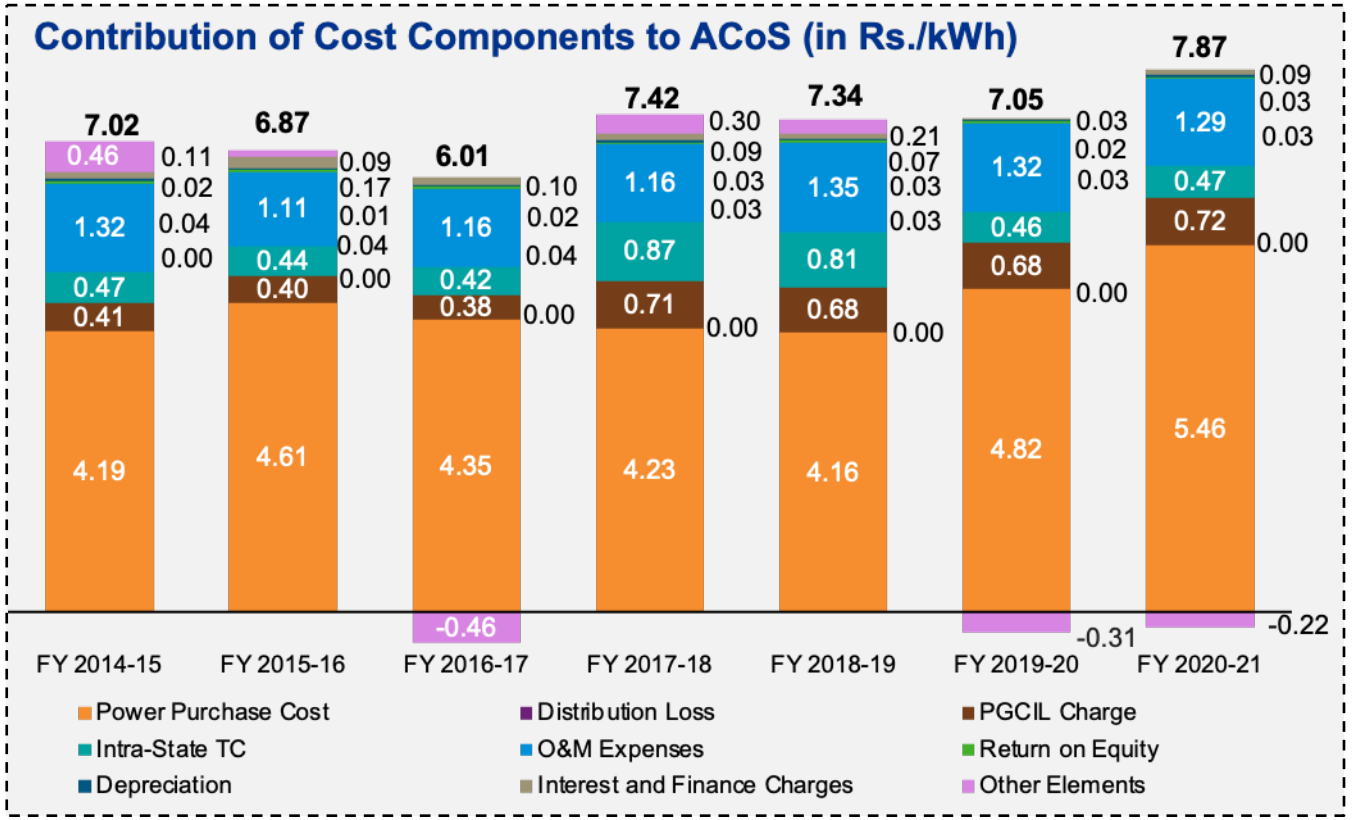
Source: Respective tariff orders issued by AERC.

Note:

1. CSS level for FY 2016-17 has not been included in the analysis as the MYT order (FY 16 to FY 19) do not contain category-wise cross-subsidy levels for the FY 2016-17.
2. Category wise revenue is excluding tariff subsidy component.

Assam: Overall Summary (2/3)

- Frequent tariff revisions have been allowed by Assam Electricity Regulatory Commission (AERC) over the last 7 years to cover the revenue gap.
- Latest true-up order has been issued for FY 2020-21.
- The approved ACoS has increased by INR 0.85/kWh over the last 7 years.
  - Significant change (~150%) in ACoS is due to increase in power purchase cost
  - Increase in PGCIL charges contributed 36% to the overall change in ACoS
  - Increase in PPC and PGCIL charges is marginally offset by reduction in other elements[1]
- Increase in ABR (in %) despite reduction in ACoS[3] during FY 2016-17 is due to approval of FPPPA charges[4]



Particulars	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	CAGR
Date of Issuance of Tariff Order	24th July 2015	31st Mar 2017[2]		19th Mar 2018	1st Mar 2019	7th Mar 2020	
Increase in approved ACoS (%)	(2.1%)	(12.7%)	23.6%	(1.0%)	(4.0%)	11.6%	2.7%
% increase in ABR	(2.1%)	2.3%	5.6%	(1.0%)	(4.0%)	11.6%	2.8%
% increase in ABR (including subsidy)	(2.1%)	2.3%	5.6%	(1.0%)	(4.0%)	11.6%	2.8%

Source: Respective tariff orders issued by AERC

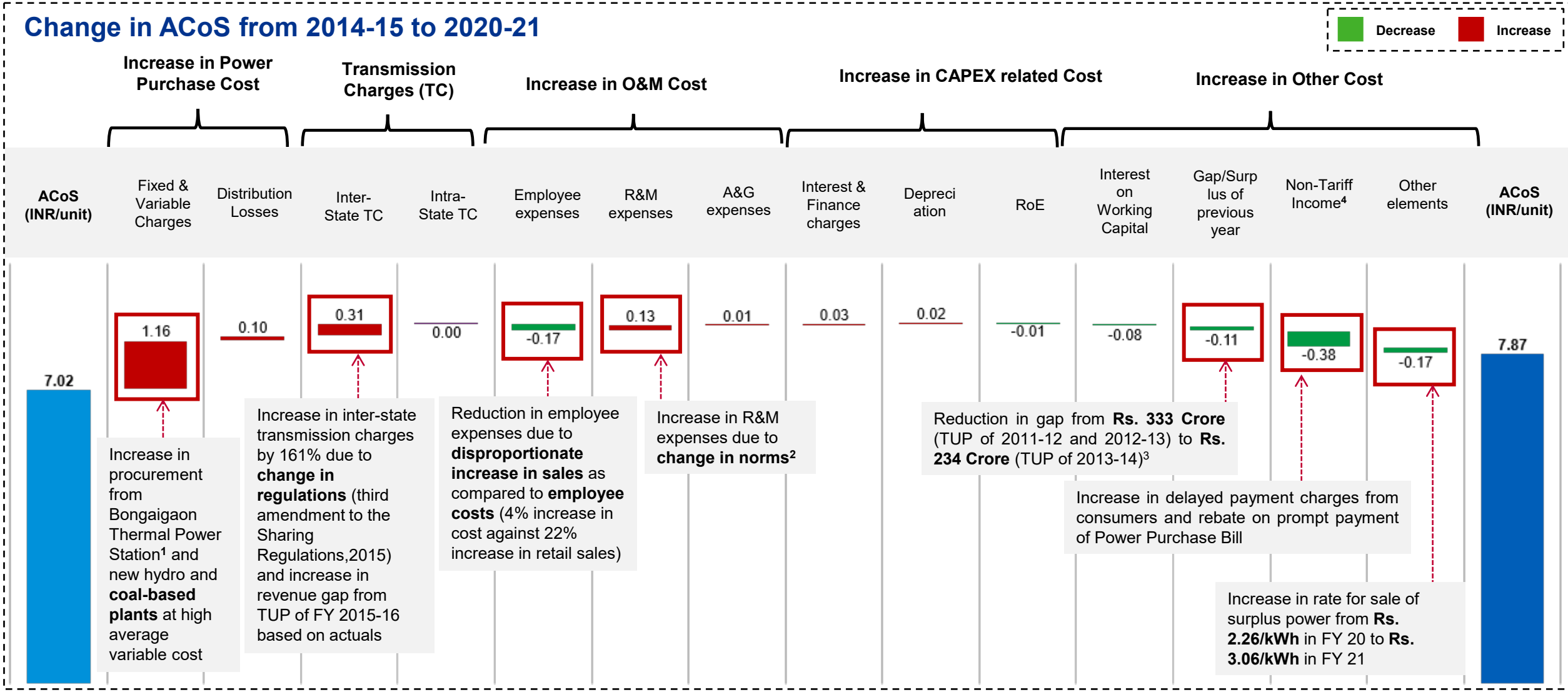
Note:

1. Other elements include gap/surplus of previous year, other income due to sale of surplus power, non-tariff income (interest income and misc. charges), among others.
2. The commission has issued a MYT order for the control period starting FY 2016-17 till FY 2018-19 on 31st March 2017 (with a 1-year delay)
3. ACoS for FY 2016-17 was reduced because true-up gap of the previous years was allowed in FY 2017-18 since the MYT order was issued with a 1-year delay.
4. Increase in ABR is due to approval of FPPPA charges (Rs. 0.59/kWh) during FY 2016-17 against nil FPPPA charges approved during FY 2015-16.

State- wise analysis: Assam (3/3)

ACoS increased by INR 0.85/kWh over the last 7 years

Change in ACoS from 2014-15 to 2020-21

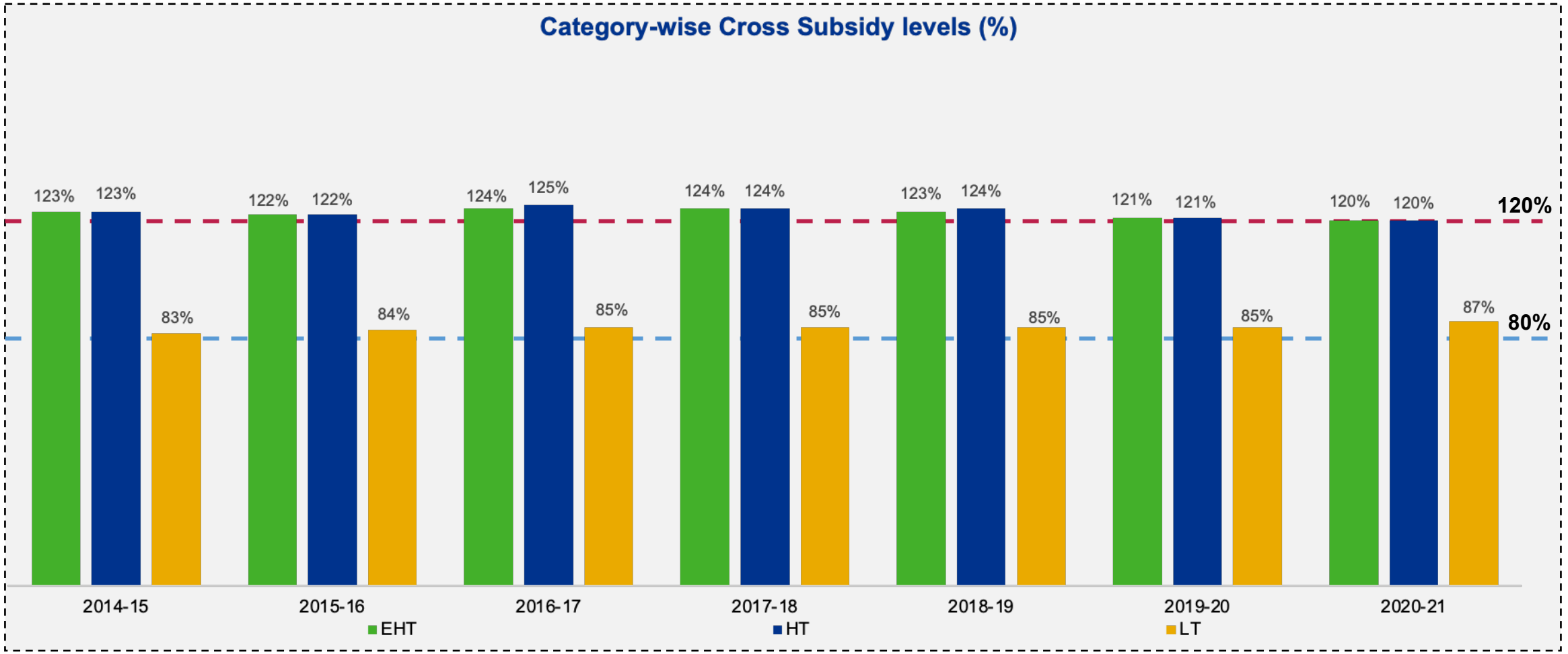


Note:

1. Procurement from Bongaigaon Thermal Power Station increased from 4% in FY 15 to 23% of total quantum in FY 21.
2. Change in AERC MYT Regulations, 2015 used for the computation of R&M expenses. R&M expenses is now computed based on average GFA for previous year multiplied with K factor and WPI inflation as against the previous approach of multiplying opening GFA with (1+ WPI) and R&M Expenses as a percentage of GFA in the last 5 years.
3. The gap was higher in FY 2014-15 mainly on account of effectuation of revised gas price w.e.f. from June 2010 for the gas based thermal stations during TUP of 2011-12 and 2012-13.
4. Non-Tariff Income comprises of interest income from investments/bank accounts, delayed payment surcharge and miscellaneous charges collected from consumers.

Odisha: Cross Subsidy trend for last 7 years (1/3)

- EHT and HT have been the major cross-subsidizing categories for the state over the last 7 years.



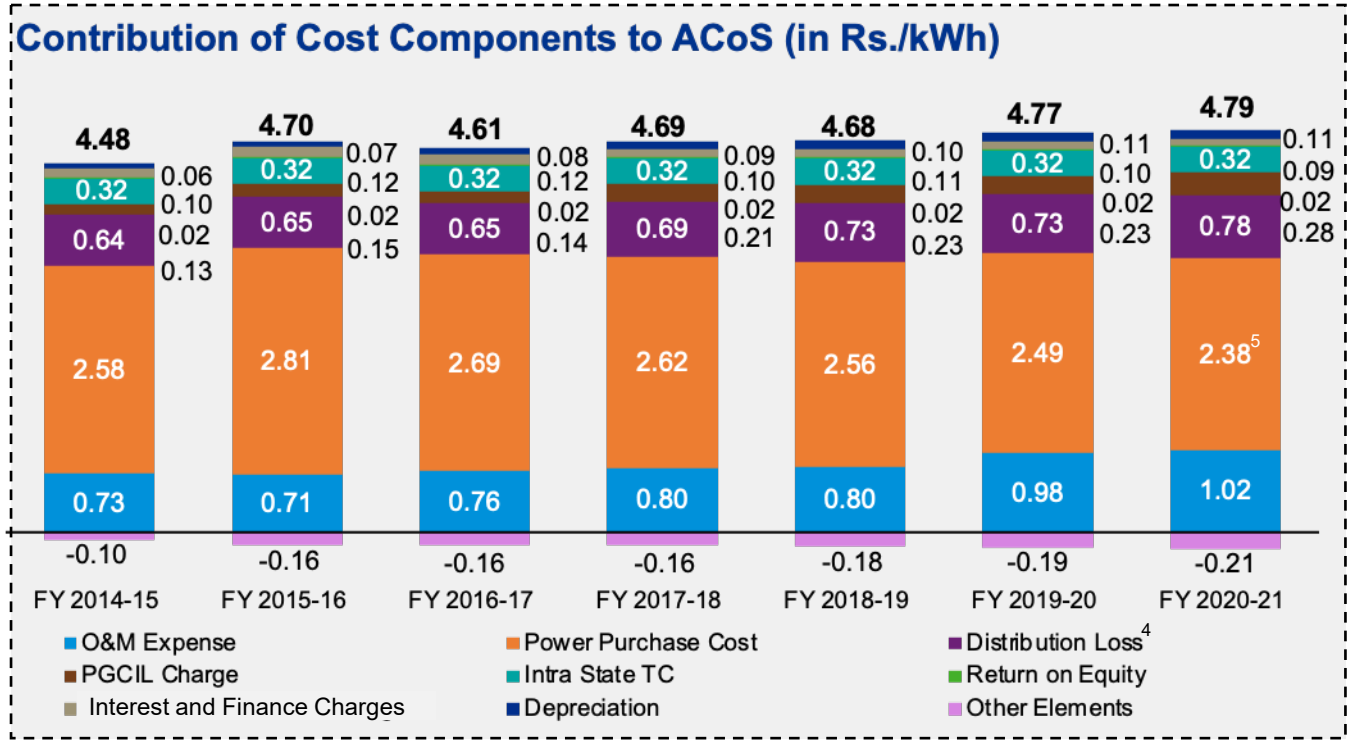
Source: Respective tariff orders issued by OERC,

Note:

1. As per tariff order all consumers is divided into 3 categories – High Tension (HT), Extra High Tension (EHT), Low Tension (LT)
2. Category wise revenue is excluding tariff subsidy component.

Odisha: Overall Summary (2/3)

- Odisha Electricity Regulatory Commission (OERC) has consistently issued tariff orders over the last 7 years.
- The latest true-up order was issued by the commission for FY 2020-21[1].
- The approved ACoS has increased by INR 0.31/kWh over the last 7 years.
  - Increase in ACoS is mainly on account of increase in O&M Expenses, PGCIL charges, and depreciation costs.
  - Power purchase cost and other elements[2] have reduced marginally over the last 7 years.



Particulars	FY16	FY17	FY18	FY19	FY20	FY21	CAGR
Date of Issuance of Tariff Order - OERC	23rd Mar 2015	21st Mar 2016	23rd Mar 2017	22nd Mar 2018	29th Mar 2019	22nd Apr 2020	
Increase in approved ACoS (%)	4.8%	-1.8%	1.7%	-0.2%	2.0%	0.4%	1.1%
% increase in ABR	4.8%	-2.1%	1.7%	-0.2%	1.8%	1.1%[3]	1.2%
% increase in ABR (including subsidy)	4.8%	-2.1%	1.7%	-0.2%	1.8%	1.1%	1.2%

Source: Respective tariff orders issued by OERC

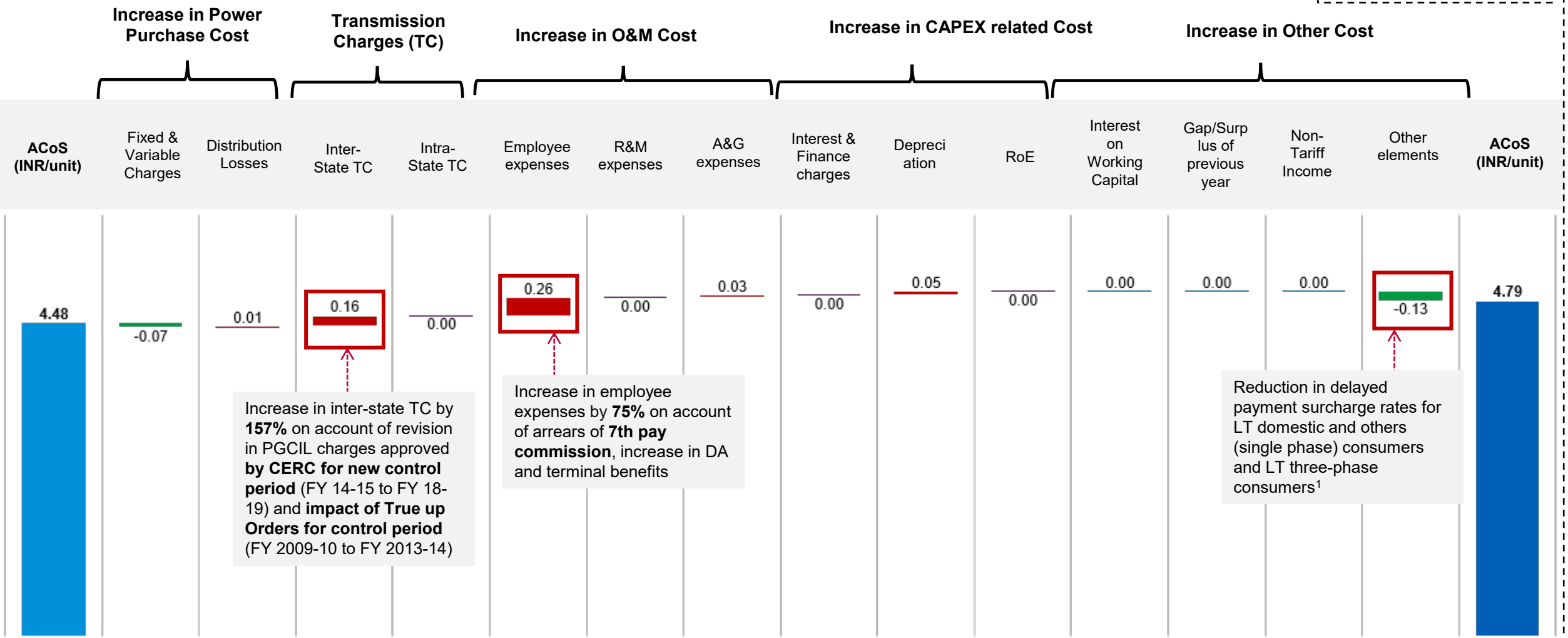
Note:

1. The Commission considers the truing up for FY2020-21 as provisional and the truing up may be finalized when the full year audited accounts are available.
2. Other elements include bad and doubtful debts & miscellaneous receipts.
3. In FY2020-21, commission has approved a revenue surplus of Rs. 79 Cr.
4. Contribution of distribution losses to ACoS has been estimated taking into account the reduction in power purchase at state periphery assuming no distribution loss.
5. GRIDCO is engaged in purchase and sale of power to the four Distribution Companies inside the state of Odisha. In FY 21, the commission has approved lower revenue for GRIDCO which has contributed to the reduction in PPC. The commission has approved revenue gap for GRIDCO to the tune of Rs. 184 Cr. (FY19), Rs. 173 Cr. (FY20), and Rs. 660 Cr (FY21). The gap in FY 21 has been approved by the commission as a relief to consumers on account of COVID-19, directing that this gap to be recovered by trading surplus energy and the remaining amount to be treated as regulatory assets.

State- wise analysis: Odisha (3/3)

ACoS increased by INR 0.31/kWh over the last 7 years

Change in ACoS from 2014-15 to 2020-21



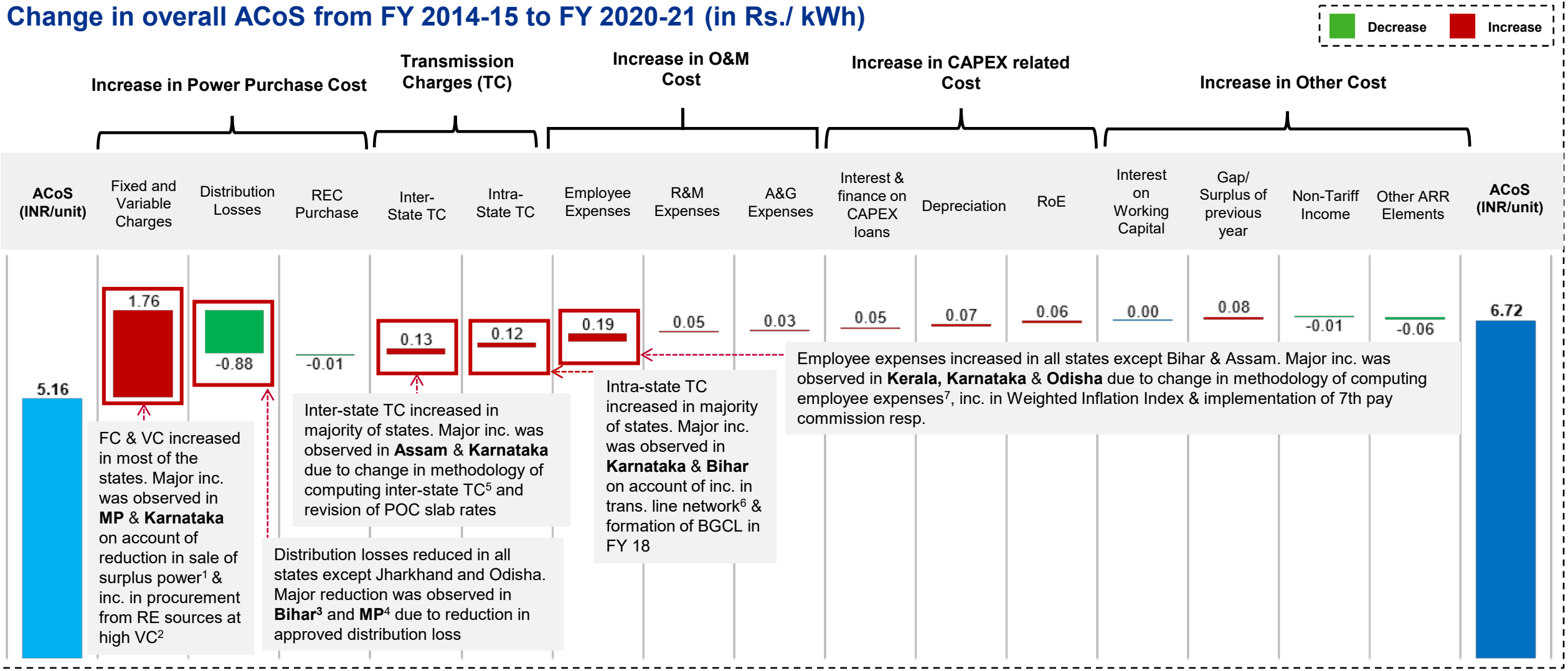
Note:

1. Reduction in DPS by 33.34%-50% (to be charged to the defaulting consumers for every 2 months of defaults)

Overall ACoS increased by INR 1.56/kWh over last 7 years for the 8 states

Year-wise change in ACoS

Change in overall ACoS from FY 2014-15 to FY 2020-21 (in Rs./ kWh)



Note: The per unit cost of each ARR component is computed by dividing the summation of each ARR component for 8 states (in Rs. Cr.) by the total of energy sales for 8 states (in MUs). Factors contributing greater than Rs. ± 0.10/kWh to the overall change in ACoS have been considered. For the state of Karnataka, segregation of O&M Expenses into Employee expenses, R&M Expenses A&G Expenses has been estimated based on TUP petitioned values from FY 15 to FY 19 as the commission does not approve the segregation of O&M expenses.

1. MP- Reduction in sale of surplus power by 38% over the last 7 years.
2. Karnataka- In FY19, PP from RE sources increased from 7,165 MUs (VC-Rs. 4.16/kWh) to 9,406 MUs (Rs. 4.39/kWh) (PPC Rs. 3.62/kWh).
3. Bihar- Reduction in approved distribution losses from 21.4% to 14% over the last 7 years as per UDAY loss trajectory.
4. MP- Reduction in approved distribution loss from 19.6% to 15.9% over the last 7 years.
5. Assam- Inc. in transmission charges as per third amendment by CERC due to change in methodology for computing POC charges.
6. Karnataka- Inc. in transmission line length from 32,689 km in FY 15 to 39,145 km in FY 21.
7. Kerala- In FY 15, the employee expenses were estimated based on CPI/WPI indices. Starting FY 16, these expenses were estimated based on O&M expense norms.

Suggested Interventions

Factors contributing to the increase in ACoS

Key factors contributing to change in ACoS based on analysis

	1 Power purchase cost	2 Transmission charges	3 Employee expenses	4 Fixed Cost (RoE, Depreciation)	5 Interest & finance charges
Inference	▪ Increase in coal prices & railways freight across all states. ▪ Increase in procurement from new TPPs at high VC. ▪ Increase in procurement from RE sources at high rate due to operationalization of PPAs signed in previous years. However, the cost will reduce in upcoming years due to signing of new PPAs at low tariff. ▪ Inc. in PPC per unit of TPPs due to low PLF's owing to increased penetration of RE sources. ▪ Increase in PPC is marginally offset by reduction in distribution losses for majority of states	▪ Huge investments made on creation of transmission infrastructure at national & state level has resulted in underutilization of transmission assets and increase in TC. ▪ However, high investment in development of transmission infrastructure has increased transmission system availability and reliability.	▪ Introduction of 7th pay commission resulted in increase in employee expenses across majority of states.	▪ Major investments have been made to enhance electricity access in last 7 years – resulting in increase in fixed cost (Dep., RoE and R&M expenses).	▪ Increase in fixed assets on account of various govt. schemes to provide quality power to the consumers resulted in increase in avg. loan.

Suggested interventions

Factors	Power purchase cost	Transmission charges	Employee expenses	Fixed Cost (RoE, Depreciation)	Interest & finance charges
Interventions	➢ SERCs to approach govt. to bring coal sector under independent regulator. ➢ Utilizing clean env. cess to mitigate impact of incremental cost. ➢ Procurement from TPPs through competitive bidding. ➢ Optimizing procurement by participation in power markets. ➢ Maintaining resource adequacy to hedge risk of high prices in open market.	➢ Transmission assets may be developed based on international competitive bidding ➢ Storage based /hybrid transmission system to be encouraged to increase transmission system utilization.	➢ Best practices (such as performance linked remuneration & employee incentive schemes) to reduce employee expenses may be adopted. Emp. expenses in Assam were Rs. 1/kWh and Kerala Rs. 0.97/kWh (FY 21).	➢ RoE may be fixed based on risk premium and performance of DISCOMs. ➢ Accumulated depreciation, over and above debt repayment, can be utilized to reduce equity base after debt repayment is over (post completion of the useful life of asset) (RERC Tariff Regulations)	➢ DISCOMs may explore cheaper alternate sources of funding (such as green funding & infrastructure investment trust) to meet capital expenditure requirements.
Leading practices	➢ Steep fall in tariff rates at power exchange- Rs. 2.50/kWh[1] (against avg. PPC of state TPPs- Rs. 3.50/kWh), prompted Punjab to shut down 7 units of 3 state-owned power plants in 2016.	➢ Competitive bidding for transmission projects under GEC Phase-I resulted in average reduction of project tariffs by ~31% as compared to cost-plus tariff rates[2]	➢ MP DISCOMs developed a variable-based incentive structure for its employees based on loss reduction and revenue recovery targets[3]	➢ MERC linked the RoE of DISCOMs to the extent of 1.5% (in MYT for 2019-24), basis performance of DISCOMs[4] ➢ JSERC reduced the RoE of DISCOMs by 100 basis points.	➢ Organizations like IREDA are offering loans to DISCOMs at low interest rate (9%) to pay outstanding amount of RE generators[5].

Note :

1. Average procurement rate at power exchanges was Rs. 2.50/kWh on July 21, 2016. Source: https://www.tribuneindia.com/news/archive/features/state-shuts-generation-buys-cheaper-power-269355
2. GEC- Green Energy Corridor. Source: https://ieefa.org/wp-content/uploads/2020/02/Increasing-Competition-in-India-Transmission-Sector_February-2020.pdf
3. Source: https://www.usaid.gov/sites/default/files/documents/1865/SRUC_Utility_HR_Incentive_Study_FINAL_2017_Nov.pdf
4. RoE of Maharashtra DISCOMs is linked to performance parameters like reduction in AT&C losses, network, and supply availability etc. Source: https://www.financialexpress.com/industry/regulators-feel-high-return-on-equity-jacks-up-power-tariffs/2317706/
5. Source: https://energy.rajasthan.gov.in/content/dam/raj/energy/jaipurdiscom/PDF2021/Jan21/AnnexureK_FinancialTurnaround_RERC.pdf

Thank You

The UK Government's Foreign, Commonwealth and Development Office (FCDO), in partnership with the Ministry of Power (MoP) and Ministry of New and Renewable Energy (MNRE), Government of India is undertaking a Technical Assistance Programme, titled "Supporting Structural Reforms in the Indian Power Sector" (Power Sector Reforms Programme)". The objective of the programme is to support structural market reforms and the integration of renewable energy into the electricity grid. In specific, it aims to achieve more sustainable and inclusive economic growth, better energy security and poverty reduction and reduced carbon emissions. KPMG is the lead implementing partner for this technical assistance programme.

Summary: Contribution of various factors to change in ACoS in 2020-21 (INR 6.72/kWh) as compared to 2014-15 (INR 5.16/kWh)

Major contributors of increase in ACoS (in Rs./kWh)

Increase in fixed and variable charges	1.76
Increase in employee expenses	0.19
Increase in interstate TC	0.13
Increase in intrastate TC	0.12
Increase in Gap/Surplus of previous year	0.08
Increase in depreciation	0.07
Increase in ROE	0.06
Increase in R&M expenses	0.05
Increase in interest on working finance and CAPEX Loans	0.05
Total increase in ACoS	**2.51**

Major contributors of decrease in ACoS (in Rs./kWh)

Reduction in distribution loss	(0.88)
Reduction in Other ARR Elements	(0.06)
Total decrease in ACoS	**(0.94)**

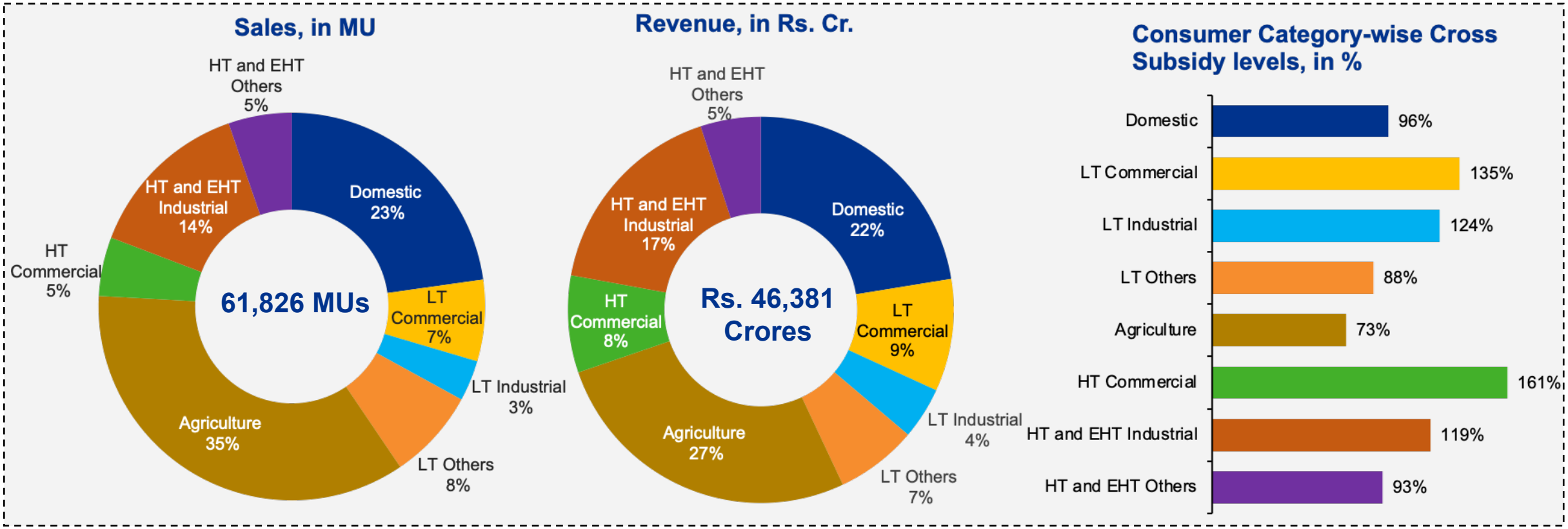
Increase in variable and fixed charges (113%[1]) has contributed significantly to overall increase in ACoS for the 8 states from FY 2014-15 to FY 2020-21.

Note:
1. Percentage with reference to change in ACoS in FY 2020-21 as compared to FY 2014-15 i.e., Rs. 1.56/kWh.
2. Factors contributing greater than Rs. ± 0.03/kWh to the overall change in ACoS have been considered.
3. Negative values have been represented in brackets.

Historical Analysis for Karnataka

Karnataka: Consumption and revenue mix for FY 2020-21

- At the state level, Agriculture consumers account for ~35% of the total sales, followed by the Domestic (23%) and HT and EHT Industrial (14%) consumers.
- HT and LT Commercial are the major cross-subsidizing categories in the state during FY 21.

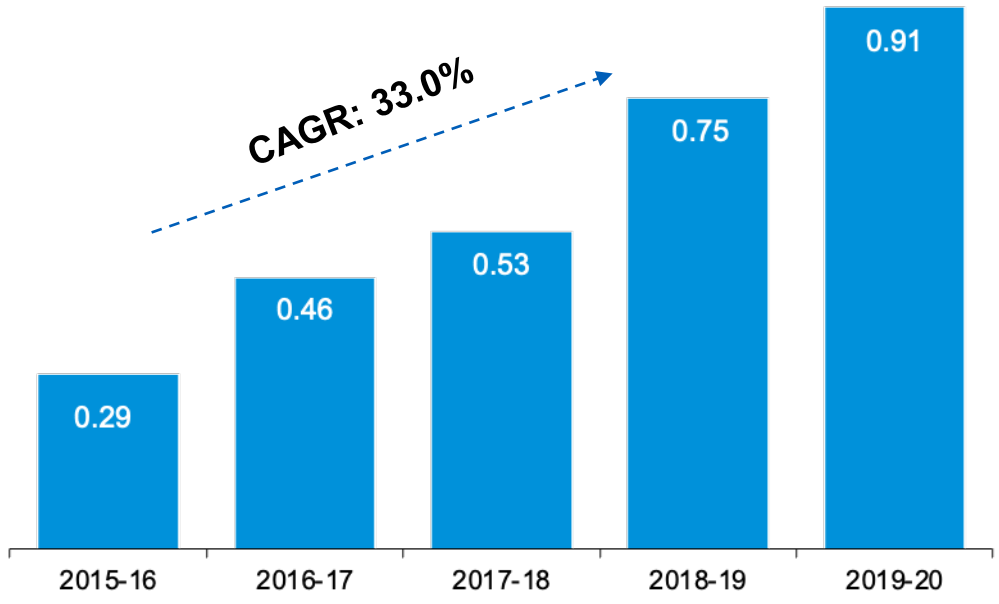


Source: Tariff orders issued by KERC for FY 2020-21.
Note: Govt of Karnataka provided subsidy only to Bhagya Jyothi/ Kutir Jyothi category and Agricultural category consumers (Irrigation Pump<10 HP). Category-wise revenue is including subsidy to BJ/KJ and Agricultural (IP<10 HP) consumer categories.

Inter & Intra-State Transmission Charges (Rs./kWh)

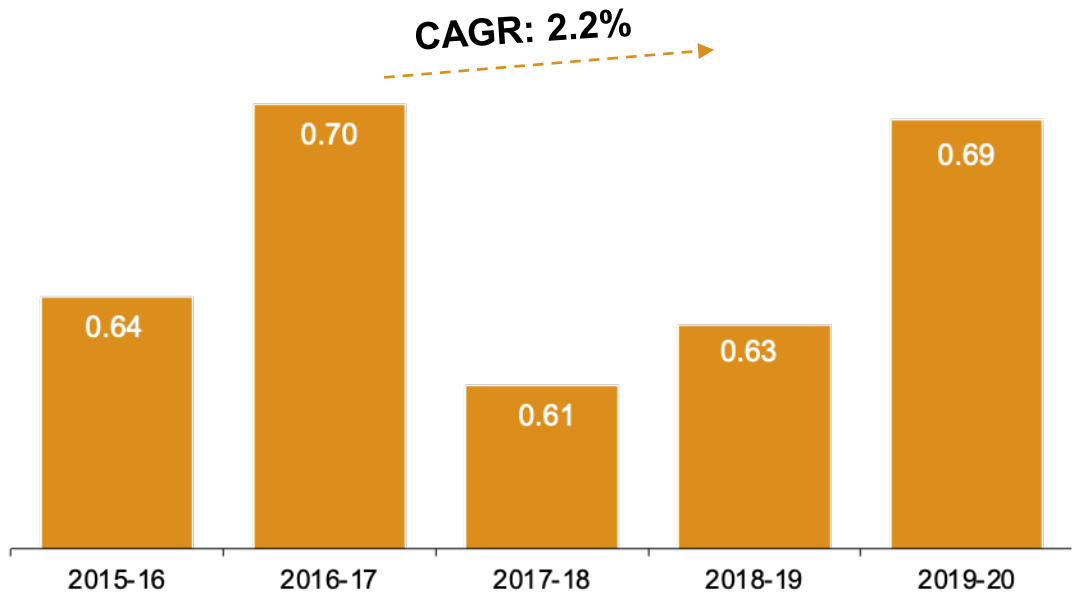
Change in Transmission Cost over the last 4 years

Inter-state TC per unit power procured from ISGS (in Rs. /kWh)



Per unit inter-state TC has witnessed an increasing trend over the last 5 years (from FY 2015-16 till FY 2019-20).

Intra-State TC per unit power procured from plants within the state (Rs./kWh)

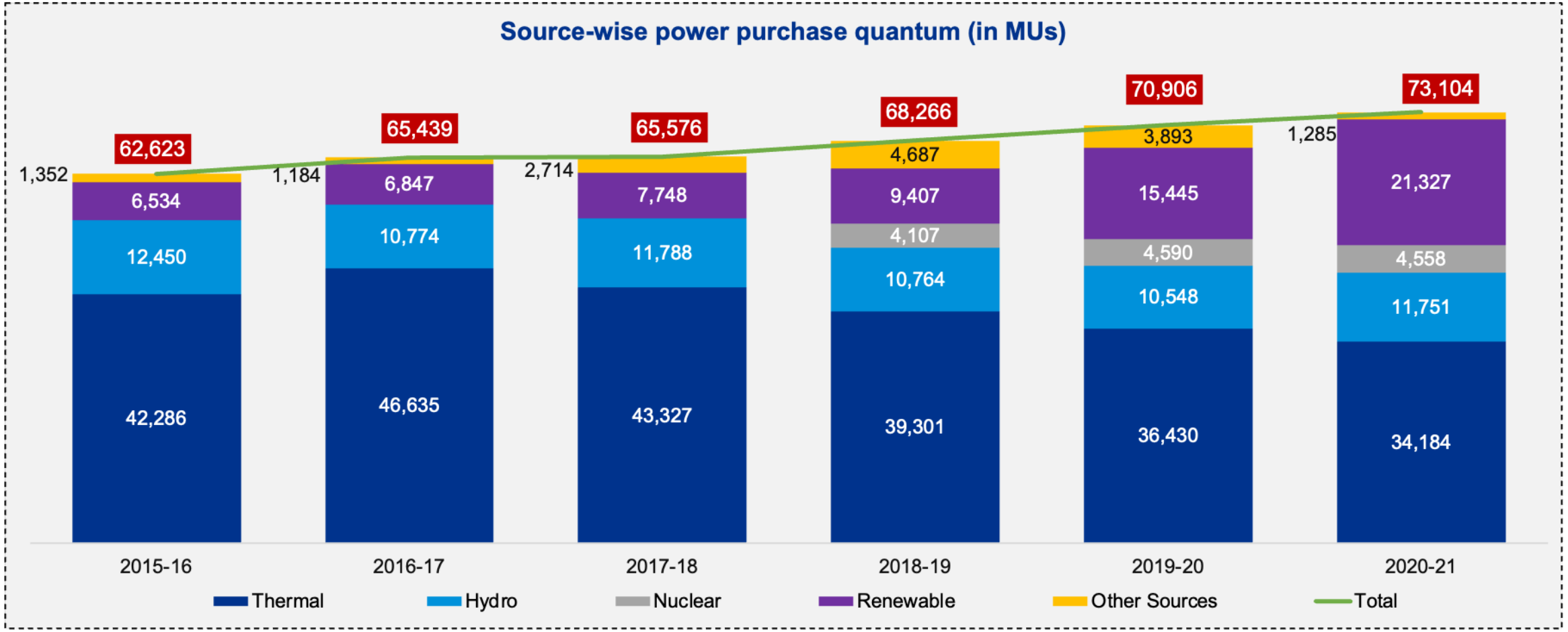


Per unit intra-state TC has increased marginally over the last 5 years with significant increase in FY 2016-17

Source: Tariff orders issued by respective state commissions for the last 7 years.
*Inter-state TC per unit is computed based on energy procured from ISGS and intra-state TC per unit is computed based on power procured from plants within the state.

Source wise power purchase quantum

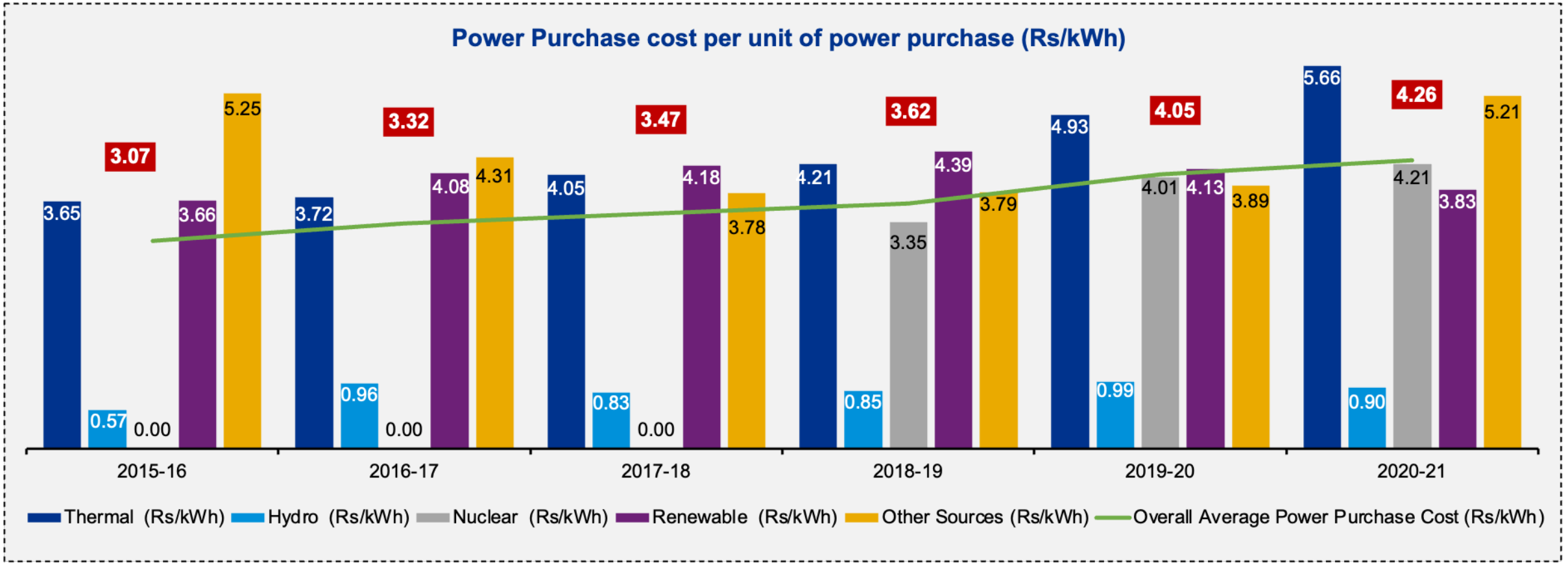
- Procurement from renewable sources has increased by 3 times in the last 6 years, while the overall quantum procured witnessing an increase of 17% during the same time period.



Source: Respective tariff orders issued by KERC.

Source wise power purchase cost

- Average power purchase cost for the state has increased over the last 6 years mainly on account of increase in procurement costs from thermal and hydro sources.

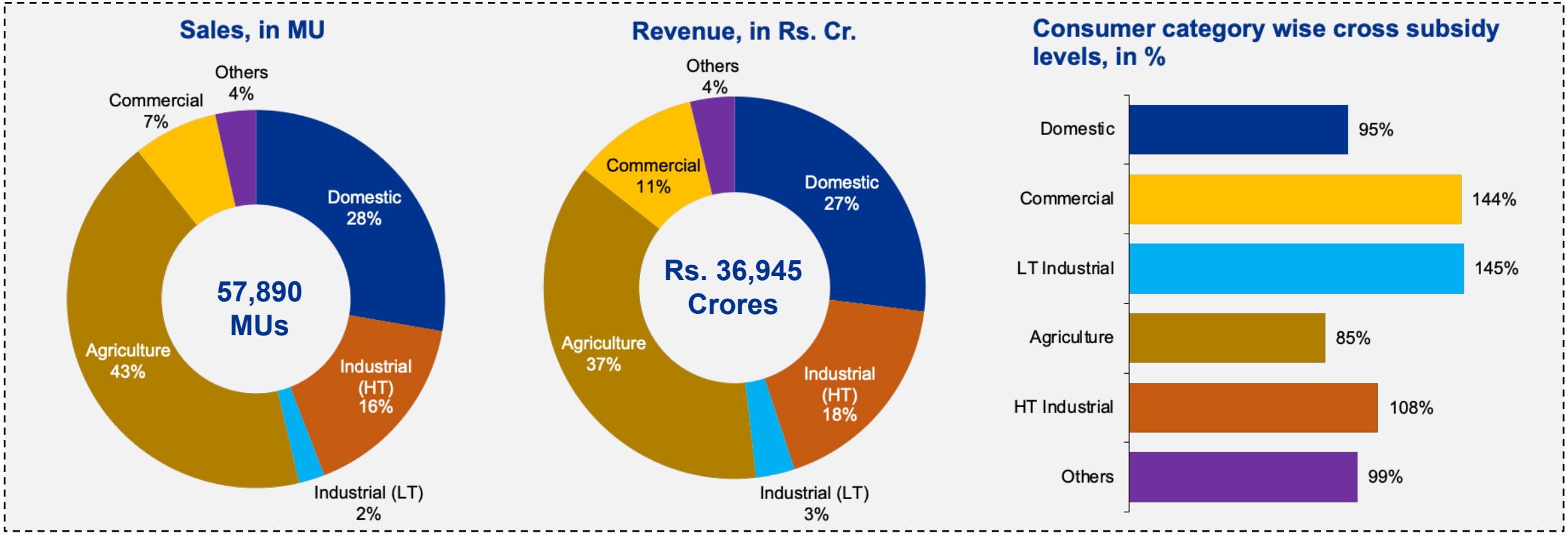


Source: Respective tariff orders issued by KERC.
Note:
1. Per unit power purchase cost is calculated dividing cost of power purchase from each source by power procured.
2. Power Purchase Cost considered excludes PGCIL, KPTCL, SLDC and POSCO charges.

Historical Analysis for Madhya Pradesh

Madhya Pradesh: Consumption and revenue mix for FY 2020-21

- At the state level, agriculture category accounts for ~43% of the total sales, followed by the domestic (28%) and HT Industrial (16%) categories.
- LT Industrial and Commercial are the major cross-subsidizing categories in the state during FY 21.

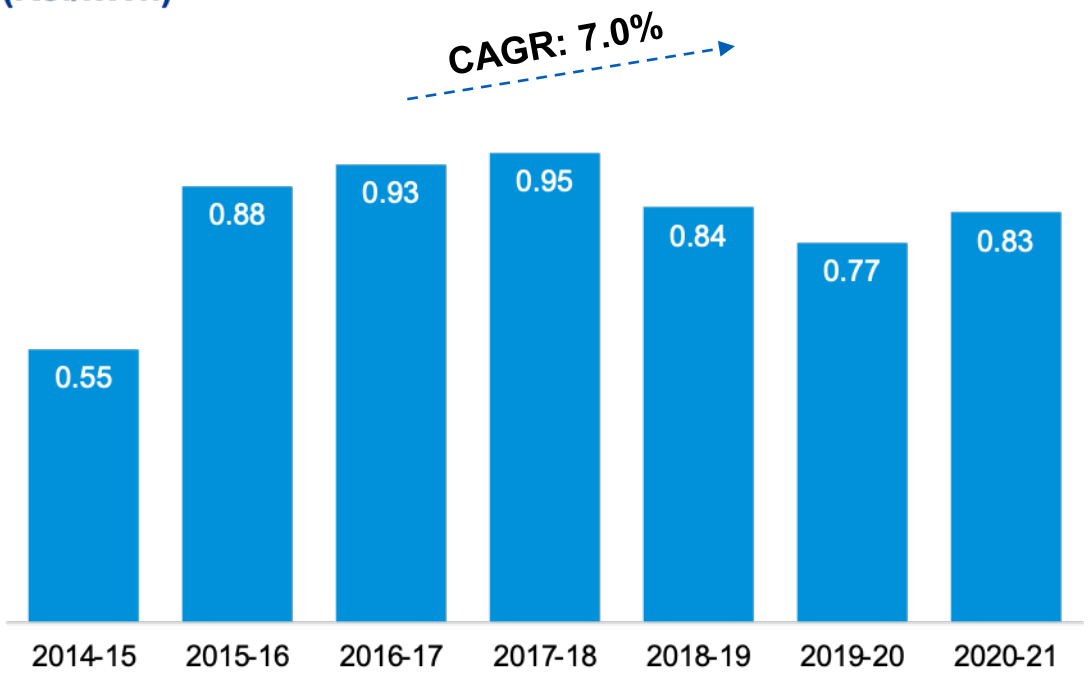


Source: Tariff order issued by MPERC for FY 2020-21.
Note: Category wise revenue is excluding tariff subsidy component.

Inter & Intra-State Transmission Charges (Rs./kWh)

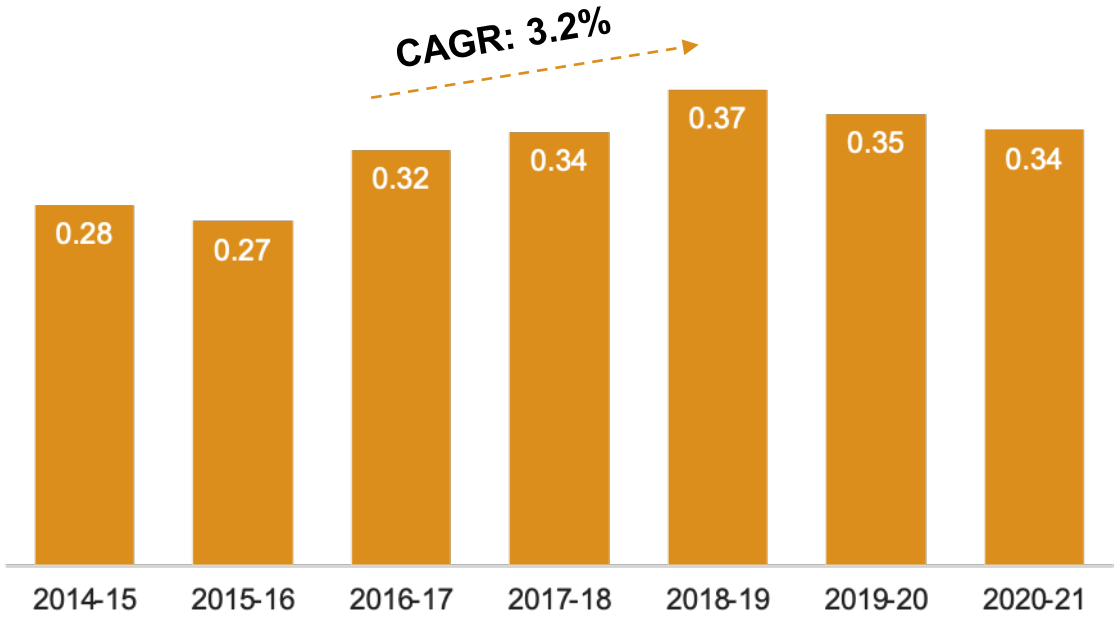
Change in Transmission Cost over the last 7 years

Inter-State TC per unit power procured from ISGS (Rs./kWh)



Per unit inter-state TC has witnessed an increasing trend over the last 7 years except in FY 2018-19 and FY 2019-20

Intra-State TC per unit power procured from plants within the state (Rs./kWh)

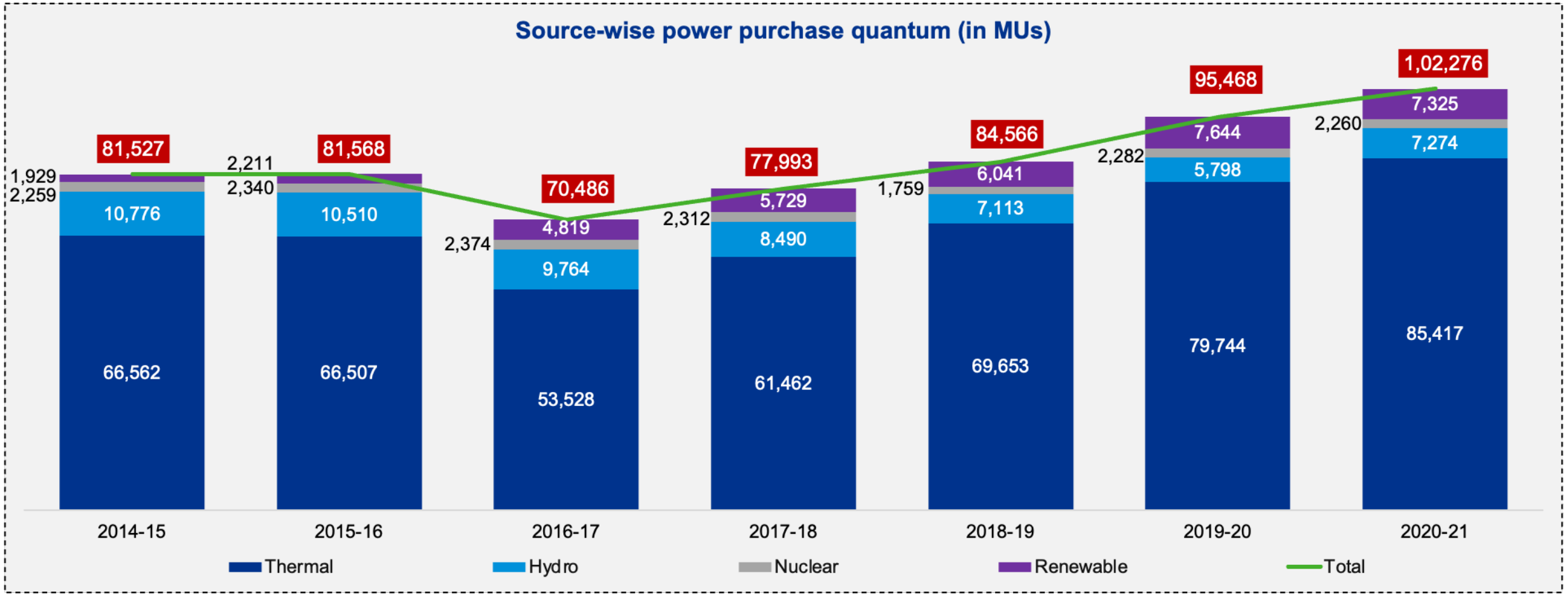


Per unit intra-state TC has increased over the last 7 years except in FY 2015-16 and FY 2019-20

Source: Tariff orders issued by respective state commissions for the last 7 years.
*Inter-state TC per unit is computed based on energy procured from ISGS and intra-state TC per unit is computed based on power procured from plants within the state.

Source wise power purchase quantum

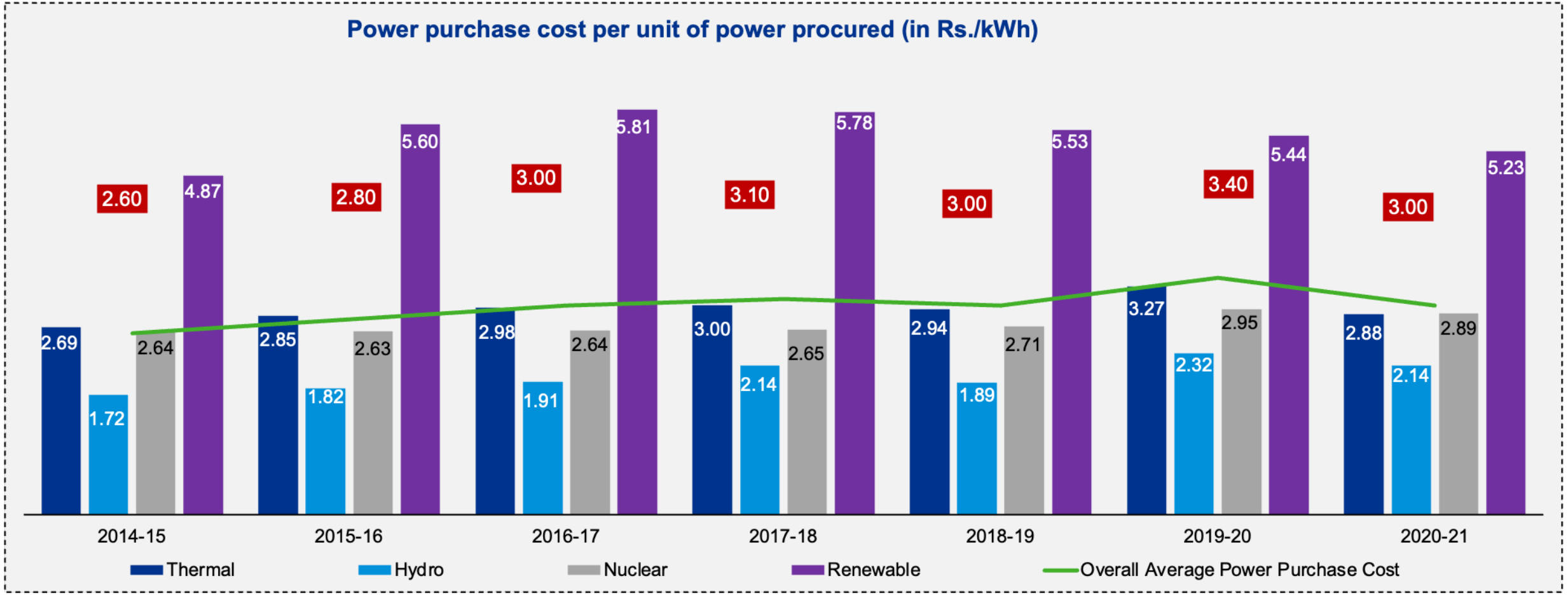
- Procurement from renewable sources increased by 4 times in the last 7 years, while from hydro sources it has reduced by 33% during the same time period. Total power purchase quantum has increased by 25% over the last 7 years



Source: Respective tariff orders issued by MPERC.

Source wise power purchase cost

- Average power purchase cost for the state has increased over the last 7 years mainly on account of increase in quantum procured from renewable sources from 2% to 7% of the total procurement in FY 21 at higher average cost of Rs. 5.23/kWh.

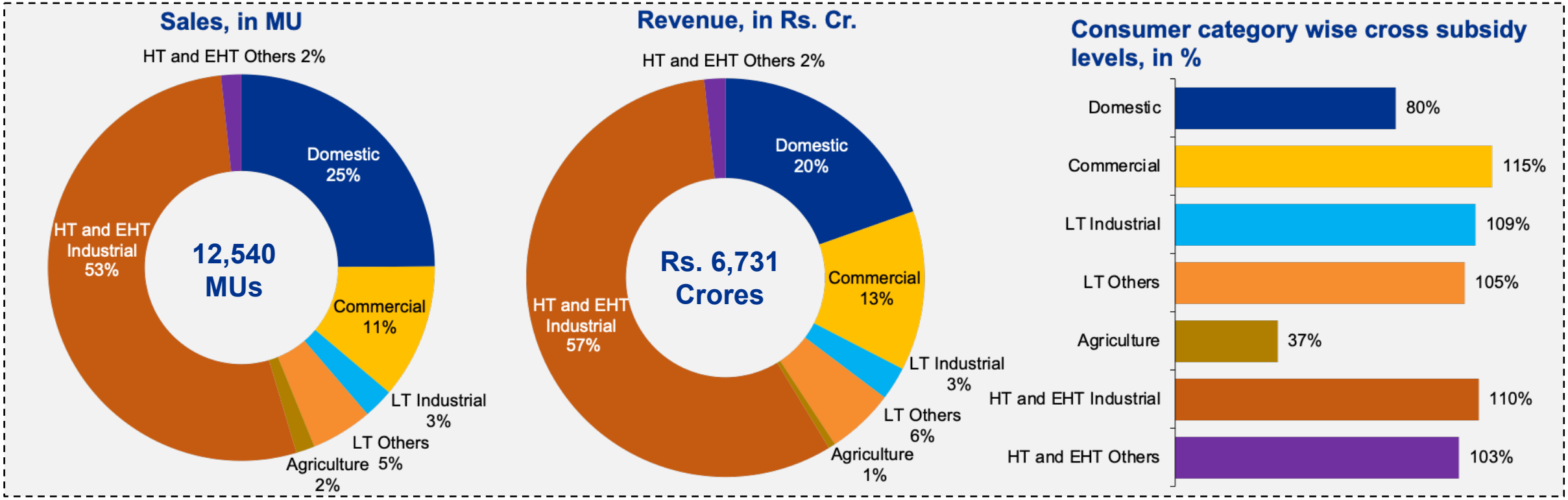


Source: Respective tariff orders issued by MPERC.
Per Unit power purchase cost is calculated by dividing cost of power purchase from each source by power procured.

Historical Analysis for Uttarakhand

Uttarakhand: Consumption and revenue mix for FY 2020-21

- At the state level, HT and EHT Industrial consumer category accounts for 53% of the total sales, followed by the domestic (25%) and commercial (11%).
- Revenue realization from industrial and commercial consumers is commensurate with sales.
- Commercial and HT and EHT Industrial are the major cross-subsidizing categories in the state during FY 21.

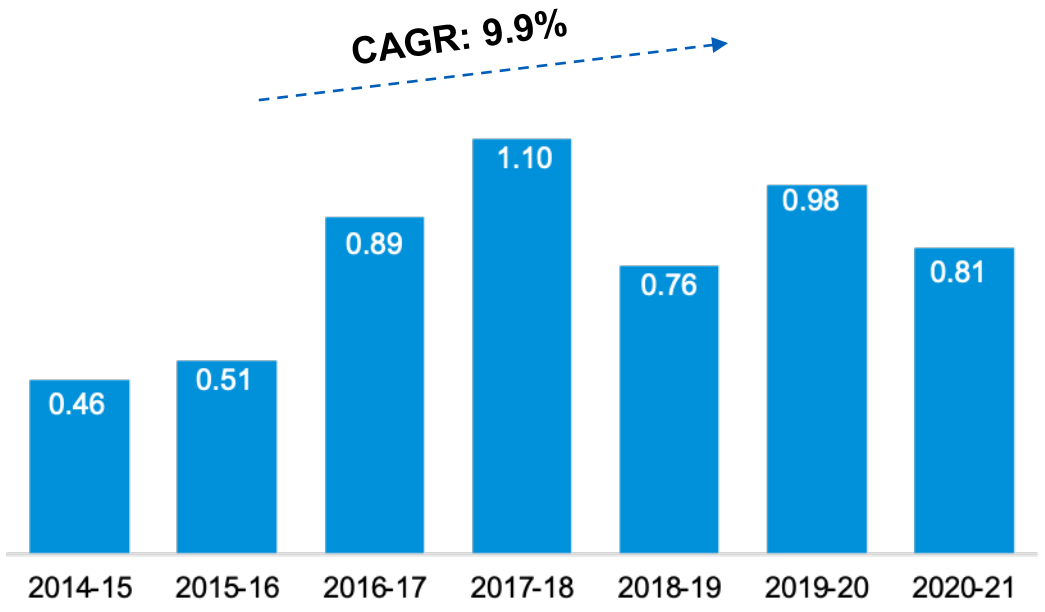


Source: Tariff orders issued by UERC for FY 2020-21
Note: Category wise revenue is excluding tariff subsidy component

Inter & Intra-State Transmission Charges (Rs./kWh)

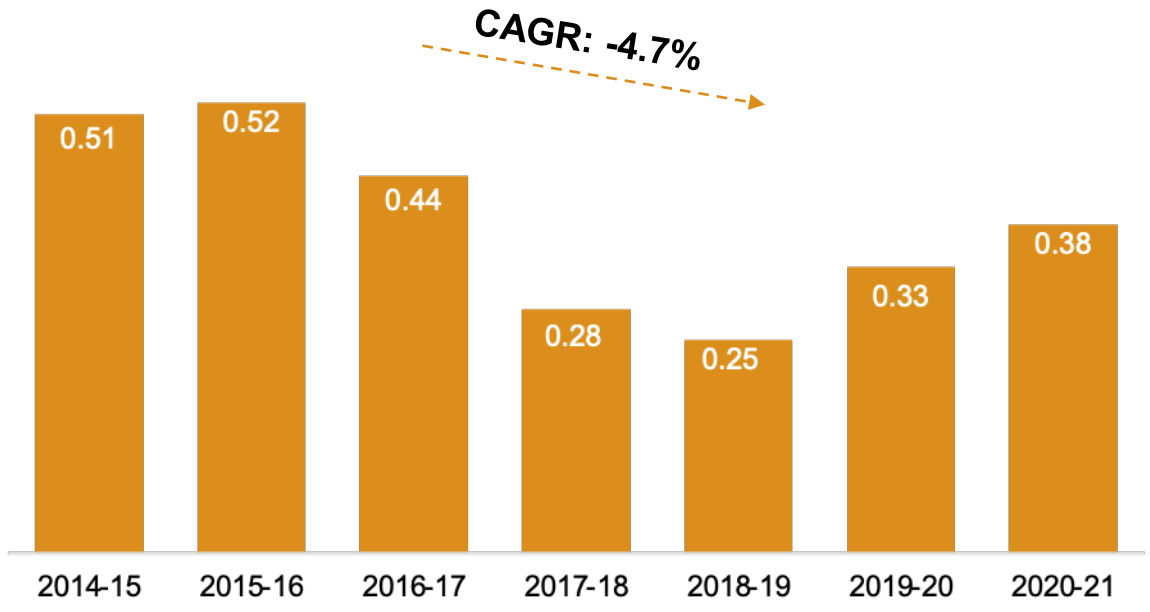
Change in Transmission Cost over the last 7 years

Inter-State TC per unit power procured from ISGS (Rs./kWh)



Per unit inter-state TC has varied in the range of Rs. 0.46/kWh - Rs. 1.1/kWh over the last 7 years.

Intra-State TC per unit power procured from plants within the state (Rs./kWh)

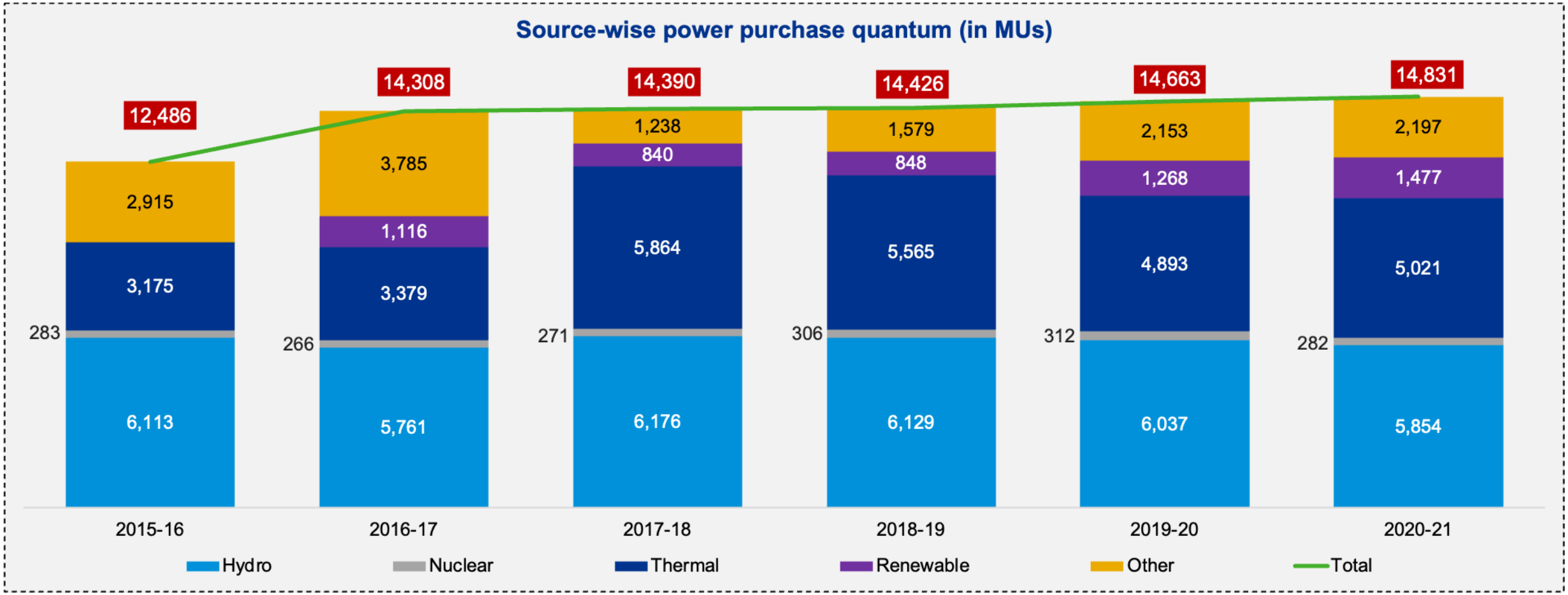


Per unit intra-state TC has reduced in FY 2020-21 as compared to FY 2014-15

Source: Tariff orders issued by respective state commissions for the last 7 years.
*Inter-state TC per unit is computed based on energy procured from ISGS and intra-state TC per unit is computed based on power procured from plants within the state.

Source wise power purchase quantum

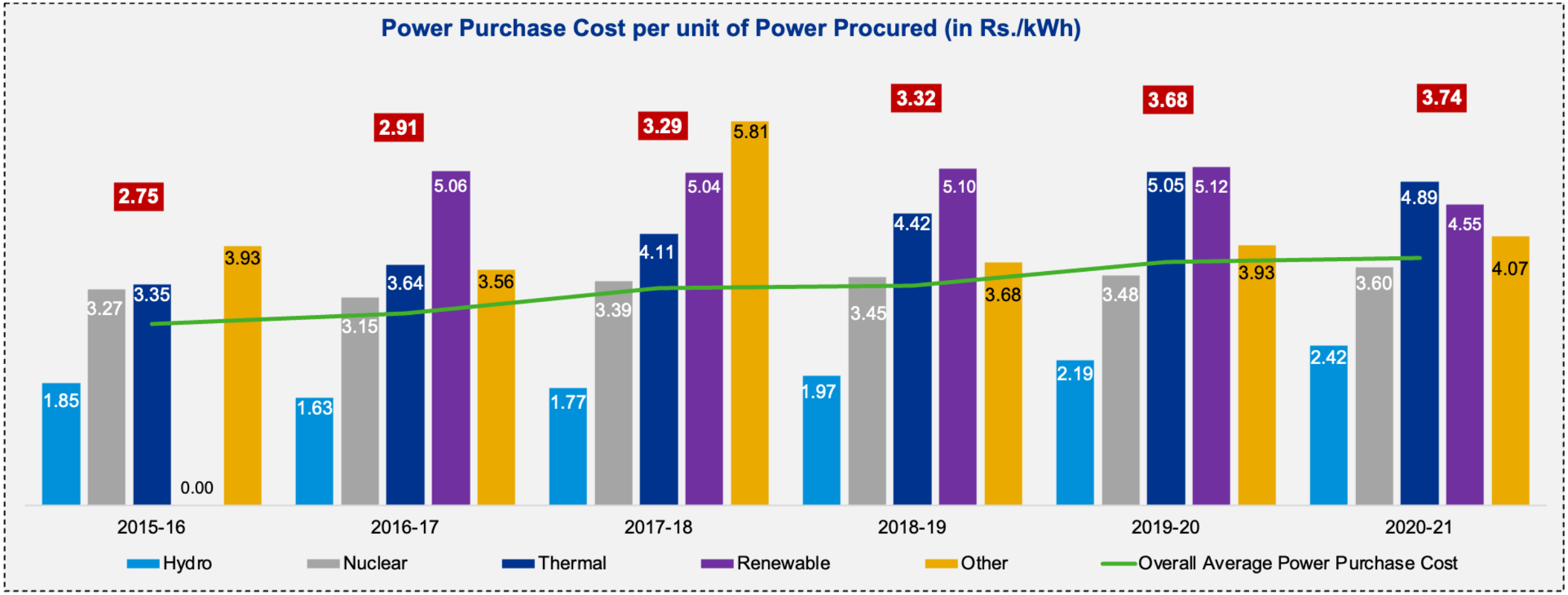
- Procurement from thermal sources has increased by 58% in the last 6 years, while the total quantum procured has increased by 19% during the same time period.



Source: Respective tariff orders issued by UERC.
Per Unit power purchase cost is calculated by dividing cost of power purchase from each source by power procured.

Source wise power purchase cost

- Average power purchase cost for the state has increased over the last 6 years mainly on account of increase in average procurement costs from thermal and renewable sources.

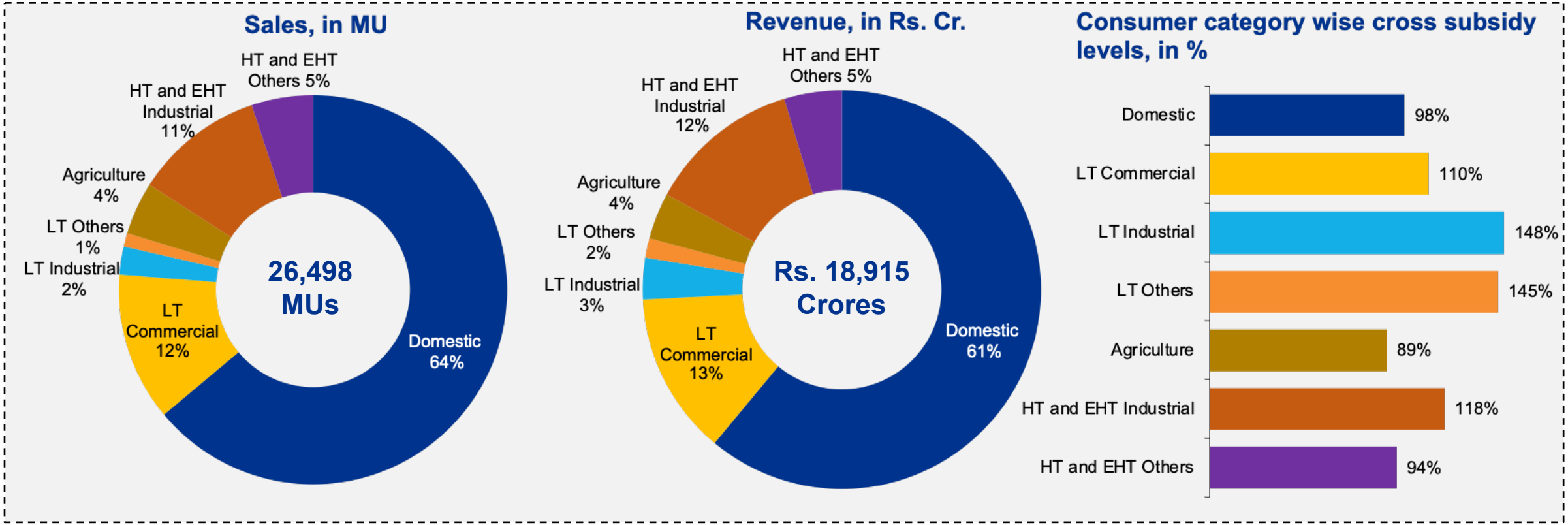


Source: Respective tariff orders issued by UERC.

Historical Analysis for Bihar

Bihar: Consumption and revenue mix for FY 2020-21

- At the state level, domestic consumer category accounts for 64% of the total sales, followed by LT Commercial (12%) and HT and EHT Industrial (11%).
- LT (Industrial and Others) consumers are the major cross-subsidizing categories in the state during FY 21.

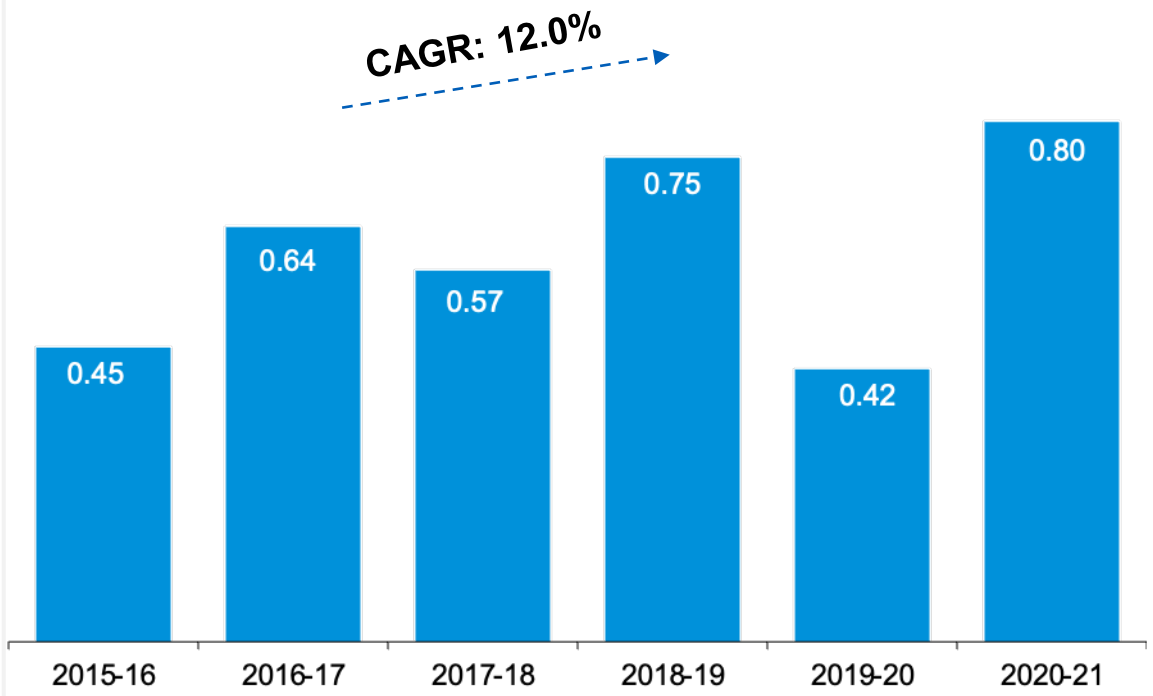


Source: Respective tariff order issued by BERC for FY 2020-21.
Note: The Commission has approved the retail tariff for FY 2020-21 without considering Government subsidy component; Revenue is inclusive of subsidy component.

Inter & Intra-State Transmission Charges (Rs./kWh)

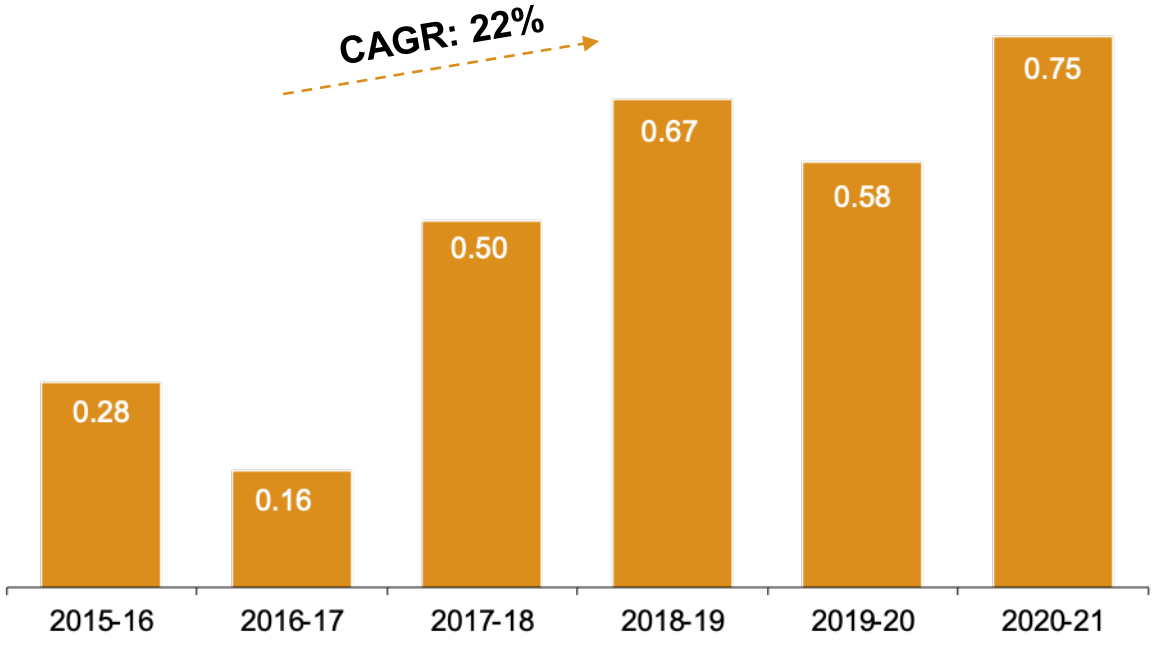
Change in Transmission Cost over the last 7 years

Inter-State TC per unit power procured from ISGS (Rs./kWh)



Per unit inter-state TC reduced significantly during FY 2019-20

Intra-State TC per unit power procured from plants within the state (Rs./kWh)

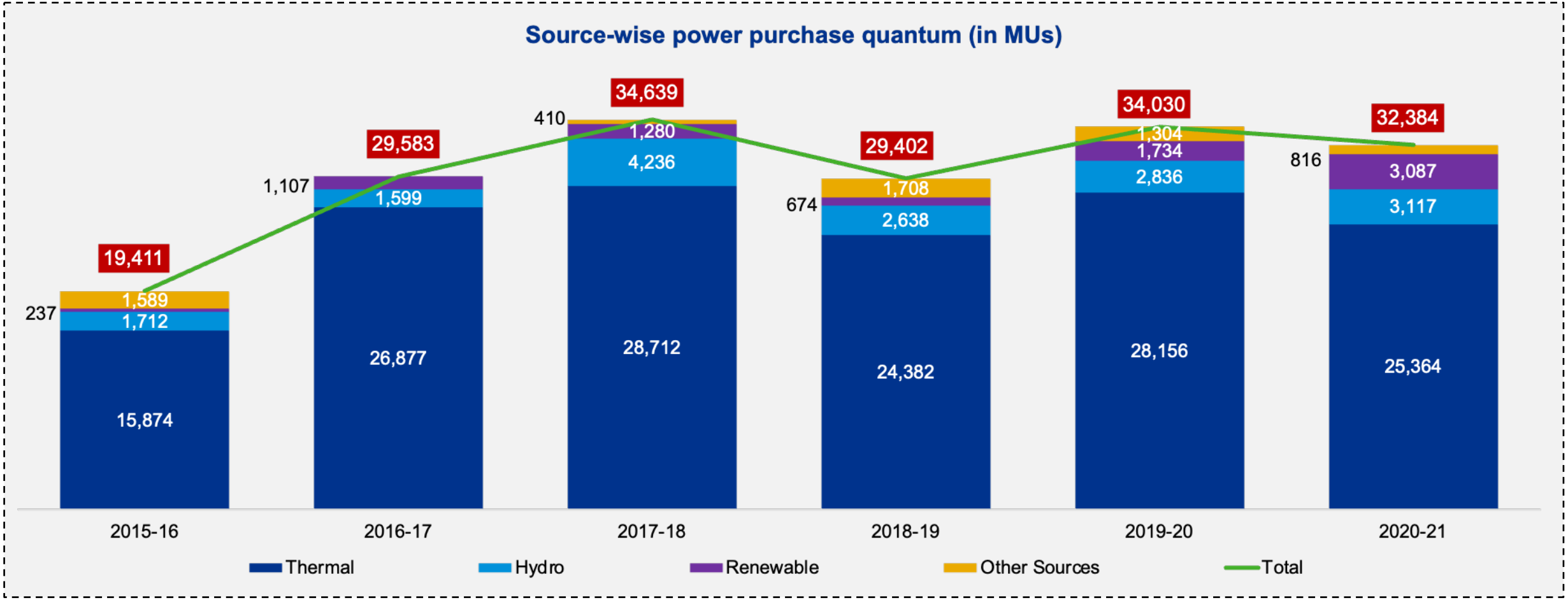


Per unit intra-state TC has increased over the last 6 years except in FY 2016-17

Source: Tariff orders issued by respective state commissions for the last 7 years;
*Inter-state TC per unit is computed based on energy procured from ISGS and intra-state TC per unit is computed based on power procured from plants within the state

Source wise power purchase quantum

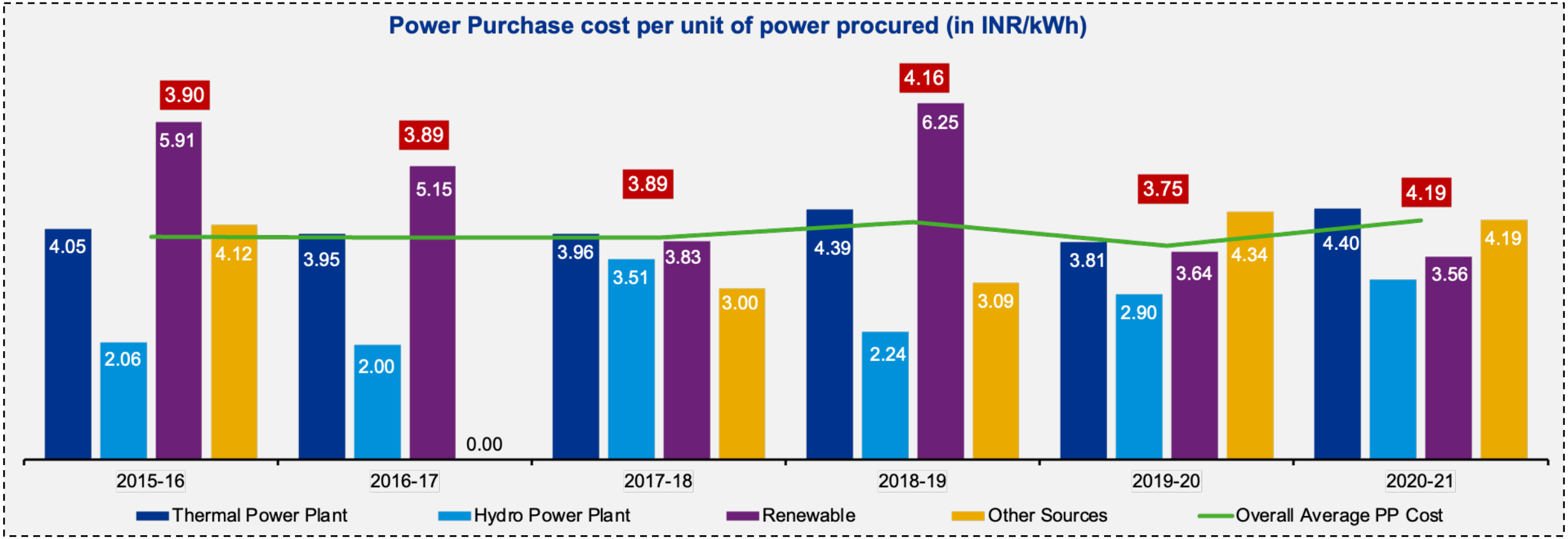
- Procurement from renewable sources has increased by 13 times in the last 6 years, while the overall quantum procured has witnessed an increase of 67% during the same time period.



Source: Respective tariff orders issued by BERC.

Source wise power purchase cost

- Significant increase in procurement cost from thermal sources[1] has contributed to the overall increase in per unit power purchase cost.
- The cost of procurement from renewable sources has witnessed a decreasing trend over the last 6 years except in FY 2018-19.



* Power Purchase Cost considered here is the power procured from firm sources (including the sales of surplus power and the excess T&D loss disallowed).

Source: Respective tariff orders issued by BERC.

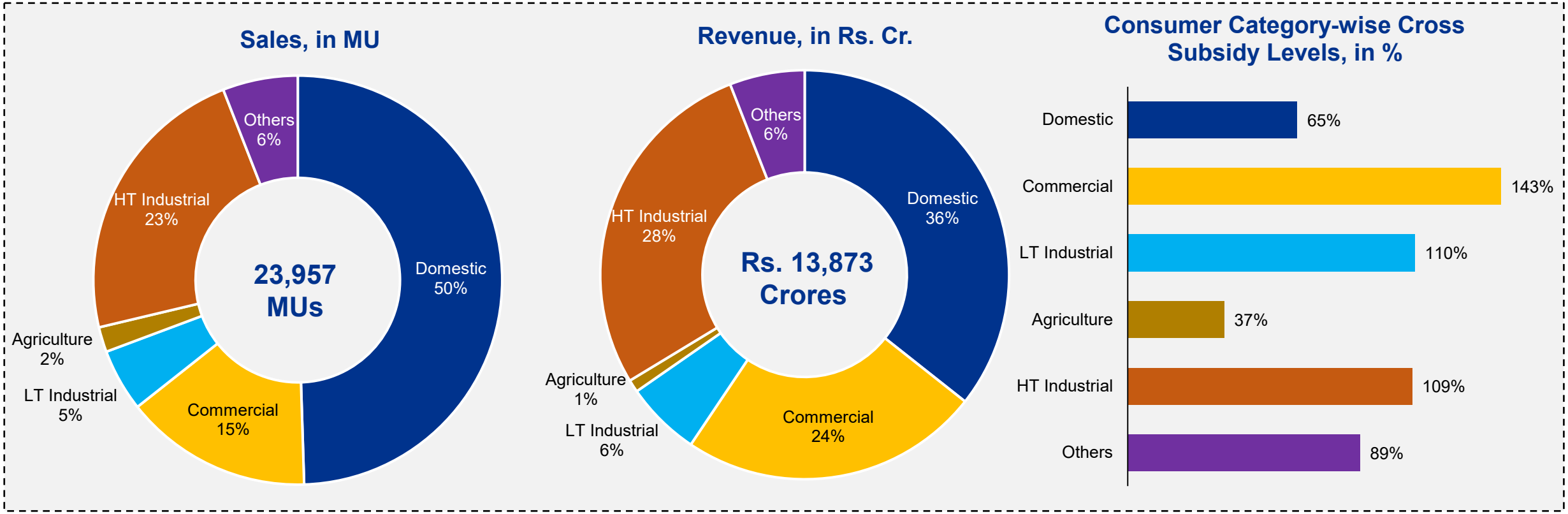
Note:

1. Increase in per unit cost of power procured from thermal power plant due to increase in per unit procurement cost from Barh Stage (2 x 660), MTPS II (2 x 195) (KBUNL), Chuka, BTPS Stage I (Unit I, II) & Stage II (Unit I & II) generating stations.

Historical Analysis for Kerala

Kerala: Consumption and revenue mix for FY 2020-21

- At the state level, domestic category accounts for 50% of the total sales, followed by HT industrial (23%) and commercial (15%).
- Commercial and industrial (HT and LT) consumers are the major cross-subsidizing categories in the state during FY 21.

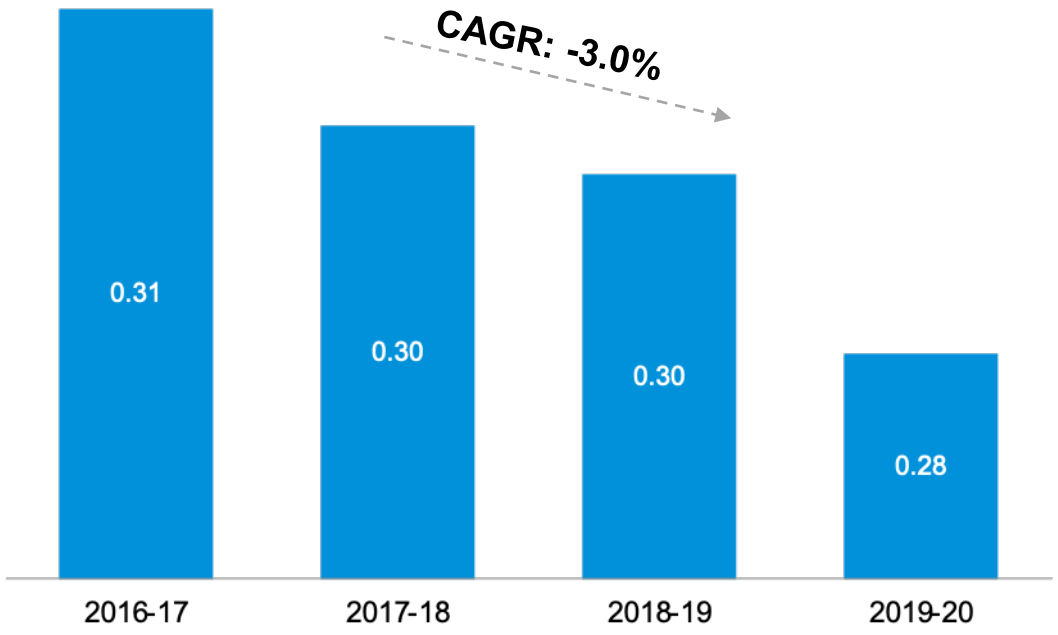


Source: Multi Year Tariff order for FY 2018-19 to FY 2021-22 issued by KSERC.
Note: Category wise revenue does not include tariff subsidy component. No subsidy component has been considered for tariff determination process.

Inter & Intra-State Transmission Charges (Rs./kWh)

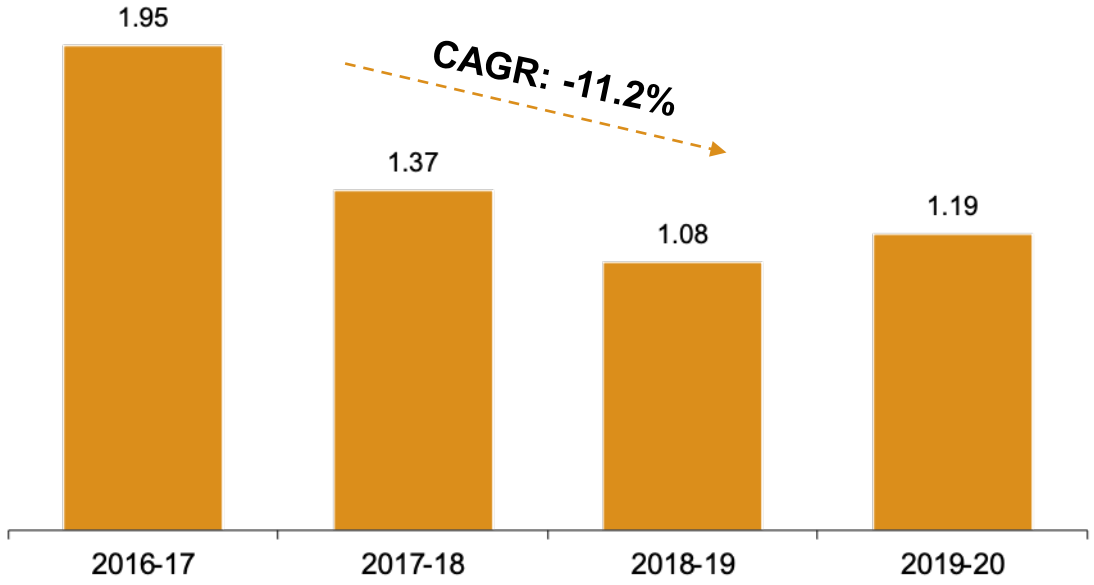
Change in Transmission Cost over the last 4 years

Inter-State TC per unit power procured from ISGS (Rs./kWh)



Per unit inter-state TC has witnessed a reducing trend over the last 4 years (from FY 2016-17 till FY 2019-20) with the highest reduction of 6% in FY 2019-20 as compared to previous year.

Intra-State TC per unit power procured from plants within the state (Rs./kWh)

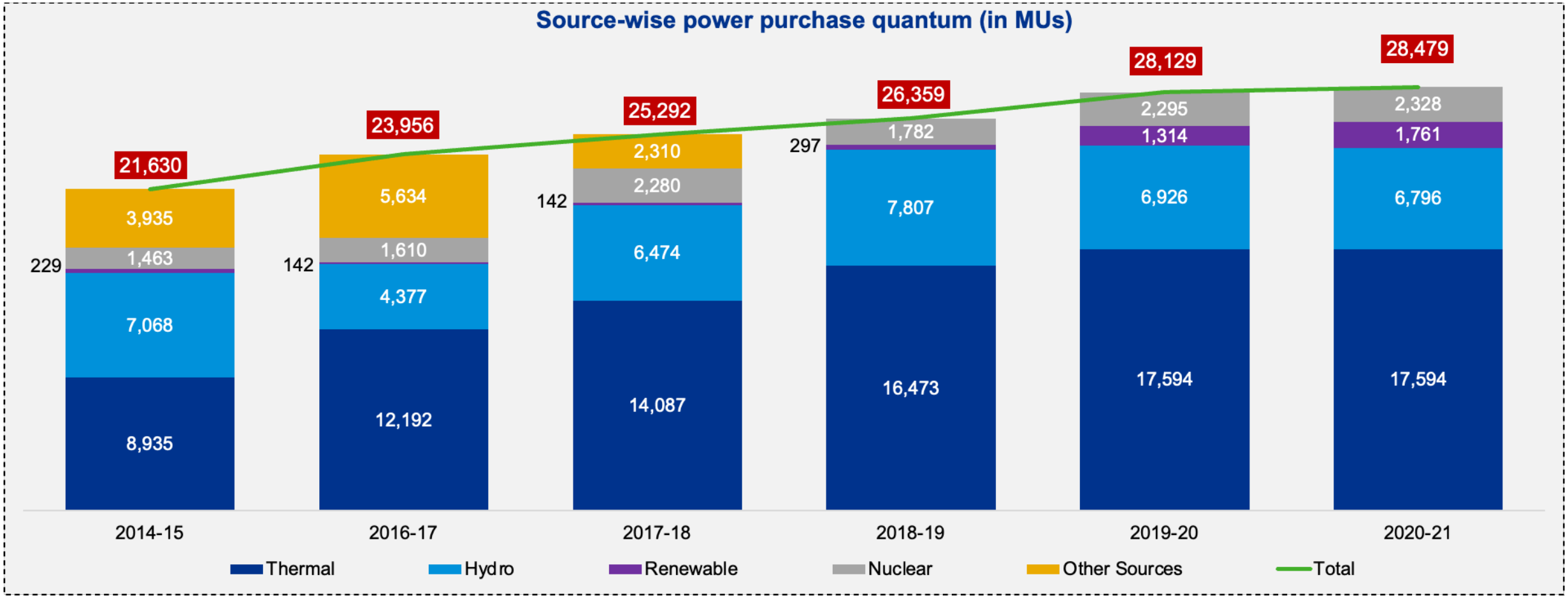


Per unit intra-state TC has reduced over the last 4 years (from FY 2016-17 till FY 2019-20) except in FY 2019-20 where it has increased by 11%.

Source: Tariff orders issued by respective state commissions for the last 7 years.
*Inter-state TC per unit is computed based on energy procured from ISGS and intra-state TC per unit is computed based on power procured from plants within the state.

Source wise power purchase cost

- Procurement from renewable sources has increased by 8 times in the last 7 years, while the overall quantum procured has witnessed an increase of 32% during the same time period.

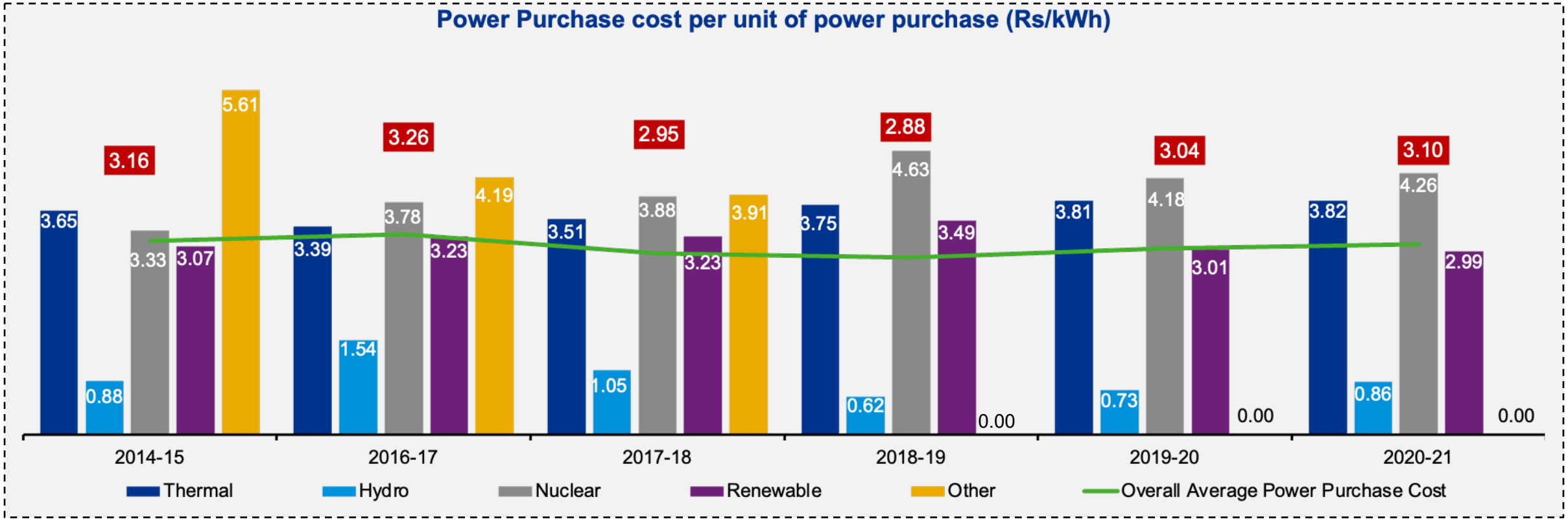


Source: Respective tariff orders issued by KSERC.

1. Data for FY 2015-16 is not available in tariff orders.
2. Power purchase from other sources has reduced to Nil in FY 2020-21 from 2,208 MUs in FY 2014-15 since the commission has approved procurement from new IPPs instead of open market.

Source wise power purchase cost

- At the state level, average power purchase cost has reduced marginally over the last 7 years due to reduction in procurement from other sources at higher cost[2].
- Procurement cost from thermal sources has increased marginally over the last 7 years mainly on account of increase in variable charges from coal based TPPs.



Source: Respective tariff orders issued by KSERC.

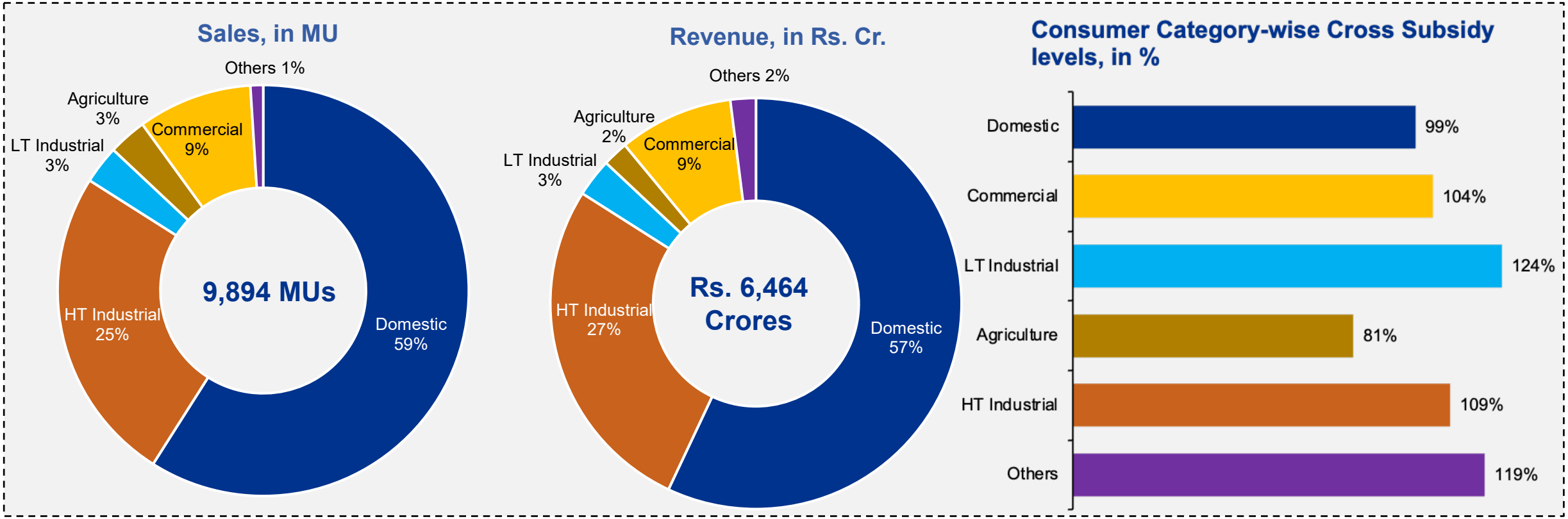
* Power Purchase Cost considered here is the power procured from firm sources (including the sales of surplus power and the excess T&D loss disallowed).

1. Data for FY 2015-16 is not available in tariff orders.
2. Power purchase from other sources has reduced to Nil in FY 2020-21 from 2,208 MUs in FY 2014-15 since the commission has approved procurement from new IPPs instead of open market.

Historical Analysis for Jharkhand

Jharkhand: Consumption and revenue mix for FY 2020-21

- At the state level, domestic consumer category accounts for 59% of the total sales, followed by the HT industrial (25%) and commercial (9%).
- Industrial (HT and LT) and others[1] consumers are the major cross subsidizing categories in the state during FY 21.



Source: Tariff order issued by JSERC for FY 2020-21.

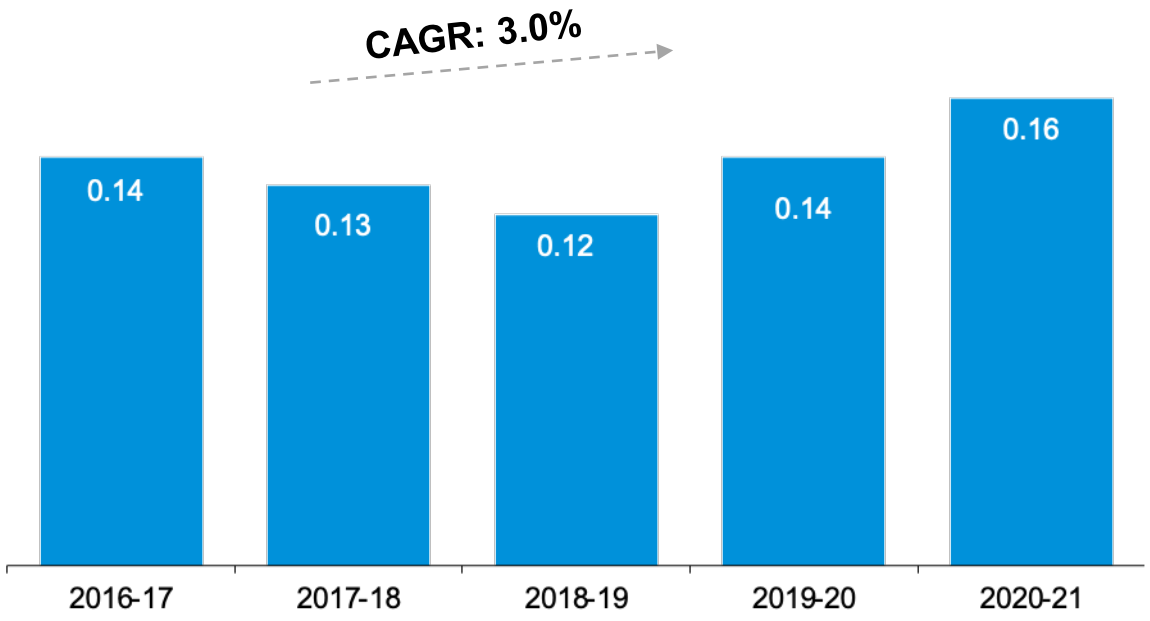
Note:

1. Others include Public Lighting / SS (Street Light Service) & RTS (Railway Traction Services) / MES (Military and Engineering Services)
2. Category wise revenue does not include tariff subsidy component. Subsidy component has not been considered for tariff determination process.

Inter & Intra-State Transmission Charges (Rs./kWh)

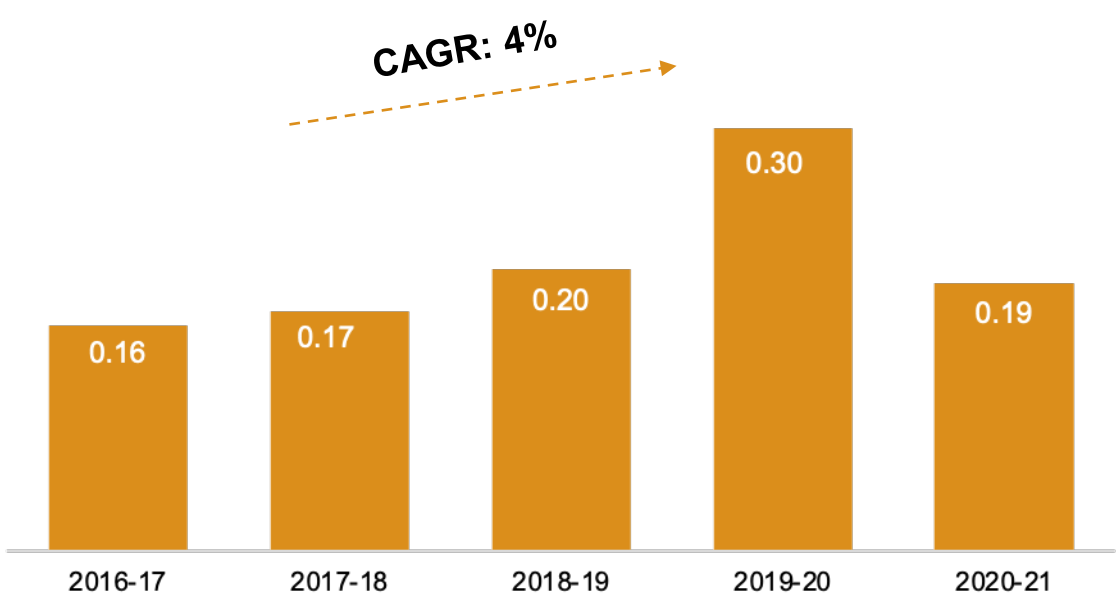
Change in Transmission Cost over the last 5 years

Inter-state TC per unit power procured from ISGS (in Rs. /kWh)



Inter-state TC has increased significantly in FY20 on account of increase in POC charges from INR 1,46,426/MW/Month (Q2, FY19) to INR 2,63,722/MW/Month (Q2, FY20)

Intra-State TC per unit power procured from plants within the state (Rs./kWh)

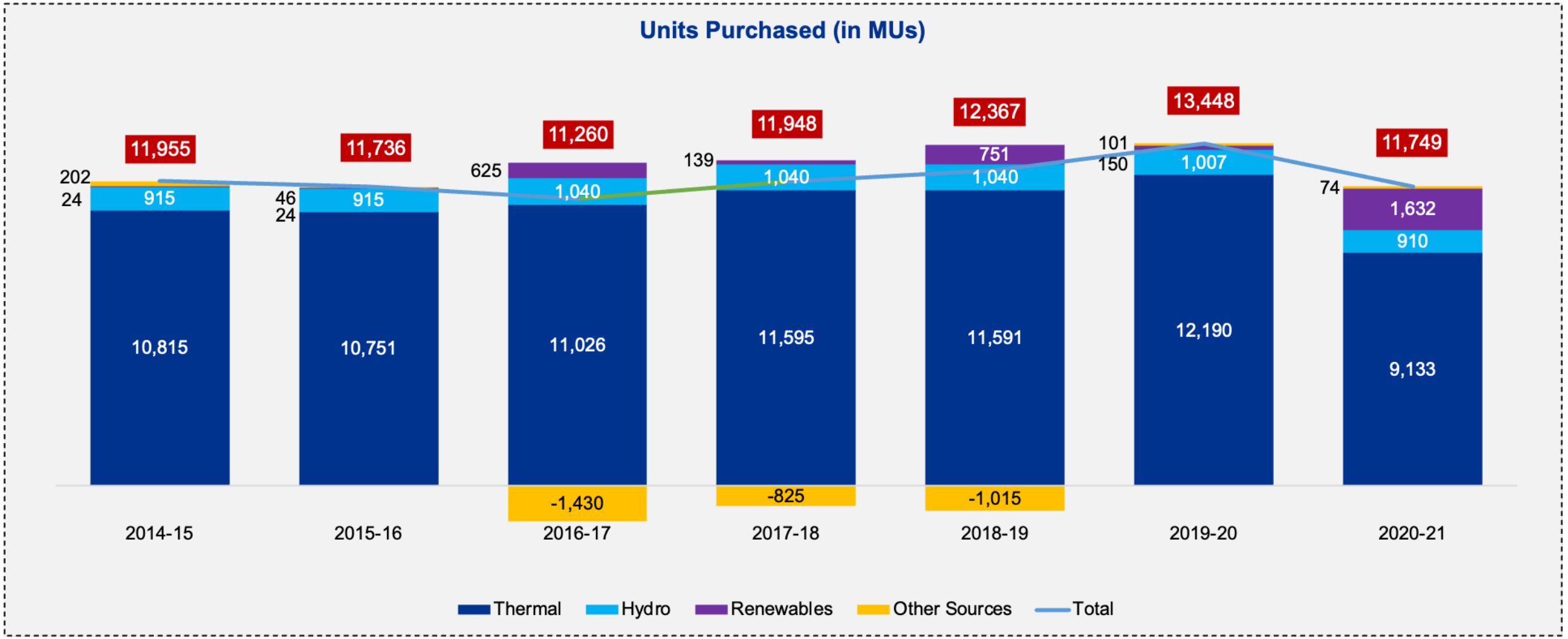


Intra-state TC has increased marginally over the last 5 years (from FY 2016-17 till FY 2020-21)

Source: Tariff orders issued by respective state commissions for the last 5 years, CERC POC Determination Orders.

Source wise power purchase cost

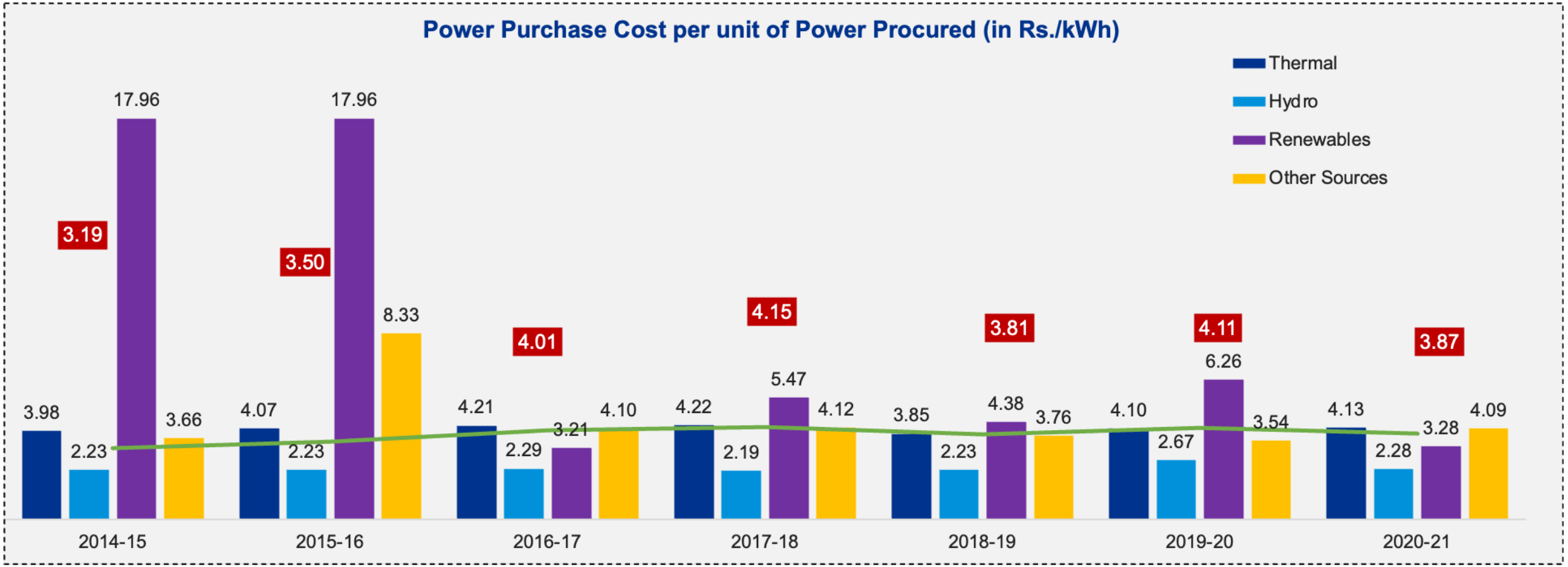
- Procurement from renewable sources has increased by 69 times in the last 7 years, while the overall quantum procured has witnessed a marginal reduction of 2% during the same time period.



Source: Respective tariff orders issued by JSERC.

Source wise power purchase cost

- Over the last 7 years, average power purchase cost for most of the sources has remained constant except for renewable sources.
- The solar PPAs were signed at a very high tariff during FY 16 but gradual renegotiations with solar IPPs in FY 17 normalized the tariff for subsequent years.

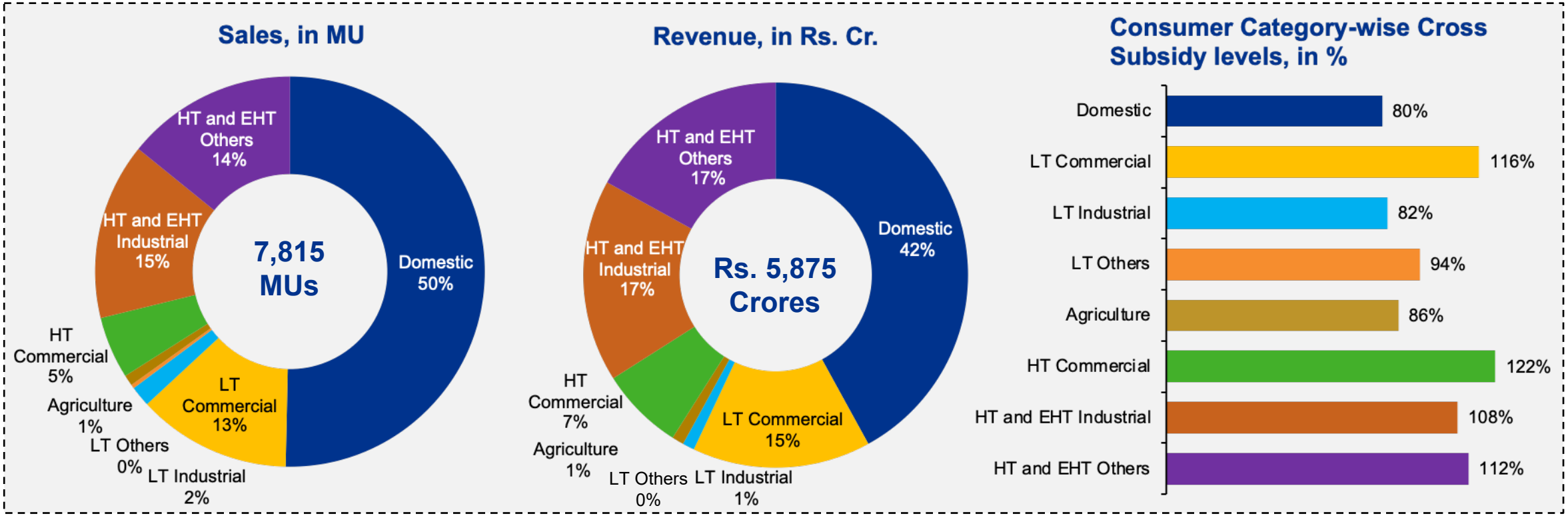


Source: Respective tariff orders issued by JSERC.

Historical Analysis for Assam

Assam: Consumption and revenue mix for FY 2020-21

- At the state level, domestic consumer category accounts for ~50% of the total sales, followed by the HT and EHT Industrial (15%) and HT and EHT Others (14%) consumers.
- HT and LT Commercial are the major cross-subsidizing categories in the state during FY 21.

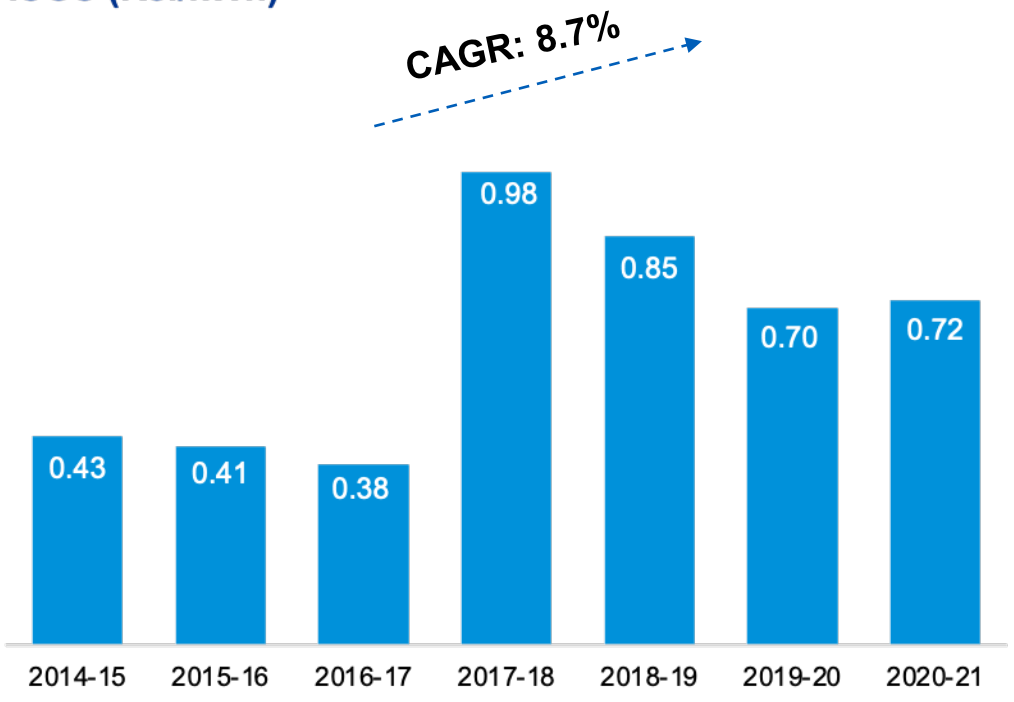


Source: Tariff order issued by AERC for FY 2020-21.
Note: Category wise revenue is excluding tariff subsidy component.

Inter & Intra-State Transmission Charges (Rs./kWh)

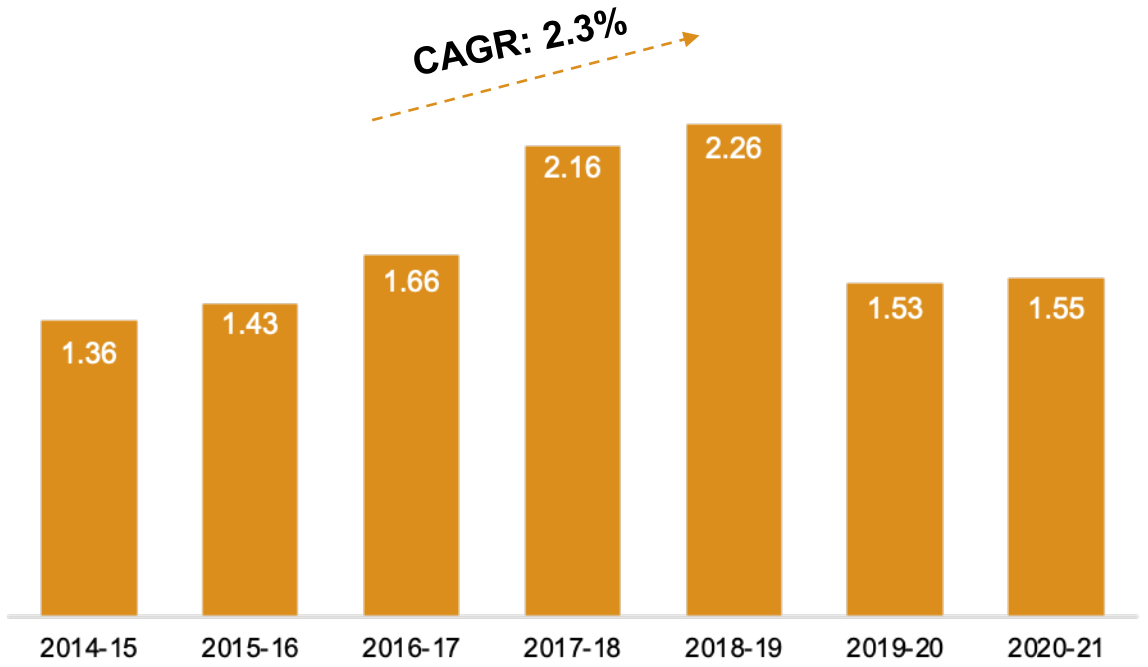
Change in Transmission Cost over the last 7 years

Inter-State TC per unit power procured from ISGS (Rs./kWh)



Per unit inter-state TC increased significantly in FY 2017-18 as compared to FY 2016-17.

Intra-State TC per unit power procured from plants within the state (Rs./kWh)

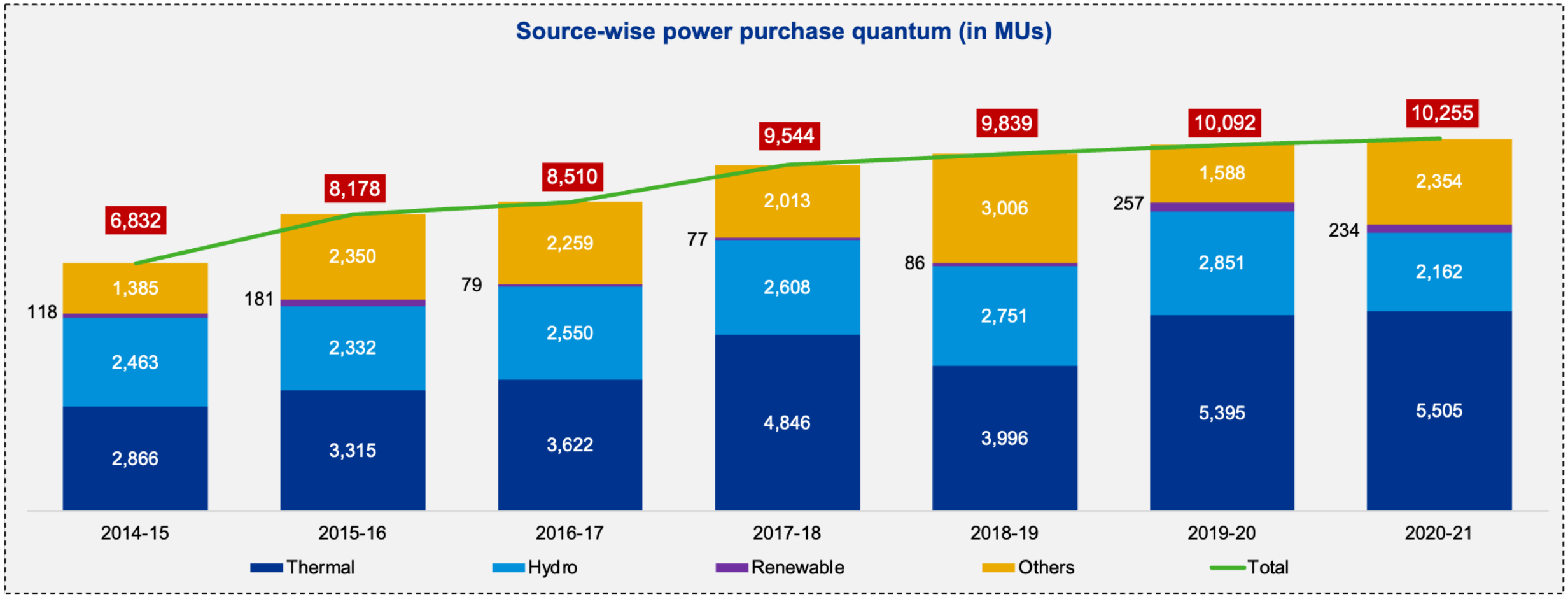


Per unit intra-state TC has increased with an annual growth rate of 2.3% over the last 7 years

Source: Tariff orders issued by respective state commissions for the last 7 years.
*Inter-state TC per unit is computed based on energy procured from ISGS and intra-state TC per unit is computed based on power procured from plants within the state.

Source wise power purchase cost

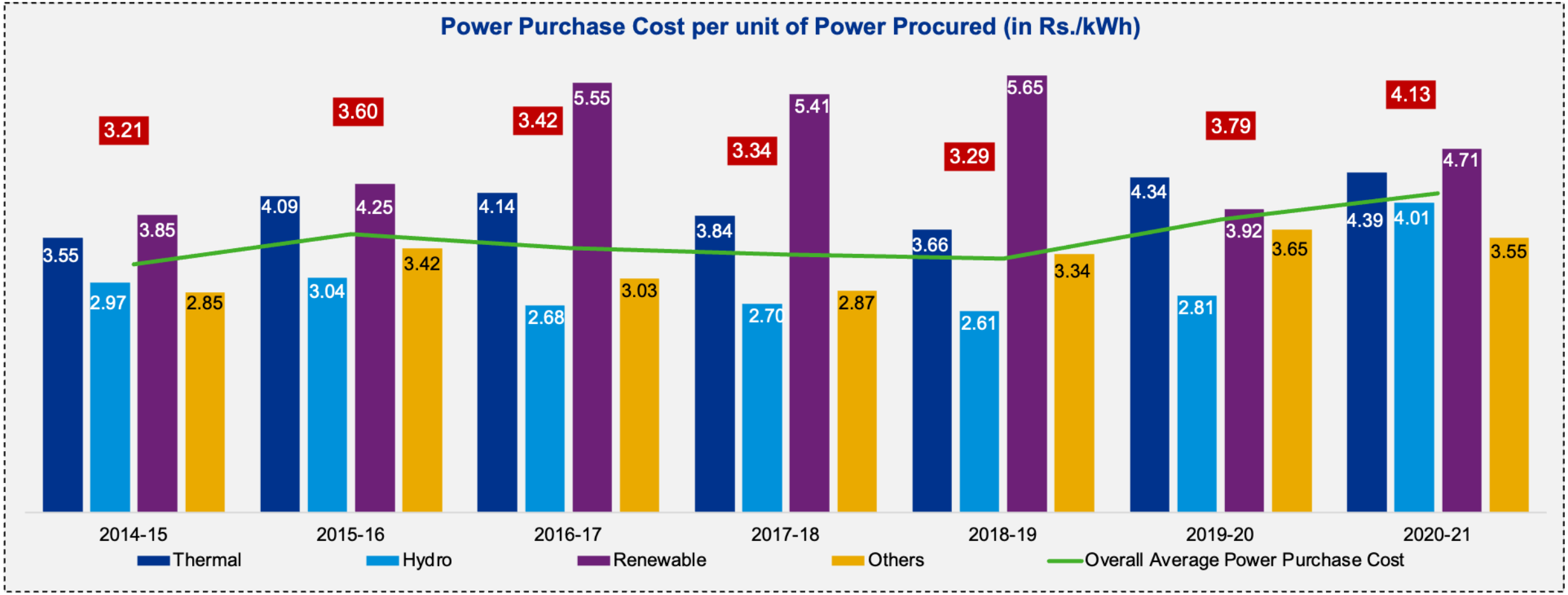
- Power procured from thermal sources has increased by 92% in the last 7 years, while the overall quantum procured has increased by 50% during the same time period.



Source: Respective tariff orders issued by AERC.

Source wise power purchase cost

- Average power purchase cost for the state has increased over the last 7 years mainly on account of increase in quantum procured from thermal sources from 42% to 54% of the total procurement in FY 21 at higher average cost of Rs. 4.39/kWh.

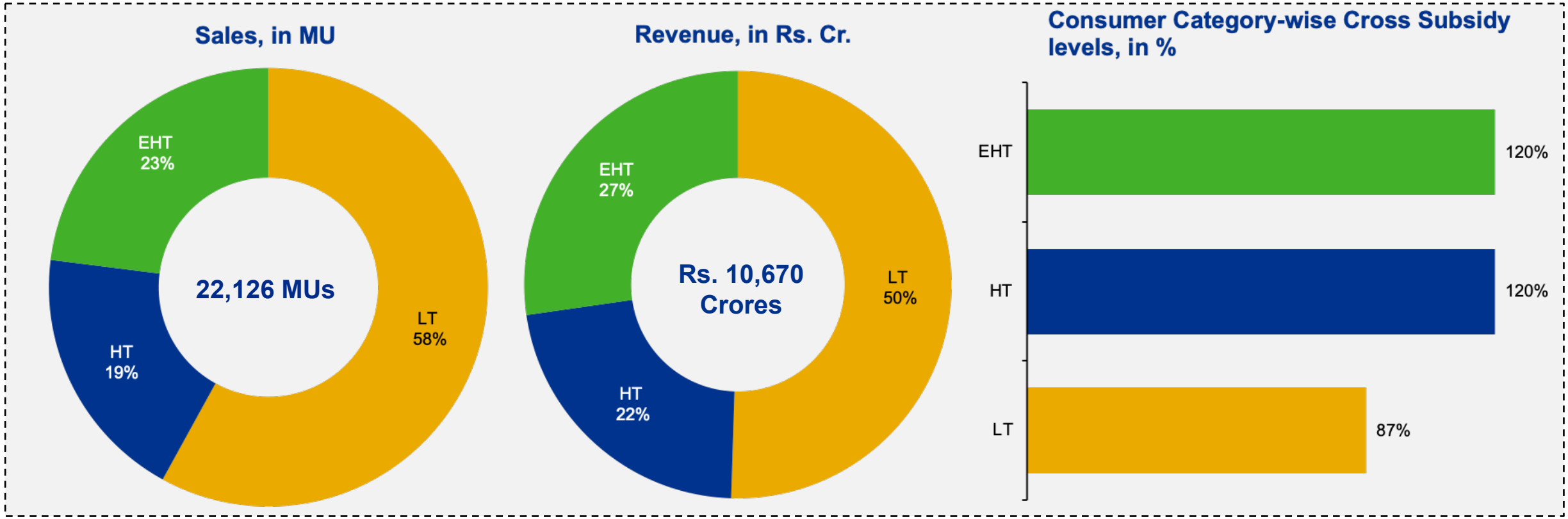


Source: Respective tariff orders issued by AERC.
Note:
Per Unit power purchase cost is calculated by dividing cost of power purchase from each source by power procured.

Historical Analysis for Odisha

Odisha: Consumption and revenue mix for FY 2020-21

- At the state level, LT consumer category accounts for ~58% of the total sales, followed by the EHT (23%) and HT (19%) categories.
- EHT and HT are the major cross-subsidizing categories for the state during FY21.

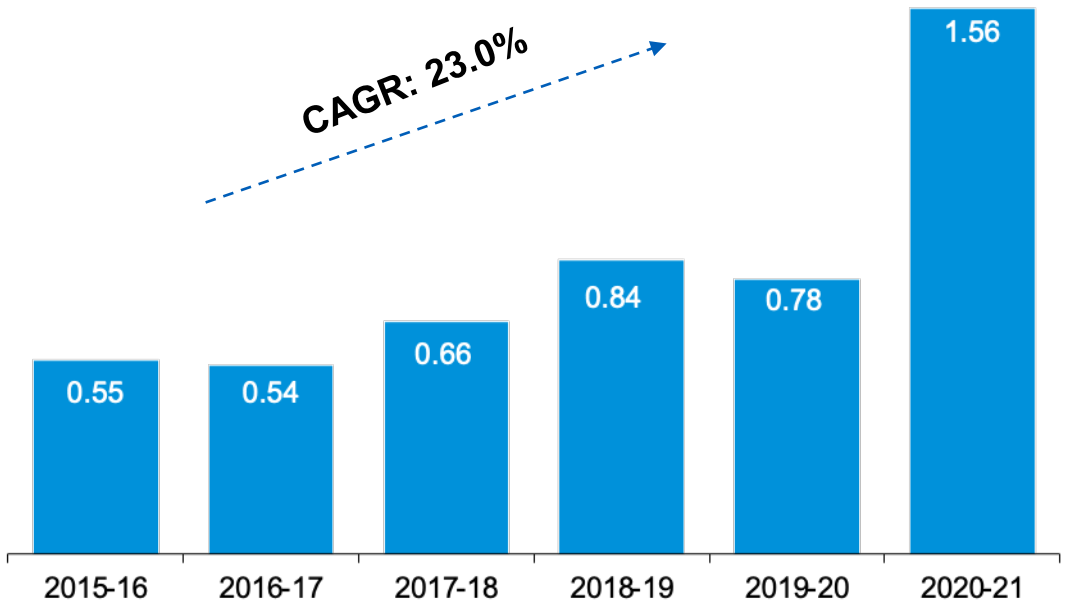


Source: Tariff order issued by OERC for FY 2020-21
Note: Category wise revenue is excluding tariff subsidy component. As per tariff order all consumers are divided into 3 categories – High Tension (HT), Extra High Tension (EHT), Low Tension (LT).

Inter & Intra-State Transmission Charges (Rs./kWh)

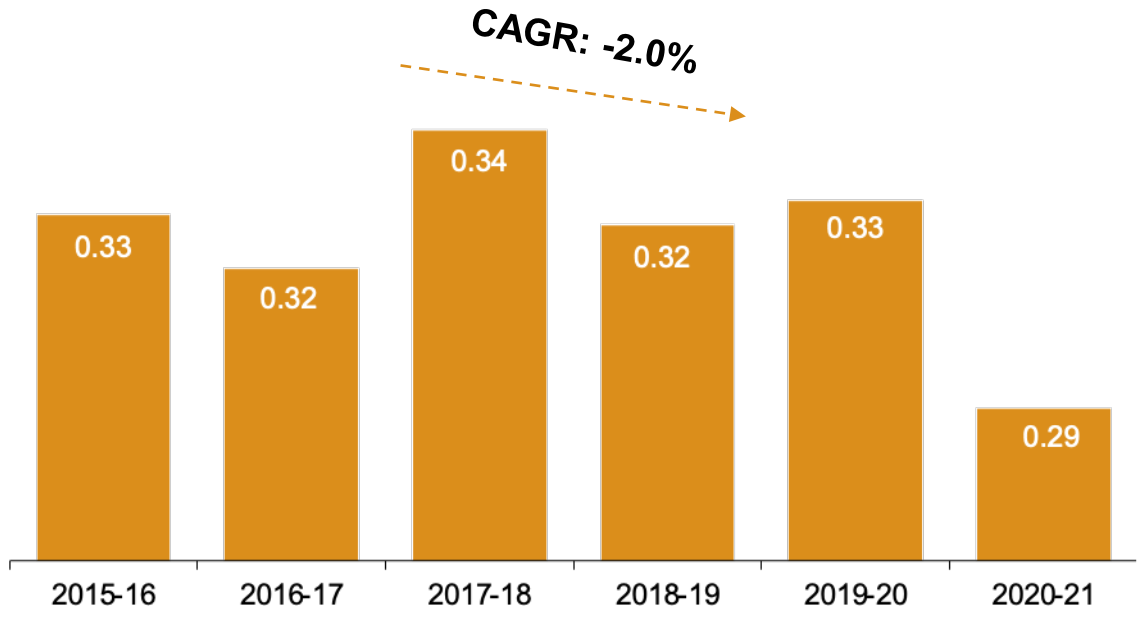
Change in Transmission Cost over the last 6 years

Inter-state TC per unit power procured from ISGS (in Rs. /kWh)



Per unit inter-state TC has witnessed an increasing trend over the last 6 years (from FY 2015-16 till FY 2020-21).

Intra-state TC per unit power procured from plants within the state (Rs./kWh)

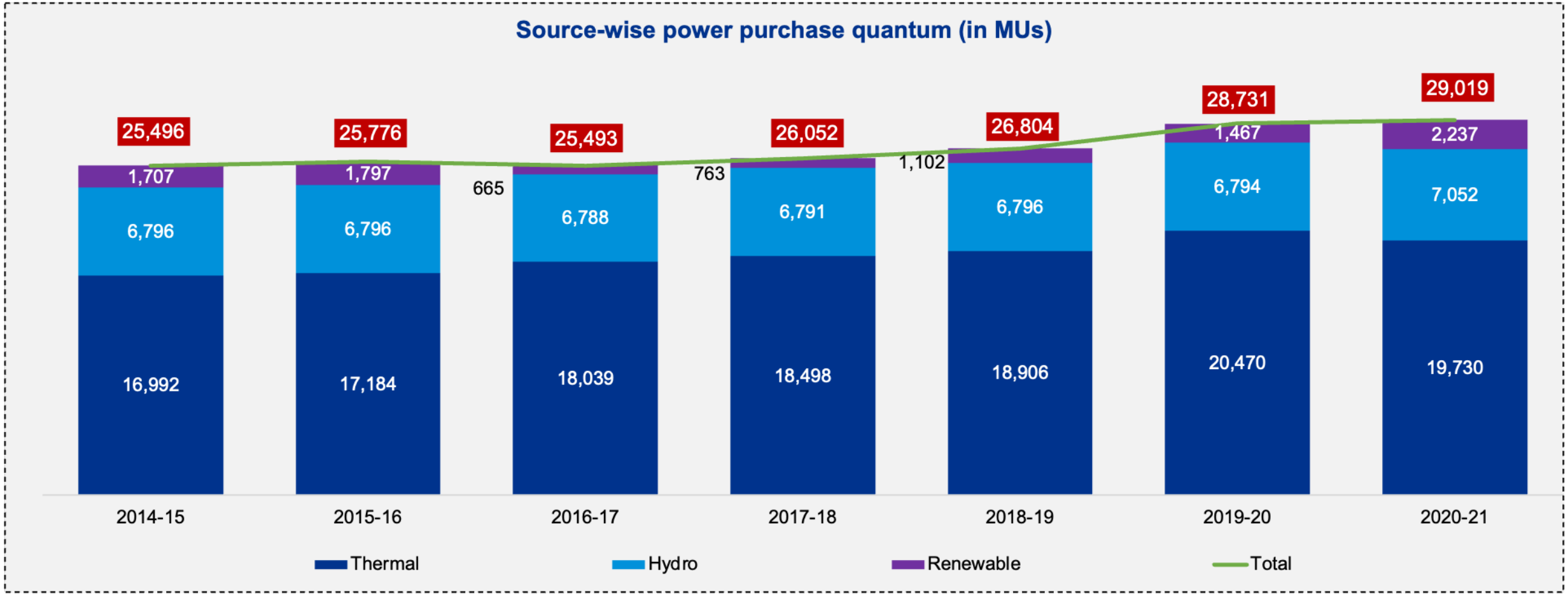


Per unit intra-state TC has reduced marginally over the last 6 years

Source: Tariff orders issued by respective state commissions for the last 6 years;
*Inter-state TC per unit is computed based on energy procured from ISGS and intra-state TC per unit is computed based on power procured from plants within the state

Source wise power purchase quantum

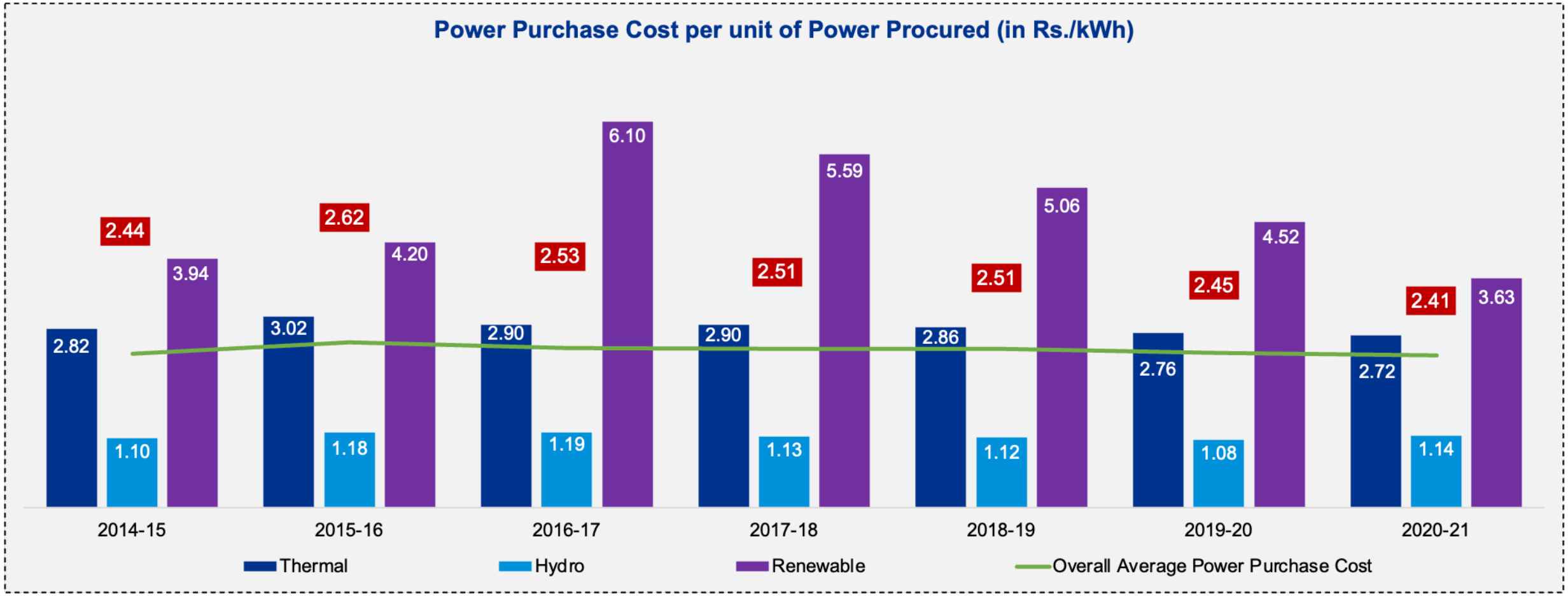
- Procurement from renewable sources has increased by 31% in the last 7 years, while the overall quantum procured has increased by 14% during the same time period.



Source:
Respective tariff orders issued by OERC.

Source wise power purchase cost

- Average power purchase cost for the state has reduced over the last 7 years mainly on account of reduction in procurement costs from thermal and renewable sources.



* Power Purchase Cost considered is the cost of power procured from GRIDCO including employee cost, pass through of OHPC and OPGC dues (excluding PGCIL charges).

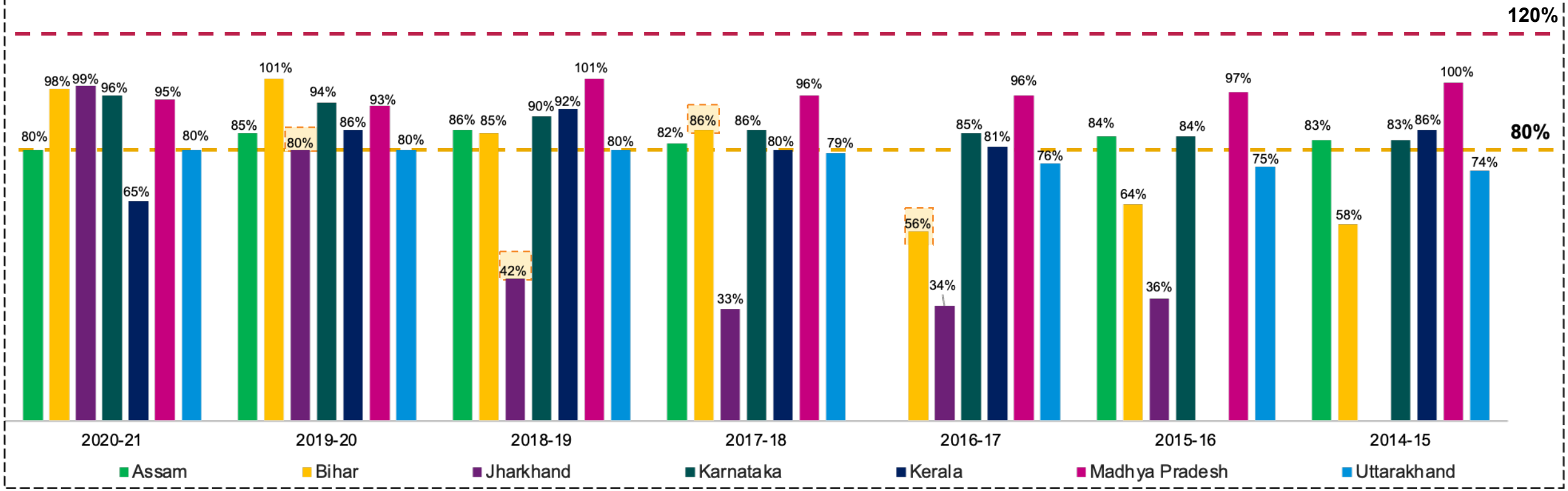
Source:

1. Respective tariff orders issued by OERC.
2. Per unit power purchase cost is calculated dividing cost of power purchase from each source by power procured.

Historical cross subsidy level trend across states

Cross Subsidy levels for Domestic consumers (1/5)

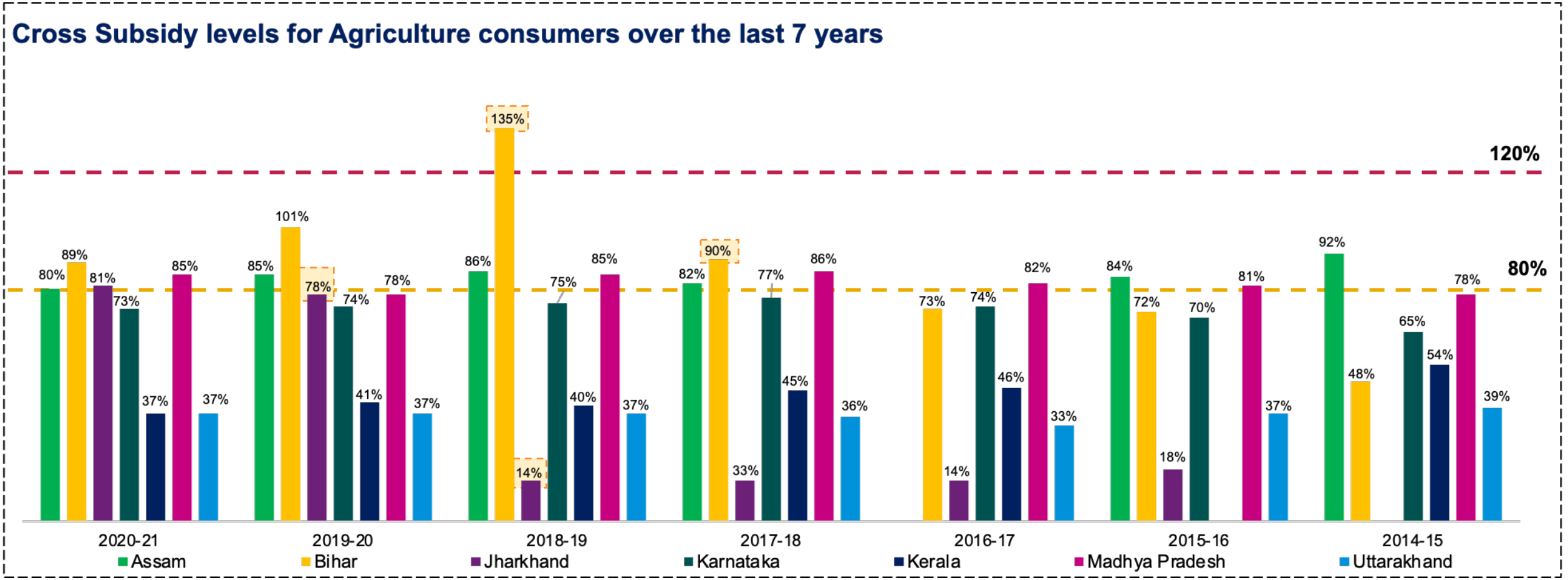
Cross Subsidy levels for Domestic consumers over the last 7 years



- Cross-Subsidization levels by domestic consumers have increased in Bihar, Jharkhand, Karnataka and Uttarakhand.
- Cross Subsidization by domestic consumers has increased significantly in Jharkhand[1] in FY 2019-20 as compared to previous year, similarly the level has increased significantly in Bihar[2] in FY 2017-18 as compared to previous year.

Note:
$ CSS level for Assam for FY 2016-17 has not been included in the analysis as the MYT order (FY 16 to FY 19) do not contain category-wise cross-subsidy levels for the FY 2016-17
CSS level of Jharkhand for FY 15 has not been included in the analysis as JBVNL started operations on 6th Jan 2014, after the unbundling of the erstwhile Jharkhand State Electricity Board (JSEB) and the commission issued first ARR for JBVNL in FY 16
*The state of Odisha has not been included for the analysis as the commission has segregated approved sales into 3 consumer categories – HT, EHT and LT
1. Increase in tariff for domestic consumer category due to removal of government subsidy component on account of DBT.
2. Increase in tariff due to increase in fixed charges for unmetered DS-I (Rural areas load up to 2 kW) consumer category from Rs. 170/connection/month to Rs. 500/connection/month

Cross Subsidy levels for Agriculture consumers (2/5)

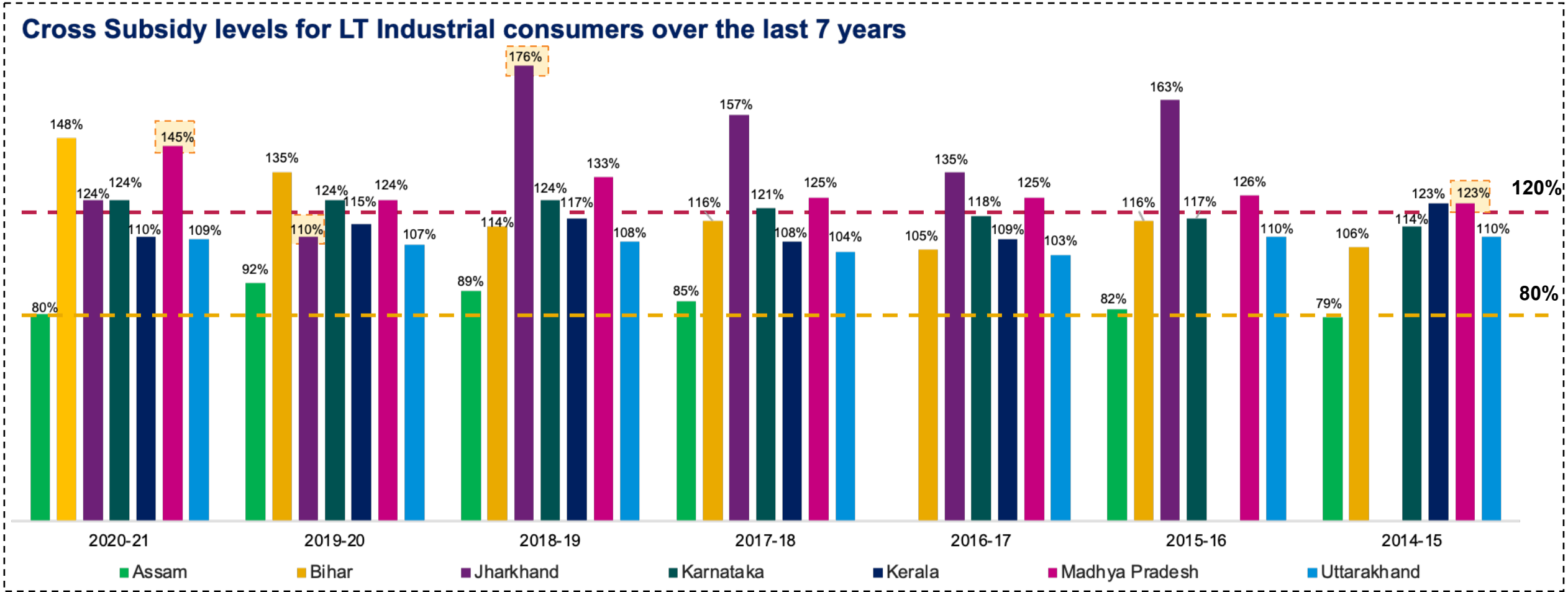


- Increase in cross-subsidization levels by agriculture consumers for Bihar, Jharkhand, Karnataka and Madhya Pradesh over the last 7 years.
- Cross Subsidization by agricultural consumers has increased significantly for Bihar[1] in FY 2018-19 as compared to previous year, similarly the level has increased significantly for Jharkhand[2] in FY 2019-20 as compared to previous year.

Note:

1. Increase in tariff due to abolishment of unmetered IAS-II (Govt tube wells, irrigation pumps) consumer category. As a result, the sales to IAS-II category increased by 68.5%, while the revenue increased by 196% in FY 2018-19 as compared to FY 2017-18. For IAS-I (Private Tube wells) the sales increased by 114%, while the revenue increased by 22 times in FY 2018-19 as compared to previous year.
2. Increase in tariff for agricultural consumers due to removal of government subsidy component on account of DBT

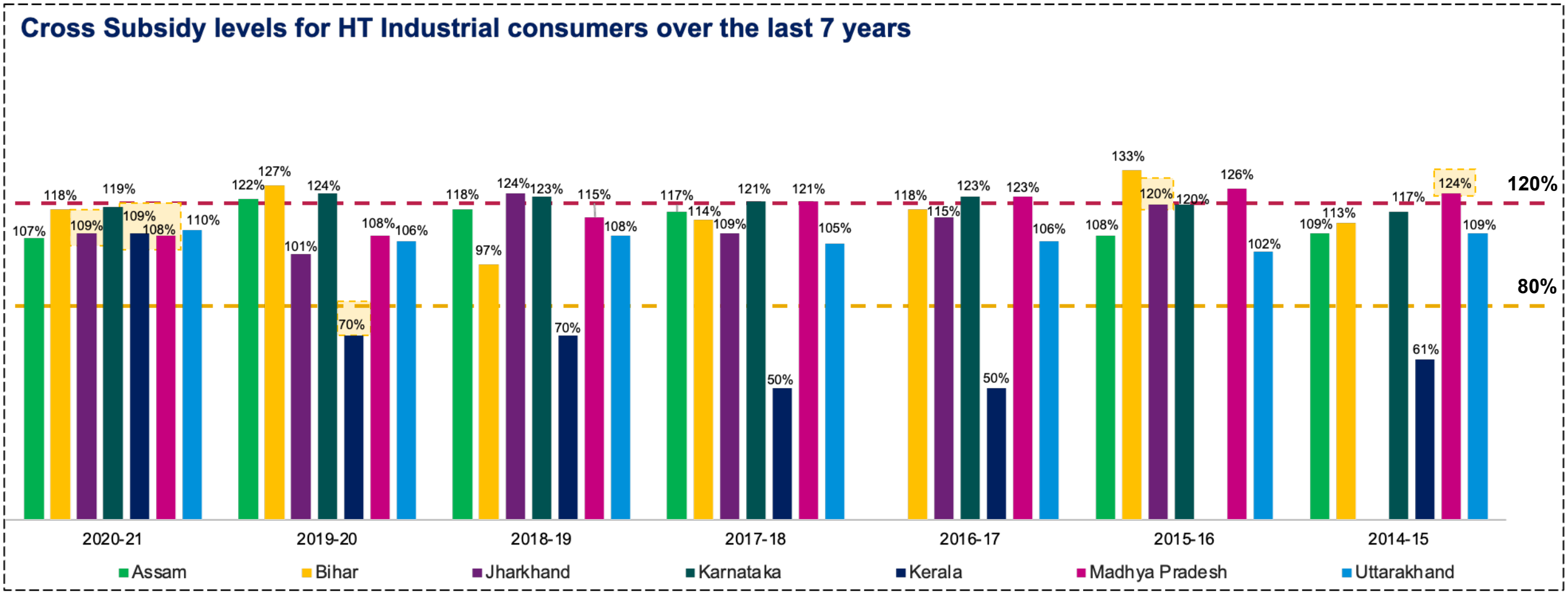
Cross Subsidy levels for LT Industrial consumers (3/5)



- Cross Subsidization (CS) by LT Industrial consumers has reduced significantly in Jharkhand in FY 2019-20 as compared to the previous year[1] whereas for the state of Madhya Pradesh the levels have increased significantly over the last 7 years.[2]

Note:
1. Reduction in cross subsidization in line with tariff rationalization efforts by the commission. The commission has also approved inc. in tariff for domestic and agriculture categories starting FY 2018-19 due to removal of govt. subsidy component (DBT)
2. Increase in energy charges from Rs. 5.20/kWh in FY15 to Rs. 6.60/kWh in FY 21 and increase in fixed charges by 45% for urban LT Industrial consumers over the last 7 years.

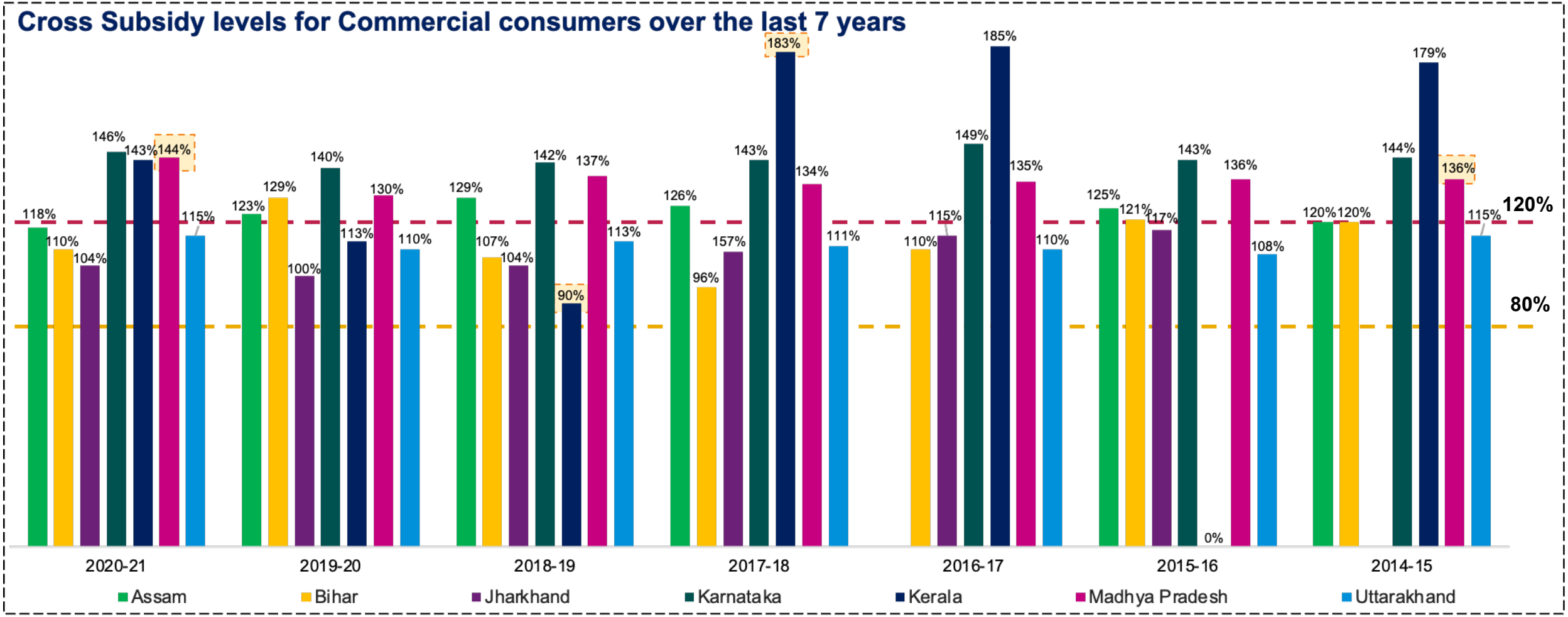
Cross Subsidy levels for HT Industrial consumers (4/5)



- Cross Subsidization by HT Industrial consumers in Kerala[1] has increased significantly in FY 2020-21.
- Few states such as Assam, MP[2] and Jharkhand[3] witnessed a reduction in Cross Subsidization by HT Industrial consumers.

Note:
1. Tariff for HT industrial consumers has increased significantly in FY 21.
2. Disproportionate increase in ACoS (Increase by 35%) compared to average billing rate (Increase by 18%) for the last 7 years
3. Reduction in energy charges for 11 kV, 33 kV, 132 kV and above High-Tension Voltage Supply (HTS) category from Rs. 5.85/kWh in FY 16 to Rs. 5.50/kVA in FY 21

Cross Subsidy levels for Commercial consumers (5/5)



- Cross-Subsidization levels by commercial consumers have increased only for the state of Madhya Pradesh and Karnataka.
- Cross Subsidization by commercial consumers has reduced significantly for Kerala[1] in FY 2018-19 as compared to previous year, whereas for the state of Madhya Pradesh the levels have increased over the last 7 years[2].

Note: For the states of Assam and Karnataka, both LT Commercial and HT Commercial consumer categories have been included in the commercial consumer category while estimating cross-subsidy levels

1. The Commission has been gradually reducing the cross-subsidy level for commercial consumers in the last 3 years targeted to bring down the cost coverage to 120% of the average cost of supply.
2. Increase due to increase in fixed charges by 70% for commercial consumers in FY 21 as compared to FY 15.

Normative Distribution Losses from FY 2014-15 to FY 2020-21

State	Distribution Loss (FY 2014-15)	Distribution Loss (FY 2020-21)
Bihar	21.40%	15.00%
Madhya Pradesh	19.59%	15.94%
Karnataka	15.52%	12.23%
Assam	18.60%	15.50%
Jharkhand	16.00%	13.00%
Kerala	14.50%	12.02%
Uttarakhand	15.50%	14.00%
Odisha	21.29%	21.23%

Source:

1. As per respective tariff orders issued by state commission

Contribution of coal prices, railway freight, environmental cess to the change in ACoS

Methodology used to compute contribution of different components

- The overall change in variable charges over the last 7 years (based on energy sales) for 8 states is segregated into impact of procurement from coal-based TPPs and procurement from other sources[1] based on actuals[2]. The change in VC from coal based TPPs is further segregated into contribution of change in coal base price, clean environment cess, and railway freight[3].
- Contribution of change in coal base price, clean environment cess, and railway freight to the VC for coal based TPPs (based on energy procured) is estimated using coal consumption. Specific **Coal Consumption** has been calculated based on the actual **Ex-bus Energy Delivered (MU)** from the respective Tariff Orders and considering assumptions for Gross Station Heat Rate (Kcal/kWh) & Wt. Avg. GCV of Coal (kCal/kg)[4]

Change in contribution of different components to the overall VC (in Rs. Crore)	=	Change in coal consumption in MMT	X	Change in different components (Actual) in Rs./Tonne
Including base price of coal, clean env. cess, freight charges (railway), royalty & sizing		Computed using Ex-bus Energy Delivered (MU) for the year assuming normative GSHR and Wt. Avg. GCV of Coal values[5]		Change in base price of coal[7], railway freight[6], clean environment cess, royalty and sizing based on notifications by CIL & Railways for the year.

- Thereafter, the per unit contribution of different components to the VC from coal-based TPPs is computed using total quantum of power procured.

Assumptions:

1. Estimated in the same proportion as contribution of VC for coal based TPPs and other sources (based on energy procured) to the overall change in VC (based on energy procured)
2. Approved values are considered where TUP is not available
3. Estimated in the same proportion as contribution of change in coal base price, clean environment cess, and railway freight (based on energy procured) to the change in VC from coal based TPPs (based on energy procured)
4. The Wt. Avg. GCV of Coal has been adjusted by 85 kCal/kg on account of variation during storage at generating station
5. To calculate the Cost of Coal assumption for Gross Station Heat Rate has been assumed as 2,349 Kcal/kWh & Wt. Avg. GCV of Coal (kCal/kg) has been assumed taking into account CIMFR testing
6. The impact of transportation charges have been estimated considering average distance slab of 700KM for each year.
7. To calculate the Impact of change in Base Price, rate for Coal Grade G-11 has been considered for each year.

Change in total variable charges basis quantum of power procured

Change in total VC[1]

Particular	Unit	FY 2014-15	FY 2020-21
Total Power Purchase from Firm Sources	MU	207,471	259,852
Total Variable Charges	Rs. Crore	42,270	66,227
Rate of Variable Charges	Rs./Unit	2.04	2.55
YoY increase in VC[2]	**%**		**3.8%**

Change in VC of procurement from Coal-based TPPs

Particular	Unit	FY 2014-15	FY 2020-21
Total Power Purchase from Firm Sources	MU	131,002	155,363
Total Variable Charges	Rs. Crore	26,571	36,760
Rate of Variable Charges	Rs./Unit	2.03	2.37
YoY increase in VC	**%**		**2.6%**

Change in VC of procurement from other sources (gas and hydro based plants, open market, etc.)

Particular	Unit	FY 2014-15	FY 2020-21
Power purchase from other sources	MU	76,470	104,490
Variable Charges	Rs. Crore	15,699	29,467
Rate of Variable Charges	Rs./Unit	2.05	2.82
YoY increase in VC	**%**		**5.5%**

- **VC of procurement from coal based TPP has increased by Rs. 0.34/kWh from FY 2014-15 to FY 2020-21, whereas VC of other sources apart from coal based TPPs has increased by Rs. 0.77/kWh during the same time period.**

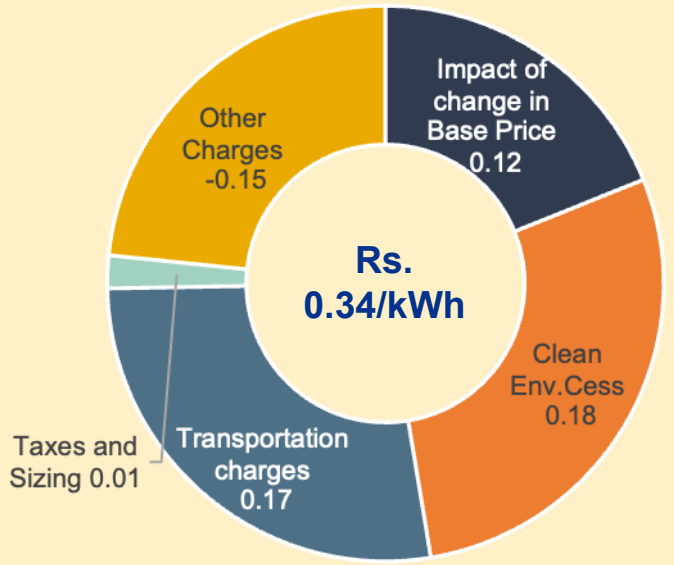
Note:

1. For the states of Bihar and Uttarakhand, VC data is considered till FY 2019-20 while for Madhya Pradesh the latest data is considered till FY 2018-19.
2. YoY increase is calculated using CAGR formula

Contribution of fuel cost, railway freight and cess to change in VC of coal-based plants

Particular	Unit	FY 2014-15	FY2020-21
Quantum	MU	131,002	155,363
Variable Charges	Rs. Crore	26,571	36,760
Rate of Variable Charges	Rs./Unit	2.03	2.37
YoY increase in VC	**%**		**2.6%**
Impact of change in Base Price	Rs./Unit	0.48	0.60
Clean Env. Cess	Rs./Unit	0.07	0.25
Transportation charges	Rs./Unit	0.72	0.89
Taxes & Sizing	Rs./Unit	0.13	0.14
Other Charges	Rs./Unit	0.63	0.48[1]

Contribution of different factor to change in VC of coal-based plants



- **Variable Charges of Coal based TPP has increased by Rs. 0.34/kWh from FY 2014-15 to FY 2020-21 basis quantum of power procured as per approved values majorly due to increase in clean environment cess (53%) and transportation charges (50%)**

Variable charges have been computed using **power purchased from coal-based plants (MU)**

Assumptions:

a) The impact of transportation charges have been estimated considering average distance slab of 700KM for each year.

b) To calculate the impact of change in Base Price, rate for Coal Grade G-11 has been considered for each year.

c) Other charges include coal loading and unloading charges, washing charges, beneficiation cost, stowing excise duty, sales tax, handling/storage/wagon loading charges, variation in GCV of Coal, grade slippage.

1. Reduction in overall other charges mainly on account of reduction in other charges of (a) Madhya Pradesh from Rs. 932 crores in FY 15 to Rs. -1824 crores in FY 19, and (b) Odisha's other charges from Rs. 396 crores in FY 15 to Rs. -116 crores in FY 21.

Variation in uncontrollable factors across states
Periodicity and adjustment of FPPCA and other uncontrollable factors

Variation in uncontrollable factors across states

S. No.	Factor	No. of ERCs (including CERC) recognized factor as uncontrollable
1.	Force majeure events	12
2.	Change in law	12
3.	Variation in the price of fuel and/ or price of power purchase	11
4.	Taxes and statutory levies	9
5.	Variation in the number or mix of consumers or quantities of electricity supplied to consumers	8
6.	Taxes on income	8
7.	Variation in power purchase expenses for the distribution licensees	7
8.	Variation in market interest rates	5
9.	Terminal liabilities	4
10.	GCV of fuel (excluding domestic coal procured through e-auction/open market and imported coal)	4
11.	Non-tariff income	3
12.	Transmission loss	2
13.	Variation in freight rates	2
14.	Land acquisition except where the delay is attributable to the generating or transmission licensee	2
15.	Foreign Exchange Rate Variation (FERV)	2
16.	Income from realisation of bad debts written off	1
17.	Interest on consumer security deposit	1

- ❑ It is evident that there is no uniform approach across states to identify uncontrollable factors.
- ❑ While some factors such as force majeure events, change in law are recognized as uncontrollable by all the 11 ERCs[1] and CERC, other factors such as transmission losses are recognized by only some of the ERCs.

Note:

1. ERCs of the following states have been included: Assam, Bihar, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Odisha, Uttarakhand, and Uttar Pradesh.

Variation in uncontrollable factors across states (1/2)

S. No.	Uncontrollable Factor	CERC	UP	Odisha	Assam	Jharkhand	Kerala	Uttarakhand	Bihar	Gujarat	HR	MP	Karnataka
1.	Force Majeure events	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2.	Change in law	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
3.	Variation in the price of fuel and/ or price of power purchase		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4.	Variation in the number or mix of consumers				Y	Y	Y	Y	Y	Y	Y	Y	
5.	Transmission Loss				Y					Y			
6.	Variation in market interest rates		Y			Y	Y	Y		Y			
7.	Taxes and Statutory levies		Y	Y	Y		Y	Y	Y	Y	Y	Y	
8.	Taxes on Income		Y	Y	Y	Y	Y	Y		Y		Y	

Considered as Uncontrollable factor | Not considered as Uncontrollable factor

Variation in uncontrollable factors across states (2/2)

S. No.	Uncontrollable Factor	CERC	UP	Odisha	Assam	Jharkhand	Kerala	Uttarakhand	Bihar	Gujarat	HR	MP	Karnataka
9.	Income from realisation of bad debts written off									Y			
10.	Terminal liabilities		Y		Y	Y					Y		
11.	GCV of Fuel (excluding domestic coal procured through e-auction/open market and imported coal)				Y			Y			Y		Y
12.	Non-Tariff income				Y	Y					Y		
13.	Variation in freight rates							Y					Y
14.	Variation in power purchase expenses for the Distribution Licensees			Y	Y	Y	Y	Y				Y	Y
15.	Land acquisition	Y											Y
16.	Interest on consumer security deposit					Y							
17.	Foreign Exchange Rate Variation					Y	Y						

Considered as Uncontrollable factor | Not considered as Uncontrollable factor

Periodicity and adjustment of fuel and/or power purchase cost

S. No.	States/UTs ERC	Periodicity	Adjustment is "with prior approval" or "without prior approval"	Adjustment of only "Fuel cost" or "Fuel & power purchase cost"	Adjustment – "Uniformly (per unit) for all the categories" or "In proportion of category-wise ABR"
1.	**Uttar Pradesh**	Quarterly	With prior approval	Both	In proportion of category-wise ABR
2.	**Karnataka**	Quarterly	With prior approval when it is ten (10) paise or more per unit.	Both	Uniformly (per unit basis)
3.	**Odisha**	Quarterly	With prior approval	Only fuel cost adjustment	Uniformly (per unit basis)
4.	**Assam**	Quarterly	With prior approval (When FPPPA charges exceed 25% of the variable component)	Both	Uniformly (per unit basis)
5.	**Jharkhand**	Quarterly	Without prior approval	Both	In proportion of category-wise ABR
6.	**Kerala**	Quarterly	With prior approval	Both	Uniformly (per unit basis)
7.	**Uttarakhand**	Quarterly	Without prior approval	Both	In proportion of category-wise ABR
8.	**Bihar**	Monthly	With prior approval when it is ten (10) paise or more per unit.	Both	Uniformly (per unit basis)
9.	**Gujarat**	Quarterly	With prior approval when it is ten (10) paise or more per unit.	Both	Uniformly (per unit basis)
10.	**Haryana**	Quarterly	With prior approval	Both	Uniformly (per unit basis)
11.	**Madhya Pradesh**	Quarterly	With prior approval	Both	Uniformly (per unit basis)

Most of the states have adopted periodicity on quarterly basis

Periodicity of other uncontrollable factors

S. No.	States/UTs ERC	Other uncontrollable factors
1.	**Uttar Pradesh**	At the time of APR/Truing-Up
2.	**Karnataka**	At the time of APR/Truing-Up
3.	**Odisha**	At the time of APR/Truing-Up
4.	**Assam**	At the time of APR/Truing-Up
5.	**Jharkhand**	At the time of APR/Truing-Up
6.	**Kerala**	At the time of APR/Truing-Up
7.	**Uttarakhand**	At the time of APR/Truing-Up
8.	**Bihar**	At the time of APR/Truing-Up
9.	**Gujarat**	At the time of APR/Truing-Up
10.	**Haryana**	At the time of APR/Truing-Up
11.	**Madhya Pradesh**	At the time of Truing-Up

- For most States/UTs, adjustment of uncontrollable item "**Fuel Power Purchase Cost Adjustment**" is carried out monthly or quarterly.
- Impact of other uncontrollable items (other than FPPCA) is analysed and allowed at the time of annual performance review/True-Up.

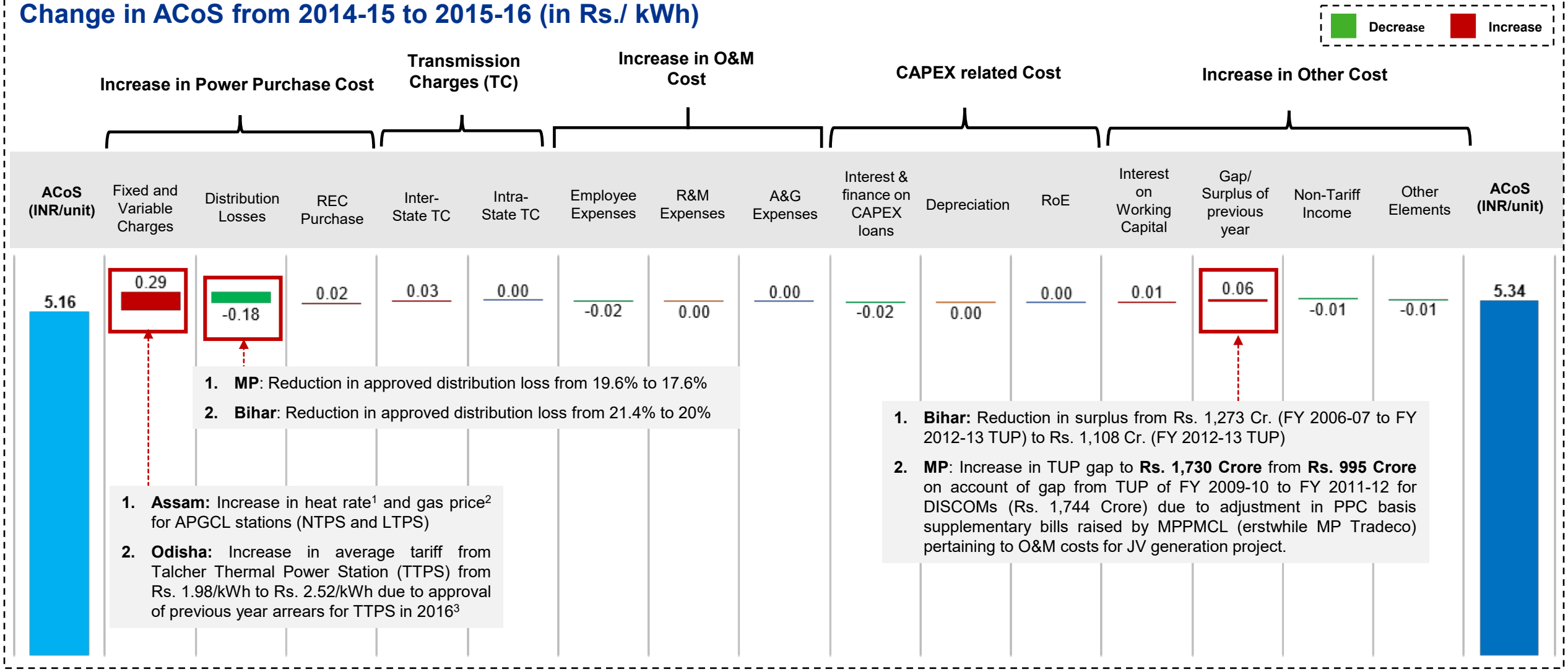
Summary: Variation in uncontrollable factors across states

- Contribution of FPPCA to ACoS is significant with majority of the states allowing these costs on monthly or quarterly basis in their respective Tariff Regulations.
  - **Uniform approach for adjustment of FPPCA** may be considered.
    - Adjustment of FPPCA up to certain ceiling (% of Energy Charges) as per the provisions of the Regulations without the prior approval of the Commission followed by post facto approval on regular basis. Any variation may be adjusted in the subsequent months.
    - FPPCA beyond the ceiling limit specified in the Regulations may be allowed with the prior approval of the Commission.
- The impact of other uncontrollable factors (other than FPPCA) shall be allowed at the **time of truing up of ARR** and Revenue of Distribution Licensee based on the actual costs incurred.

Change in overall ACoS for 8 states over past year

ACoS increased by INR 0.18/kWh in FY 2015-16 as compared to previous year

Change in ACoS from 2014-15 to 2015-16 (in Rs./ kWh)



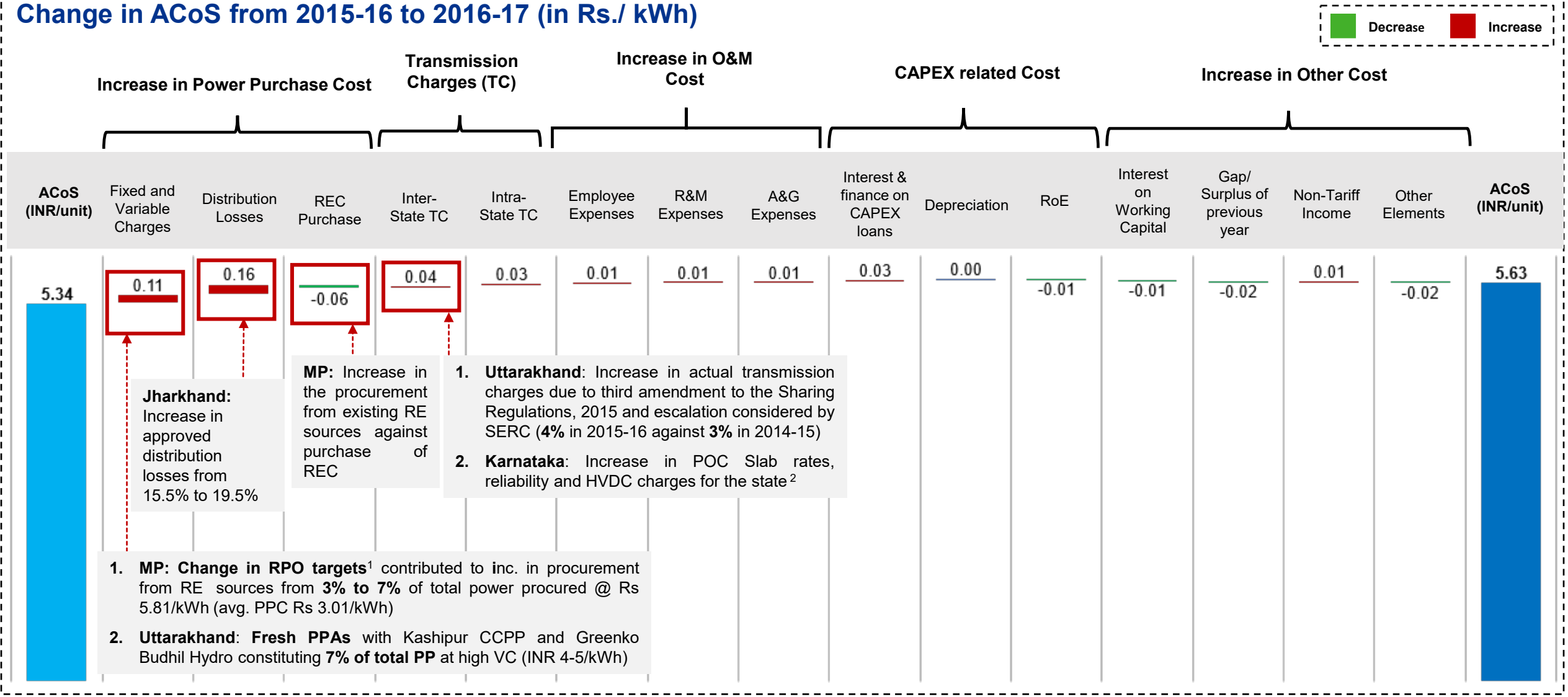
Note:

1. Heat Rate for NTPS & LTPS has increased from 3,266 kcal/kWh to 3,900 kcal/kWh & 2,872 kcal/kWh to 3,200 kcal/kWh respectively.
2. Gas price for NTPS has increased from Rs 6,275/'000 SCM to Rs. 8,252 /'000 SCM and from Rs. 8,172 /'000 SCM to Rs. 11,023 /'000 SCM for LTPS
3. An amount of Rs. 740 crores has been approved based on actuals by CERC for TTPS due to increase in AFC across the period 2009 to 2014. Increase in annual fixed cost is due to additional R&M expenditure towards ash handling works, environment system, R&M Switchyard, fire fighting and air system, water system, electrical auxiliaries, cooling tower etc.
4. Component wise change is derived from individual sum of each ACoS component and sales of 8 states (Kerala, Karnataka, Bihar, Assam, Jharkhand, Odisha, Madhya Pradesh, Uttarakhand)

Back

ACoS increased by INR 0.29/kWh in FY 2016-17 as compared to previous year

Change in ACoS from 2015-16 to 2016-17 (in Rs./ kWh)



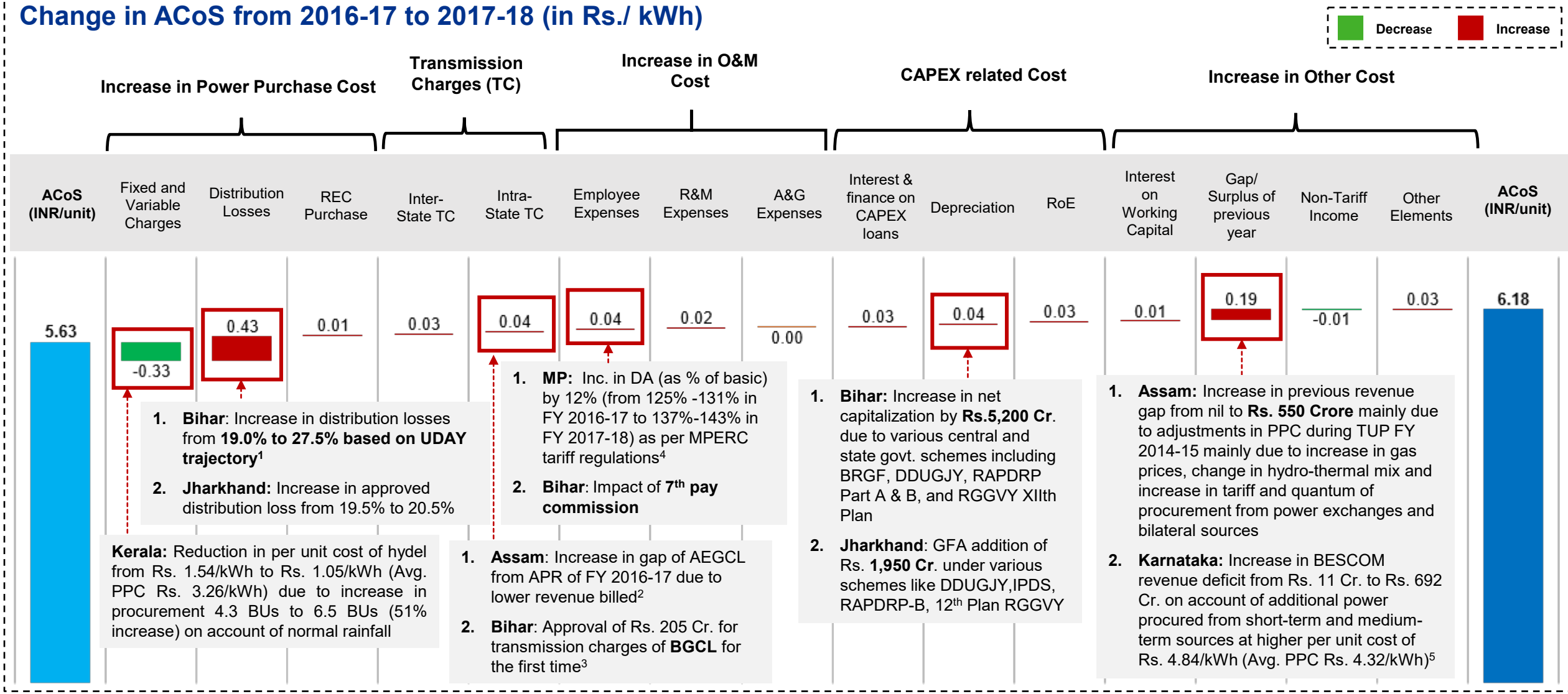
Note:

1. Increase in RPO targets from 7% in 2015-16 to 7.75% in 2016-17 and significant increase in the procurement from RE sources other than solar
2. Increase in PGCIL Charges from Rs. 622 Cr to Rs. 949.2 Cr; POC Charges increased from Rs. 305438 MW/Month to Rs. 320069 MW/Month in Q1-15 to Q1-16 (CERC)

Back

ACoS increased by INR 0.55/kWh in FY 2017-18 as compared to previous year

Change in ACoS from 2016-17 to 2017-18 (in Rs./ kWh)



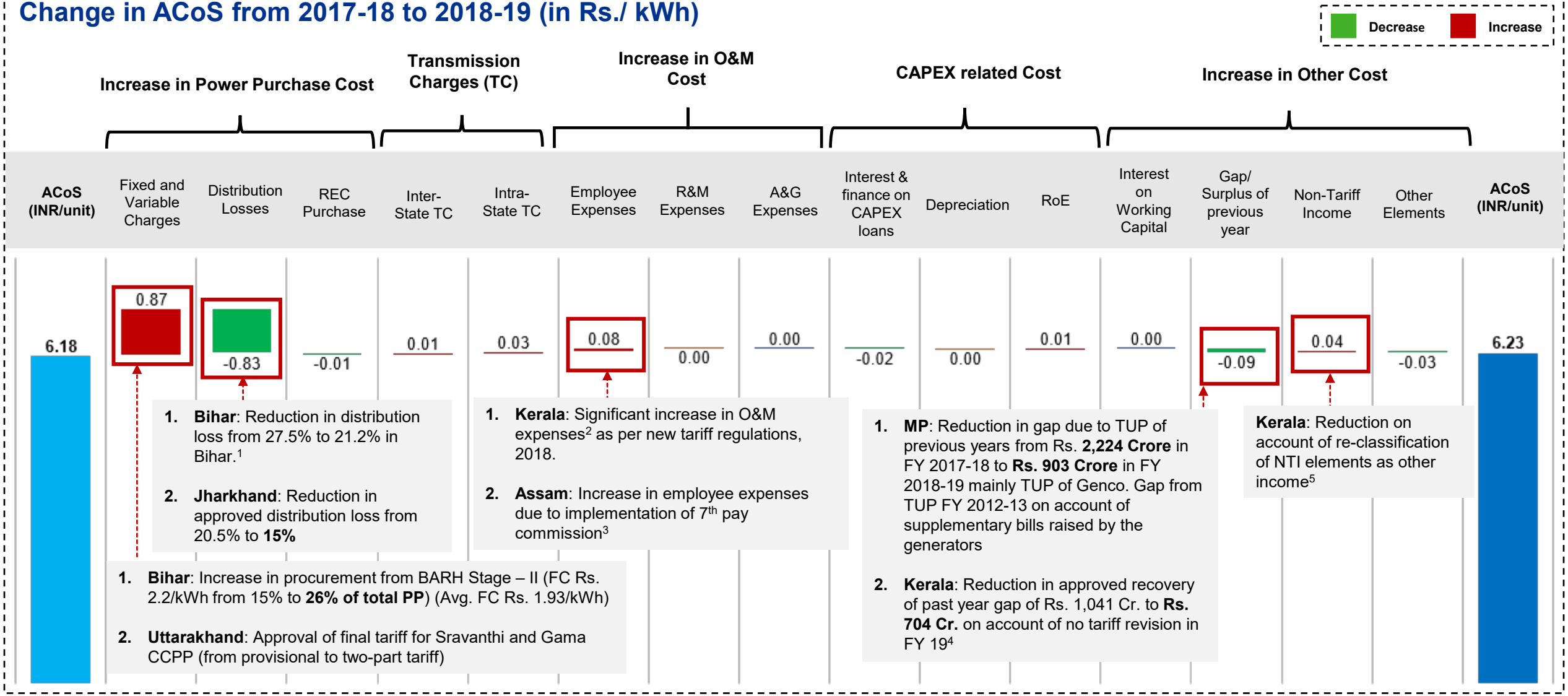
Note:

1. The Commission specified that if the distribution loss trajectory is not aligned to UDAY trajectory, the State Govt. assistance, if any, would not be available to DISCOMs. Hence, the commission revised the loss trajectory in line with UDAY
2. The Commission has considered the actual revenue billed as Rs. 537.92 Cr. as per audited accounts for FY 2016-17 against approved value of Rs. 827 Cr.
3. BGCL filed the petition in January 2017 for the first time for determination of ARR and Transmission tariff for FY 2017-18 including CAPEX for construction activities of 400/220 KV and 220/132 KV GIS stations including Fathua 400 KV GIS, Gaighat 400 KV GIS, and Bihta 400 KV GIS, among others.
4. As regards Seventh Pay Commission, the Commission is of the view that any impact in employee expenses based on change in salary due to implementation of recommendation of seventh pay commission will be allowed during the true-up for FY 2017-18 based on actuals
5. Sporadic shutdown of Raichur Thermal Power Station due to below par rainfall leading to shortfall of cooling water

Back

ACoS increased by INR 0.06/kWh in FY 2018-19 as compared to previous year

Change in ACoS from 2017-18 to 2018-19 (in Rs./ kWh)



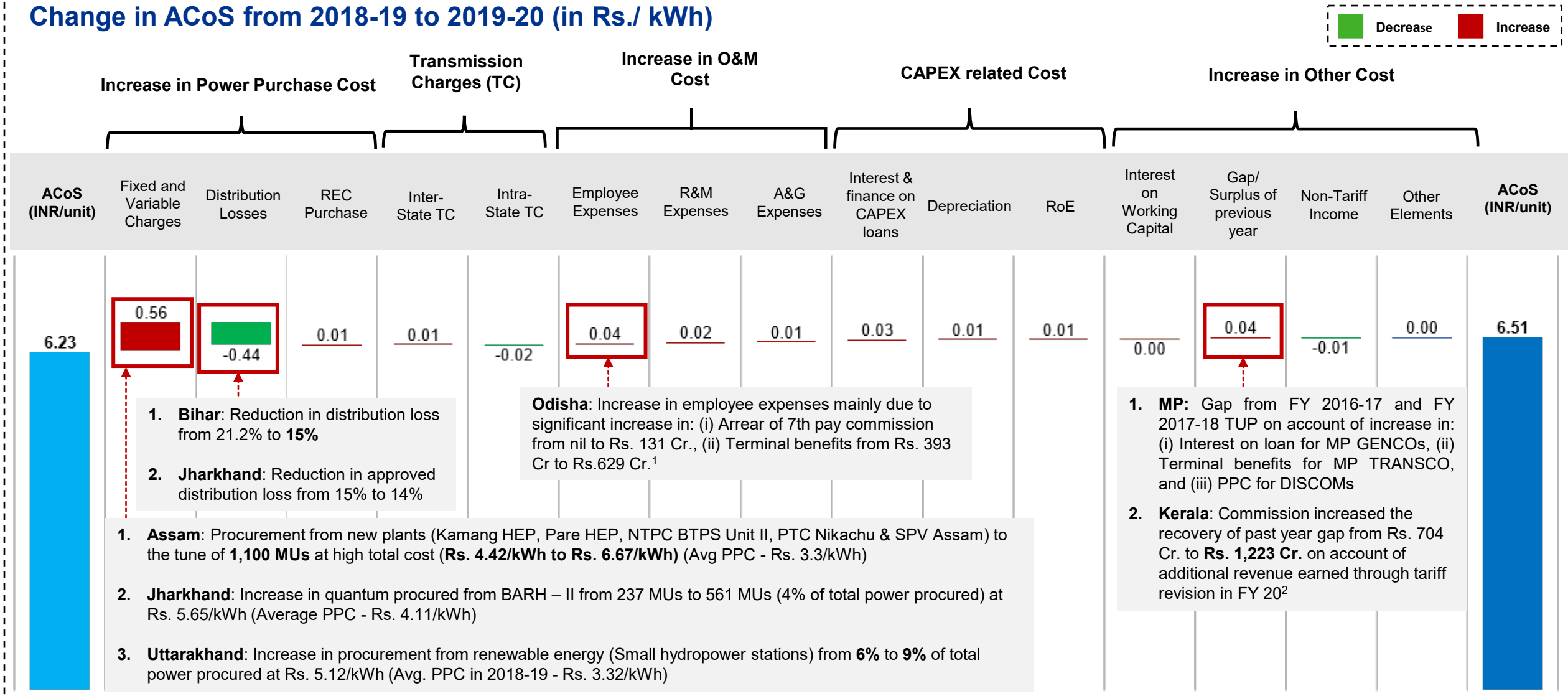
Note:

1. The commission has approved distribution loss of 22% for SBPDCL and 20% for NBPDCL for FY 2018-19 against approved value of 30% and 24% respectively in FY 2017-18 as per the Distribution loss trajectory approved in the UDAY scheme
2. The commission has revised the norms for FY19 in tariff regulations, 2018 considering FY 2016-17 norms as base year whereas in the previous regulations of 2014, the base year has been considered as FY 2013-14
3. The Commission has considered the implementation of 7th pay commission started during the last quarter of FY 2017-18. Hence, the commission has considered the impact of revision of pay during APR for FY 2017-18 and ARR determination for FY 2018-19
4. Recovery of past year gap decreased from Rs. 1,041 Cr. in FY 2017-18 to Rs. 704 Cr. in FY 2018-19 on account of no tariff revision in FY19 against a tariff revision to recover Rs. 550 Cr. in FY 18.
5. NTI has reduced from Rs. -449 Cr. in FY 2017-18 to Rs. -174 Cr. in FY 2018-19

Back

ACoS increased by INR 0.28/kWh in FY 2019-20 as compared to previous year

Change in ACoS from 2018-19 to 2019-20 (in Rs./ kWh)



1. **Bihar**: Reduction in distribution loss from 21.2% to **15%**
2. **Jharkhand**: Reduction in approved distribution loss from 15% to 14%

Odisha: Increase in employee expenses mainly due to significant increase in: (i) Arrear of 7th pay commission from nil to Rs. 131 Cr., (ii) Terminal benefits from Rs. 393 Cr to Rs.629 Cr.[1]

1. **Assam**: Procurement from new plants (Kamang HEP, Pare HEP, NTPC BTPS Unit II, PTC Nikachu & SPV Assam) to the tune of **1,100 MUs** at high total cost (**Rs. 4.42/kWh to Rs. 6.67/kWh)** (Avg PPC - Rs. 3.3/kWh)
2. **Jharkhand**: Increase in quantum procured from BARH – II from 237 MUs to 561 MUs (4% of total power procured) at Rs. 5.65/kWh (Average PPC - Rs. 4.11/kWh)
3. **Uttarakhand**: Increase in procurement from renewable energy (Small hydropower stations) from **6%** to **9%** of total power procured at Rs. 5.12/kWh (Avg. PPC in 2018-19 - Rs. 3.32/kWh)

1. **MP:** Gap from FY 2016-17 and FY 2017-18 TUP on account of increase in: (i) Interest on loan for MP GENCOs, (ii) Terminal benefits for MP TRANSCO, and (iii) PPC for DISCOMs
2. **Kerala**: Commission increased the recovery of past year gap from Rs. 704 Cr. to **Rs. 1,223 Cr.** on account of additional revenue earned through tariff revision in FY 20[2]

Note:

1. The increase is mainly due to accrued arrears of retired employees which were pending due to implementation of 7th pay commission and revision of terminal liabilities
2. Commission in its MYT order FY 19 to FY 22 has estimated accumulated revenue gap after truing up of 2016-17 as Rs. 5,693 Cr. Past accumulated revenue gap to be amortized from Rs 5,693 Cr. to Rs. 2,593 Cr. Commission has determined the amortization values for FY19 to FY22 in MYT order as per analysis of ARR and additional revenue expected during tariff revision through out this period. The amount amortized for FY 19 to FY 22 are Rs.400 Cr, Rs. 1,000 Cr., Rs. 850 Cr. and Rs. 850 Cr. For FY 19, commission has approved a tariff revision thereby generating an additional revenue of Rs.903 Cr

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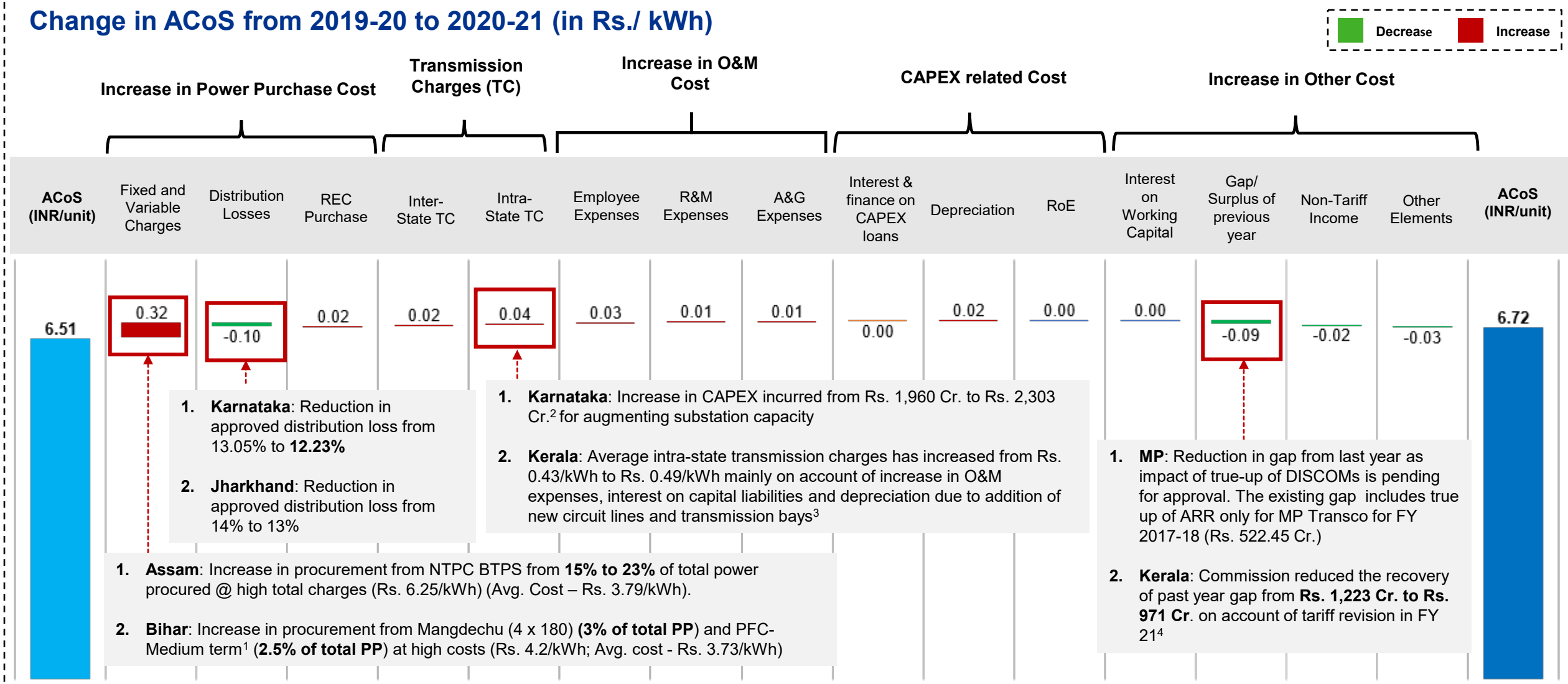
ACoS increased by INR 0.22/kWh in FY 2020-21 as compared to previous year

Change in ACoS from 2019-20 to 2020-21 (in Rs./ kWh)



1. **Karnataka**: Reduction in approved distribution loss from 13.05% to **12.23%**
2. **Jharkhand**: Reduction in approved distribution loss from 14% to 13%

1. **Karnataka**: Increase in CAPEX incurred from Rs. 1,960 Cr. to Rs. 2,303 Cr.[2] for augmenting substation capacity
2. **Kerala**: Average intra-state transmission charges has increased from Rs. 0.43/kWh to Rs. 0.49/kWh mainly on account of increase in O&M expenses, interest on capital liabilities and depreciation due to addition of new circuit lines and transmission bays[3]

1. **Assam**: Increase in procurement from NTPC BTPS from **15% to 23%** of total power procured @ high total charges (Rs. 6.25/kWh) (Avg. Cost – Rs. 3.79/kWh).
2. **Bihar**: Increase in procurement from Mangdechu (4 x 180) **(3% of total PP**) and PFC-Medium term[1] (**2.5% of total PP**) at high costs (Rs. 4.2/kWh; Avg. cost - Rs. 3.73/kWh)

1. **MP**: Reduction in gap from last year as impact of true-up of DISCOMs is pending for approval. The existing gap includes true up of ARR only for MP Transco for FY 2017-18 (Rs. 522.45 Cr.)
2. **Kerala**: Commission reduced the recovery of past year gap from **Rs. 1,223 Cr. to Rs. 971 Cr**. on account of tariff revision in FY 21[4]

Note:

1. The Commission has approved for procurement of 200 MW off taking 100% power for 3 years on RTC basis through PFC consulting as nodal agency and PTC India Ltd as aggregator, at a tariff of Rs. 4.2/kWh
2. Increase in KPTCL charges from Rs, 3,506 Cr to Rs, 4,292 Cr; Number of new substations increased from 32 to 36 from FY 2019-20 to FY 2020-21.
3. Increase in transmission charge has been factored in ARR of SBU-T which has increased from Rs. 1,020 Cr. to Rs. 1,204 Cr. mainly on account of increase in O&M expenses (Rs. 397 Cr. to Rs. 452 Cr.), interest on capital liabilities (Rs. 185 Cr. to Rs. 263 Cr.) and depreciation (Rs. 173 Cr. to Rs. 223 Cr.). O&M expenses has increased mainly due to increase in transmission bays from 2,682 to 2,914 and transmission lines from 9,823 Ckt-km to 10,670 Ckt-km.
4. Commission has determined the amortization values in MYT order based on analysis of ARR value and additional revenue expected during tariff revision. In FY20 an additional revenue of Rs.903 Cr through tariff revision compared to no tariff revision in FY21 was approved. The amount amortized for FY19 to FY22 are Rs. 400 Cr., Rs. 1,000 Cr., Rs. 850 Cr., Rs., 850 Cr.

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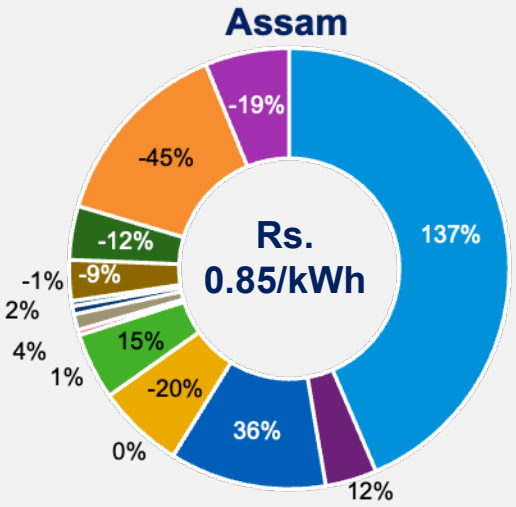
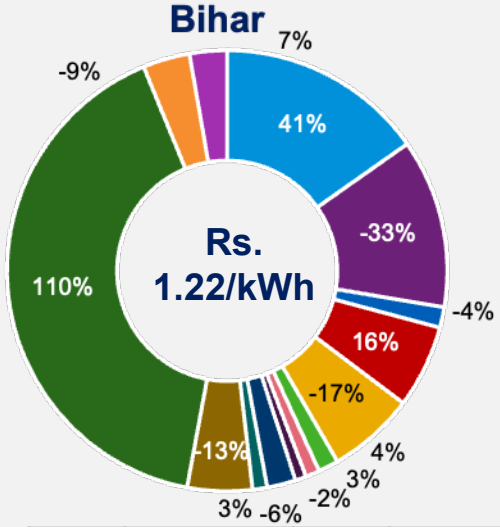
Major contributors of change in ACoS across States

Major contributors of change in ACoS: State-wise analysis (1/4)



- Contribution of increase in FC and VC to the overall increase in ACoS in Assam was the highest due to increase in procurement from coal-based plants at high VC[1]
- Significant increase in inter-state TC in Assam due to change in regulations[2]
- Assam witnessed increase in non-tariff income due to increase in delayed payment charges from consumers and rebate on prompt payment of power purchase bill



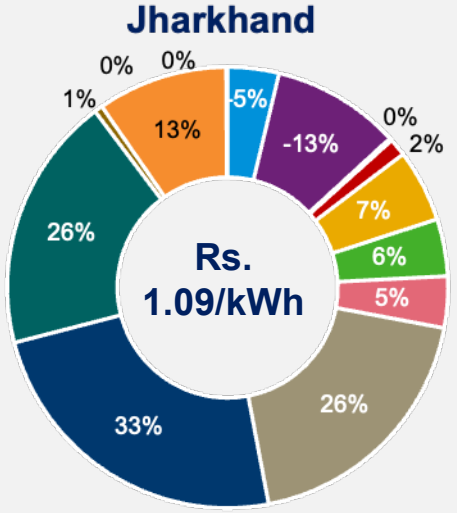
- Contribution of increase in gap/surplus of previous year to the overall increase in ACoS in Bihar was the highest due to reduction in surplus in FY 17 and increase in revenue gap in FY 18[3]
- Bihar witnessed a significant increase in FC and VC on account of increase in procurement from long and medium-term sources at higher tariff.[4]
- Significant reduction in approved distribution loss from 21.4% to 15% in Bihar.

	FC and VC		Inter-State TC		Employee expenses		A&G expenses		Depreciation		Interest on WC		Non-Tariff Income
	Dist. Loss		Intra-state TC		R&M expenses		Interest & Finance Charges		ROE		Gap/Surplus		Other ARR elements

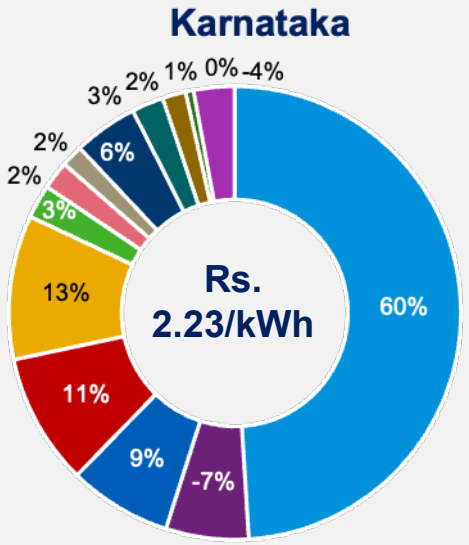
Note:

1. Increase in procurement from NTPC BTPS from 900 MUs to 1,530 MUs at high total cost (Rs. 6.27/kWh; avg. cost Rs. 3.3/kWh) during FY 2019-20.
2. Increase in actual transmission charges as per third amendment by CERC due to change in methodology for calculating POC charges
3. Surplus reduced from Rs. 1,273 crores in FY 16 to NIL in FY 17. Increase in revenue gap in FY 18 due to FY 2015-16 TUP mainly on account of increase in power purchase cost based on actuals.
4. Increase in procurement from PFC Medium term (2.5% of total PP) at high costs (Rs. 4.2/kWh; avg. cost Rs. 3.73/kWh) in FY 21. The Commission has approved for procurement of 200 MW off taking 100% power for 3 years on RTC basis through PFC consulting as nodal agency and PTC India Ltd as aggregator, at a tariff of Rs. 4.2/kWh

Major contributors of change in ACoS: State-wise analysis (2/4)



- Contribution of increase in depreciation to the overall increase in ACoS in Jharkhand was the highest due to increase in GFA from Rs 2,155 crore to Rs. 15,610 crore[1]
- Significant increase in interest and finance charges in Jharkhand due to increase in average normative loan from Rs. 261 crores to Rs. 5,019 crores on account of increase in GFA
- Jharkhand witnessed a significant increase in ROE on account of increase in equity base from Rs. 238 crores to Rs. 2,076 crores due to increase in GFA



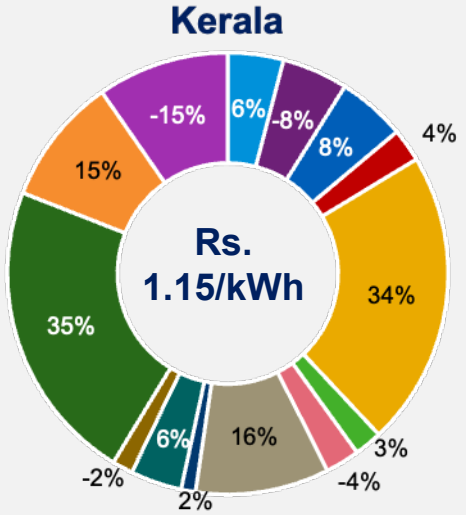
- Contribution of increase in FC and VC to the overall increase in ACoS in Karnataka was the highest due to increase in procurement from RE sources at high VC[2]
- Karnataka witnessed reduction in only two ACoS components (Distribution loss and Other ARR elements) over the last 7 years

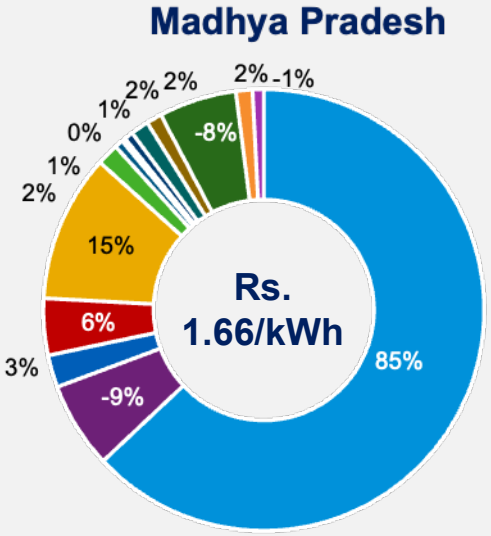
	FC and VC		Inter-State TC		Employee expenses		A&G expenses		Depreciation		Interest on WC		Non-Tariff Income
	Dist. Loss		Intra-state TC		R&M expenses		Interest & Finance Charges		ROE		Gap/Surplus		Other ARR elements

Note:

1. Increase in GFA due to various Central/ State Govt. schemes to enhance energy access and quality power to the consumers.
2. Inc. in quantum of power purchase from RE sources from 6.5 BUs to 17.6 BUs (21% energy share) @ high VC Rs. 3.9 – Rs. 4.4/kWh (avg PPC- Rs. 3.0-Rs. 3.5./kWh).

Major contributors of change in ACoS: State-wise analysis (3/4)





- Contribution of increase in Gap/Surplus of previous year to the overall increase in ACoS in Kerala was the highest due to increase in previous year revenue gap from Rs. 704 Cr. in FY 19 to Rs. 1,223 Cr. in FY 20[1]
- Kerala witnessed a significant increase in employee expenses due to change in methodology[2]

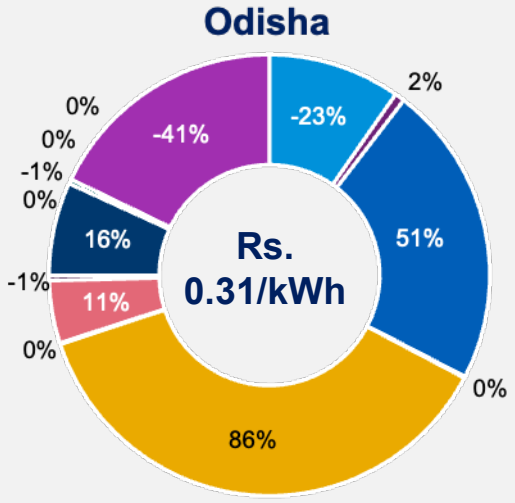
- Contribution of increase in FC and VC to the overall increase in ACoS in Madhya Pradesh was the highest due to increase in procurement from coal-based CGS at higher tariff rates[3] and revision of RPO targets[4]

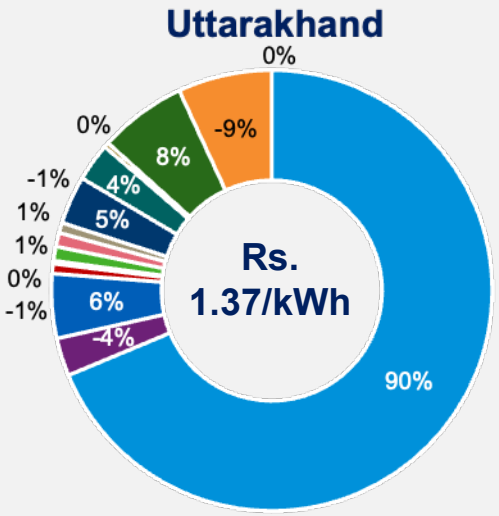
	FC and VC		Inter-State TC		Employee expenses		A&G expenses		Depreciation		Interest on WC		Non-Tariff Income
	Dist. Loss		Intra-state TC		R&M expenses		Interest & Finance Charges		ROE		Gap/Surplus		Other ARR elements

Note:

1. The commission approved accumulated revenue gap Rs. 5,693 Cr during FY 2016-17 TUP based on actuals. Out of this gap, recovery plan of Rs. 3,100 Cr was provided in MYT order (to be recovered across a period of 4 years from FY2019-22).
2. Inc. due to revision of the O&M expense norms as per KSERC tariff regulations 2018. Employee expenses are now computed considering FY2016-17 as the base year against the previous base of FY 2013-14 considered for computing EE.
3. Increase in procurement from SGTPS and NTPC Mouda Unit 1 & 2 in 2017-18 at high VC (Rs. 2.42/kWh and Rs. 2.49/kWh resp, avg VC in 2016-17- Rs. 1.85/kWh) from nil to 6.3 BUs (8% of total power procured)
4. Increase in RPO targets from 7% in FY 16 to 7.75% in FY 17

Major contributors of change in ACoS: State-wise analysis (4/4)





- Contribution of increase in employee expenses to the overall increase in ACoS in Odisha was the highest due to implementation of 7th pay commission and increase in DA and terminal benefits
- Odisha witnessed a significant increase in inter-state TC due to increase in approved POC slab rate during the control period FY 15 to FY 19[1]
- Significant reduction in FC and VC in Odisha due to reduction in power procured from FSTPS I & II (Rs. 3.15/unit, average tariff- Rs. 2.48/kWh) from 1,549 MU to nil in FY 21[2]
- Other ARR elements reduced in Odisha due to reduction in DPS rates for LT domestic and others (single phase) consumers and LT three-phase consumers[3]
- Contribution of increase in FC and VC to the overall increase in ACoS in Uttarakhand was the highest due to increase in procurement from gas-based plants at high VC[4] in FY 18

	FC and VC		Inter-State TC		Employee expenses		A&G expenses		Depreciation		Interest on WC		Non-Tariff Income
	Dist. Loss		Intra-state TC		R&M expenses		Interest & Finance Charges		ROE		Gap/Surplus		Other ARR elements

Note:

1. Increase in PoC slab rate from Rs. 1,41,489/MW/month in FY17 to Rs. 1,96,652//MW/Month in FY 18
2. Due to availability of additional power within state mainly from OPGC Unit 3 & 4 and following Merit Order Principle the commission has decided not to procure power from FSTPS I & II and KhTPS Stage-II plants for FY 21.
3. Reduction in DPS by 33.34%-50% (to be charged to the defaulting consumers for every 2 months of defaults)
4. Fresh PPAs with gas-based plants (Sravanthi and Beta CCPP) in 2017-18 (16% of total PP) at high VC (Rs. 4.7/kWh)

UK Government

Study on Analysis of Historical Trend of Electricity Tariffs

Analysis for 4 States (Andhra Pradesh, Gujarat, Haryana & Uttar Pradesh)

April 2022

PSR PROGRAMME | Supporting Structural Reforms in the Indian Power Sector

CER Centre for Energy Regulation

Contents

Rationale and Objectives

Rationale

- Retail supply tariffs are designed to recover the cost incurred across the entire value chain i.e., generation, transmission, distribution and retail supply.
- Tariff depends on multiple factors (*i.e.,* cost of fuel and transport, cost of generation, transmission and distribution, taxes and cess, etc.) which varies from state to state.
- Keeping this in view, the study on **"Analysis of Historical Trend of Electricity Tariffs"** has been undertaken to assess the impact of these factors on electricity tariffs.

Objectives

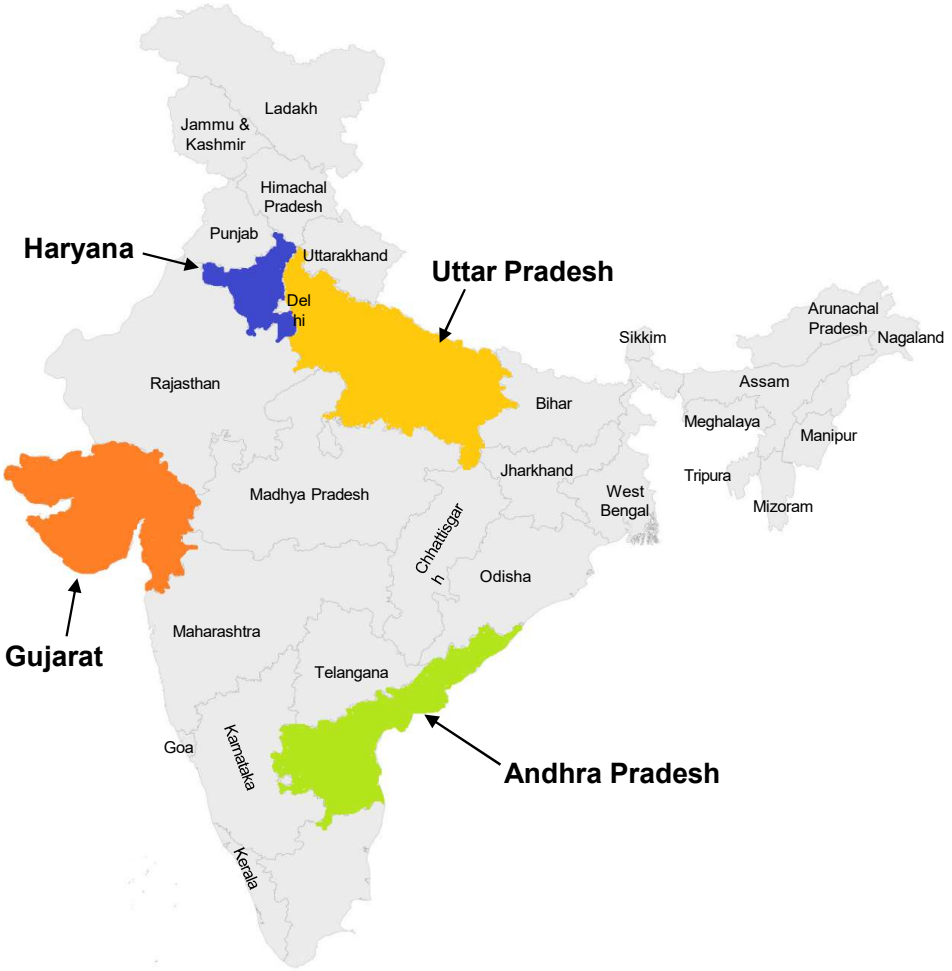
To assess change in electricity tariffs and identify key factors impacting the same

To identify measures required to reduce electricity tariffs

The study was carried out under the Technical Assistance Programme, titled "Supporting Structural Reforms in the Indian Power Sector" (Power Sector Reforms Programme) implemented by UK Government's Foreign, Commonwealth and Development Office (FCDO), in partnership with the Ministry of Power (MoP) and Ministry of New and Renewable Energy (MNRE), Government of India. The Centre for Energy Regulation (CER) is seed funded by the Govt. of UK under the PSR Programme.

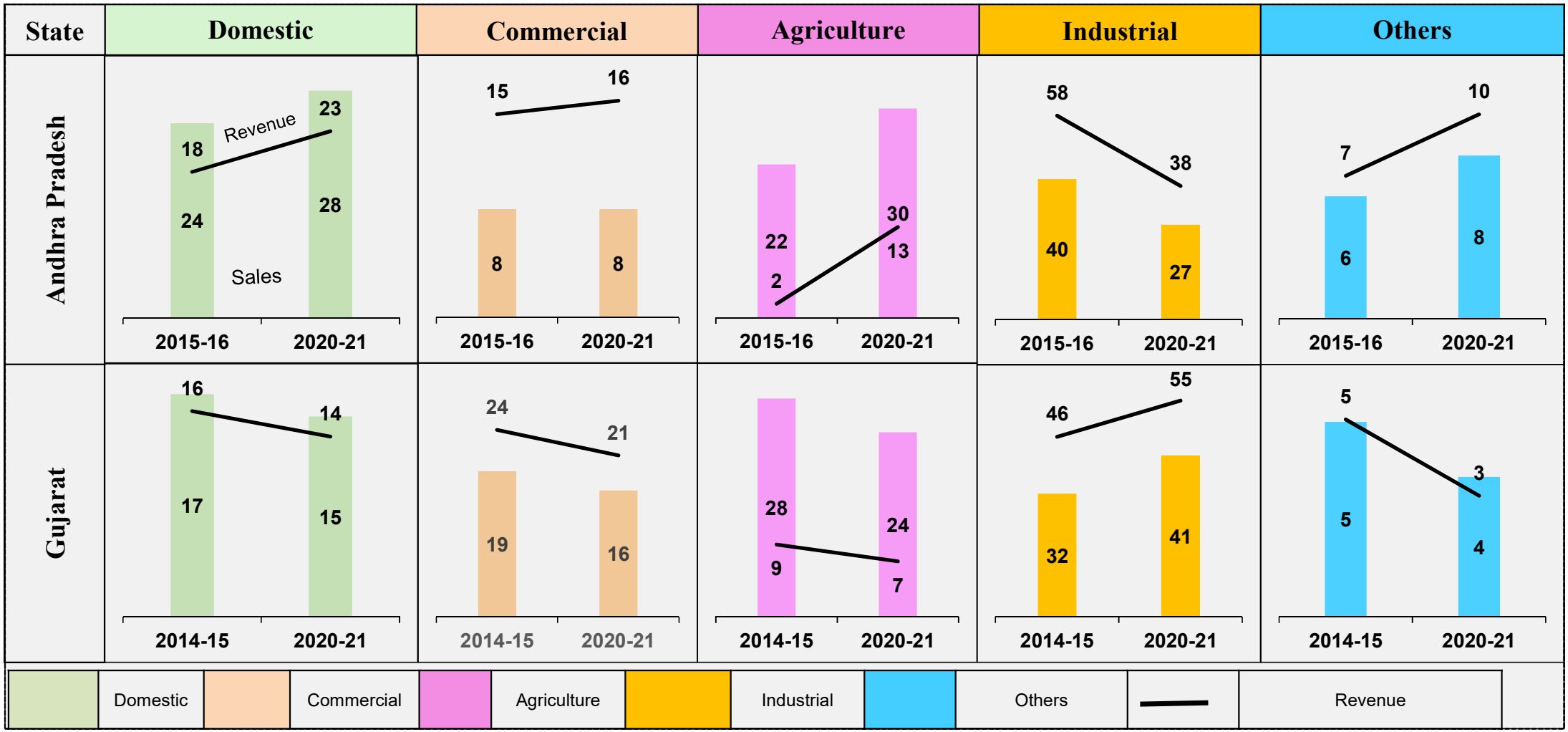
Selection of States for the study

- CER, IIT Kanpur has conducted this study for four states, namely Andhra Pradesh, Gujarat, Haryana and Uttar Pradesh.
- These states accounted for 29% (approx.) of the total electricity consumption[1] in the country (FY20).
- Among these states, Gujarat followed by Haryana has highest per capita electricity consumption.
- Share of energy sale for agriculture category in Andhra Pradesh (AP), Gujarat (GJ), and Haryana(HR) is 30%, 23% and 25% respectively.
- Share of revenue realized from agriculture category in AP, GJ, HR and UP is 13%, 7%, 0.3% and 8% respectively.
- Share of revenue realized from domestic category in HR and UP is 30% and 52% respectively.



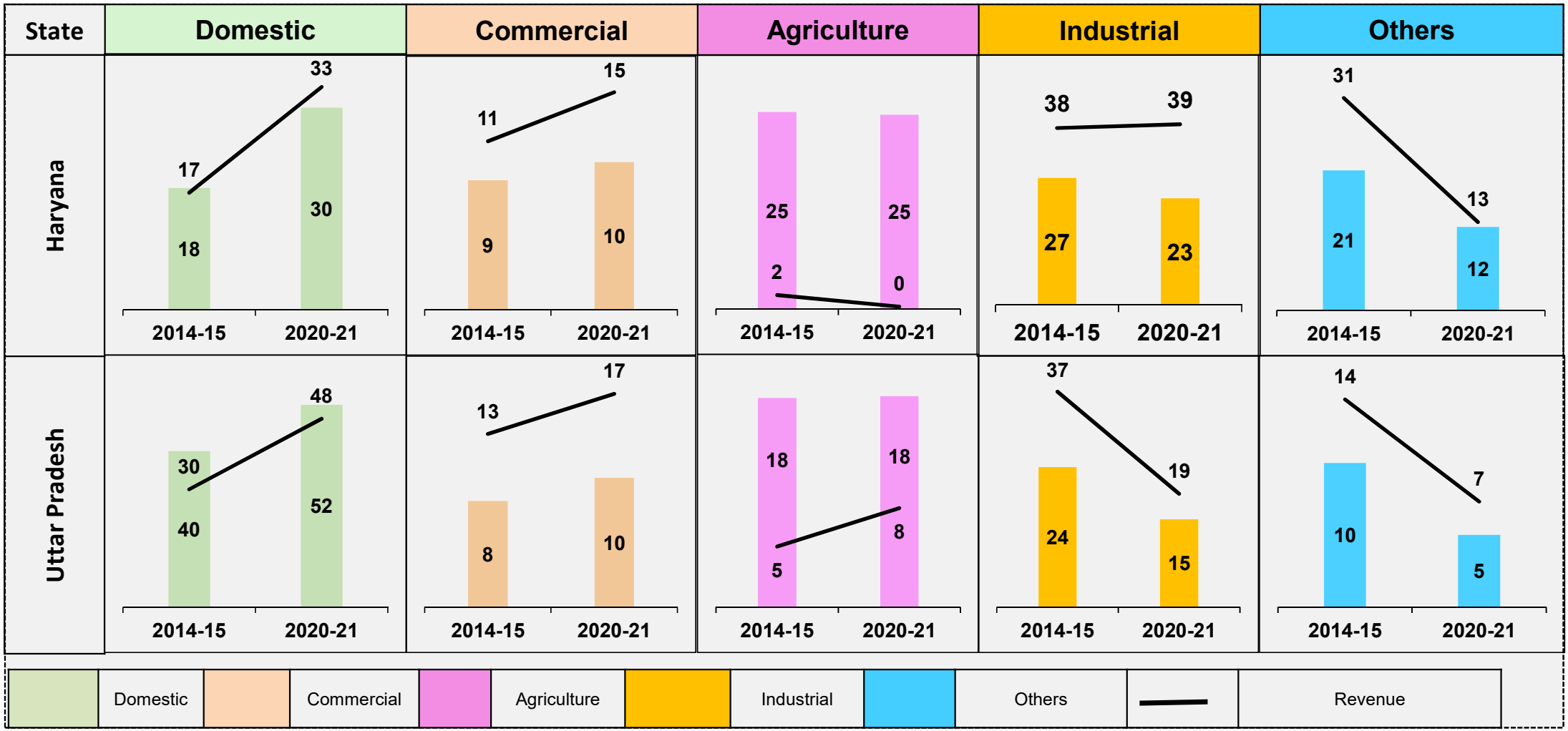
Note: Gross Energy Sold, Source: PFC Report on Performance of State Power Utilities 2019-20.

Share of Sales and Revenue (%)



Note:
1. Bar depicts the share of Energy Sale (%) for different consumer categories
2. Line depicts the share of Revenue (%) for different consumer categories

Share of Sales and Revenue (%)



Note:
1. Bar depicts the share of Energy Sale (%) for different consumer categories
2. Line depicts the share of Revenue (%) for different consumer categories

Overview of Electricity Consumption in study states

Share of sales and revenue (FY21)

States	Approved Sales (in MU)	Domestic		Commercial		Agriculture		Industrial[3]		Others	
		Sales (%)	Revenue (%)	Sales (%)	Revenue (%)	Sales (%)	Revenue (%)	Sales (%)	Revenue (%)	Sales (%)	Revenue (%)
Andhra Pradesh	61819	28	23	8	16	30	13	27	38	7	10
Gujarat	87824	15	14	16	21	23	7	42	55	4	3
Haryana	37177	30	33	10	15	25	0.3	23	39	12	13
Uttar Pradesh	92410	52	48	10	17	18	8	15	20	5	7

Category-wise ABR/ACoS (%) (FY21)

States	Domestic (%)	Commercial (%)	Agricultural (%)	Industrial (%)	Others (%)
Andhra Pradesh	62	152	32	106	94
Gujarat	63	89	21	93	60
Haryana	69	92	1	106	66
Uttar Pradesh	85	151	43	118	133

Source: Respective tariff orders issued by SERCs and PFC reports..

Note:

1. Category wise revenue is exclusive of tariff subsidy for all the states.
2. For majority of states, industrial consumers contribute to the most of revenue except for Uttar Pradesh which has domestic consumers (48%) as the major contributor.
3. For industrial consumer category, both LT industrial and HT/HT and EHT industrial consumer categories have been included while estimating sales and revenue mix.
4. For Gujarat - Others category incl. public lighting, public water work, general Lighting purpose (GLP) and non-RGP & LTMD.
5. For Haryana – Others category incl. Lift Irrigation, Bulk Supply, Railway Traction, Street Lighting, MITC/ Societies and Public Water Works (PWW)
6. For Uttar Pradesh - Others category incl. Public lamps, light, fan & power for public/pvt. Institution, public water works, temporary supply, departmental employees, Evs, railway traction and extra state consumers

Change in ACoS: State-wise analysis

Change in ACoS[1]

States/ Component	ACoS (FY15)	ACoS (FY21)	CAGR (%)
Andhra Pradesh*	5.38	6.87	4.16
Gujarat	5.67	5.89	0.55
Haryana*	6.26	7.49	3.03
Uttar Pradesh	5.81	7.05	2.80
All India average ACoS[4]	**5.21[2]**	**6.72[3]**	3.70

Note: All units are in ₹/kWh unless mentioned

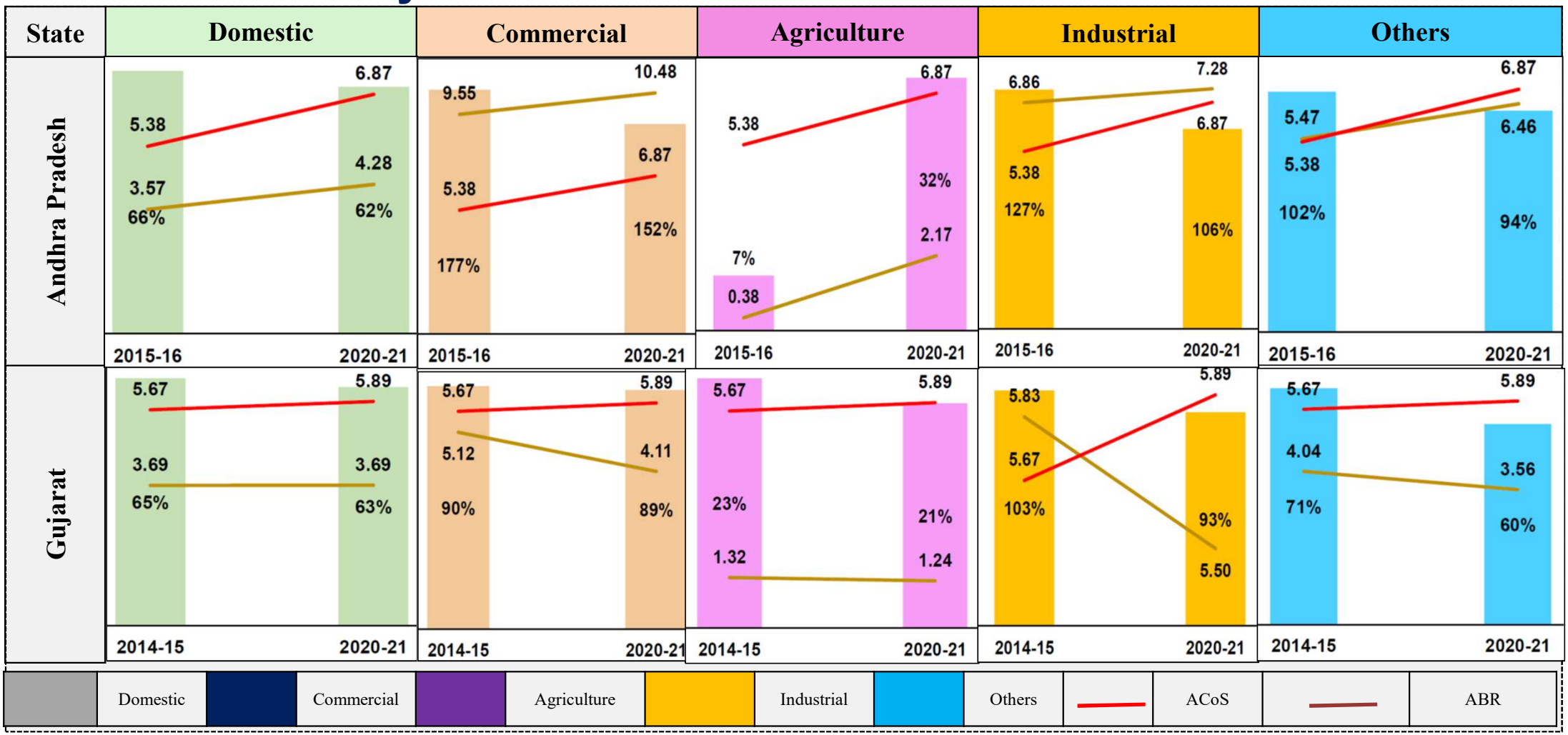
1. Change in ACoS is in CAGR.
2. Source: Tariff Orders and PFC Report on performance of state power utilities.
3. Source: CER's Database
4. * Analysis for AP and HR starts from FY16
5. Change in ACoS for AP is higher than all India average *i.e.* 3.70.

Higher than all India average change in ACoS

Lower than all India average change in ACoS

Historical Cross-subsidy Level Trends Across States

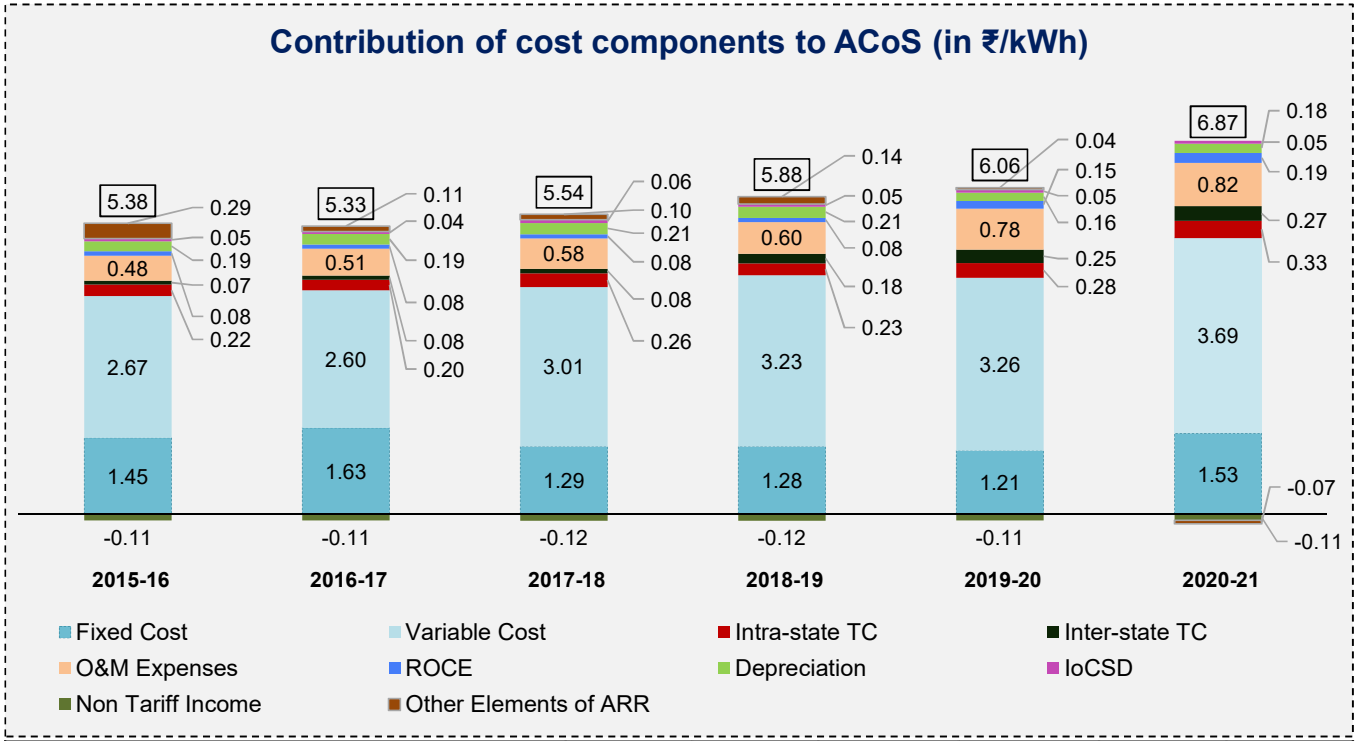
Cross-subsidy Level



Note:
1. Bar shows the ABR/ACoS (%)
2. ACoS and ABR are in (Rs./kWh)

Performance Summary

- Andhra Pradesh Electricity Regulatory Commission (APERC) has ensured timely revision of tariff to minimize the revenue gap in the state-with subsidy
- The approved ACoS has increased by ₹1.49/kWh over the last 6 years. This is mainly due to increase in:
  - Power purchase cost[1] – Contributed 74% to the change in ACoS
  - O&M Expenses – Contributed 23% to the change in ACoS, consisting 20% from Employee and A&G expenses and 3% from R&M expenses
  - Transmission Cost – Contributed 21% consisting 14% from Inter-state and 7% from Intra-state transmission cost



Particulars	FY 17	FY 18	FY 19	FY 20	FY 21	CAGR
Date of Issuance of Tariff Order	31st Mar, 2016	31st Mar, 2017	27th Mar, 2018	22nd Feb, 2019	10th Feb, 2020	
Increase in approved ACoS (%)	-0.99%	4.00%	6.06%	3.07%	13.41%	5.01%
% change in ABR without Subsidy	-0.99%	4.00%	5.42%	2.42%	14.83%	5.01%
% change in ABR with Subsidy	-0.83%	2.83%	-0.70%	2.00%	7.80%	2.17%

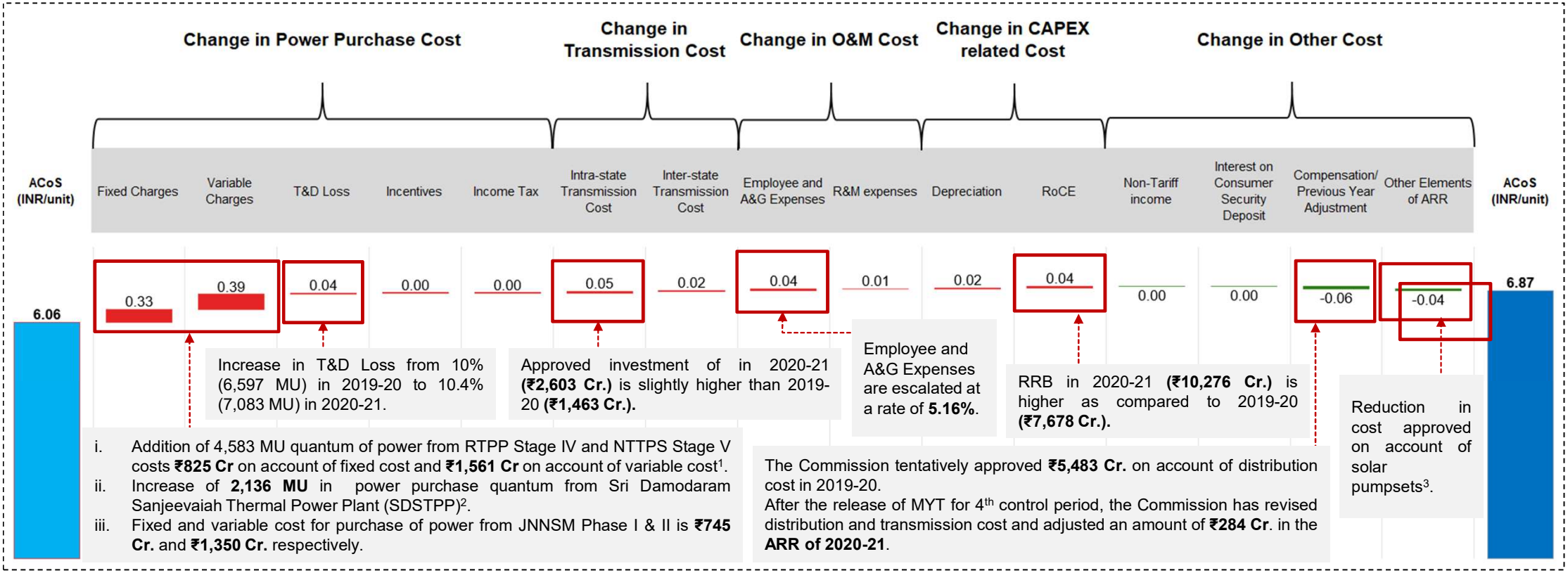
Source: Respective tariff orders issued by APERC

1) Variable cost has a significant contribution of 66% followed by fixed charge (6%) and T&D loss (2%) to the change in ACoS
2) Other Elements of ARR includes Income Tax, Energy Efficiency Expenses, Capitalised Expenses and Distribution Cost for Ananthpur and Kurnool Districts.

ACoS increased by ₹0.81/kWh in 2020-21 as compared to previous year

Change in ACoS from 2019-20 to 2020-21 (in Rs./kWh)

Tariff Study of Andhra Pradesh

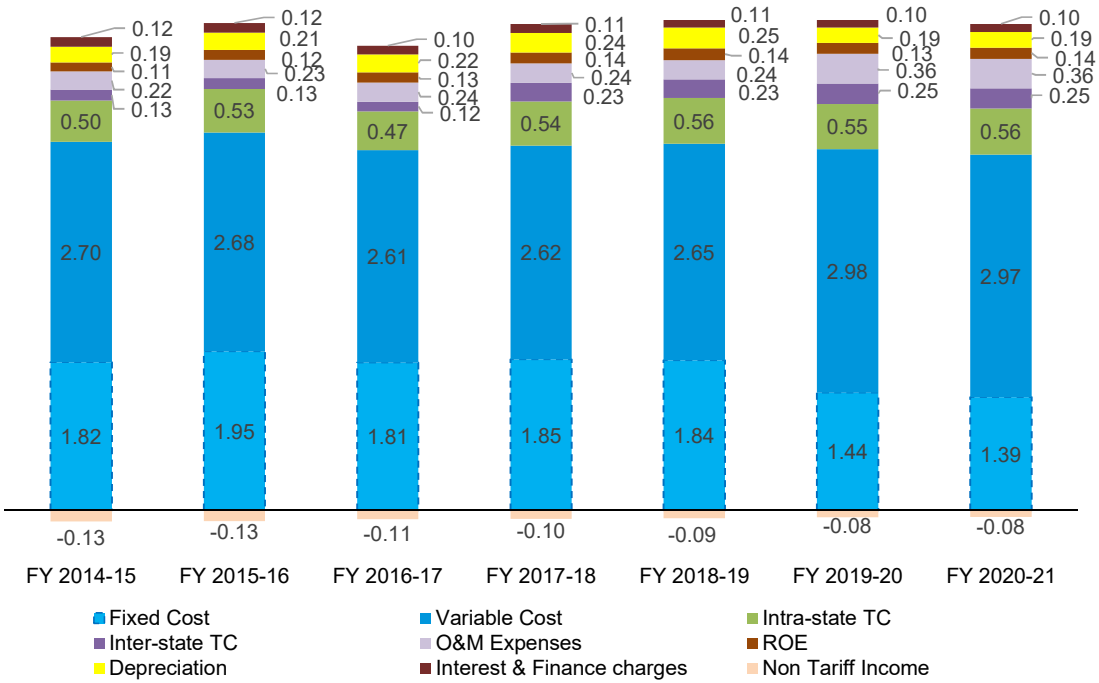


Note:
1) Variable charge for RTPP Stage IV is ₹3.66/unit and NTTPS Stage V is ₹3.14/unit
2) 2,136 MU increase in power purchase quantum results in increase of ₹1,376 Cr. in fixed cost and ₹1,227 Cr. in variable cost (average VC of SDSTPP is ₹3.14/kWh and average VC from overall plant is ₹3.31/kWh).
3) Cost approved for solar pumpsets in 2020-21 is ₹67 Cr. which is lower than previous year's approved cost (₹178 Cr).

Performance Summary

- Gujarat Electricity Regulatory Commission (GERC) has ensured timely revision of tariff allowing commensurate tariff hike over the years and adjusted revenue gaps and surplus in true-up orders.
- Approved ACoS has increased by Rs. 0.218/kWh over the last 7 years.
  - Increase in Variable charges mainly on account of purchase of power from SGS.
  - Increase in transmission charges is offset by reduction in power purchase cost, interest cost and other ARR components.

Contribution of cost components to ACoS (in ₹/kWh)



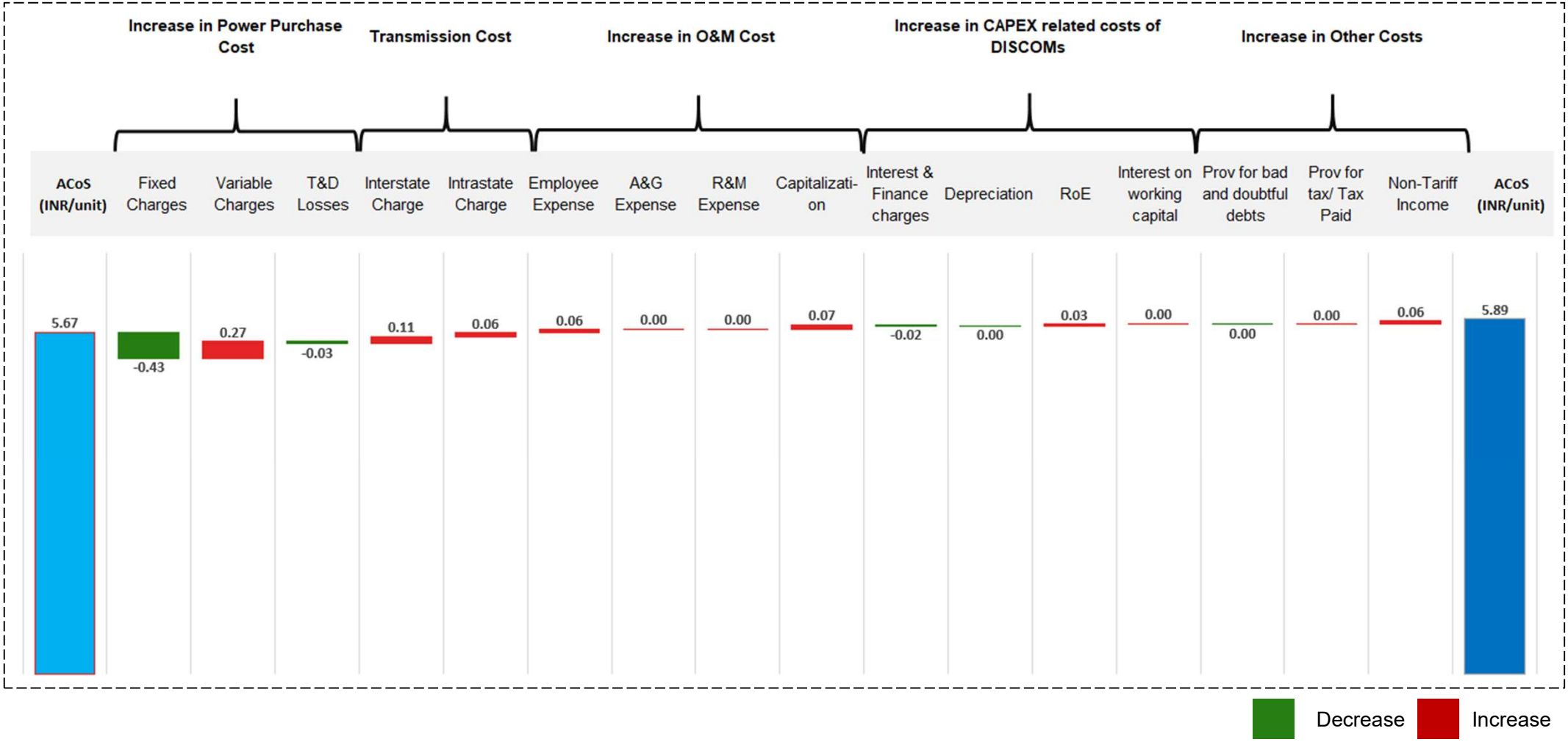
Particulars	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	CAGR
Date of Issuance of Tariff Order	29th April 2014	31st March 2016	31st March 2017	31st Mar 2018	24th April 2019	24th April 2019	
Increase in approved ACoS (%)	3.15%	-4.29%	4.83%	1.20%	-0.05%	-0.81%	0.63%
Change in ABR* with Subsidy (%)	0.19%	-9.55%	16.23%	1.52%	-0.33%	-0.03%	1.06%
Change in ABR* without Subsidy (%)	0.00%	-9.61%	15.91%	1.00%	-0.59%	-0.17%	0.82%

Source: Respective tariff orders issued by GERC for all state owned DISCOMs
*Tariff hike for the year has been computed as change in approved ABR values as compared to previous year.

ACoS increased by ₹0.218/kWh over the last 7 years

Change in ACoS from 2014-15 to 2020-21 (in Rs./ kWh)

Tariff Study of Gujarat

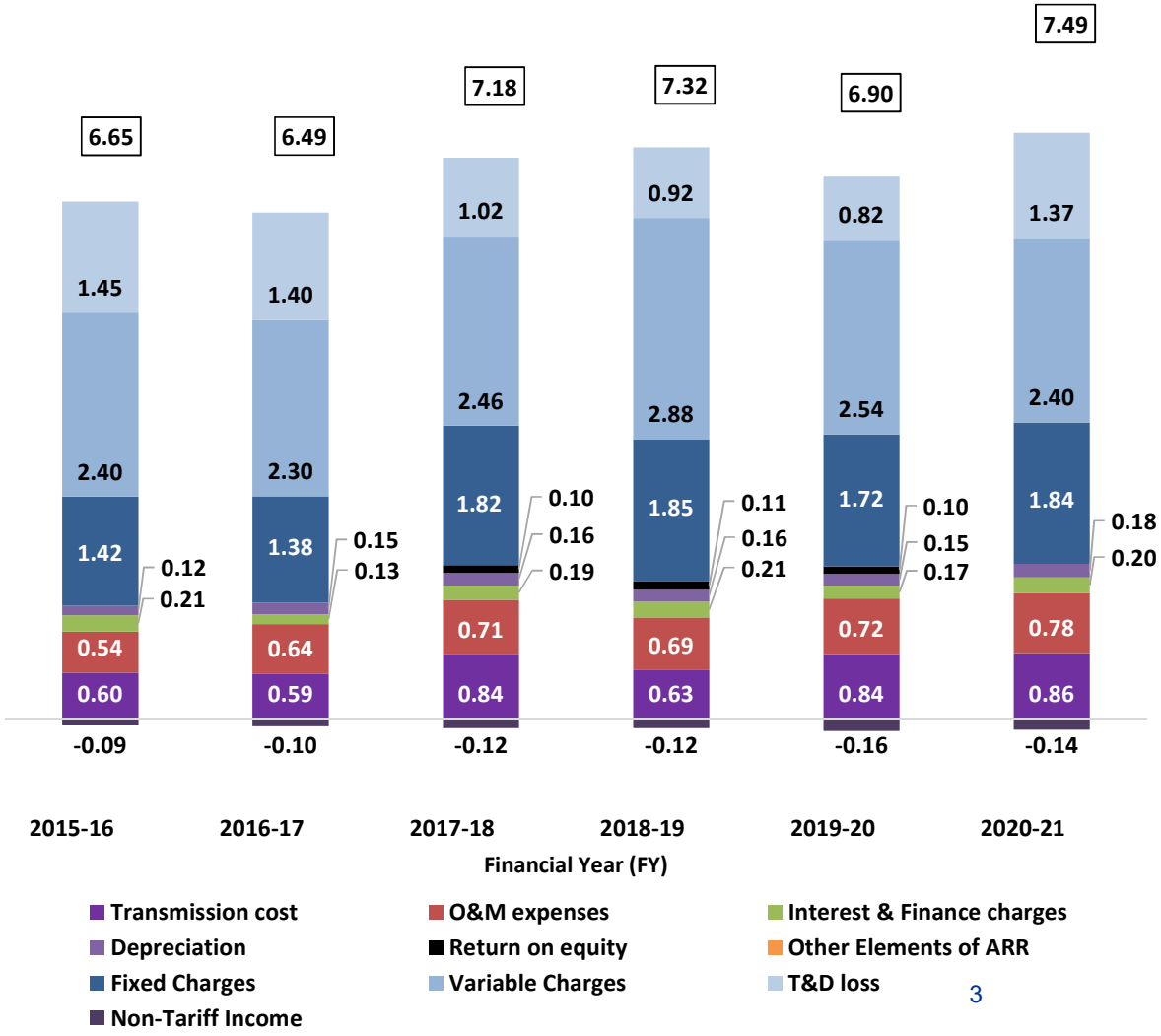


Performance Summary

- Haryana Electricity Regulatory Commission (HERC) has ensured timely issuance of tariff orders.
- Approved ACoS has increased by Rs. 0.84/kWh over the last 6 years.
  - Increase in power purchase cost contributed significantly in change of ACoS.
  - Increase in transmission charges and O&M expenses also led to increase in ACoS

Particulars	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	CAGR
Date of Issuance of Tariff Order	7th May 2015	1st August 2016	11th July 2017	15th November 2018	7th March 2019	1st June 2020	
Increase in approved ACoS (%)#	6.19%	-6.08%	8.88%	7.64%	-5.72%	8.52%	2.40%
Tariff Hike* with Subsidy (%)	-7.41%	-2.98%	-0.14%	0.33%	5.96%	33.76%	6.62%
Tariff Hike* without Subsidy (%)	-15.39%	-2.36%	-4.33%	-4.41%	19.60%	44.52%	9.07%
Gap between Tariff Hike* (with and without subsidy) (Rs /kWh)	1.72	1.65	1.79	1.95	1.64	1.79	

Contribution of cost components to ACoS (in ₹/kWh)

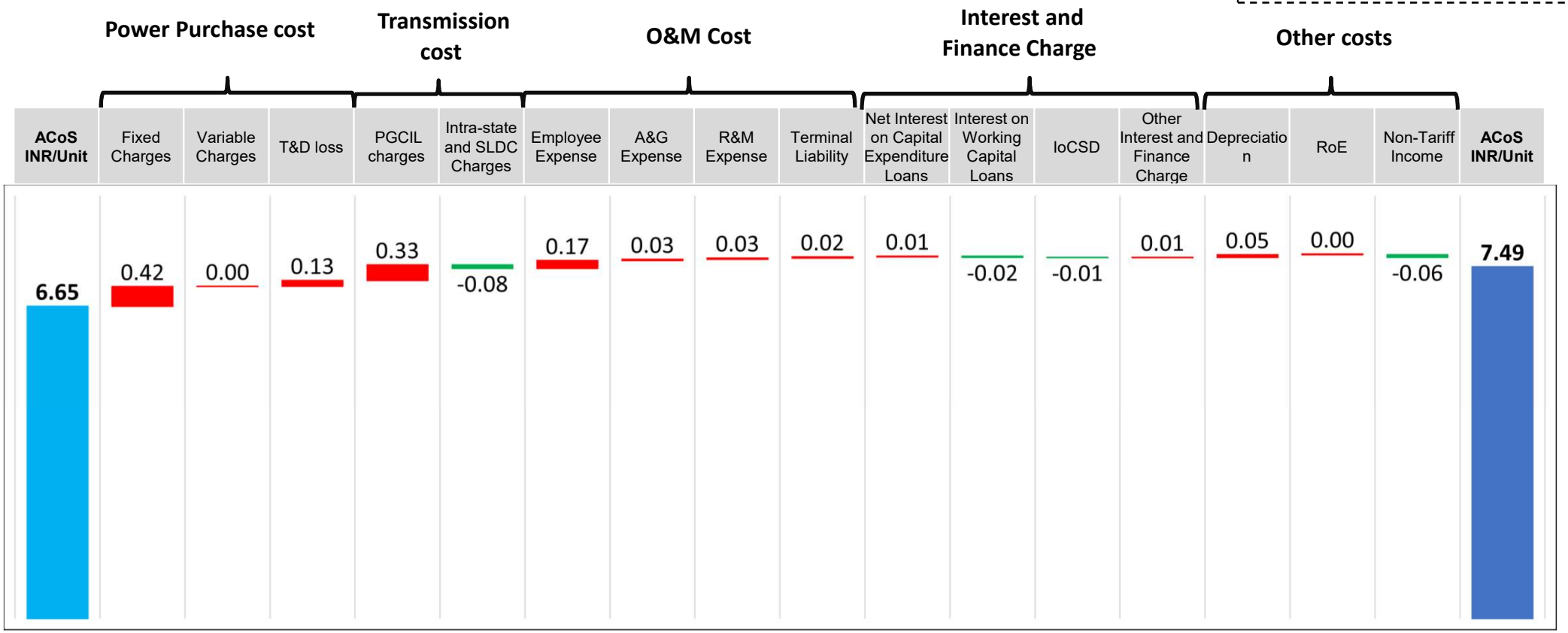


Source: Respective tariff orders issued by HERC for state owned DISCOMs.
*Tariff hike for the year has been computed as change in approved ABR values as compared to the previous year.

ACoS increased by ₹0.839 /kWh over the last 6 years

Change in ACoS from 2015-16 to 2020-21 (in Rs./ kWh)

Tariff Analysis of Haryana



Decrease Increase

Transmission

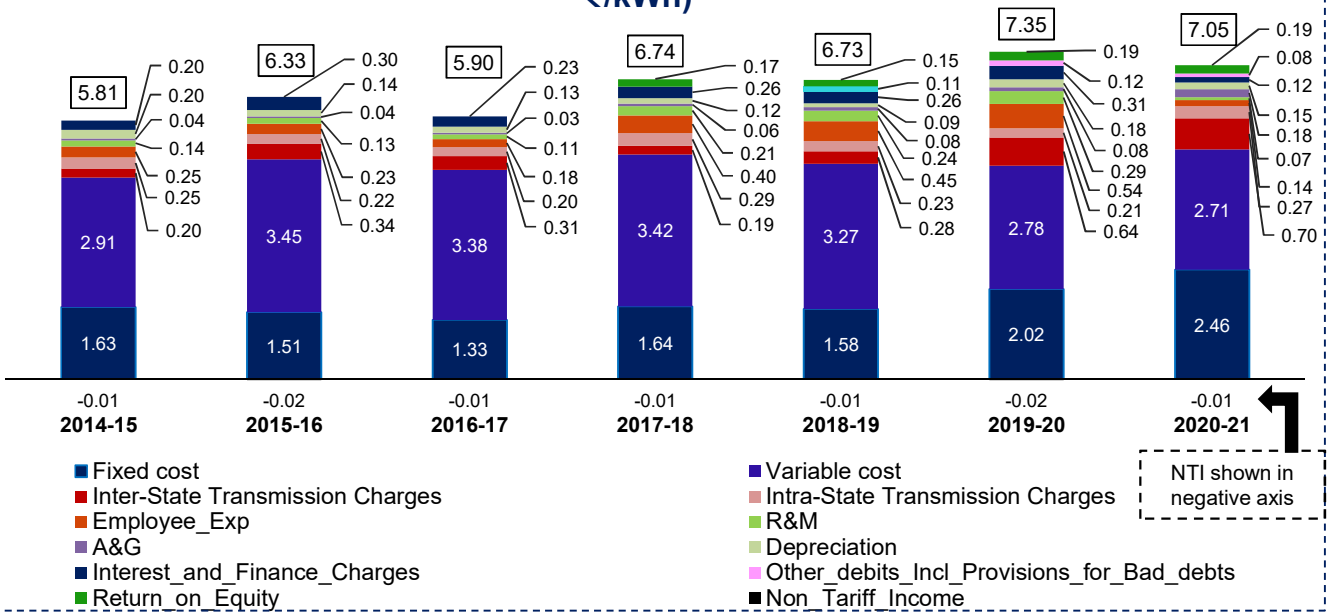
PoC slab

Performance Summary

- Uttar Pradesh Electricity Regulatory Commission (UPERC) has ensured timely issuance of tariff orders.
- The approved ACoS has increased by ₹1.24/kWh over the last 7 years. This is mainly due to increase in:
  - Power purchase cost: Contributed 51% to the change in ACoS
    - Increase in Fixed Charges has a significant contribution of (67%) to the change in ACoS followed by Variable cost (-17%)
  - Transmission Cost: Contributed 41% to the change in ACoS consisting 40% from Inter-state and 2% from Intra-state transmission cost
  - RoE Expenses: Contributed 15 % to the change in ACoS
  - O&M Expenses and Depreciation: Contributed -3% and -4% to the change in ACoS, respectively

Source: Respective tariff orders issued by UPERC

Contribution of cost components to ACoS (including FC and VC) (in ₹/kWh)

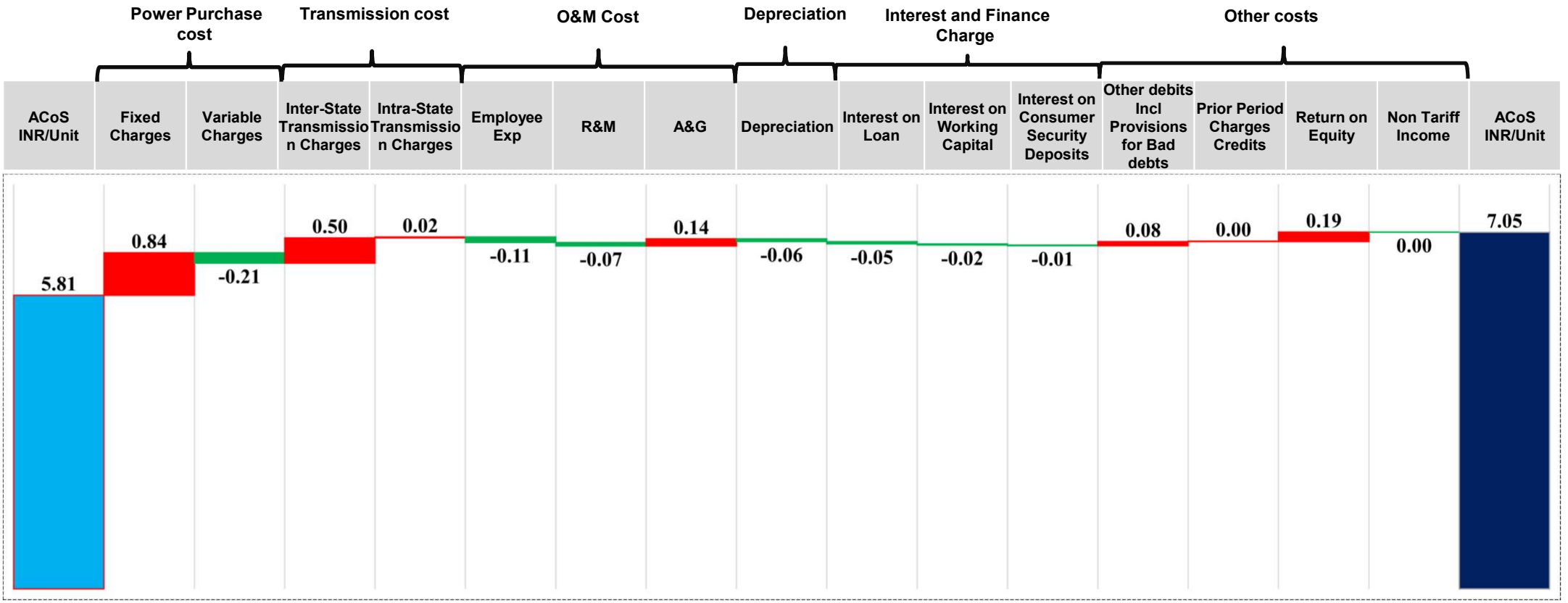


Particulars	FY16	FY 17	FY 18	FY 19	FY 20	FY 21	CAGR
Date of Issuance of Tariff Order	18th Jun, 2015	1st Aug, 2016	30th Nov, 2017	22nd Jan, 2019	3rd Sep, 2019	11th Nov, 2020	
Increase in approved ACoS (%)*	9.01%	-6.81%	14.27%	-0.25%	9.31%	-4.07%	2.18%
% change in ABR with Subsidy*	-8.25%	-13.78%	17.13%	8.44%	13.59%	16.46%	7.69%
% change in ABR without Subsidy*	-3.48%	-11.27%	18.37%	-2.66%	21.53%	16.68%	7.71%

ACoS increased by ₹1.24 /kWh over the last 7 years

Change in ACoS from 2014-15 to 2020-21 (in Rs./kWh)

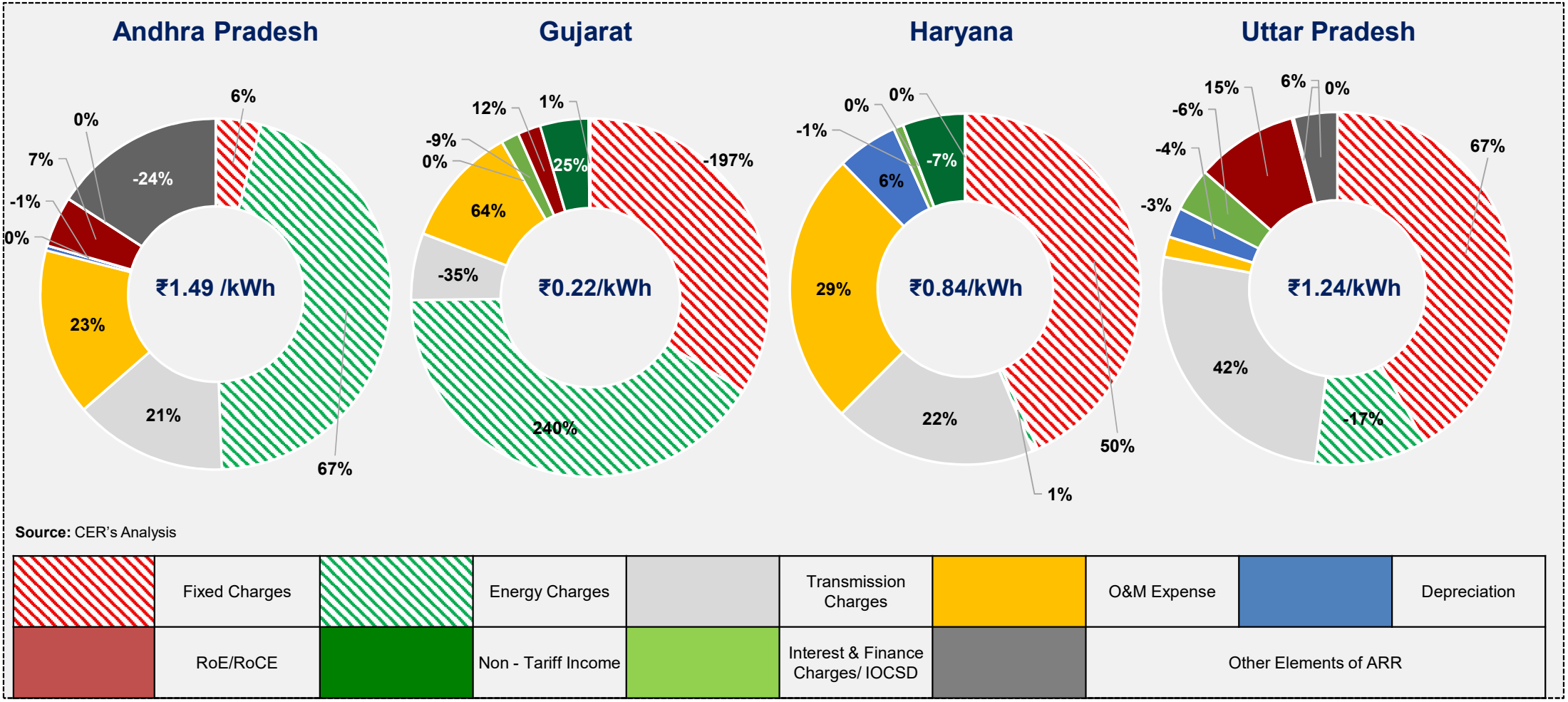
Tariff Analysis of Uttar Pradesh



Decrease Increase

Transmission PoC Slab

Major contributors of change in ACoS: FY15 vs FY21



Note: The analysis is from FY15 to FY21 for Uttar Pradesh and Gujarat; for Andhra Pradesh and Haryana FY16 to FY21 is covered.

1. ROCE and IOCSD is used for Andhra Pradesh.
2. Hatching design shows break-up of Power Purchase Cost *i.e.* FC & VC.

Major reasons for increase in ACoS over last 7 years

Andhra Pradesh (₹5.38/kWh to ₹6.87/kWh) (28%)

1. **Increase in Energy Charges** – Energy charges of coal-based TPPs has increased by ₹0.86/kWh in 2020-21 as compared to 2015-16 partly due to increase in other charges (55%), railway freight (19%), and environmental cess (13%).
2. **Inter-state TC** – Due to increase in Point of Connection charges, the PGCIL charge has increase significantly from 2018-19.
3. **Procurement from non-conventional energy sources** – Procurement from non-conventional sources has continuously increased at an average energy charge of Rs. 4.68/kWh.

Gujarat (₹5.67/kWh to ₹5.89/kWh) (4%)

1. **Increase in Energy Charges** – Energy charges has increased mainly on account of purchase of power from SGS and to meet their RPO target.
2. **Inter-state TC** – Due to increase in POC Slab rate in 2014-15 to 2020-21.
3. **Increase in Employee Expense** – Employee exp. increased on account of 7th Pay Commission.

Haryana (₹6.26/kWh to ₹7.49/kWh) (20%)

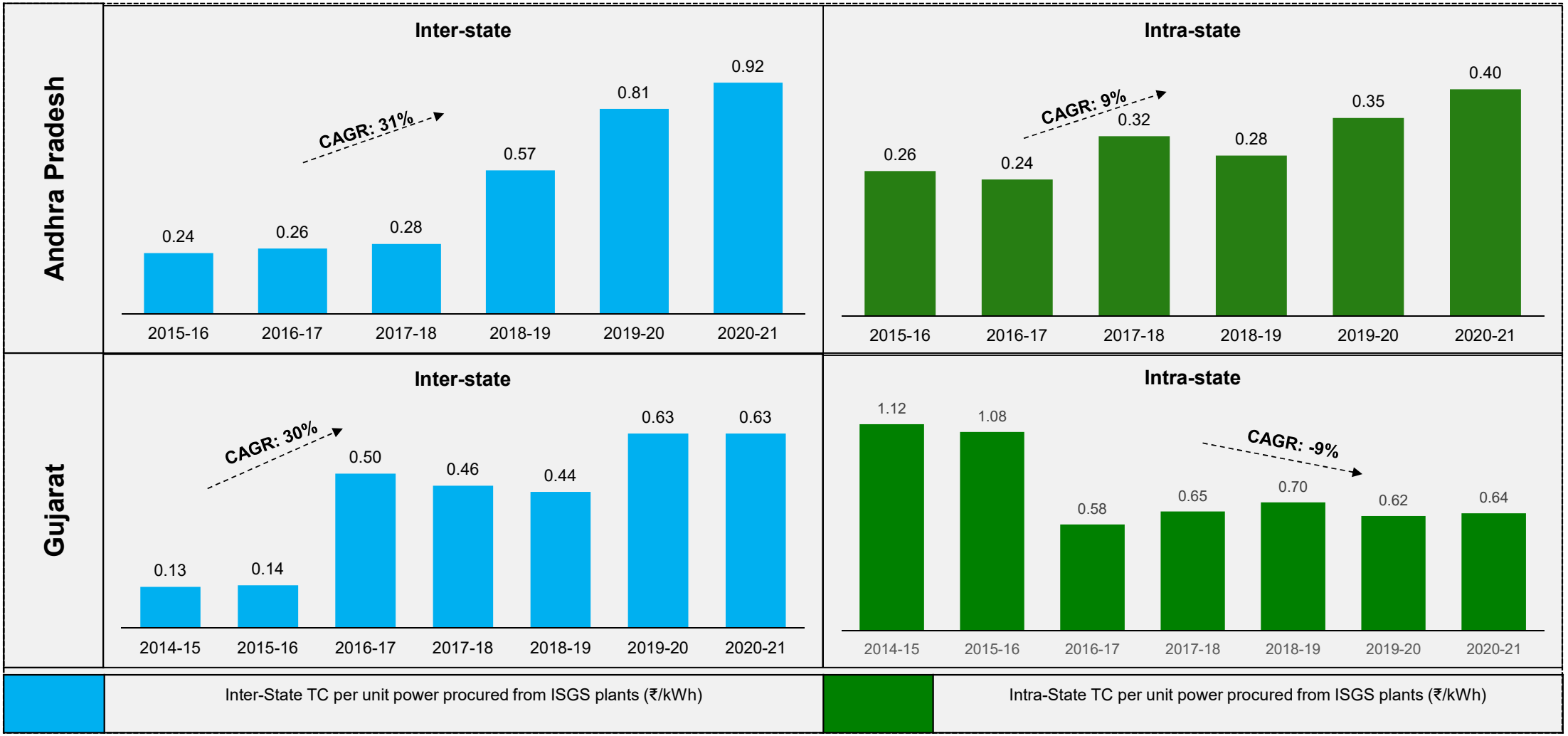
1. **Increase in Fixed Charges** – Addition of new PPA worth Rs. 1800 Cr. (Rs. 1230 Cr. from TPP; Rs. 585 Cr. from large hydro plants).
2. **Increase in Intra-state TC** – Due to significant increase in Point of Connection charges in 2nd quarter from FY16 to FY21.
3. **Increase in Employee Expense** – Employee exp. increased on account of 7th Pay Commission.

Uttar Pradesh (₹5.81/kWh to ₹7.05 /kWh) (21%)

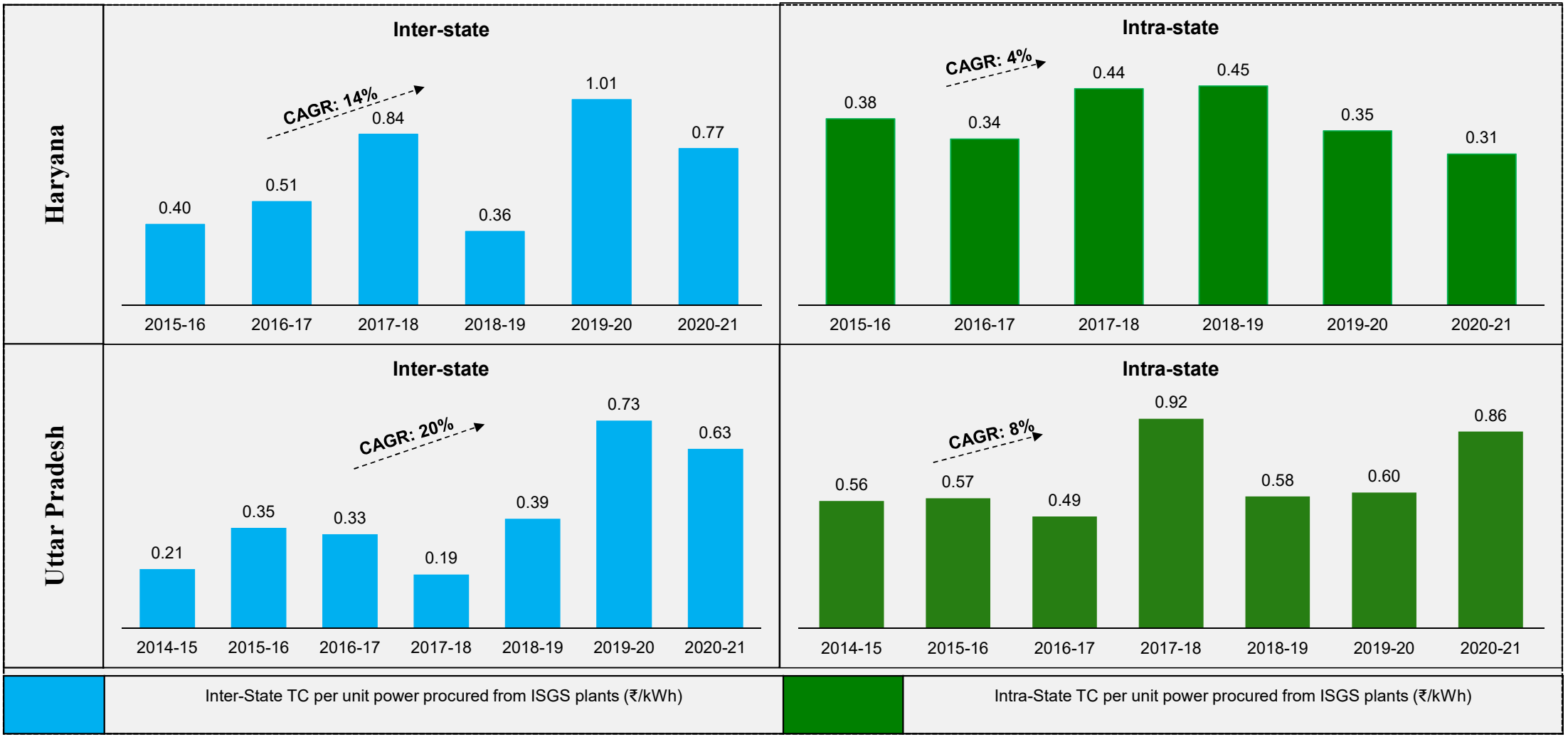
1. **PPC** – The power procurement increased by 37,981 MU resulting in increase in total power purchase cost by ₹19,697.95 Cr. (₹12459.32 Cr. on account of FC and ₹7,238.63 Cr. on account of VC)
2. **Increase in RoE** – Post FY13, no Return on Equity was approved until FY18 (₹1527 Cr.).
3. **Increase in Inter-state TC** – Due to increase in Point of Connection charges, the PGCIL charge has increased significantly from 2nd Quarter of FY17.

Note: Components with significant contribution to the overall change in ACoS (in %) over the last 7 years have been considered.

Inter-state & intra-state transmission charges (₹/kWh)

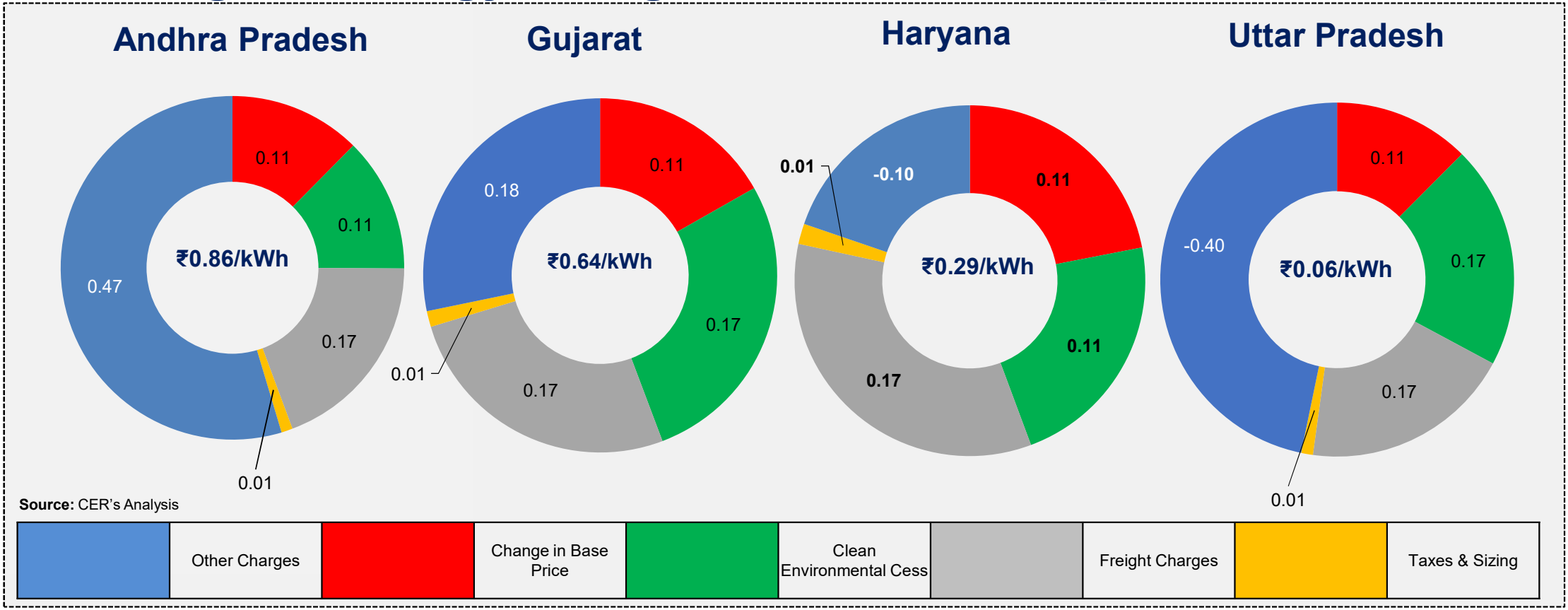


Inter-state & intra-state transmission charges (₹/kWh)



Contribution of coal prices, railway freight, environmental cess to the change in ACoS

Contribution of fuel cost, railway freight and cess to change in energy charges of coal-based plants



Note: Other charges incl. coal loading & unloading charges, washing charges, beneficiation cost, stowing excise duty, sales tax, handling/storage/wagon loading charges, variation in GCV of coal and grade slippage

Summary: Contribution of various factors to change in ACoS

Factors influencing ACoS: FY15 vs FY21 (Rs./kWh)

ARR Components		Andhra Pradesh	Gujarat	Haryana	Uttar Pradesh
Power Purchase Cost	Fixed Charges	+0.09	-0.43	+0.42	+0.84
	Energy Charges	+0.98	0.27		-0.21
	T&D Losses	+0.04	-0.03	-0.08	
Transmission Cost	Inter-state	+0.20	0.11	+0.26	+0.50
	Intra-state	+0.11	0.06		+0.02
O&M Cost	Employee Expenses	+0.30	0.06	+0.25	-0.11
	A&G Expenses				+0.14
	R&M Expenses	+0.05			-0.07
	Capitalization		0.07		
CAPEX related Costs	Interest & Finance Charges		-0.02	-0.01	-0.08
	Depreciation	-0.01		+0.06	-0.06
	Return on Equity	+0.10 (ROCE)	0.03		+0.19
Other Costs	Provision for bad and doubtful debts				+0.08
	Income tax	-0.01			
	Other elements of ARR (distribution cost)	-0.10			
	Adjustment of prev. yr. gap/surplus & TUP values	-0.25			
	Non-Tariff Income		0.06	-0.06	

Note: All values are rounded up to two decimal places

Suggested Interventions

Suggested interventions

Factors	Power purchase cost	Transmission charges	O&M/Employee expenses	RoE	Interest & finance charges
Interventions	➢ Improved long-term and short-term demand forecasting and power procurement planning, cost optimization. FSA for timely recovery of fuel cost and to reduce the burden on consumers (to pay IOWC). ➢ Avenues for utilizing surplus power. In case of established surplus availability during certain months of the year, seasonal tariff may be introduced to reduce overall avg. fixed cost.	➢ Creation of new transmission assets based on international competitive bidding.	➢ Benchmarking of employee/O&M cost & incentive/dis-incentives based on standard of performance	➢ ROE to be worked out on the basis of the risk associated with business and the estimated cost of equity*. ➢ One should examine whether concept of ROCE has led to a lower overall impact on the interest plus ROE.	➢ DISCOMs may explore cheaper alternate sources of funding (such as green funding & infrastructure investment trust) to meet capital expenditure requirements.

* Singh, Kewal, Anoop Singh, and Puneet Prakash. "Estimating the cost of equity for the regulated energy and infrastructure sectors in India." **Utilities Policy** 74 (2022): 101327.

THANK YOU

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ARTIFICIAL INTELLIGENCE IN REGULATORY BODIES- GEARING UP FOR TOMMOROW

22nd April 2022 (FOR MEETING)

CERC to embrace AI, machine learning to improve functioning

First quasi-judicial body to strengthen its digital back-end

SHREYA JAI
New Delhi, 14 January

The apex power sector regulator, the Central Electricity Regulatory Commission (CERC), is planning to set up an artificial intelligence (AI)-based regulatory expert system tool (REST) for improving access to information and assist the commission in discharge of its duties.

So far, only the Supreme Court (SC) has an electronic filing (e-filing) system and is in the process of building an AI-based back-end service.

The CERC will be the first such quasi-judicial regulatory body to embrace AI and machine learning (ML). The decision comes at a time when the CERC has been shut for four months, following an SC order.

According to the data available on the CERC website, there are 1,000 cases pending with the regulator while it was shut. In 173 cases, the order has been reserved by the CERC, but not pronounced yet. There are 450 fresh applications pending for hearing.

The CERC floated a request for proposal (RFP) in December to select a consultant working in the domain of AI, ML natural language processing to develop AI-based REST for the CERC.

The commission in the RFP said REST was for the purpose of "building institutional memory and for creation, reference, and intelligent retrieval of information/documents to assist the commission in discharge of its functions under the Electricity Act, 2003". The CERC has a management information system (MIS) called System for Adjudication Using Digital Access & Management of Information (SAUDAMINI) for sourcing data. However, officials said an intelligent system was needed to handle the increasing workload and widening the gamut of cases.

In the RFP issued by the CERC, it said over the years, the number of petitions filed before the CERC had increased manifold and the orders issued by the commission have ranged over an increasing number of topics/issues.

"Therefore, the monitoring and analysing of such orders have become a challenging task for the CERC. In addition, the CERC regularly receives information from the regulated entities/stakeholders/nodal bodies. The information received is important from a regulatory perspective. However, such information generally contains voluminous inter-related data of a complex nature," said the RFP.

The agency hired for setting up REST for the CERC will need to provide AI-based search and recommendation, an automated system creation and extraction of legal documents, and develop process automation data visualisation tools. The new system will be later merged with the existing MIS SAUDAMINI, said the CERC.

While the commission is yet to receive bids, the deadline for developing the new back-end system is six months from the date of selection of the consultant.

Recently, following the Covid-induced lockdown, the SC moved to e-filing of legal documents and had initiated online hearing as well.

Similar guidelines for high courts and district courts have been issued. Once all courts are plugged into a central system, AI-based portals will enable efficiency and reduce paperwork.

TAKING THE DIGI ROUTE

- **To use AI-based** search tools and input-data analysis
- **Automatic legal document** creation & assembly
- **Process** automation & data visualisation tool
- **Data visualisation tool to have dashboards** for data trends, data analytics of regulatory compliance and petition status, etc.
- **Single data repository/** institutional memory for all the data
- **Intuitive user** interface
- **Scalable to additional** third-party software/ data sources/ tool integrations in future

Business Problem

- **Tariff petitions are voluminous, bulky and numerous.**
- **Judicial process is thorough, but time-consuming.**
- **Multi-stage process**
- **Building institutional memory**

Regulatory Expert System Tool (REST)

Commission's initiative towards Strengthen its digital backend with a view to

- **Increase efficiency**
- **Enhance decision making process**
- **AI Based searching of cases**
- **Creation, reference and intelligent retrieval of information/documents**

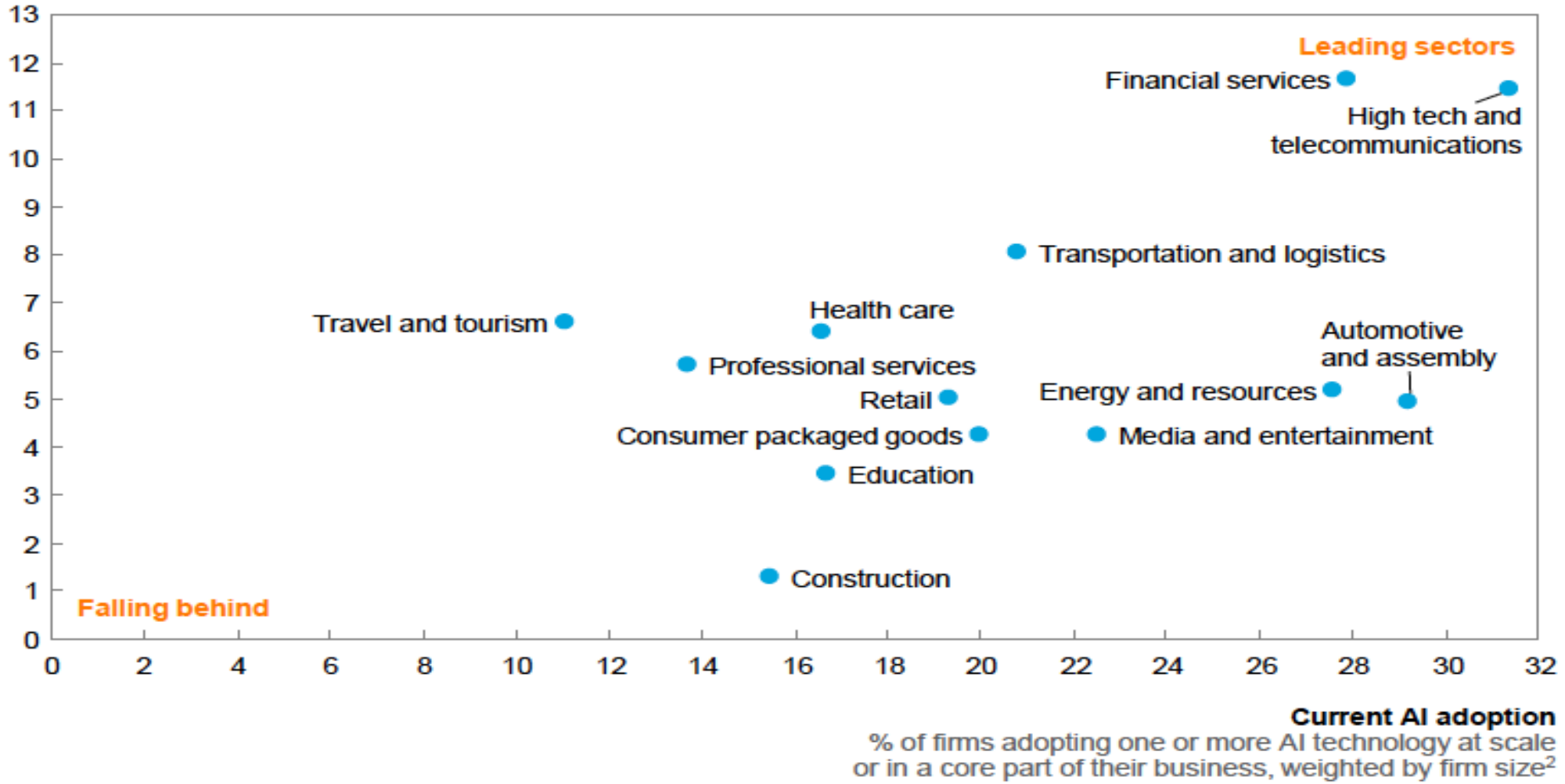
- **Process Automation & Business Intelligence and building institutional memory**

Global Developments in AI

- US published its AI report in December 2016
- France published the AI strategy in January 2017 followed by a detailed policy document in March 2018
- Japan released a document in March 2017
- China published the AI strategy in July 2017
- U.K. released its industrial strategy in November 2017.
- India released Discussion Paper on National Strategy of AI in June 2018.
- India released an Approach Document on Responsible AI for All In February 2021.

Future AI demand trajectory[1]

Average estimated % change in AI spending, next 3 years, weighted by firm size[2]



Current AI adoption

% of firms adopting one or more AI technology at scale or in a core part of their business, weighted by firm size[2]

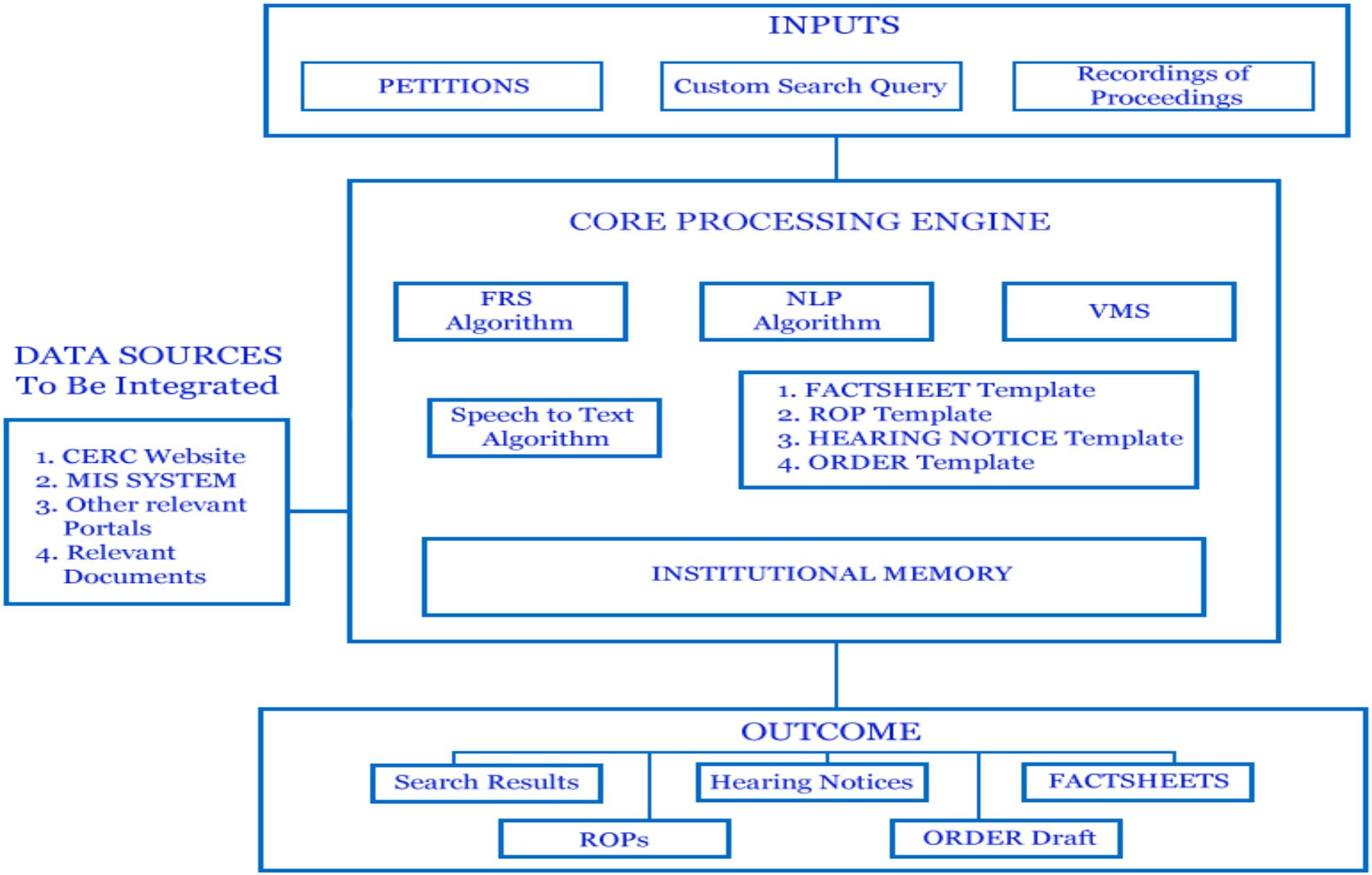
1 Based on the midpoint of the range selected by the survey respondent.
2 Results are weighted by firm size. See Appendix B for an explanation of the weighting methodology.

Source: McKinsey Global Institute AI adoption and use survey

KEY AREAS WHERE AI WILL BE USEFUL FOR REGULATORY BODIES

- AI Based Searching of information including intelligent recommendations, query completion to guide users.
- AI Based Chat Bots
- Automatic Document Creation & Assembly comprising of automated extraction of data, words, sentences along with its underlying meaning.
- Process Automation & Data Visualization tool to automate the organization process through scheduled email, automated workflow etc.
- Data Analytics & data visualization tool with dashboards for data trends, data analytics of regulatory compliance etc.
- Speech to Text Conversion.
- Monitoring Regulatory Compliance where structured and unstructured data may be fetched from the respective websites available in the public domain.
- Predictive Analysis.

CERC REGULATORY EXPERT SYSTEM TOOL PROCESS FLOW



Some Glimpse of
CERC AI BASED
REGULATORY EXPERT SYSTEM TOOL
(REST)

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CERC AI BASED REGULATORY EXPERT SYSTEM TOOL (REST)

Home | AI Search | Document Extraction | Document Creation | Text summarization | Analytics | Automation

40
AI Search

15
Documents Extracted

37
Documents Created

67
Orders Summarization

Petition Statistics

Petitions Registered Petitions Disposed

50

CERC

CERC

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80%

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AI Search

- Document Upload Search
- Free Text Search
- Citation Search
- Assisted Search
- MIS Search

Documents Extraction

- Tag Based
- Page No. Based
- Paragraph Based
- Summary Based
- Keyword Based

Document Creation

- FactSheet
- ROP
- Draft Order
- MOM
- Misc.

Order Summarization

- Tariff Orders
- Non-Tariff Orders
- Review Orders

Analytics

- Legal Analytics
- Video Analytics
- Data Analytics

Business Intelligence

- Process Automation
- E-mail Automation
- Document Automation

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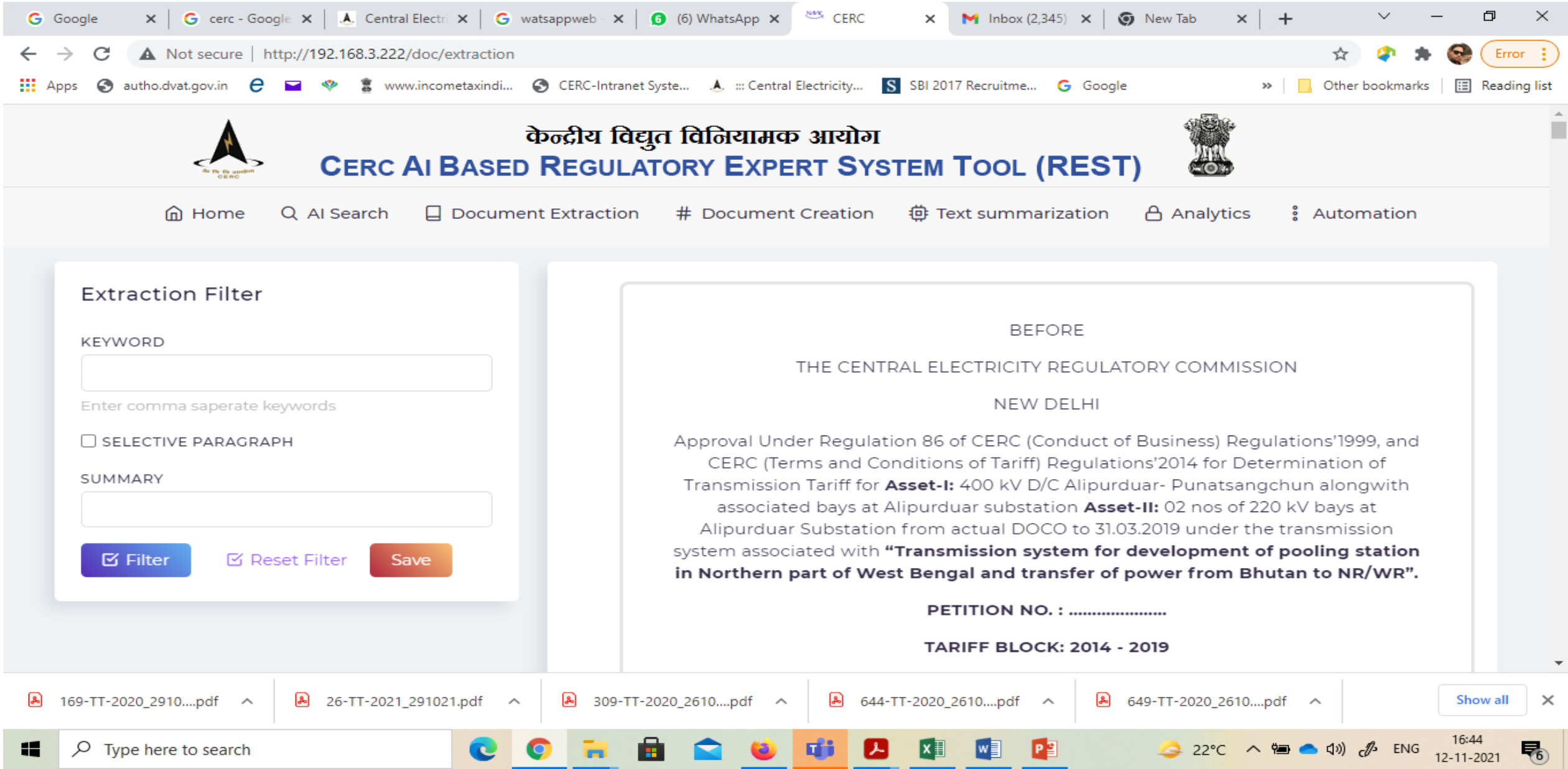
AI SEARCH-DOCUMENT UPLOAD SERACH

Document Extraction



Selective Paragraph

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Extraction Filter

KEYWORD

Enter comma saperate keywords

SELECTIVE PARAGRAPH

SUMMARY

Filter | Reset Filter | Save

please be registered.

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POWER GRID CORPORATION OF INDIA LTD.

GURGAON REPRESENTED BY

DATED: 13.02.2019 Deputy GENERAL MANAGER (COMMERCIAL)

BEFORE

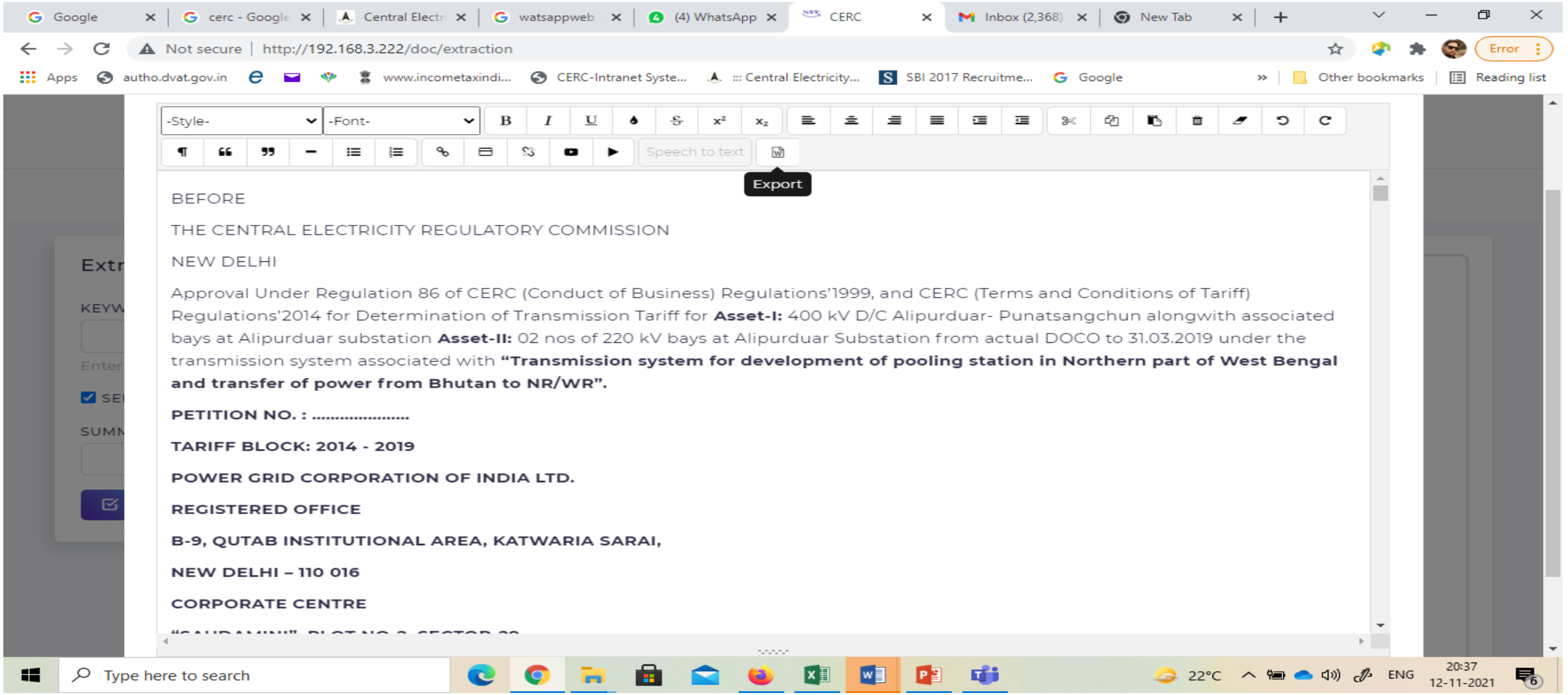
THE CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

PETITION NO.: .....

IN THE MATTER OF: Approval Under Regulation 86 of CERC (Conduct of Business) Regulations'1999, and CERC (Terms and Conditions of Tariff) Regulations'2014 for Determination of Transmission Tariff for **Asset-I:** 400 kV D/C Alipurduar-Punatsangchun alongwith associated bays at Alipurduar substation **Asset-II:** 02 nos of 220 kV bays at Alipurduar Substation from actual DOCO to 31.03.2019 under the transmission system associated with **"Transmission system for development of pooling station in Northern part of West Bengal and transfer of power from**

Extraction Result after clicking save



CERC | trans1-2022-01.pdf

cerc.rest.com/doc/factsheet

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FactSheet Creation

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PETITION NO

Create

trans1-2022-01.xls

Show all

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All Factsheet

Add New

ID | Peitition No | Search

Id	Name	Uploaded Petition	Created Factsheet	Created At	Updated At	Action
30	193/TT/2019	View Petition doc	View Factsheet	Feb 9, 2022 09:50:01 AM	Feb 9, 2022 09:50:01 AM	
29	511/TT/2020	View Petition doc	View Factsheet	Feb 9, 2022 07:38:45 AM	Feb 9, 2022 07:38:47 AM	
28	647/TT/2020	View Petition doc	View Factsheet	Feb 9, 2022 07:38:23 AM	Feb 9, 2022 07:38:25 AM	
27	655/TT/2020	View Petition doc	View Factsheet	Feb 9, 2022 07:38:01 AM	Feb 9, 2022 07:38:02 AM	
26	685/TT/2020	View Petition doc	View Factsheet	Feb 9, 2022 07:37:39 AM	Feb 9, 2022 07:37:40 AM	
25	693/TT/2020	View Petition doc	View Factsheet	Feb 9, 2022 07:37:14 AM	Feb 9, 2022 07:37:15 AM	
24	473/TT/2020	View Petition doc	View Factsheet	Feb 9, 2022 07:36:47 AM	Feb 9, 2022 07:36:50 AM	

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Transcript list

Add

Recording	Status	Added On	
hearing-cut.mp4	Completed	10/01/2022	Edit
test1.mp4	Convertion [video to audio] + Speaker Detection	06/01/2022	
test1.mp4	Convertion [video to audio] + Speaker Detection	08/01/2022	
test1.mp4	Convertion [video to audio] + Speaker Detection	10/01/2022	
test1.mp4	Convertion [video to audio] + Speaker Detection	08/02/2022	
test1.mp4	Convertion [video to audio] + Speaker Detection	08/02/2022	

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Summerization

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MAX WORDS

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MIN WORDS

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Summerize

09 February 2022
Wednesday

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All Summerize Orders

Add New

ID

Search

Id	Uploaded Orders	Created Orders	Created At	Updated At	Action
13	View Order pdf	View Summerize Order	Feb 8, 2022 06:38:30 AM	Feb 8, 2022 06:38:30 AM	
12	View Order pdf	View Summerize Order	Feb 7, 2022 09:35:08 AM	Feb 7, 2022 10:04:07 AM	
11	View Order pdf	View Summerize Order	Feb 7, 2022 09:24:47 AM	Feb 7, 2022 09:24:47 AM	

09 February 2022
Wednesday

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केन्द्रीय विद्युत विनियामक आयोग
CERC AI BASED REGULATORY EXPERT SYSTEM TOOL (REST)

Next REC Trading on 27th January 2022

Source: PXIL INDIA

PRICE FROM POWER EXCHANGE FOR TIME BLOCK 15:15 - 15:30 DATED 09 FEB 2022					
5,961 MW SURPLUS POWER AT POWER EXCHANGE	3.87 ₹/Unit AVG MARKET CLEARING PRICE	171 GW DEMAND MET (CURRENT)	174 GW DEMAND MET (YESTERDAY)	DURING PEAK 492 MW [0.30 %] SHORTAGE FOR YESTERDAY ENERGY 7 MU [0.20 %]	[100.00 %] % OF TIME UNCONSTRAINED PRICE

Source: VIDYUT PRAVAH

POWER PROCUREMENT ON 07 Feb 2022					
ALL INDIA POWER POSITION (MW) [CURRENT]					
DEMAND MET 1,71,145 MW	THERMAL GENERATION 1,26,666 MW	GAS GENERATION 3,199 MW	NUCLEAR GENERATION 5,222 MW	HYDRO GENERATION 9,498 MW	RENEWABLE GENERATION 26,322 MW

Source: MERIT INDIA

Generation Reports

Daily Generation Reports [As on 07-02-2022]

Transmission Reports [As on JAN-2022]

Transmission Lines

Installed Capacity Reports [As on JAN-2022]

All India Installed Capacity of Power Stations

केन्द्रीय विद्युत विनियामक आयोग
CERC AI BASED REGULATORY EXPERT SYSTEM TOOL (REST)

Generation Reports

Daily Generation Reports [As on 07-02-2022]

- 1.All India / Region Wise Power generation Overview
- 2.Region Wise, State Wise, Sector Wise, Type Wise, Station Wise, Unit Wise Generation Report
- 3.All India Summary Report
- 4.Region Wise Utility Wise Summary Report
- 5. Region Wise Availabilty(above 25 MW)
- 6. Daily Report for Hydro Reservior
- 7. Daily Outage Report (Hydro Units)

Transmission Reports [As on JAN-2022]

Transmission Lines

- Progress Status of Transmission Lines
- Transmission Lines Commissioned Monthly
- Transmission Lines Commissioned Yearly
- RFD Progress Status of Transmission Lines

Transformation Capacity

- Progress Status of Sub Station
- Sub Station Commissioned Monthly
- Sub Station Commissioned Yearly
- RFD Progress Status of Sub Station

Transmission Schemes

Installed Capacity Reports [As on JAN-2022]

- All India Installed Capacity of Power Stations
- State-Wise Installed Capacity-Northern
- State-Wise Installed Capacity-Eastern
- State-Wise Installed Capacity-Western
- State-Wise Installed Capacity-Southern
- State-Wise Installed Capacity-North Eastern

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Emailer

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SUBJECT

TEXT

Sent

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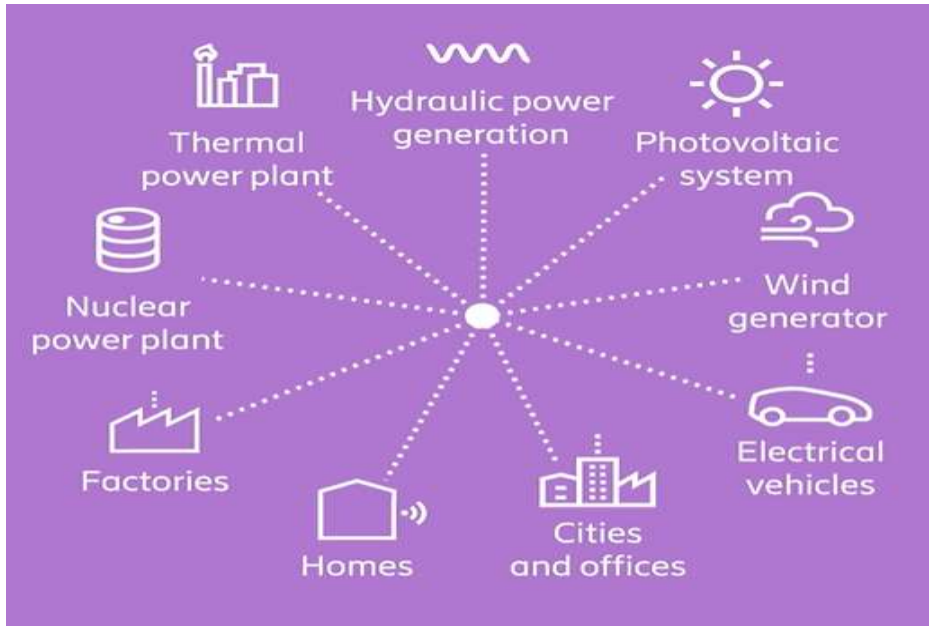
Vaishali Rana , Deputy Chief(MIS)
Central Electricity Regulatory Commission
vaishali@cercind.gov.in

Presentation to FOR
on
Cross Sector Collaboration
between
Telecom and Power Sector

By
Telecom Regulatory Authority of India
22-Apr-2022

Energy network are transforming

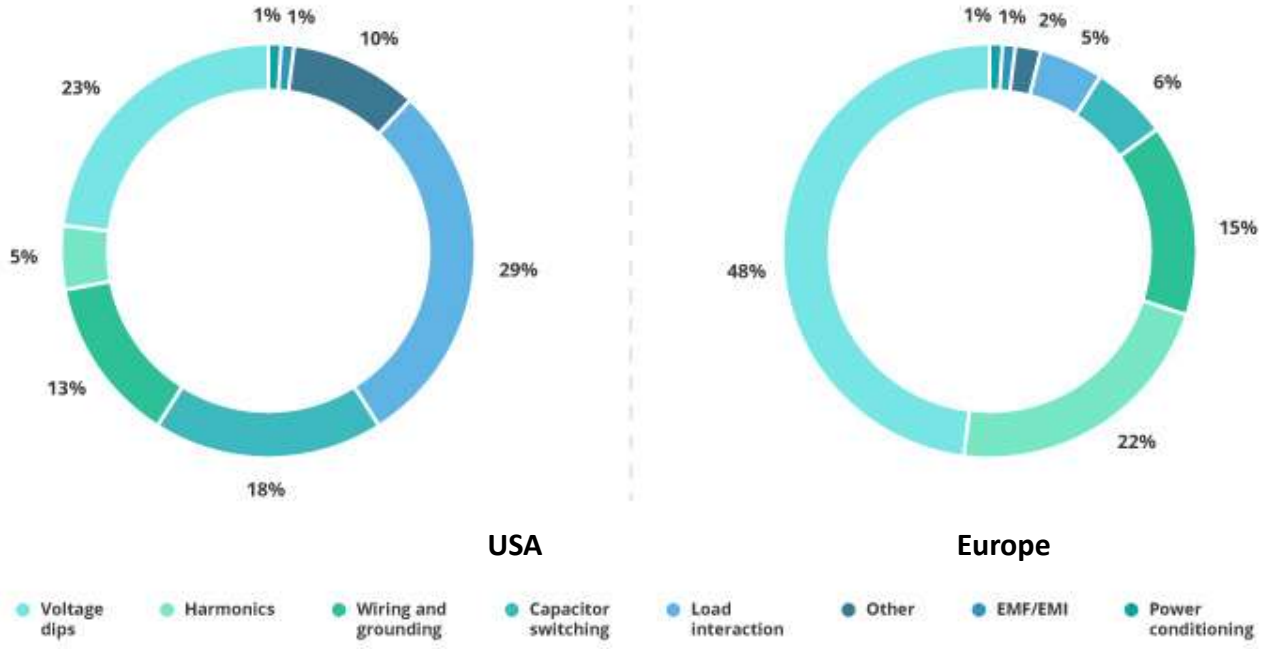


Energy network are transforming from a closed, hierarchical, and highly predictable infrastructure to an open, multi-owned, decentralized ecosystem and pose huge challenges of stability, resiliency, high availability, security, privacy and viability.

- Traditional power grids have a clear hierarchical structure: electricity production at the top and end users at the bottom.
- As renewable, distributed power generation grows in popularity, power grids will have to evolve, to be able to help handle:
  - a large number of power generators
  - bi-directional energy distribution; in other words, being able to both sell to and buy from the same prosumer
  - greater fluctuation in power production - renewable generation is less predictable
  - Greater fluctuation in power consumptions with electrical vehicle charging requirements
  - a larger number of network issues, causing power quality problem
- UN estimates that up to 85 percent of electricity must be renewable by 2050
- On 15 May 2016, RES supplied nearly all of German domestic electricity demand

Faults in grids and power quality problems in networks

Most common power quality problems in the US and Europe



In Europe 85% of incidents originate from voltage dips and swells, harmonics, wiring, and grounding issues. Any power dips and swells can cause system outages and malfunctions.

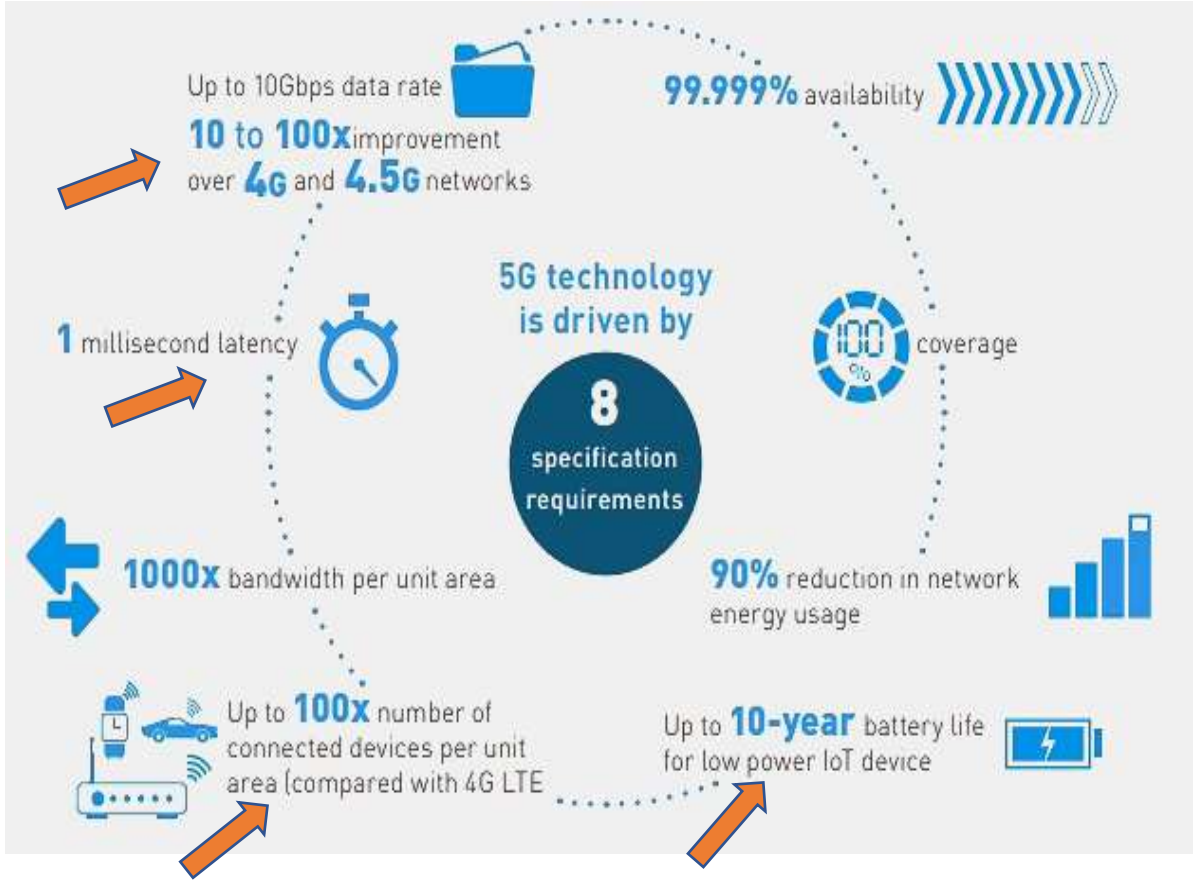
The Electric Power Research Institute (EPRI) estimates that industrial facilities in the US lose around $119 to $188 billion annually to downtimes caused by power problems.

- It is important to have mechanisms in the energy networks which are able to locate, identify, isolate and fix faults by reconfiguring the network to restore services automatically in the shortest time and for as many customers as possible.
- Connectivity, sensors and automation can enable greater availability and protection of the power grid.

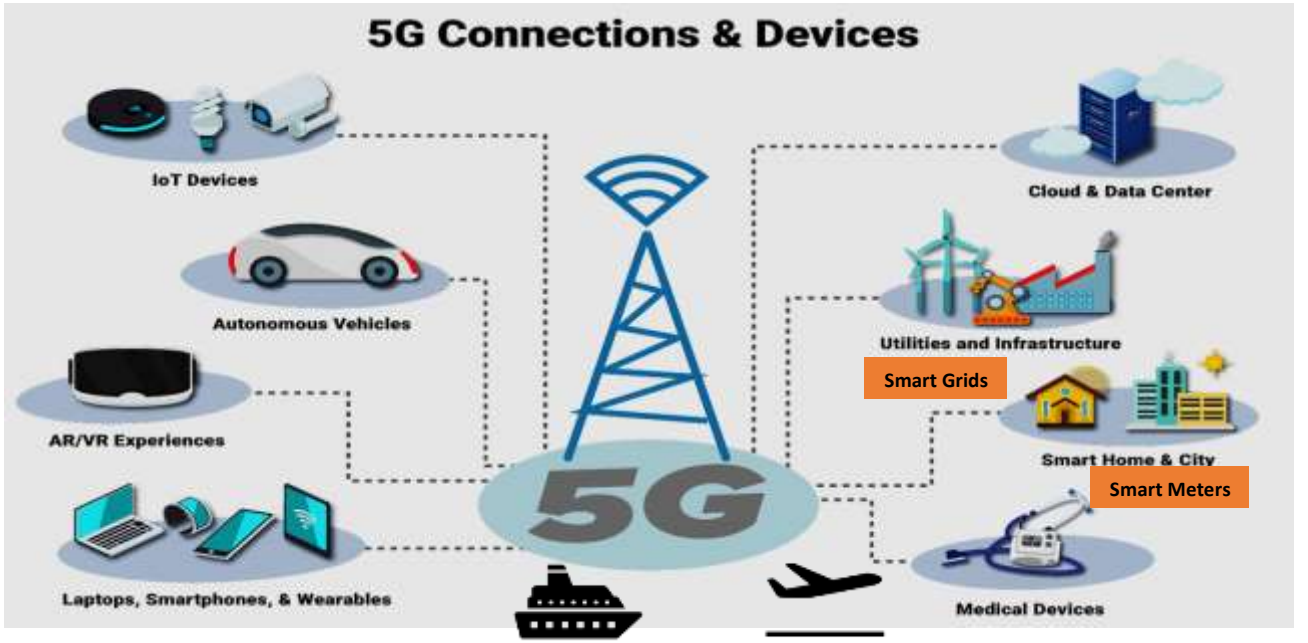
That's where 5G technology can benefit Power Sector

5G features & use cases

5G wireless technology is designed to deliver higher multi-Gbps peak data speeds, ultra low latency, massive network capacity.



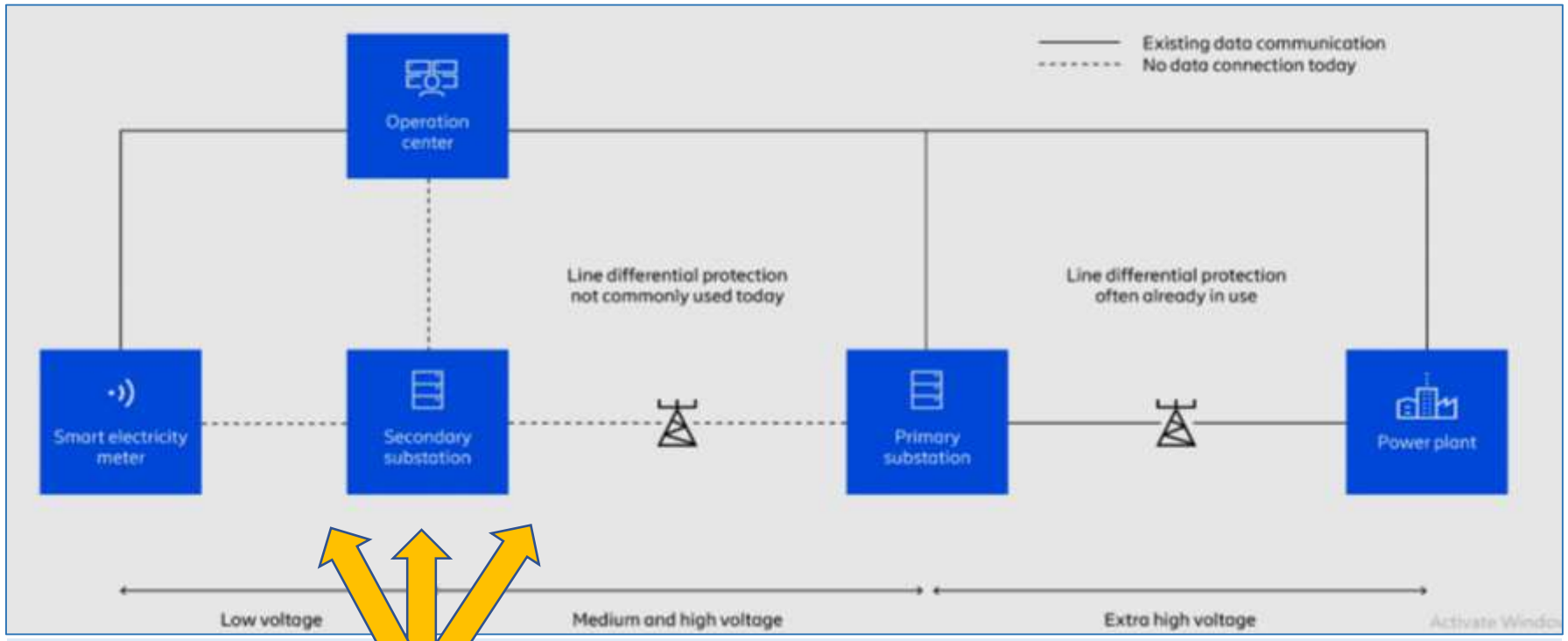
5G features and Machine to Machine communication is giving rise to numerous use cases changing the way Citizens and business work



Industries that gain the most from 5G

Source: Ericsson, The Industry Impact of 5G, Deloitte Research

5G networks can enhance automation, smart monitoring and predictive analysis for energy sector



- While smart energy grids observability is already in place in the High and mostly in the Medium Voltage branches of the energy networks, situational awareness of Low Voltage/Low Pressure branches is lagging behind.
- Smart energy “last mile” network represents an ideal vertical for extensive 5G deployment, where different applications with different requirements can be managed

5G enabled uses cases across energy and utility sector are:

- Distribution of energy within a smart grid
- Smart meters for the smart homes
- Remote monitoring of energy sites and running Condition Based Maintenance programs
- Smart Power generation, Green energy, and distribution automation
- AI-powered predictive analysis and edge computing

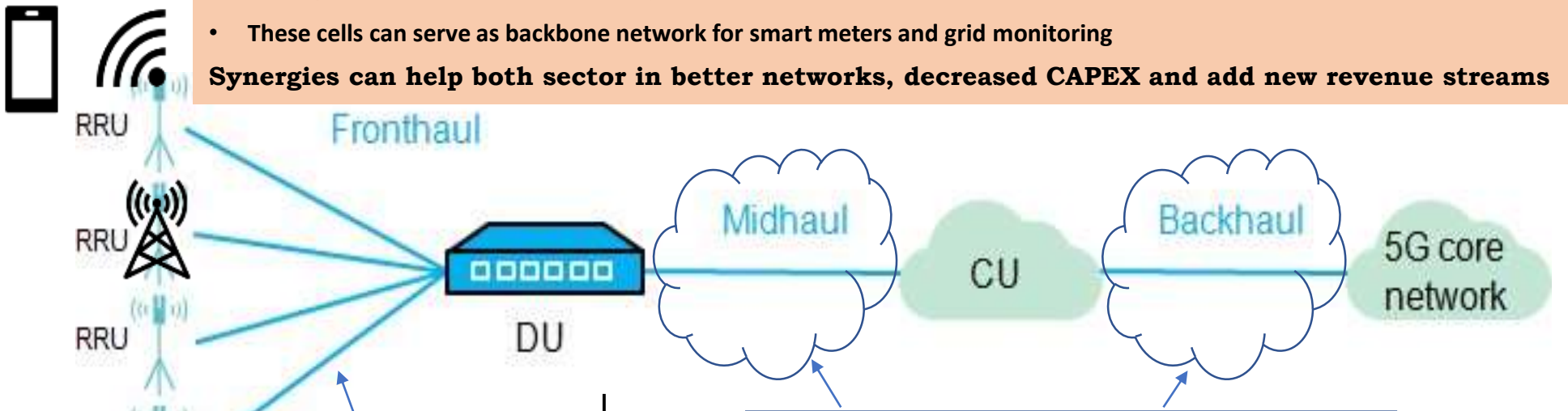
Cross Sectoral collaborations – Key to Infrastructure and Nation building

- GatiShakti programme that marks a paradigm shift in decision making to break the silos of departmentalism.
- Cross-sector partnership between sectors can benefit them through leveraging shared resources and increased scales.
- Cross sectoral collaboration can bring in new revenue opportunities and cost savings for the stakeholders.

Telecom & Power Sector – Best placed to collaborate

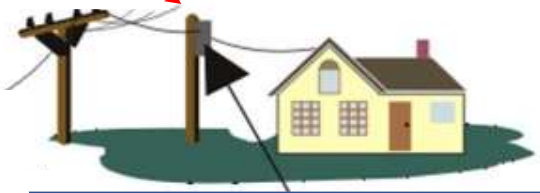
- 5G will require lakhs of cells to be placed close to users.
- Placing them on Poles and Connecting these cells on aerial fiber can save costs and time
- These cells can serve as backbone network for smart meters and grid monitoring

Synergies can help both sector in better networks, decreased CAPEX and add new revenue streams



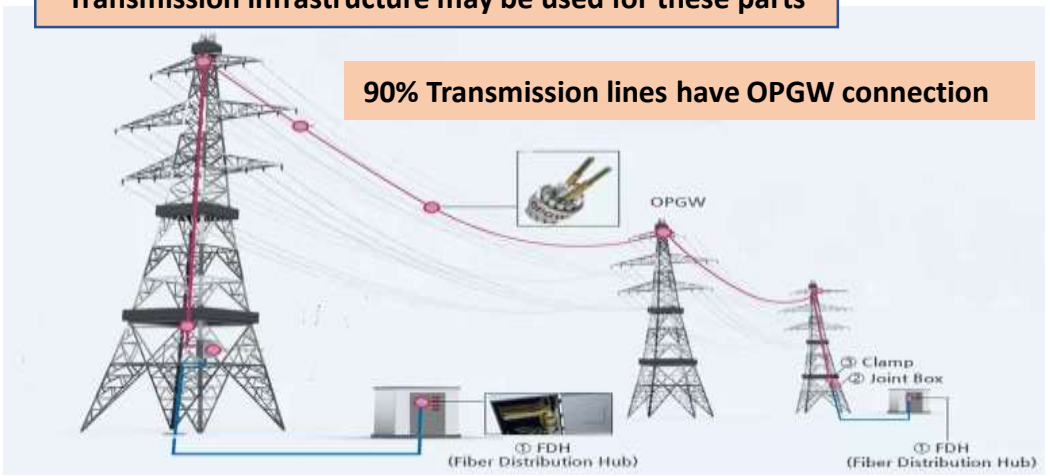
Distribution infrastructure may be used for Aerial fiber this part

Transmission infrastructure may be used for these parts

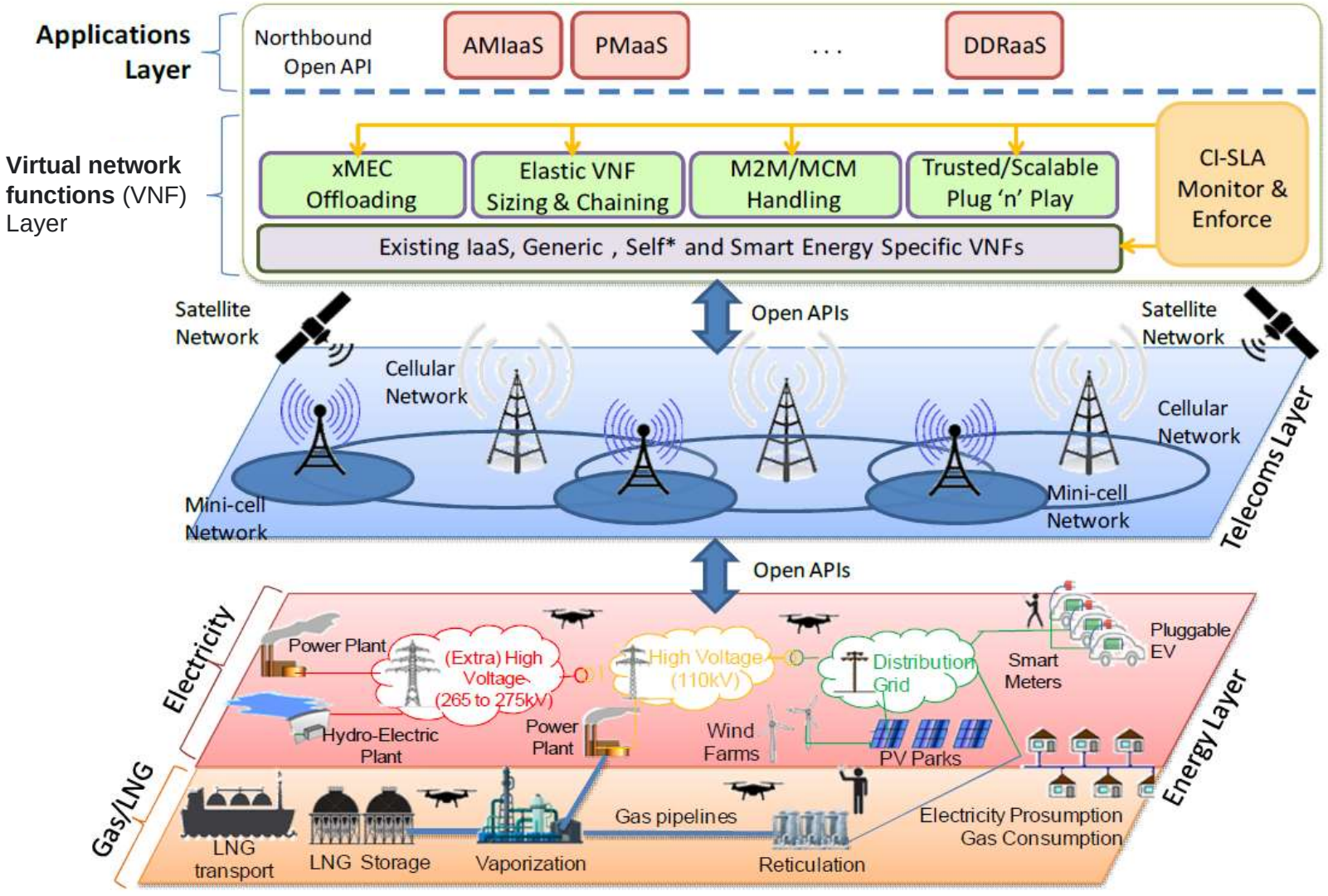


Lighting poles can be equipped with small cells

90% Transmission lines have OPGW connection



Application layer over Energy and Telecom Layer can change the way the Power sector works



Smart energy networks =
Energy network +
Telecom network +
Applications
= New revenue opportunities

Georgia Power –

Proactively offered 5 lakh outdoor streetlights poles and 90,000 transmission structures to telecom service pr**Telecom Colocation and Land Leasing Program**oviders to accelerate 5G build-out.

Online GIS mapping displays all available Georgia Power infrastructure and land assets

Working Group formed by FOIR

- Realizing the importance of cross-sectoral collaborations between Power & Telecom sector, in 21st Annual General Body Meeting of FOIR held on 30.09.2020, a Working Group was constituted to submit recommendations on "Cross Sector Collaborative Regulation between Telecom Regulators and Electricity Regulators".
- The recommendations of the working group, inter-alia, covered *"Legal, regulatory and licensing issues to enable cross sector collaboration"*
- Some of the recommendations of Working Group that requires action by SERCs have been covered in subsequent slides

Request to SERCs for action on some of the Recommendations of Working Group

a) **Monetizing assets of Power utility companies** - For revenues earned by Transmission and Distribution companies through Telecom business, supporting regulations are required:

- CERC Regulation (Sharing of Revenue Derived from Utilization of Transmission Assets for Other Businesses), 2020 describes the manner of revenue sharing if any transmission licensee engages in telecommunication business (The amount of the sharing is 10% of gross revenue from Telecom business in a financial year).
  - **Possible course of action –** The same may be suitably modified and adopted by SERCs.

b) One application for multiple sites will be required for large number of small cells. Discoms should adopt **One Discom-One Bill-One Payment** policy for all Business users that use electricity connections at multiple locations including Telecom sector service/infra providers.

c) Telecom sites should be provided electricity **connection under Utility/Industrial tariff.**

Request to SERCs for action on some of the Recommendations of Working Group

e) DISCOMs to **Install Prepaid smart meters at telecom sites** on priority.

f) Electricity **consumption at each telecom site may be allowed to be aggregated and offset with green power** (solar, wind, hydro etc) generated at distant locations. SERCs to incorporate same in their regulations.

g) As Telcos are bound to meet quality of service parameters prescribed by TRAI, they have to ensure that the mobile sites are not shut down due to prolonged power outages. For effective planning of fuel availability for diesel generator and monitoring of consumption they have requested that DISCOMs should provide area wise information on their website about the **power outages for past week and future maintenance schedule**.

h) As per CBDT Circular dated 30th June, 2021, Companies are paying 0.1% TDS over DISCOM bill payments, whereas some DISCOMs are yet to upgrade their payment portals to accept bill nett of TDS resulting in double payment problem. DISCOMs should seek exclusion from CBDT for TDS applicability upon electricity payments or seek some moratorium period to upgrade their system.

THANK YOU