



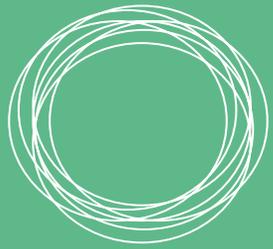
# Jemena Electricity Networks (Vic) Ltd

## 2021-26 Electricity Distribution Price Review Regulatory Proposal

Attachment 05-10

Update of Jemena's MCR rates





**eneea**  
CONSULTING

# Update of Jemena's MCR Rates

Prepared for the Australian Energy Regulator  
On behalf of Jemena





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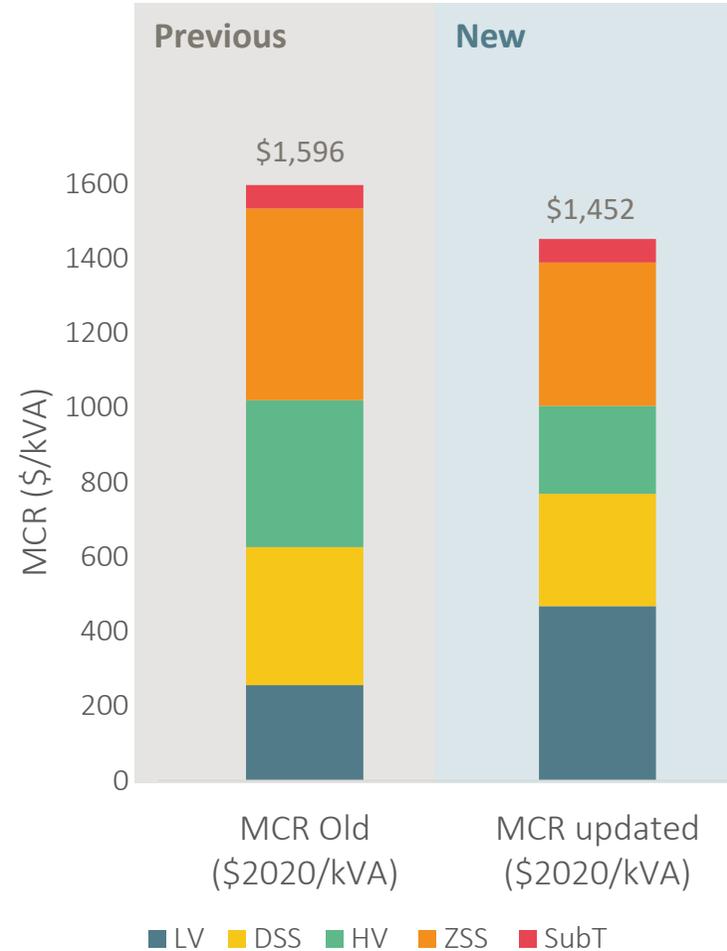
# Jemena's revised Marginal Cost of Reinforcement (MCR) rates are 9.1 % lower than its previous rates

Jemena's newly computed MCR rates have utilised both Customer Initiated and Network Planning (AUGEX) projects

The new overall rate of 1,451.70 \$2020/kVA exhibits a 9.1 % decrease compared to the MCR rate computed using previous methodology

The MCR rate at each connection level has also displayed some variance

- ▶ MCR at the LV level ↑ by 83%
- ▶ MCR at the DSS level ↓ by 19%
- ▶ MCR at the HV level ↓ by 40%
- ▶ MCR at the ZSS level ↓ 25%
- ▶ MCR at the Sub-transmission level has remained unchanged





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## Previous and revised MCR rates are detailed by connection levels

Voltage level	Previous MCR methodology (\$2020/kVA)		New MCR methodology (\$2020/kVA)	
	Per Level	Cumulative	Per Level	Cumulative
LV	\$255.96	\$1,596.42	\$467.55	\$1,451.70
DSS	\$369.62	\$1,340.46	\$300.82	\$984.15
HV	\$393.96	\$970.84	\$236.24	\$683.33
ZSS	\$513.91	\$576.88	\$384.12	\$447.09
Sub-T	\$62.97	\$62.97	\$62.97	\$62.97

Note: these values are the MCR (Marginal Costs of Reinforcement) of Jemena. The AUR (Augmentation Unit Rates) applied to the connecting customers will differ.



# The revised MCR rates were computed based on Customer Initiated projects and Network Planning (AUGEX) projects

## Customer initiated projects

Non-zero added shared capacity and corresponding cost identified for projects

Three level of connection detailed

- ▶ Low Voltage (LV)
- ▶ Distribution Substation (DSS)
- ▶ High Voltage (HV)

## AUGEX projects

Historical costs and added capacity for projects

Four level of connection detailed

- ▶ Distribution Substation and Low Voltage (DSS)
- ▶ High Voltage (HV)
- ▶ Zone Substation (ZSS)
- ▶ Sub-Transmission Line (Sub-Trans).



## MCR Computation

Weighted average of additional capacity (\$/kVA) is computed at each level

$$MCR_{level\ i} = \frac{\sum \text{Shared costs of projects at level } i}{\sum \text{Capacity added by projects at level } i}$$

Note that the costs are actual costs i.e. accounting for inflation between project year and 2020

Sources used for each level were hence:

- ▶  $MCR_{LV}$ : Customer Initiated projects
- ▶  $MCR_{DSS}$ : AUGEX projects + Customer Initiated projects
- ▶  $MCR_{HV}$ : AUGEX projects + Customer Initiated projects
- ▶  $MCR_{ZSS}$ : AUGEX projects
- ▶  $MCR_{Sub-trans}$ : AUGEX projects

Customer Initiated and AUGEX project data, and detailed MCR methodology and computation is available in the file 'JEN MCR Computation Tool - FINAL.xlsx'.



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# MCR rates were calculated on customer projects with positive shared network costs and added capacity

- ▶ Customer Initiated projects reviewed: 753
- ▶ Customer Initiated projects with shared added capacity: 283

MCR Level	LV Lines	Distribution Substation	HV Lines
Number of Customer Initiated projects (with added shared capacity)	243 (65)	425 (161)	85 (57)
Capacity created (kVA)	11,375	77,226	28,215
MCR - All projects (\$2020/kVA)	\$421.89	\$258.76	\$316.33
MCR – Non-zero shared capacity projects (\$2020/kVA)	\$387.14	\$234.40	\$316.33



# To estimate added capacity, projects were classified in four different scopes of work

## 1<sup>st</sup> scope of work: New asset

- ▶ Assets potentially installed include: Substation, HV Feeder or LV circuit
- ▶ Added capacity is considered equal to the new asset's rating.

## 2<sup>nd</sup> scope of work: Asset upgrade

- ▶ Assets potentially upgraded include: Substation, HV Feeder or LV circuit
- ▶ Added capacity is considered equal to the new asset's rating minus the previous asset's rating
- ▶ When upgrading a conductor from one-phase to three-phase, a maximum added capacity of 500kVA was considered due to upstream network limitations
- ▶ When upgrading several portions of a conductor with different previous ratings, the added capacity was considered to be the difference between the new rating and the lowest previous rating.

## 3<sup>rd</sup> scope of work: HV or LV switching

- ▶ Rearrangement of HV or LV circuits to balance the loads
- ▶ Added capacity is considered null.

## 4<sup>th</sup> scope of work: HV or LV extension

- ▶ Extension of an existing HV or LV circuit to accommodate new customers
- ▶ Added capacity was considered to be equal to the capacity of the new substation installed at the end of the extension. If no substation was added, the customer's load was considered

Ratings of conductors and cables used are available in the **"JEN MCR Computation Tool - FINAL.xlsx"** file



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# MCR rates were calculated based on AUGEX projects using project costs and added capacity as inputs

- ▶ Network planning (AUGEX) projects reviewed: 81
- ▶ Network planning (AUGEX) projects with shared added capacity: 76

MCR Level	LV Lines	Distribution Substation	HV Lines	Zone Substation	Sub Transmission
Number of AUGEX projects (with added shared capacity)	16 (11)	61 (61)	2 (2)	2 (2)	0 (0)
Capacity created (kVA)	1,091	20,375	18,386	95,200	0
MCR - All projects (\$2020/kVA)	\$1885.72	\$552.53	\$113.34	\$384.12	-
MCR – Non-zero shared capacity projects (\$2020/kVA)	\$1305.64	\$552.53	\$113.34	\$384.12	-



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# Overview of MCR computation

## Customer Initiated

MCR Level	LV Lines	Distribution Substation	HV Lines	Zone Substation	Sub Transmission	Total
Number of Customer Initiated projects	243	425	85	0	0	753
Total shared cost (\$2020)	\$4,799,126	\$19,983,065	\$8,925,213	\$0	\$0	\$33,707,403
Number of Customer Initiated projects - non-zero shared capacity	65	161	57	0	0	283
Shared cost of non-zero shared capacity projects (\$2020)	\$4,403,833	\$18,101,997	\$8,925,213	\$0	\$0	\$31,431,043
Capacity created (kVA)	11375	77226	28215	0	0	116816
MCR - All projects (\$2020/kVA)	\$421.89	\$258.76	\$316.33	-	-	\$288.55
MCR - Non-zero shared capacity projects (\$2020/kVA)	\$387.14	\$234.40	\$316.33	-	-	\$269.06

## AUGEX

Number of AUGEX Projects	16	61	2	2	0	81
Total cost (\$2020)	\$2,058,118	\$11,257,786	\$2,083,872	\$36,568,447	\$0	\$51,968,224
Number of AUGEX Projects - non-zero shared capacity	11	61	2	2	0	76
Total cost - non-zero shared capacity projects (\$2020)	\$1,424,998	\$11,257,786	\$2,083,872	\$36,568,447	\$0	\$51,335,104
Capacity created (kVA)	1091	20375	18386	95200	0	135053
MCR - AUGEX (\$2020/kVA)	\$1,305.64	\$552.53	\$113.34	\$384.12	-	\$380.11

## Total

Total cost of non-zero shared capacity projects (\$2020)	\$5,828,831	\$29,359,783	\$11,009,085	\$36,568,447	\$0	\$82,766,146
Total capacity added (kVA)	12467	97601	46601	95200	0	251869
Final MCR (\$2020/kVA)	\$467.55	\$300.82	\$236.24	\$384.12	\$62.97	\$1,451.70