Electric Utility
2018-2027 Capital Improvement Program
Dark Fibre and Communications Systems

Description
This program provides dark fibre (exclusive communication network) for the City of Lethbridge and other community entities.

Internal City customers include: Electric Utility, Corporate IT, Water/Wastewater, Radio, Fire, Police and the Emergency Operations Centre/Public Safety Communications Centre.

External customers include: Alberta Health Services, University of Lethbridge, Lethbridge College, and Cybera.

This program includes the addition of new fibre facilities and replacement of existing fibre facilities.

Total Cost (2018-2021): $1.2 million
Net increase to Operating Costs: $0
Distribution Extension and Improvement Annual Program

Description
The City of Lethbridge is responsible to provide electrical connection services to all customers within the corporate city limits.

A new request to provide power to any home or business requires funding to extend and adapt the existing electrical system to accommodate the new load while maintaining the same power quality and reliability to existing customers.

Total Cost (2018-2021): $40 million

Net increase to Operating Costs: $0
**Distribution Renewal Annual Program**

**Description**
This program provides for the renewal and life extension of existing core assets that provide bulk power shipment through the electric distribution system.

The backbone of the distribution system is referred to as the "main line feeders". The main line feeders are critical to maintaining a reliable supply of electrical power to customers throughout the city.

When a main line fault occurs thousands of customers can be impacted. This program ensures that main lines are reviewed and renewed proactively to minimize the number of faults that could occur.

<table>
<thead>
<tr>
<th>Total Cost (2018-2021):</th>
<th>$13 million</th>
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<tr>
<td>Net increase to Operating Costs:</td>
<td>$0</td>
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Electrical System Control

**Description**

This program provides remote control and monitoring capabilities for electric distribution and transmission facilities.

Real time monitoring and control is necessary to meet the requirements of the Alberta Interconnected Electric System and to provide reliability and control functions within the system.

**Total Cost (2018-2021):** $776,000

**Net increase to Operating Costs:** $0
Fleet Annual Program

Description
Electrical fleet vehicles are required for other capital programs as well as ongoing maintenance and system operation.

The majority of the Electrical fleet budget is spent on replacements of existing units. Most units operate on a 10 year replacement scheduled as directed by Fleet Services.

<table>
<thead>
<tr>
<th>Total Cost (2018-2021):</th>
<th>$ 3.8 million</th>
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<tbody>
<tr>
<td>Net increase to Operating Costs:</td>
<td>$0</td>
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North/South Transmission Tie Line in west Lethbridge

Description
A new 138kV transmission line connection between the north and south ends of west Lethbridge will be required to support growth in electrical load in this part of the city.

In addition, site modifications to support the additional line will be required at 674S and 181S substations.

Total Cost (2026): $10 million

Net increase to Operating Costs: $0
Protection and Control

Description
Protection and Control involves the use of equipment to provide protection, control, operation and observation of the status of the transmission system. The life expectancy of this electronic equipment is estimated to be 10 to 15 years.

Current and Future Project/Program Requirements:
1. Purchase Aspen software to facilitate engineering analysis of protection and control systems

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<tr>
<th>Total Cost (2018-2023):</th>
<th>$1.1 million</th>
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<td>Net increase to Operating Costs:</td>
<td>$0</td>
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Substation 13.8kV Switchgear Upgrades

Description
Substation 146S and 593S require upgrades to the 13.8kV switchgear equipment which includes building modifications/additions to accommodate the new switchgear.

This switchgear is at the end of it’s life cycle and needs replacing.

Total Cost (2018-2019): $11.9 million

Net increase to Operating Costs: $0
Substation Breaker and Switch Upgrades

Description
This program provides for the lifecycle upgrading of high voltage circuit breakers and disconnect switches which are used to control and isolate the flow of power within substations.

Total Cost (2018-2023): $3.1 million

Net increase to Operating Costs: $0
Substation Infrastructure (Yard/Building) Upgrades

Description
This project involves all changes or upgrades required to substation yards, fences, buildings and associated equipment.

The roofs of the control buildings at 146S and 593S are at the end of their life cycle and due for replacement.

Total Cost (2018): $133,000
Net increase to Operating Costs: $0
Substation Transformer Upgrades

Description
The Transformer Upgrade project provides funding for the replacement of major power transformers that have reached the end of their life cycle. Testing and monitoring results are captured at regular intervals and used in an end-of-life study to allow for long-term planning to upgrade these assets. Expected service life for these assets is 35-40 years.

Total Cost (2018-2021): $3.75 million

Net increase to Operating Costs: $0
Support Plant Renewal Annual Program

Description
Items within the 2018 to 2021 time period which require funding from this program include:

Facilities Management - update hardware servers and software that run the GIS system

Work and Financial Management – update servers/software that run the work order management system

Major Tools - renewal of specialized test equipment used in electrical metering and high voltage operations

Facilities/Furnishings - creation of cold storage facility to handle end-of-life transformers prior to recycling and upgrades to office items at the operations centre that have reached the end of their life cycle.

Total Cost (2018-2021): $1.8 million
Net increase to Operating Costs: $0