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# Replacement / Unforeseen Project Summaries

There were no failures or other unforeseen replacement needs on the Energex network, with a value greater than 2 million dollars, during 2021/22.

A complete listing of all committed projects is contained within Appendix D. A summary list of replacement driven projects that have recently been approved with a capital cost of \$2M or greater is shown below.

**Table 1 – Projects (>\$2M Replacement) Approved in the Past Twelve Months**

Project Name	Estimated Commissioning
BWH-MLY-WFD – Replace 33kV OH F477	Feb-25
AMR-IBL-MRR – Replace 33kV OH F339-2	Jun-25
HPK Holland Park – Replace 33/11kV Transformer TR2	Dec-24
WED West End – Replace 11kV Switchgear	Feb-26
RWD Rosewood – Rebuild Substation to Replace Ageing Assets	Jun-26

Details of replacement driven projects that have been recently approved are shown on the following pages.

**Identified need**

Three-ended 33kV feeder F477 from Beerwah Bulk Supply Substation (SSBWH) connects to Woodford Zone Substation (SSWFD) and Maleny Zone Substation (SSMLY-Normally Open) and consists of SSBWH to SSMLY-tee off section, SSMLY-tee off to SSWFD section and SSMLY-tee off to SSMLY section.

SSWFD is normally supplied from SSBWH via 33kV feeders F428 and F477. Under contingency, SSWFD can also be supplied from Caboolture Bulk Supply Substation (SST11) 33kV network via feeder F323 from Caboolture West Zone Substation (SSCBW).

SSMLY is normally supplied from Nambour Bulk Supply Substation (SST16) 33kV network via 33kV feeder F344. Under contingency, it can also be supplied from the SSBWH 33kV network via F477.

SSKCY is supplied from SSBWH 33kV network via feeder F324 from SSWFD. In addition, a new 33kV feeder F3190 is to be constructed between SSWFD and SSKCY.

Energex overhead conductors have traditionally been replaced on failure. However, the EQL Asset Management Plan Overhead Conductors has transitioned to a condition-based assessment prior to a replacement recommendation being made, subsequent to the conductor being identified as having an age greater than 70 years (55 years for SC/GZ conductor in coastal environments). F477 section from SSMLY tee to SSWFD consists of aged 7/104 HDCu conductors. In addition, this section is in a very poor condition. It is visibly corroded with many of the spans having multiple sleeves which are a known failure point. There are also a multitude of bush poles, aged poles and cross arms identified for replacement. Furthermore, the feeder runs across private properties with many sections through high or very high potential bushfire areas.

**Credible options considered (options considered but rejected are available on request)**

1) Reconductor aged and poor condition F477 section between SSMLY-tee and SSWFD.

Other than the above option that has been assessed as meeting the applied service standards, no other practically feasible and economically equivalent network option has been identified in this analysis.

**Economic comparison**

As there has only been a single credible option identified, no economic comparison has been undertaken.

**Approved Project Cost and Timing**

The estimated total project cost is \$2.6M at 2021/22 prices. Construction will occur during the period leading up to the estimated completion date of February 2025.

**Impact on Network Charges**

This project has been estimated as having an impact on average network charges of 0.00420 ¢/kWh.

**Identified need**

The overhead 33kV feeder F339 is part of the 33kV network from Gympie Bulk Supply (SST8) and supplies Amamoor Zone Substation (SSAMR), Imbil Zone Substation (SSIBL) and Mary River Pumping Station (SSMRR). F339 is currently operated as a radial feeder with two normally open tie points to 33kV feeder F340 from SST8, which supplies Gympie South (SSGYS) and Kenilworth (SSKWH) zone substations.

Energex overhead conductors have traditionally been replaced on failure. However, the EQL Asset Management Plan Overhead Conductors has transitioned to a condition-based assessment prior to a replacement recommendation being made, subsequent to the conductor being identified as having an age greater than 70 years (55 years for SC/GZ conductor in coastal environments). Sections of F339 from SST8 to SSAMR, as well as from SSAMR to X1667-E, normally open tie point to F340, have been identified as consisting of aged 7/.104 HDBC conductors. It has also been identified that the 11kV feeder AMR3 that is under-built along this section of F339 has 7/.104 HDBC conductors.

It is also identified that the communications network servicing this part of the Energex network is via a third-party provided ADSL service. Hence, as part of the Grid Technology Strategic Plan for Telecommunications and consistent with the Optical Fibre Cable In-Fill Program, optical fibre has been recommended to be installed from SSAMR to SSIBL, SSMRR and to the open point X1667-E.

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**Credible options considered (options considered but rejected are available on request)**

1) Reconductor section of F339 and install optical fibre.

Other than the above option that has been assessed as meeting the applied service standards, no other practically feasible and economically equivalent network option has been identified in this analysis.

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**Economic comparison**

As there has only been a single credible option identified, no economic comparison has been undertaken.

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**Approved Project Cost and Timing**

The estimated total project cost is \$4.8M at 2020/21 prices. Construction will occur during the period leading up to the estimated completion date of June 2025.

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**Impact on Network Charges**

This project has been estimated as having an impact on average network charges of 0.00770 ¢/kWh.

**Identified need**

Holland Park Zone Substation (SSHPK) provides electricity supply to approximately 8,800 predominantly residential customers in the surrounding suburbs, while also supplying a major customer.

SSHPK is equipped with 2 x 15/20MVA 33/11kV transformers TR1 and TR2. Based on a Condition Based Risk Management (CBRM) analysis, it has been identified that TR2 has been deemed to have reached its retirement age in 2021.

**Credible options considered (options considered but rejected are available on request)**

1) Replace existing TR2 with a new transformer.

Other than the above option that has been assessed as meeting the applied service standards, no other practically feasible and economically equivalent network option has been identified in this analysis

**Economic comparison**

As there has only been a single credible option identified, no economic comparison has been undertaken.

**Approved Project Cost and Timing**

The estimated total project cost is \$5.2M at 2022/23 prices. Construction will occur during the period leading up to the estimated completion date of December 2024.

**Impact on Network Charges**

This project has been estimated as having an impact on average network charges of 0.00846 ¢/kWh

**Identified need**

West End Zone Substation (SSWED) provides electricity supply to approximately 9,200 predominantly residential customers in the surrounding suburbs, while also supplying four major customers.

Based on a Condition Based Risk Management (CBRM) analysis, the following assets have been deemed to reach their retirement ages: 6 x 11kV Westinghouse J18 oil circuit breakers in BB14 by 2022; 15 x protection relays during 2024 to 2026 and 110kV porcelain surge arresters on transformers by 2022.

In addition, it has been determined that an 11kV feeder from SSWED does not have sufficient back-up protection reach to isolate phase to phase faults on the 11kV network for a failure of the primary protection.

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**Credible options considered (options considered but rejected are available on request)**

- 1) Replace BB14 11kV oil switchgear, replace the end-of-life protection relays, upgrade substation security and upgrade 11kV feeder protection on remote-end sites.

Other than the above option that has been assessed as meeting the applied service standards, no other practically feasible and economically equivalent network option has been identified in this analysis.

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**Economic comparison**

As there has only been a single credible option identified, no economic comparison has been undertaken.

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**Approved Project Cost and Timing**

The estimated total project cost is \$5.8M at 2021/22 prices. Construction will occur during the period leading up to the estimated completion date of February 2026.

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**Impact on Network Charges**

This project has been estimated as having an impact on average network charges of 0.00930 ¢/kWh.

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**Approved Project:**

**RWD Rosewood - Rebuild Substation to Replace Ageing Assets**

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### **Identified need**

Rosewood Zone Substation (SSRWD) is equipped with 2 x 5MVA 33/11kV transformers and provides electricity supply to approximately 2,330 predominantly residential customers in the surrounding suburbs.

Based on a Condition Based Risk Management (CBRM) analysis, the following assets have been deemed to reach their retirement ages: 5 x 33kV problematic isolators by 2021; 7 x 11kV problematic isolators by 2021; 2 x 33kV porcelain surge arresters by 2021; 2 x Expulsive drop out fuses by 2021; 4 x controllers for reclosers by 2026 and 33kV feeder protection relay by 2021.

In addition, a number of issues have been identified with the aged outdoor pipework buses including corrosion, inadequate boundary clearances from the 11kV bus and low inter-bay clearances.

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### **Credible options considered (options considered but rejected are available on request)**

1) Rebuild substation to replace ageing assets at SSRWD.

Other than the above option that has been assessed as meeting the applied service standards, no other practically feasible and economically equivalent network option has been identified in this analysis

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### **Economic comparison**

As there has only been a single credible option identified, no economic comparison has been undertaken.

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### **Approved Project Cost and Timing**

The estimated total project cost is \$10.93M at 2021/22 prices. Construction will occur during the period leading up to the estimated completion date of June 2026.

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### **Impact on Network Charges**

This project has been estimated as having an impact on average network charges of 0.01762 ¢/kWh.