**Cory Decarbonisation Project**

**Responses to Deadline 3 submissions on behalf of Landsul Limited and Munster Joinery (U.K.) Limited**


Summary

This submission is in support of Landsul and Munster Joinery's objection to the compulsory acquisition of its land and focuses on two of the issues not agreed with the Applicant: electrical distribution and the heat transfer station.

In the case of the electrical distribution, Landsul and Munster Joinery are submitting a report from Blake Clough which evidence that an 11kv distribution system would, in comparison to a 132/33kv, be more efficient, more cost effective and save 4,000m2 of space.

In the case of the heat transfer station, the Fichtner Report is the only available evidence of heat demand and demonstrates that there is no demand for the heat produced by the CCF. Even if there were a demand the Fichtner Report and Dr Edgar's supplementary expert report (Annex A of REP3-045) cast doubt as to whether it would be technically and economically viable to service such demand, and there would be a need for further planning permissions and consents before any heat could be transferred from the CCF to service such demand.


Introduction

1. This submission is prepared on behalf of Landsul Limited ("Landsul") and Munster Joinery (U.K.) Limited ("Munster Joinery") and summarises their response to the D3 submissions.

2. Landsul and Munster Joinery maintain its position that the Munster Joinery Land is not required to construct the proposed scheme and that there is no compelling case for compulsory acquisition. Further, the 'not agreed' issues listed in the Applicant's Rule 17 response dated 29 January 2025 (AS-077) remain not agreed.

3. This submission focuses on the following not agreed issues:

    a. the approach to electrical distribution; and

    b. whether there is a sufficient heat demand, separate to the heat demand for heat captured from Riverside 1 ("RRRF") and Riverside 2 ("REP"), to justify the inclusion of a heat transfer station ("HTS") for the Carbon Capture Facility ("CCF").

4. We will provide any further comments and evidence on the other not agreed issues at D5 once we have received the Applicant's D4 submissions.

The approach to electrical distribution

5. In support of Dr Edgar's supplementary expert report submitted at D3 (REP3-045), Landsul and Munster Joinery commissioned a report from Blake Clough to consider Dr Edgar's conclusions that the electrical infrastructure for the CCF could be reduced to an 11kv distribution system.

6. A copy of Blake Clough's report is annexed hereto at Annex A and concludes that there are significant advantages of transitioning to the 11kv distribution system. In particular, it would:

    a. be more efficient with a potential reduction in system losses of 93.5%;

    b. be more cost efficient with potential savings of £7.65 million; and

    c. reduce space requirements potentially in the order of 4,000m2.

7. At CAH2, the Applicant's representatives confirmed that distribution at 11kv was achievable but cited the practicalities of providing an 11kv connection from RRRF and REP as a reason to provide for 132kv, on what appears to be a precautionary basis. The Applicant indicated that the assessment to support that reasoning will be provided at D4. Accordingly, Landsul and Munster Joinery will await that report before commenting further. It appears to be agreed that distribution at 11kv will result in a substantial reduction in the land required for the scheme.

Whether there is sufficient heat demand, separate to the heat demand for heat captured from RRRF and REP, to justify the inclusion of a HTS for the CCF

8. In the Applicant's letter of 5 February 2025 (AS-083) it claims that there is a heat demand of 900MW. This was reiterated by the Applicant during CAH2, as set out in the transcript excerpt annexed hereto at Annex B.

9. To date, no technical evidence has been submitted by the Applicant in support of such claims and so they should not be given any weight in assessing the need for the HTS.

10. The only available technical evidence of the heat demand is the Fichtner report (Annex B to Landsul and Munster Joinery's D3 submissions (REP3-045)). Consequently, this must be given substantial and greater weight than any unsubstantiated claims made by the Applicant regarding heat demand.

11. The Fichtner report concludes that there is an average heat demand of 10.9MW and a peak heat demand of 30.9MW.

12. At CAH2, the Applicant confirmed that RRRF and REP would have a combined heat output of up to 360MW, as set out in Annex B.

13. As set out in Landsul and Munster Joinery's D3 submissions (REP3-045), heat export from RRRF and REP has already been consented and does not rely upon the grant of this proposed DCO to be brought forward. The Applicant confirmed this during CAH2 as set out in Annex B. Further, permission has also been granted under reference 22/00728/FUL for the installation of a district heat network pipeline in Norman Road connecting to RRRF to distribute the heat to the wider network (Annex H of Landsul and Munster Joinery's D3 submissions (REP3-045)).

14. RRRF and REP can therefore service the entirety of the heat demand assessed in the Fichtner report. After doing so, there would be a substantial amount of heat available from RRRF and REP, approximately 329MW, to service any additional heat demand that may arise in the future.

15. There would need to be additional heat demand in excess of 329MW which is technically and economically viable for the CCF to service for there to be a need for the heat produced by the CCF and, in turn, the HTS.

16. Based on the only available technical evidence, the Fichtner Report, there is no such demand, and it remains unproven that it would be technically and economically viable for any additional demand outside of the locality of the CCF, to be serviced by the CCF.

17. The Fichtner Report notes a number of limitations in the transfer of heat as follows:

    a. in the case of supply of heat by hot water, the report notes that a predominant engineering issue *"relates to the installation of the heat supply pipeline."* It states that *"Determining a feasible route for such pipeline is complex"* because *"Existing buried services may obstruct the most direct route to end consumers. Infrastructure* *crossings may be required and the supply and return pipelines would need to be routed along public highways"*. As a result, such *"issues have a direct bearing on cost and installation time".* It further states that *"Physical constraints imposed by local infrastructure and topology have a significant impact on which consumers can viably be connected. Both river and rail crossings exist in the area surrounding RRRF and present obstructions to connect some consumers. Engineering a bridge crossing will likely require detailed structural assessments and the consent of the bridge owner. Trenching in road crossings will require traffic management and permission from the highway authority.";*

b. in the case of transferring heat to the north of the River Thames it states that *"Based on our engineering assessment, connecting sites to the North of the River Thames would not be feasible"; and*

c. it also concludes that only new housing developments would represent a viable option for heat transfer as *"In most cases, existing domestic buildings are typically unsuitable for inclusion in a DH network as a result of the prohibitive costs of replacing existing heating infrastructure and connecting multiple smaller heat consumers to a network".*

18. Whilst the Applicant claims that it would be technically and economically viable for the CCF to service heat demand outside of its locality, it has not provided any evidence to support this, and the conclusions of the Fichtner Report cast doubt on such claims. As does Dr Edgar's supplementary report submitted at D3 (Annex A of REP3-045).

19. Even if it were technically and economically viable for the heat from CCF to service any wider additional heat demand, additional planning permissions and consents would be needed.

20. For long range heat pipe transmission, there would be a need for:

    a. planning permission to lay out such pipework and any required infrastructure crossings;

    b. consent from the highway authority where such pipework is to be installed under the public highway; and/or

    c. consent from statutory undertakers where the laying of such pipework would interfere with existing underground services.

21. For mobile heat, there would be a need for:

    a. planning permission for a jetty and to lay pipework from the CCF to the barge where the thermal batteries would be stored and from the thermal batteries to its final destination; and

    b. licences from the Port of London Authority to operate the barge on the River Thames.

22. There is no evidence that such planning permissions or consents would be forthcoming to enable the transfer of heat from the CCF and without such, the heat would not be capable of transfer.

23. The Fichtner Report also concluded that the transfer of heat from RRRF and REP was economically unviable stating that *"Without some form of fiscal incentive, the returns based on heat sales revenue alone are unattractive and carry a reasonable level of uncertainty"*. The only reason the Applicant is able to fund the transfer of heat from RRRF and REP is due to it being awarded £12.1 million through the Government's Heat Network Investment Project.

24. Consequently:

    a. there is no evidenced demand for the heat produced by the CCF;

    b. even if there were a demand, there is no evidence that it would be technically and economically viable to service such demand from the CCF; and

    c. even if it were technically and economically viable to service any demand from the CCF, such demand could not be serviced until additional planning permissions and consents were obtained,

    so that there is no need for a HTS within the CCF.

<u>Conclusion</u>

25. The electrical report prepared by Blake Clough demonstrates that the 11kv distribution system is more efficient and cost effective than the Applicant's proposed 132/33kv system and would create a space saving of 4,000m2.

26. There is no demand for the heat produced by the CCF and even if there were a demand it would not be technically or economically viable for it to be serviced by the CCF nor could it be serviced by the CCF without additional planning permissions and consents.

27. Landsul and Munster Joinery is concerned that neither of the above issues were properly explored at CAH2. In respect of electrical distribution, the Applicant's reasoning for providing for 132kv distribution has not been set out in any document. Landsul and Munster Joinery should be afforded the opportunity to scrutinise the Applicant's assessment (and should have been given that assessment before CAH2). In the case of heat distribution, the time limits imposed on CAH2 prevented the case for compulsory acquisition from being questioned and explored. It should be noted that the land required for the proposed 132kv yard and the HTS together exceed the area of Landsul and Munster Joinery's land. Landsul and Munster Joinery submits that a further CA hearing should be held to explore these issues.

**For and on behalf of Landsul and Munster Joinery**

**February 2025**

# ANNEX A

## Blake Clough Report

BCC10610

# Cory Decarbonisation

## Electrical Assessment

Client: Landsul Ltd and Munster Joinery

# Document Control

| Revision | Status | Prepared by | Checked by | Approved by | Date |
|---|---|---|---|---|---|
| R0 | First Issue | WA | OA | SM | 27/01/2025 |
| R1 | Second Issue | WA | OA | AF | 18/02/25 |

**Project Title:** Cory Decarbonization Project Electrical Assessment

**Project Reference:** BCC10610

**Client:** Landsul Ltd and Munster Joinery (U.K.) Ltd

**Website:** www.blakeclough.com

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**Contact Number:** [redacted]

# Contents

## List of Abbreviations

| | |
|---|---|
| AC | Alternating Current |
| BESS | Battery Energy Storage System |
| DC | Direct Current |
| TR | Thermal Resistivity |
| HDD | Horizontal Directional Drilling |
| XLPE | Cross Link Polyethylene |
| HV | High Voltage |
| LV | Low Voltage |
| P | Active Power |
| PF | Power Factor |
| POC | Point of Connection |
| POS | Point of Supply |
| p.u. | Per Unit |

## Units

| | |
|---|---|
| kV | Kilovolts |
| MV | Megavolt |
| MVA | Megavolt-Amperes |
| MVAr | Megavar |
| MW | Megawatt |

# 1. Introduction

## 1.1. Project Background

Cory Environmental Holdings Limited ("Cory") ("the Applicant") has made an application for a Development Consent Order (DCO) for a decarbonisation project associated with its Riverside 1 and Riverside 2 facilities in Belvedere, London. As part of the proposed scheme, Cory is seeking powers to compulsorily purchase land owned by Landsul, part of which is currently used for facilities belonging to Munster Joinery. Landsul has submitted an objection to the Planning Inspectorate (PINS) as part of their relevant representation. Landsul has engaged Dr Craig Edgar of CRE Future Energies Ltd to provide a critique of the proposed development with a particular focus on why and how the proposed scheme could be implemented without requiring the Munster Joinery Land.

As part of his work, Dr Edgar has reviewed the proposed equipment layout for the carbon capture development and has concluded that the electrical infrastructure requirements could be reduced by changing the proposed electrical distribution philosophy. Blake Clough, as a specialist energy consultancy with a focus on electricity distribution and transmission, has been engaged to provide a technical review on the feasibility and implications of electrical distribution at 11kV as suggested in Dr Edgar's review.

The scope of this study is as follows:

- Design a single line diagram (SLD) as per the updated 11 kV distribution system.
- Provide an operational loss comparison for both options.
- Prepare a cost comparison analysis report for 132 kV and 11 kV systems.

## 1.2. About Blake Clough

Blake Clough Consulting is a specialist energy consultancy with a focus on the electricity networks. We cover a range of areas relating to grid connection consulting, power systems studies and electrical design.

We are passionate about the decarbonisation of the energy system and the transition to "Net Zero" and aim to support our clients to accelerate this change as effectively as possible, whether that be local authorities, large network companies, private developers etc.

Our clients range from electricity network operators, regulators, and public sector organisations through to private developers, both onshore and offshore, looking to develop projects connecting into the electricity networks.

We have strong relationships with a wide range of partners and associates, developed over many years of working in the industry, which ensures that we can offer the highest quality and most appropriate capabilities, tailored to meet the requirements of each project and client.

Our work is underpinned by solid analysis and modelling, including techno-economic assessment, cost benefit analysis, power systems analysis and network modelling. We use software tools including DIgSILENT PowerFactory, PSCAD, IPSA, PSSe, ELEK and AutoCAD

## 1.3. Scope

The Applicant proposes to distribute power from the Riverside 1 and Riverside 2 Energy from Waste (EfW) facilities to the proposed carbon capture development. Although the main source of electricity for the development will be from two back-pressure steam generators, installed as part of the carbon capture development, power from the Riverside 1 and Riverside 2 facilities is required for start-up, top-up on occasions where the power generated from the back-pressure steam turbines is not sufficient, and as a back-up in case the back-pressure steam turbines are not able to generate electricity. The Applicant intends to distribute this electricity at 132 kV.

Blake Clough has been engaged to assess the technical feasibility and cost implications of changing to an 11kV distribution system and in particular to:

- Prepare an indicative Single Line Diagram (SLD) for an 11kV distribution system
- Perform an operational loss comparison between the 11kV option and the Applicant's proposed 132kV design
- Prepare a high-level cost comparison between the 11kV option and the Applicant's proposed 132kV design

## 1.4. Single Line Diagrams (SLD) of 11 kV Option.

The Single Line Diagrams (SLDs) that accompany this report include the required modification of the network to eliminate 132/33 kV transition by directly delivering the required power at 11 kV. This includes using 11 kV cables to bring the required power from Riverside 1 and 2 at 11 kV Bus to combine the power of 2 x back-pressure steam turbines each of 15 MVA and replacing all 33 kV transformers with 11kV to optimise the design. This also eliminates 2 x 3-winding transformers 132/33/11 kV and 2 x 33/11 kV transformers.

## 1.5. Computational Tool

DIgSILENT PowerFactory 2023 SP4A.

**Model Versions:**

- Cory DCO 11kV Option-R0.pfd
- Cory DCO 132kV Option-R0.pfd

# 2. Comparative Analysis of 132/33 kV and 11 kV Options

A comparative analysis has been performed for both options on DIgSILENT PowerFactory to major the distribution losses within both options.

## 2.1. Model Data & Assumptions

The system is modelled using data provided in SLDs. All other required data was assumed for in order to make the comparison. The assumptions made in these studies are presented below:

- All transformer data are assumed based on generic data due to unavailability.
- Load was assumed to be 44MW after adding all the loads from the SLD.
- A single run of 400 mm$^2$ Al 132 kV cable was assumed with an approximate length of 500 m for each circuit.
- No power factor correction or reactive power equipment was assumed to be required.
- Cables datasheets were not shared, so generic datasheets have been used.
- The electrical parameters used for the modelling of all the transformers are derived from internally available data sheets within Blake Clough. See Appendix-A3.
- The load flow study was conducted assuming that cables are at their maximum operating temperature of 90 $^{o}$C.
- The tentative 11 kV switchroom location is considered to be within 250 m from the generation site.
- For the 11 kV option, 250m of 2 runs of 630 mm$^2$ Cu XLPE cable was used.

## 2.2. 132/33 kV Option Model

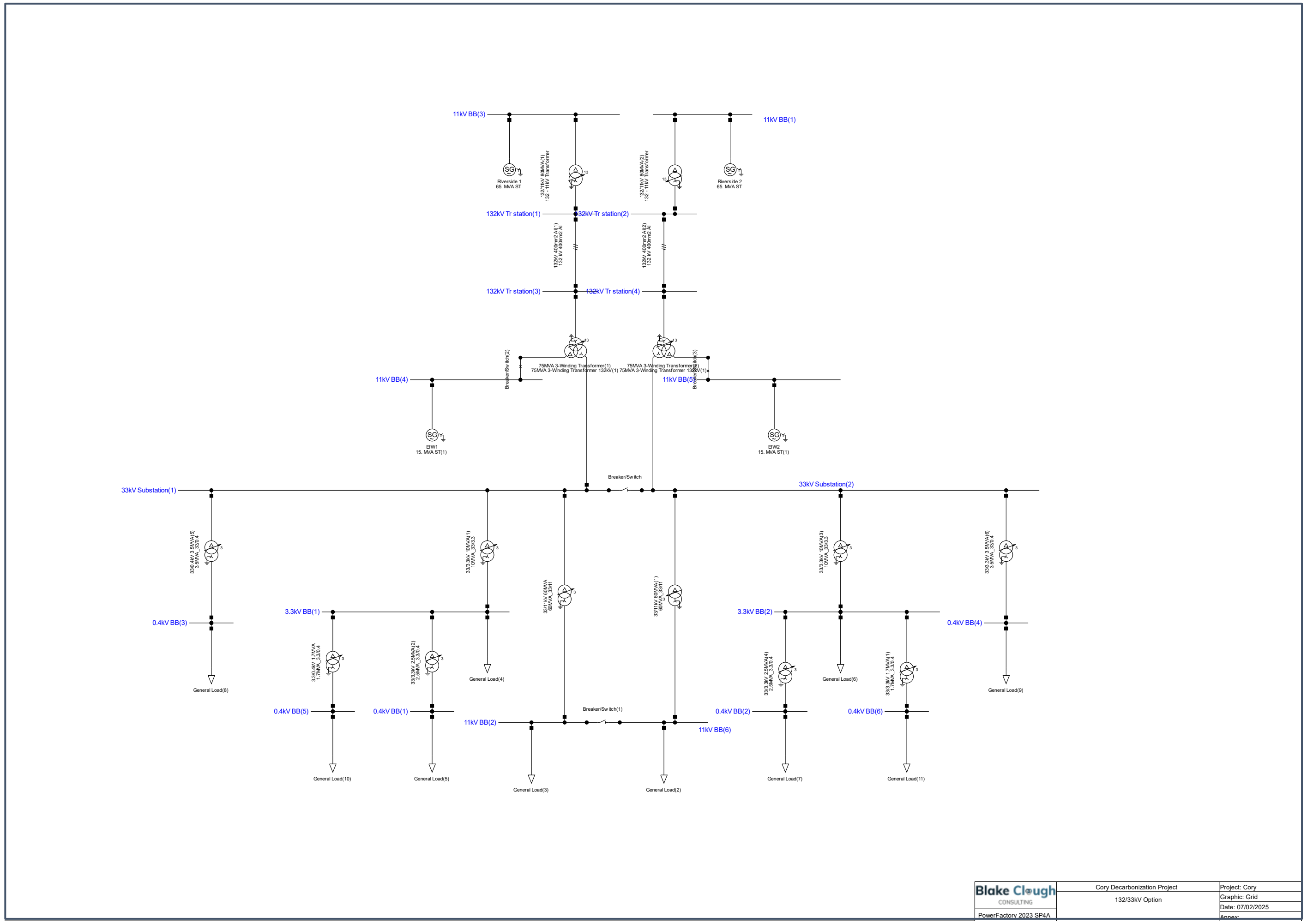


**Figure 2-1: Cory DCO 132/33 kV single line diagram.**

## 2.3. 11 kV Option Model

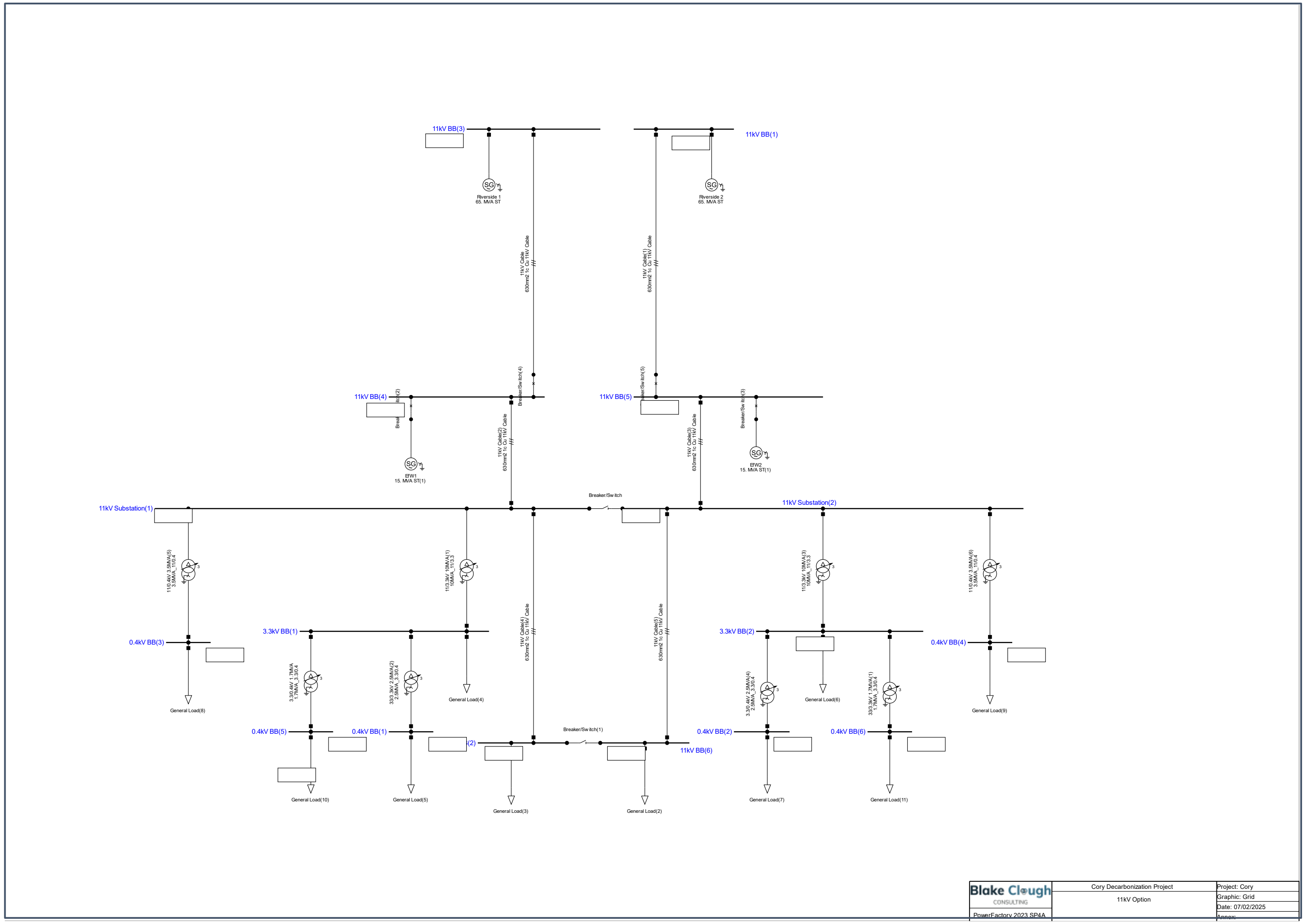



**Figure 2-2: Cory DCO 11 kV single line diagram (alternative option)**

## 2.4. System Losses

The power losses of the plant were calculated by conducting load flow analysis for both options in similar conditions. The losses are a combination of the passive losses in the cables and transformers. The results for the system losses are presented in Table 2-1 below.

**Table 2-1: 132/33 kV option system losses.**

| Name | Description | Systems Losses | |
|---|---|---|---|
| | | Active (kW) | Reactive (kVAr) |
| | **Total** | **522.46** | **5148** |
| Cables | 132 kV 400 mm² Al (1) | 0.34 | -426.93 |
| | 132 kV 400 mm² Al (2) | 0.41 | -512.46 |
| Transformers | 132/11 kV 80 MVA (1) | 16.87 | 275.98 |
| | 132/11 kV 80 MVA (2) | 16.92 | 277.73 |
| | 3.3/0.4 kV 1.7 MVA (2) | 3.5 | 9.1 |
| | 33/0.4 kV 3.5 MVA (1) | 7.08 | 41.79 |
| | 33/11 kV 60 MVA (2) | 45.08 | 900.49 |
| | 33/11 kV 60 MVA (1) | 45.09 | 900.68 |
| | 3.3/0.4 kV 1.7 MVA (1) | 3.5 | 9.1 |
| | 33/3.3 kV 10 MVA (1) | 4.65 | 46.46 |
| | 33/3.3 kV 10 MVA (2) | 4.65 | 46.47 |
| | 3.3/0.4 kV 2.5 MVA (1) | 3.26 | 4.69 |
| | 3.3/0.4 kV 2.5 MVA (2) | 3.26 | 4.69 |
| | 33/0.4 kV 3.5 MVA (2) | 7.08 | 41.8 |
| | 75 MVA 3-Winding Transformer (1) | 180.38 | 1764.05 |
| | 75 MVA 3-Winding Transformer (2) | 180.38 | 1764.27 |

The total losses for the 132/33 kV option are around 5.174 MVA and the major contributors to these losses are the transformers, in particular the 75 MVA 3-winding combining transformers.

Table 2-2: 11 kV option system losses.

| Name | Description | Systems Losses Active (kW) | Systems Losses Reactive (kVAr) |
|---|---|---|---|
| | **Total** | **107.07** | **314.87** |
| Cables | 11 kV Cable (4) | 3.9 | 6.22 |
| | 11 kV Cable (5) | 3.9 | 6.22 |
| | 11 kV Cable (3) | 5.15 | 9.07 |
| | 11 kV Cable (2) | 5.15 | 9.07 |
| | 11 kV Cable (1) | 25.72 | 45.29 |
| | 11 kV Cable | 25.72 | 45.29 |
| Transformers | 3.3/0.4 kV 2.5 MVA (1) | 3.42 | 4.39 |
| | 3.3/0.4 kV 2.5 MVA (2) | 3.42 | 4.39 |
| | 3.3/0.4 kV 1.7 MVA (1) | 3.64 | 8.51 |
| | 3.3/0.4 kV 1.7 MVA (2) | 3.64 | 8.51 |
| | 11/0.4 kV 3.5 MVA (1) | 6.98 | 39.3 |
| | 11/0.4 kV 3.5 MVA (2) | 6.98 | 39.3 |
| | 11/3.3 kV 10 MVA (3) | 4.72 | 44.65 |
| | 11/3.3 kV 10 MVA (1) | 4.72 | 44.65 |

The total losses in this option are around 0.332 MVA as there are no major transformers in this option, the length of 11 kV cables is within 250 m which is not a significant length for 11 kV, and all small distribution transformers are not fully loaded.

The loss comparison between the two options reveals that the 11 kV configuration results in approximately 93.5% less loss compared with the 132/33 kV options. Although an 11 kV option would typically incur higher losses due to higher current, in this case the shorter cable length and the elimination of multiple transformers which were the primary sources of losses means that the 11 kV option significantly more efficient.

# 3. 11kV Switchgear Room Space

Since there is no 132/33 kV transition in the 11 kV option, the space requirement has been reduced significantly. The 11 kV cables connecting the Riverside 1, 2 and 2 x back-pressure steam turbines can be combined at 11 kV switchroom, and from this switchroom the power can be distributed to different loads. The size of this room is estimated to be around ~10 m x 7 m.

The following figure shows the tentative location of this 11 kV switchgear room.

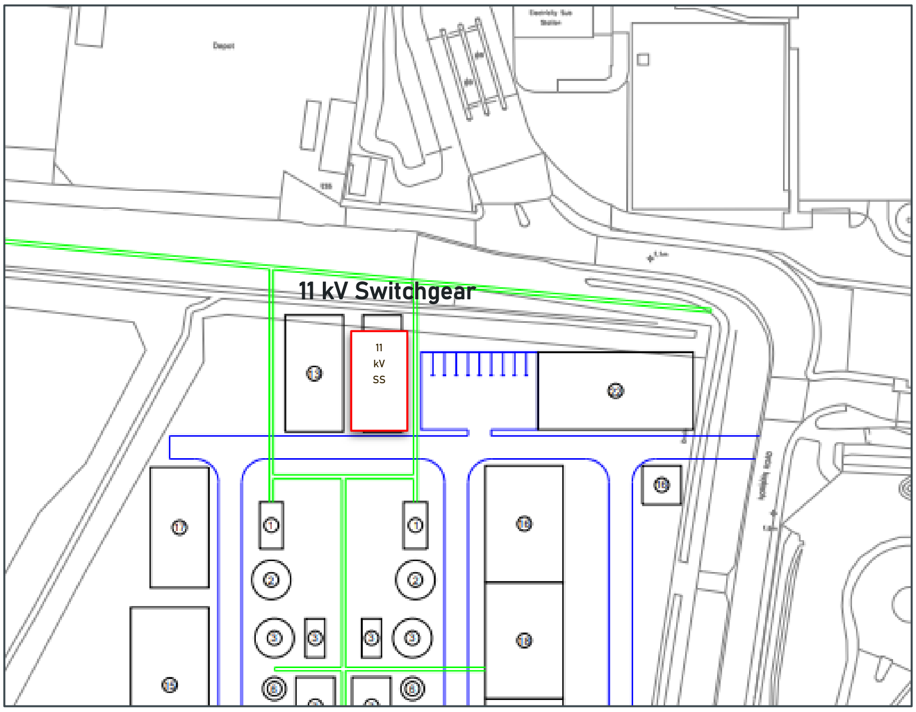



Figure 3-1: 11 kV Switchgear.

The proposed 11kV switchgear location would replace the Applicant's original proposal for the 132kV substation (item 10 on the Applicant's equipment).

# 4. Cost Comparison

The cost comparison has been carried out based on only the key equipment that is either added, replaced or removed.

The equipment high-level costs are estimated using an average across the data range collected from the latest available quotes from the manufacturers and other sources. A summary of the costs is given in Table 4-1 below. Please note that the prices provided may vary at the time of ordering. The costs provided should be used to compare the options only, and are not for budgeting purposes for the project. An independent connection provider (ICP) should provide accurate and up-to-date costs in a competitive tender process.

The estimated costs below were reviewed considering Blake Clough's cost database made up from several recent connection offers and taken as an average across several sources. Some assumptions were made where specific costs were not available.

**Table 4-1: High-level cost comparison between 132 kV & 11 kV options.**

| Cost Analysis | 132/33 kV Option | | 11 kV Option | |
|---|---|---|---|---|
| **Equipment** | **Quantity** | **Total Cost (£m)** | **Quantity** | **Total Cost (£m)** |
| 132/33/11 kV (75MVA) Transformer | 2 | 3 | - | - |
| 132kV Cable | 1 km | 1.1 | - | - |
| 132 kV AIS Bay | 2 | 2.2 | - | - |
| 33/11 kV (60MVA) Transformer | 2 | 2.1 | - | - |
| 11kV Cable | - | - | 1 km (2 x 0.5 km) | 0.55 |
| 11 kV CB | - | - | 4 | 0.2 |
| **Total (£m)** | | **8.4** | - | **0.75** |

There is a potential significant saving of approx. £7.65 m in CAPEX if the 11 kV option is used.

# 5. Conclusion

The analysis of the Cory Decarbonisation Project's electrical distribution network highlights the significant advantages of transitioning to the 11 kV distribution system over the 132/33 kV system. The 11 kV option not only reduces system losses by approximately 93.5% due to shorter cable lengths and the elimination of multiple transformers but also offers substantial capital cost savings of around £7.65 million. Additionally, the design minimises space requirements, further improving efficiency and practicality. These findings support the implementation of the 11 kV configuration as a more cost-effective and efficient solution for the project's electrical infrastructure.

**Note: This study is based on assumed data where specific details were unavailable and is intended solely for high-level comparison purposes. The results and findings should not be used for detailed design or decision-making without validation against OEM-provided data. For precise costing and implementation, it is recommended that an Independent Connection Provider (ICP) or OEM provide accurate cost estimates.**

# 6. References

[1] THE GRID CODE, Issue 6, Revision 25, 5th July 2024. Available at: Grid Code (GC) | ESO (nationalgrideso.com)

[2] Efacec, "High and Medium Voltage Switchgear," 2023. [Online]. Available: https://www.efacec.pt/en/wp-content/uploads/2016/10/CS243I1410B1_low.pdf.

[3] National Electricity Transmission System Security and Quality of Supply Standard Version 2.7 04 May 2024. Available at: download (nationalgrideso.com).

[4] Prysmian Cables, "Copper 6.35/11 kV – Single core heavy duty screened unarmoured."

[5] DEMIRER KABLO, "DEMIRER KABLO High and Extra High Voltage Cable System 66-500kV XLPE cable." Accessed: Dec. 11, 2023. [Online]. Available: http://www.demirerkablo.com/media/33103/catalogue.pdf.

# Appendices

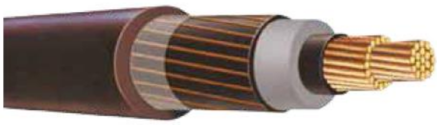
## Appendix-A1 11 kV Cable Data Sheet

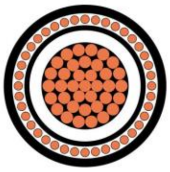
PRYSMIAN

A brand of the Prysmian Group

MEDIUM VOLTAGE CABLES

### Copper 6.35/11 kV – Single core heavy duty screened unarmoured







**Application**

Electricity distribution network cable typically used as primary supply to Commercial, Industrial and urban residential networks. Suitable for high fault level systems rated up to 10kA/1sec. Higher fault current rated constructions are available on request.

**Approvals**

Approved by all major power Utilities and industrial customers in Australia.

**Behaviour in flame and fire:**

PVC or LSOH outer sheath exceeds the requirements of IEC 60332-1.

**Temperature range**

Minimum installation temperature: 0 °C
Maximum operating temperature: +90 °C
Minimum operating temperature: -25 °C

**Minimum bending radius**

| | |
|---|---|
| Installed cables: | 12D (PVC only)<br>15D (HDPE) |
| During installation: | 18D (PVC only)<br>25D (HDPE) |

**Resistance to**

| | |
|---|---|
| Chemical exposure: | Accidental |
| Mechanical impact: | Light (PVC only)<br>Heavy (HDPE) |
| Water exposure: | XLPE – Spray<br>EPR – Immersion/Temporary coverage |
| Solar radiation and weather exposure: | Suitable for direct exposure. |

**Cable design**

Conductor:
Plain circular compacted copper

Conductor screen:
Extruded semi-conductive compound, bonded to the insulation and applied in the same operations as the insulation.

Insulation:
Cross Linked Polyethylene (XLPE) – standard
Ethylene Propylene Rubber (EPR) – alternative

Insulation screen:
Extruded, semi-conductive compound

Metallic screen:
Plain annealed copper wire: nominal 10kA for 1 second.
See table next page.

Sheath:
Black 5V-90 polyvinyl chloride (PVC) – standard
Orange 5V-90 PVC inner plus black high density polyethylene (HDPE) outer – alternative
Low smoke zero halogen (LSOH) – alternative

**Installation conditions**

In free air
In duct
In trench
In ground with protection



Certified System Quality ISO 9001 SAI GLOBAL | Telarc Registered Quality ISO 9001

Prysmian Australia Pty Ltd | Ph: 1300 300 304 | Fx: 1300 300 307 | E-mail: sales.au@prysmiangroup.com | www.prysmiancable.com.au
Prysmian New Zealand Ltd | Ph: (09) 827 3109 | Toll Free: 0800 492 225 | E-mail: sales.nz@prysmiangroup.com | www.prysmiancable.co.nz

**MEDIUM VOLTAGE CABLES**



## Physical & electrical characteristics

Copper 6.35/11 kV – Single core heavy duty screened unarmoured

Product code: 1CCUX11HD

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal conductor area mm² | | 25 | 35 | 50 | 70 | 95 | 120 | 150 | 185 | 240 | 300 | 400 | 500 | 630 |
| Nominal conductor diameter mm | | 6.1 | 7.0 | 8.2 | 9.8 | 11.5 | 12.9 | 14.3 | 16.1 | 18.2 | 20.6 | 23.5 | 26.6 | 30.3 |
| Nominal insulation thickness mm | | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 | 3.4 |
| Approx cable diameter mm | | 21.4 | 23.7 | 24.8 | 27.1 | 28.1 | 29.5 | 31.1 | 32.9 | 35.3 | 38.0 | 41.7 | 45.0 | 48.9 |
| Approx mass kg/100m | | 80 | 100 | 125 | 165 | 195 | 220 | 245 | 285 | 340 | 405 | 495 | 600 | 735 |
| Max pulling tension on conductor kN | | 1.8 | 2.5 | 3.5 | 4.9 | 6.7 | 8.4 | 11 | 13 | 17 | 21 | 25 | 25 | 25 |
| Max pulling tension on stocking grip kN | | 1.6 | 2.0 | 2.1 | 2.6 | 2.8 | 3.1 | 3.4 | 3.8 | 4.4 | 5.1 | 6.1 | 7.1 | 8.4 |
| Min bending radius* during installation mm | | 390 | 430 | 450 | 490 | 510 | 530 | 560 | 590 | 630 | 680 | 750 | 810 | 880 |
| Min bending radius* set in position mm | | 260 | 280 | 300 | 330 | 340 | 350 | 370 | 390 | 420 | 460 | 500 | 540 | 590 |
| Max conductor resistance, dc @ 20°C Ohm/km | | 0.727 | 0.524 | 0.387 | 0.268 | 0.193 | 0.153 | 0.124 | 0.0991 | 0.0754 | 0.0601 | 0.0470 | 0.0366 | 0.0283 |
| Conductor resistance, ac @ 90°C & 50 Hz Ohm/km | | 0.927 | 0.668 | 0.494 | 0.342 | 0.247 | 0.196 | 0.159 | 0.128 | 0.0980 | 0.0790 | 0.0630 | 0.0507 | 0.0413 |
| Inductance, trefoil touching mH/km | | 0.477 | 0.468 | 0.447 | 0.418 | 0.392 | 0.375 | 0.364 | 0.352 | 0.339 | 0.330 | 0.320 | 0.310 | 0.302 |
| Inductive reactance, trefoil touching @ 50Hz Ohm/km | | 0.150 | 0.147 | 0.140 | 0.131 | 0.123 | 0.118 | 0.114 | 0.110 | 0.107 | 0.104 | 0.101 | 0.0974 | 0.0948 |
| Zero seq. impedance @ 20°C & 50 Hz Ohm/km | | 1.51+ j0.0833 | 1.09+ j0.0801 | 0.783+ j0.0745 | 0.560+ j0.0663 | 0.475+ j0.0601 | 0.435+ j0.0559 | 0.406+ j0.0529 | 0.381+ j0.0498 | 0.358+ j0.0467 | 0.343+ j0.0443 | 0.330+ j0.0421 | 0.320+ j0.0395 | 0.312+ j0.0375 |
| Capacitance, phase to earth µF/km | | 0.211 | 0.230 | 0.254 | 0.289 | 0.324 | 0.353 | 0.382 | 0.418 | 0.463 | 0.516 | 0.586 | 0.650 | 0.725 |
| Min insulation resistance @ 20°C MOhm.km | | 12,000 | 11,000 | 10,000 | 8,900 | 7,900 | 7,200 | 6,600 | 6,000 | 5,400 | 4,900 | 4,300 | 3,900 | 3,400 |
| Electric stress at conductor screen kV/mm | | 2.64 | 2.56 | 2.49 | 2.40 | 2.33 | 2.29 | 2.25 | 2.22 | 2.18 | 2.14 | 2.11 | 2.08 | 2.06 |
| Charging current @ rated voltage & 50 Hz A/phase/km | | 0.420 | 0.460 | 0.507 | 0.576 | 0.646 | 0.704 | 0.762 | 0.834 | 0.924 | 1.03 | 1.17 | 1.30 | 1.45 |
| Short circuit rating | Phase conductor kA, 1 sec | 3.6 | 5.0 | 7.2 | 10.0 | 13.6 | 17.2 | 21.5 | 26.5 | 34.3 | 42.9 | 57.2 | 71.5 | 90.1 |
| | Metallic screen kA, 1 sec | 3.5 | 5.0 | 7.1 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Continuous current rating | In ground, direct buried A | 145 | 175 | 205 | 250 | 295 | 335 | 370 | 415 | 475 | 530 | 595 | 665 | 735 |
| | In ground, in singleway ducts A | 145 | 170 | 195 | 235 | 270 | 300 | 330 | 365 | 410 | 450 | 495 | 545 | 600 |
| | In free air, unenclosed & spaced from wall A | 145 | 180 | 215 | 270 | 320 | 370 | 420 | 480 | 560 | 640 | 735 | 835 | 950 |

The cables described are designed to be used for the supply of electrical energy in fixed applications up to the rated voltages at a nominal power frequency between 49Hz and 61Hz.
All values are for XLPE cables only. *Increased radius required for HDPE and nylon incorporating designs.

Prysmian Australia Pty Ltd | Ph: 1300 300 304 | Fx: 1300 300 307 | E-mail: sales.au@prysmiangroup.com | www.prysmiancable.com.au
Prysmian New Zealand Ltd | Ph: (09) 827 3109 | Toll Free: 0800 492 225 | E-mail: sales.nz@prysmiangroup.com | www.prysmiancable.co.nz

**Appendix-A2 132 kV Cable Data Sheet**

# 76/132 (145) kV

## XLPE Insulated with Cu Wire + Lead Sheath

**Continuous Current Rating for Single Circuit (A)**

### COPPER CONDUCTOR

| Cross-Sectional Area ( $mm^2$ ) | | 240 | 300 | 400 | 500 | 630 | 800 | 1000 | 1200 | 1600 | 2000 | 2500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct-buried | | 545 | 618 | 708 | 808 | 924 | 1043 | 1163 | 1339 | 1494 | 1650 | 1807 |
| Pipe | | 526 | 598 | 685 | 783 | 899 | 1018 | 1140 | 1315 | 1475 | 1636 | 1802 |
| In Air | Trefoil | 587 | 671 | 775 | 892 | 1031 | 1171 | 1317 | 1566 | 1769 | 1974 | 2185 |
| | Flat (S=3D) | 816 | 825 | 961 | 1113 | 1298 | 1490 | 1696 | 1981 | 2258 | 2543 | 2843 |

**HDPE pipe diameter = 2D**

### ALUMINIUM CONDUCTOR

| Cross-Sectional Area ( $mm^2$ ) | | 240 | 300 | 400 | 500 | 630 | 800 | 1000 | 1200 | 1600 | 2000 | 2500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct-buried | | 425 | 482 | 556 | 637 | 731 | 834 | 941 | 1058 | 1215 | 1358 | 1501 |
| Pipe | | 411 | 467 | 538 | 618 | 711 | 814 | 922 | 1039 | 1200 | 1346 | 1495 |
| In Air | Trefoil | 459 | 526 | 611 | 709 | 822 | 947 | 1078 | 1244 | 1453 | 1642 | 1841 |
| | Flat (S=3D) | 559 | 644 | 756 | 882 | 1027 | 1194 | 1370 | 1564 | 1838 | 2090 | 2358 |

**HDPE pipe diameter = 2D**

33 HV & EHV Cable Systems DEMİRER KABLO

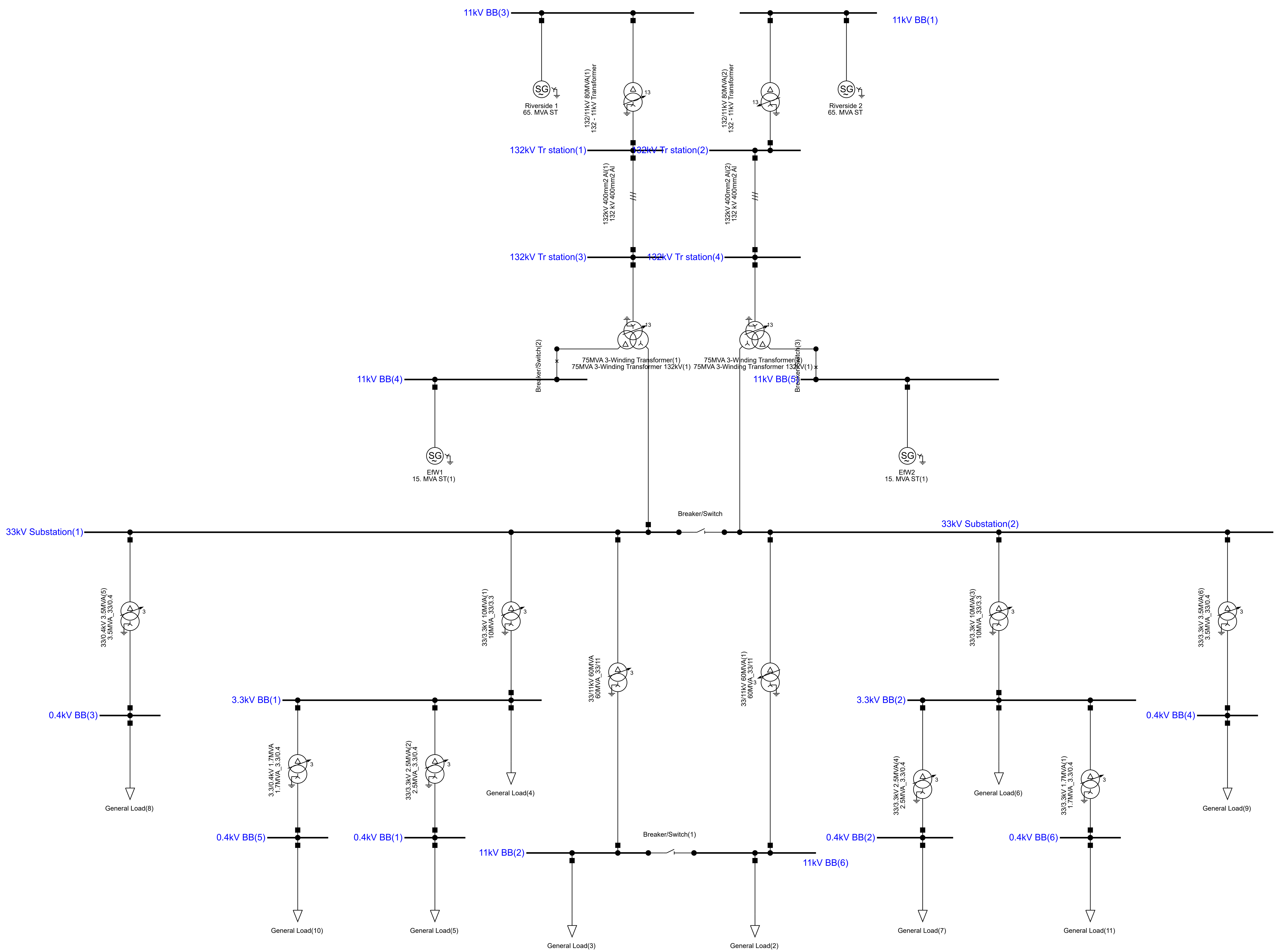
| CONDUCTOR (Cu) | Cross-Sectional Area (mm²) | 240 | 300 | 400 | 500 | 630 | 800 | 1000 | 1200 | 1600 | 2000 | 2500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Shape | Circular | Circular | Circular | Circular | Circular | Circular | Circular | Milliken | Milliken | Milliken | Milliken |
| | Diameter (mm) | 18 | 20,4 | 23,45 | 26,4 | 30,25 | 34 | 39 | 43,5 | 49,5 | 56 | 63,5 |
| Thickness of Conductor Screen (mm) | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,4 | 1,4 | 1,5 | 1,6 | 1,6 |
| Thickness of Insulation (mm) | | 17 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| Thickness of Insulation Screen (mm) | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| Cu-Screen Cross-Sectional Area (mm²) | | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Thickness of Lead Sheath (mm) | | 2,2 | 2,2 | 2,2 | 2,2 | 2,4 | 2,4 | 2,5 | 2,6 | 2,7 | 2,8 | 3 |
| Thickness of Outer Sheath (mm) | | 3,1 | 3,2 | 3,2 | 3,3 | 3,5 | 3,6 | 3,7 | 3,9 | 4,1 | 4,5 | 4,8 |
| Outer Diameter of Cable (mm) | | 74 | 77 | 78 | 81 | 86 | 90 | 96 | 101 | 108 | 116 | 125 |
| Weight of Cable (kg/m) | | 11,3 | 12,3 | 13,1 | 14,5 | 17 | 19,2 | 22,3 | 25,4 | 30,1 | 35,6 | 43,1 |
| Max. DC Cu Conductor Resistance at 20°C (ohm/km) | | 0,0754 | 0,0601 | 0,047 | 0,0366 | 0,0283 | 0,0221 | 0,0176 | 0,0151 | 0,0113 | 0,009 | 0,0072 |
| Capacitance (µF/km) | | 0,132 | 0,141 | 0,16 | 0,172 | 0,188 | 0,204 | 0,226 | 0,248 | 0,273 | 0,301 | 0,334 |
| Inductance (mH/km) | | 0,468 | 0,45 | 0,425 | 0,41 | 0,394 | 0,38 | 0,365 | 0,355 | 0,342 | 0,332 | 0,322 |

| CONDUCTOR (Al) | Cross-Sectional Area (mm²) | 240 | 300 | 400 | 500 | 630 | 800 | 1000 | 1200 | 1600 | 2000 | 2500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Shape | Circular | Circular | Circular | Circular | Circular | Circular | Circular | Milliken | Milliken | Milliken | Milliken |
| | Diameter (mm) | 18,5 | 21,1 | 24,25 | 27,4 | 30,6 | 34,8 | 39 | 43,5 | 50,2 | 56,5 | 63,5 |
| Max. DC Al Conductor Resistance at 20°C (ohm/km) | | 0,125 | 0,1 | 0,0778 | 0,0605 | 0,0469 | 0,0367 | 0,0291 | 0,0247 | 0,0186 | 0,0149 | 0,0127 |
| Weight of Cable (kg/m) | | 10 | 10,6 | 10,9 | 11,7 | 13,1 | 14,4 | 15,8 | 17,9 | 20,7 | 23,3 | 27,4 |

## Appendix-A3 Electrical parameters of transformers

| Transformer ID and Voltage | Power Rating (MVA) | Winding Type | Vector Grouping | Impedance (%) | Copper / Load Losses (kW) |
|---|---|---|---|---|---|
| 132/11 kV | 80 | Two winding | YNd11 | 12 | 300 |
| 132/33/11 kV | 75 (60/75/15) | Three winding | YNy11d11 | 12/10/14.3 | 300/75/75 |
| 33/11 kV | 60 | Two winding | Dyn11 | 10 | 300 |
| 33/3.3 kV | 10 | Two winding | Dyn11 | 10 | 50 |
| 33/0.4 kV | 3.5 | Two winding | Dyn11 | 8 | 30 |
| 3.3/0.4 kV | 2.5 | Two winding | Dyn11 | 7 | 15 |
| 11/0.4 kV | 3.5 | Two winding | Dyn11 | 8 | 30 |
| 11/3.3 kV | 10 | Two winding | Dyn11 | 10 | 50 |

# End of Report

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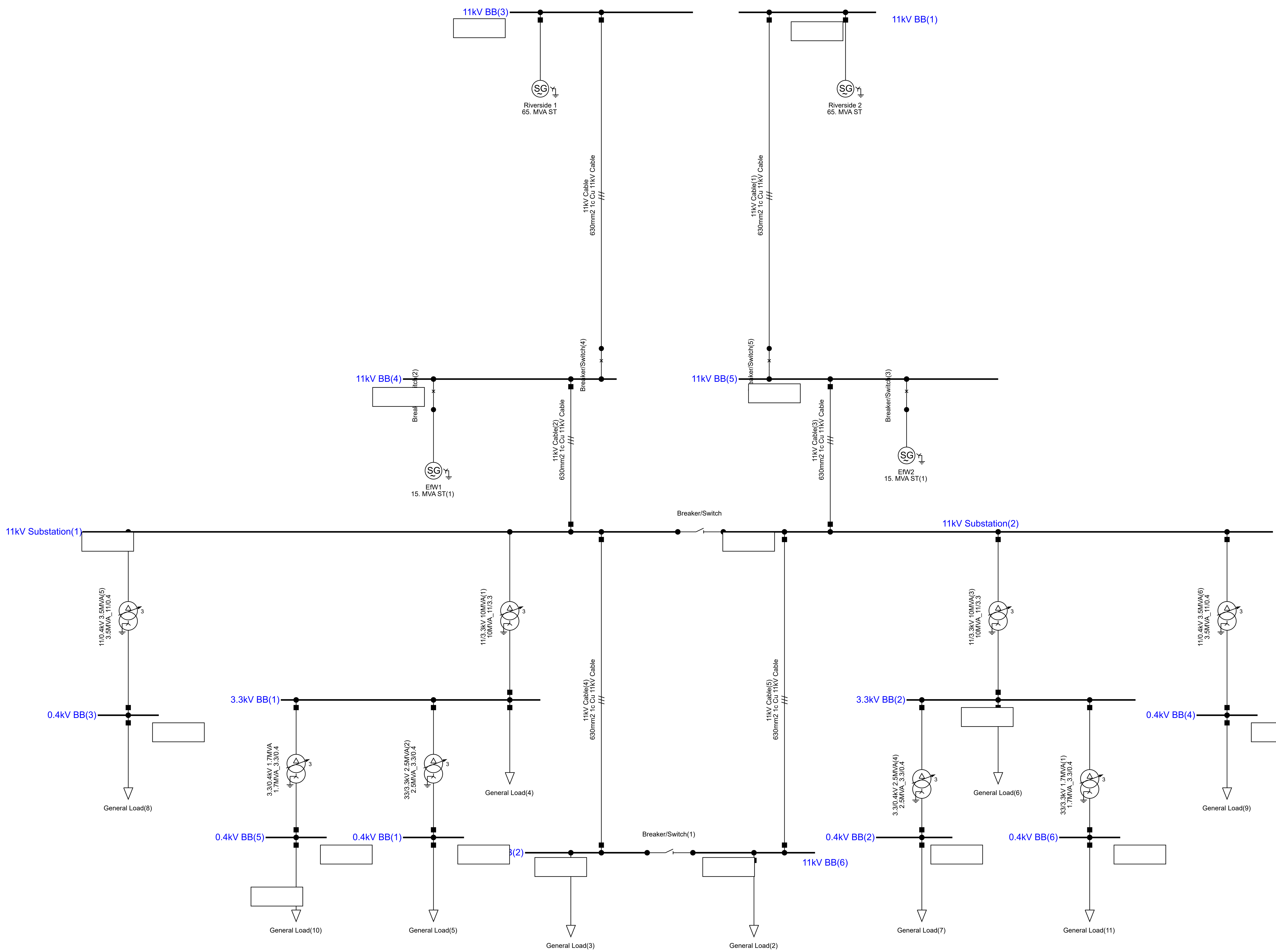
| | 132/33kV Option | Graphic: Grid |
| | | Date: 07/02/2025 |
| PowerFactory 2023 SP4A | | Annex: |

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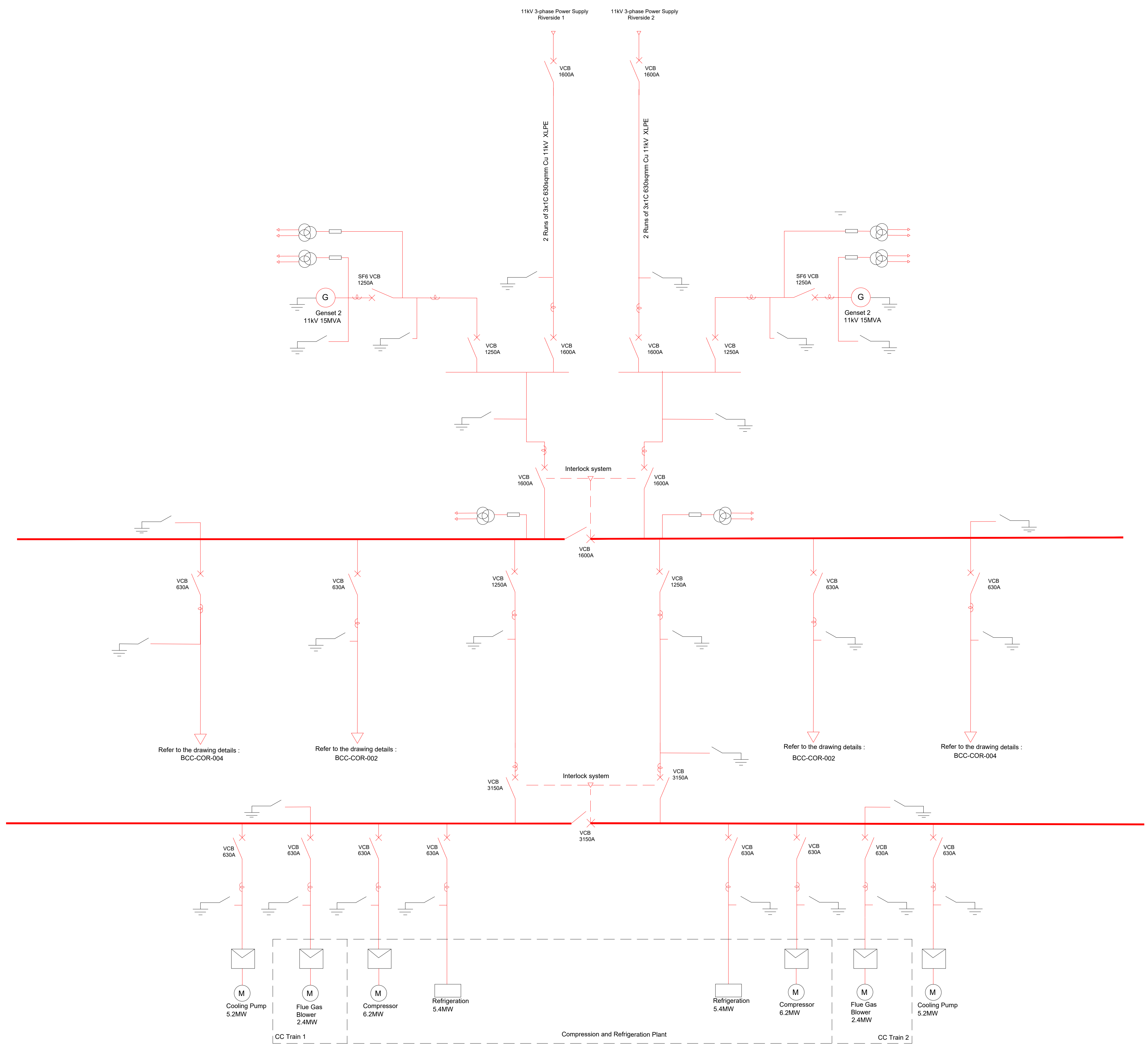
PowerFactory 2023 SP4A

Cory Decarbonization Project

11kV Option

Project: Cory
Graphic: Grid
Date: 07/02/2025
Annex:




## LEGEND

- SURGE ARRESTOR
- VOLTAGE TRANSFORMER
- EARTH SWITCH
- CURRENT TRANSFORMER
- ON LOAD ISOLATOR
- TRANSFORMER WITH TAP CHANGER
- CIRCUIT BREAKER
- GENSET
- MOTOR STATER
- MOTOR
- 11kV (Red Line)
- 3.3kV (Brown Line)
- 400V (Blue Line)

## Notes:

1- VOLTAGE TRANSFORMER SHALL BE STEP-DOWN TO 110V AT THE SECONDARY SIDE
2- ALL EQUIPMENT RATINGS ARE PRELIMINARY AND TO BE COMFIRMED
3- BUS COUPLER AND INCOMER INTERLOCKS SHALL BE TWO OUT OF THREE CLOSED
4- TYPE OF MOTOR STARTER TO BE CONFIRMED FOR EACH CIRCUIT
5- DETAILS OF 132KV CONNECTION TO DISTRIBUTION NETWORK TO BE CONFIRMED
6- GENERATORS SHALL OPERATE ONLY IN PARALLEL WITH THE GRID. ISLAND MODE OPERATION IS NOT CONSIDERED
7- 11 KV MOTOR STARTERS ARE SEPARATE FROM THE SNATCHBOARD

## Document History

| Rev. | Date | Drw. By | Chk. By | Apr. By | Description |
|---|---|---|---|---|---|
| A | 23.01.25 | WA | OA | SA | PRELIMINARY DESIGN |

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Drawing Title
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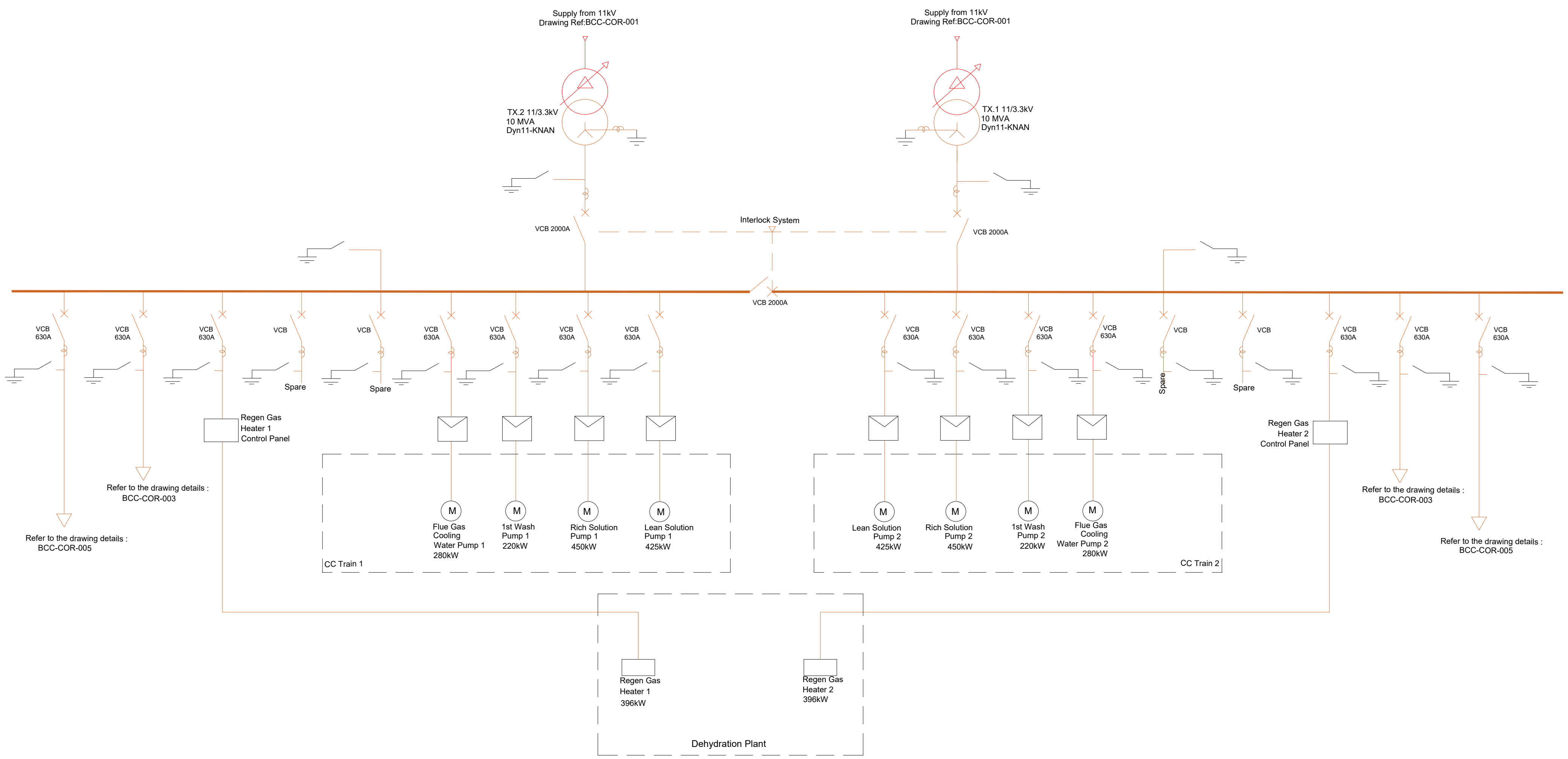


## LEGEND

- SURGE ARRESTOR
- VOLTAGE TRANSFORMER
- EARTH SWITCH
- CURRENT TRANSFORMER
- ON LOAD ISOLATOR
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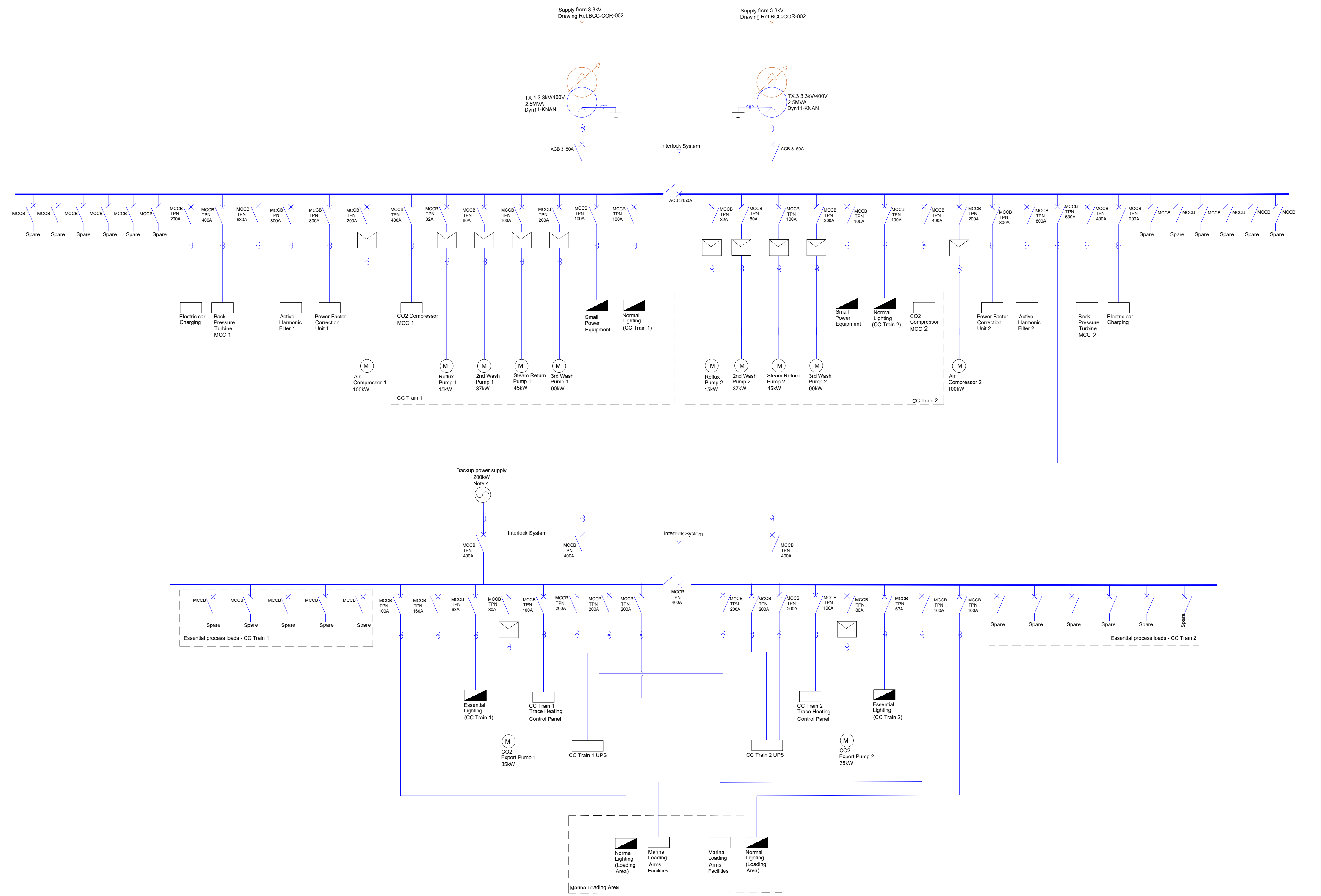


# LEGEND

- SURGE ARRESTOR
- VOLTAGE TRANSFORMER
- EARTH SWITCH
- CURRENT TRANSFORMER
- ON LOAD ISOLATOR
- TRANSFORMER WITH TAP CHANGER
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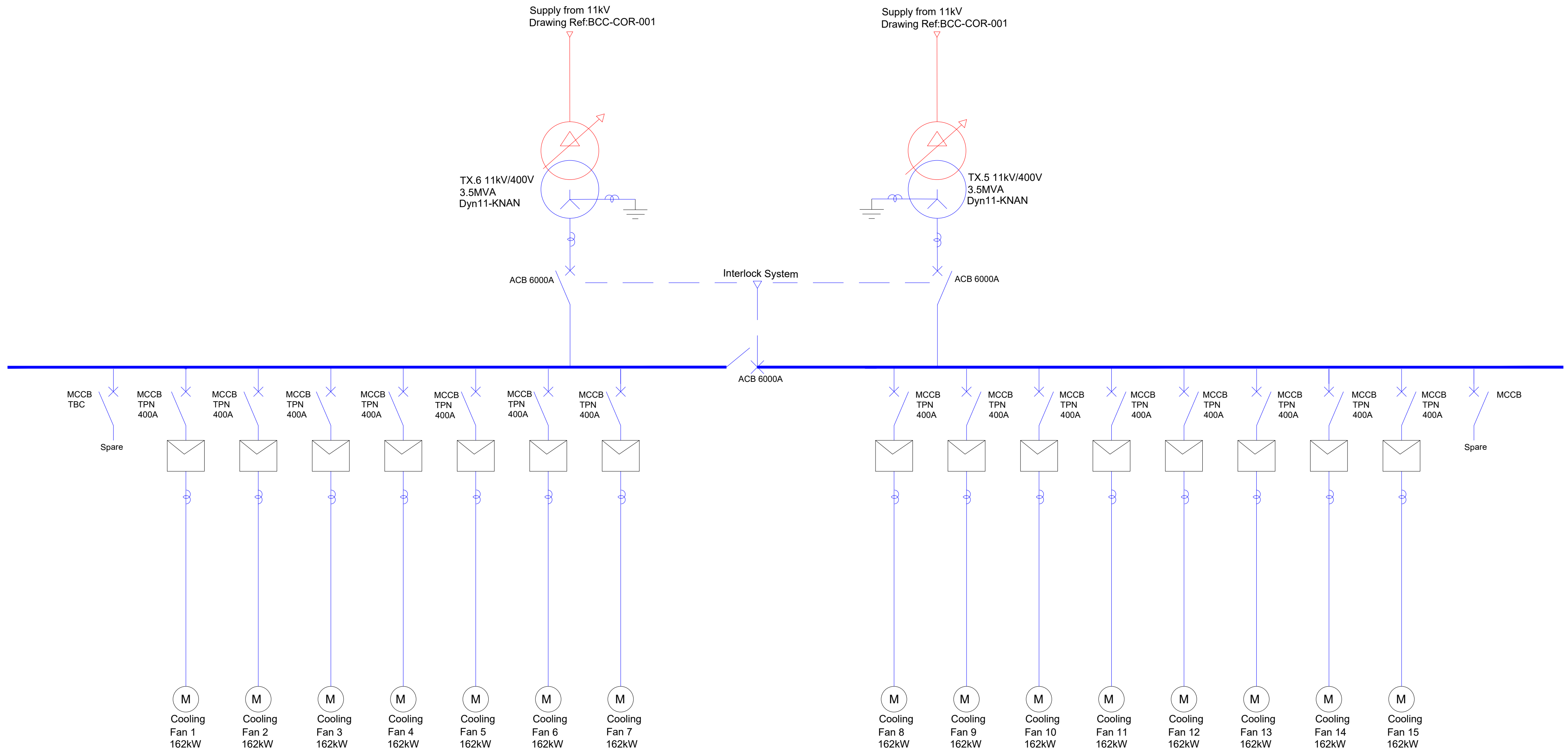


## LEGEND

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- VOLTAGE TRANSFORMER
- EARTH SWITCH
- CURRENT TRANSFORMER
- ON LOAD ISOLATOR
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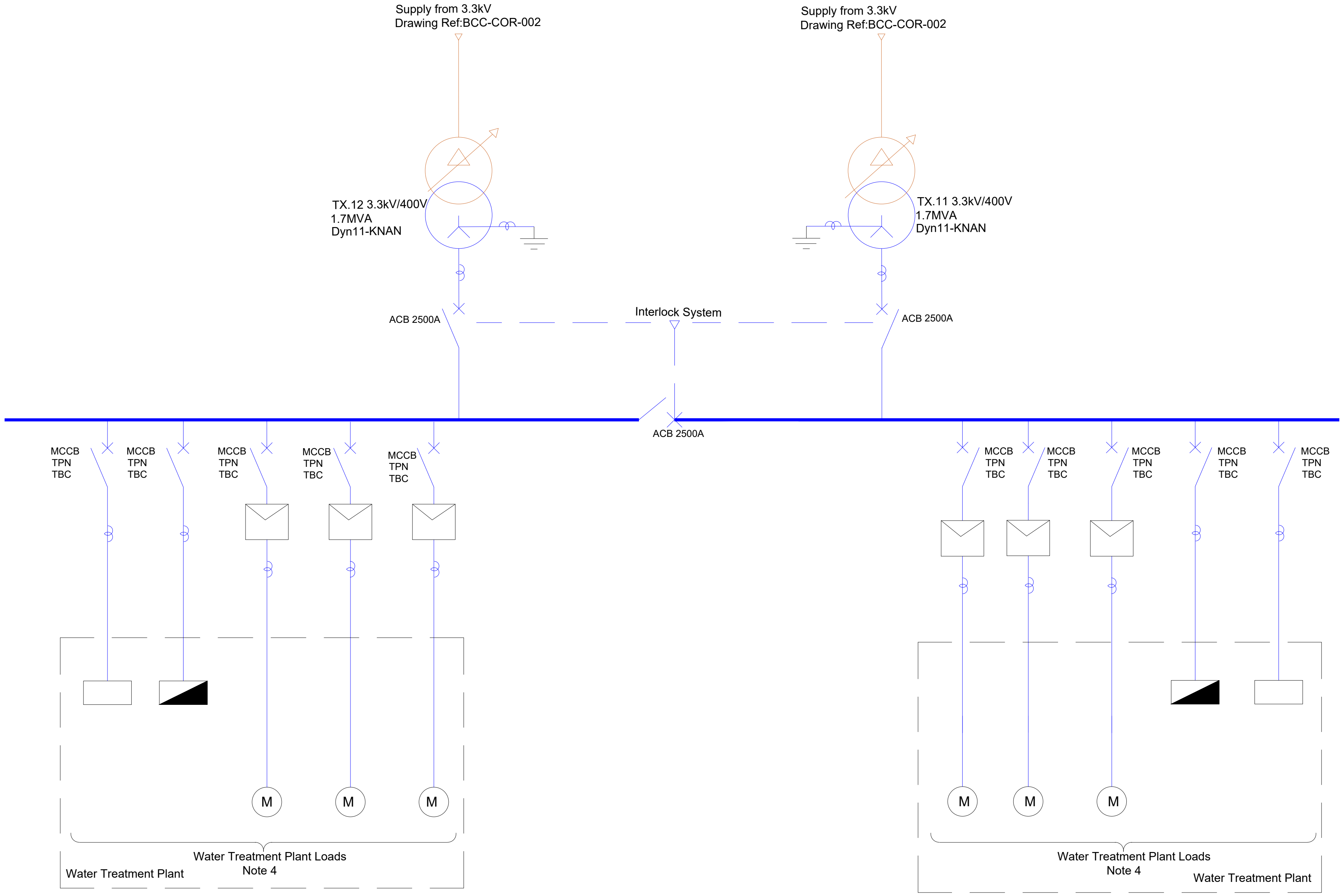


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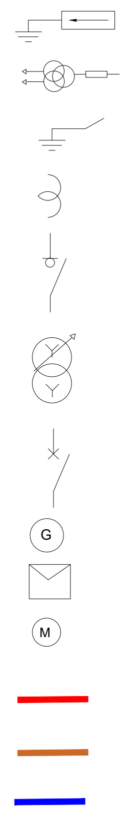

SURGE ARRESTOR
VOLTAGE TRANSFORMER
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**ANNEX B**

**CAH2 Transcript Excerpt**

00:27:33:04 - 00:28:02:22
Richard Turney for Landsul. So, um, so the position on heat transfer, if I can summarize is this there are existing consents for Riverside one and two, both of which require in various forms, progress towards developing heat networks and the provision of heat transfer stations. Now, obviously, is the foundation of those networks. Now those heat transfer stations are to be provided within Riverside one and Riverside Two's uh, perimeters.

00:28:04:14 - 00:28:38:08
In discharging those conditions, the applicant, Cory, prepared a report, uh, which was submitted to London Borough of Bexley in 2022 I think which is called the Fichtner Report. It's an appendix to our deadline three submission. That report assessed the, um, the viability of exporting heat from, uh, Riverside one and Riverside two, and, uh, the amount of heat that could be exported, the likely demand and the viability of a network.

00:28:39:01 - 00:29:13:07
It concluded that, um, Riverside one could export 28 megawatt, uh, megawatt, megawatt thermal, um, uh, and Riverside two 30 megawatt thermal. And it identified a demand which was less than, um, taking into account seasonality as well, less than what those two, uh, facilities could export. Um, the heat network identified was not found to be viable, but the government gave a grant of £12 million, which would alter the viability of that.

00:29:13:09 - 00:29:51:18
So total available heat consumers that could be connected to Cory's land at Belvedere less than the heat that could be transferred from Riverside one and two. That's the position in 2021, in the applicant’s assessment. Now they're promoting a new heat transfer station as part of this development, and they have provided to the examination until last week, no evidence that the heat demand is different from that which was set out in the very detailed fichtner report in 2021.

00:29:54:00 - 00:30:24:20
And we say that evidence is that there is no case for the heat transfer station in compulsory purchase terms. Again, it may be you should grant development consent for it because it provides future flexibility, but there's no compelling case in the public interest. So that's the that's the position in terms of where we are. If heat demand could be connected through a transfer through through a heat network, could heat demand, could be met through a heat network.

00:30:25:01 - 00:30:59:02
Then, because of the existing consents, Riverside one and Riverside two would have to provide that. In other words, they will come first before any heat demand, uh, any heat export from this site could come forward. There has now been further evidence in the past few weeks, um, from the applicant. Um, just to put this in context, Fichtner identified on behalf of the applicant 30MW of heat demand, um, in 2021.

00:30:59:22 - 00:31:33:21
The applicant's position now, which isn't supported by any technical evidence, is that there might be up to 900MW thermal of heat demand. Um, so, in other words, a 30 times increase in the heat demand that their own experts assessed. We say that's not credible and you don't have any evidence to support that. Secondly, they say that that heat demand could be served by new networks, which include, for example, the possibility of um, transferring heat via batteries, um, on the Thames.

00:31:34:20 - 00:32:06:05
There's no evidence that such a scheme is viable. It would obviously require further planning consents. Um, and similarly, there's no evidence that there is another viable network that can lead to this, um, heat from this site being exported viably to a network. The, um, the final point I think we would make is that the applicant seems in its, um, assessment that it's provided most recently to have misunderstood what the possible output is.

00:32:07:02 - 00:32:37:09
Um, it's claimed that, um, the total heat output from Riverside one, Riverside two is 492MW Thermal, which is inconsistent with Fichtner. And we think that the mistake that they've made in their recent submission is that that is the total energy input into Riverside one and Riverside two, not the waste heat. So, in other words, all of the waste going in it. So it would assume that it's 100% efficient.

00:32:37:15 - 00:32:56:12
Plus, uh, it only goes to waste heat as opposed to, uh, electricity and other outputs. So they seem to have significantly changed their numbers. They haven't produced evidence to support it. None of this is in the application documents, none of this at all about, um, where heat might go.

00:32:58:03 - 00:33:32:18
We accept that aspirationally heat transfer is a good idea, but there is no evidence that it's likely to be implemented here. It will inevitably follow Riverside one and Riverside two, which can more than meet the identified heat demand in the area, and it would only then come forward after that if there was further heat demand that could be viably connected. And at this point, there is no evidence that that's the case. The final point I think, on this is, is about the doubling up and as Mr.

00:33:32:23 - 00:34:05:02
Sorry. As Doctor Edgar explains in his first report, the applicant's design at the moment includes a full cooling, 100% cooling that it might require, plus a heat transfer station. If heat transfer station is built. Less cooling will be required because some of the heat will go via the heat transfer station. It essentially consented both options or seeking to consent both options. If the heat transfer station is removed, 4000m² of space saving and that allows further

00:34:06:24 - 00:34:30:12
flexibility And just to note that obviously Doctor Edgar has included the heat transfer station in his alternative layout. So this is a point a point which is additional. Or for example, if, um, Cory's right on six CO2 tanks, then the difference in CO2 tank storage area would be more than outweighed by the removal of the heat transfer station.

00:34:32:07 - 00:34:36:29
Okay. Thank you. The applicant might just want any of those points.

00:34:38:06 - 00:34:43:12
Um, yes sir,  I'm going to ask David Carter, who is Cory's managing director for heat, to respond.

00:34:45:17 - 00:35:23:25

Uh, David Carter for the applicant. Um. Thank you. I'll respond in turn to the points that have been made. So the first observation is that, uh, there is a requirement within the Riverside one and two planning permissions for heat transfer from those sites. Uh, and therefore, there can only be consent to heat transfer from, uh, the carbon capture facility to the extent that the heat is captured within the carbon capture facility. We agree with that. And the specification that's been created is based on heat from carbon capture. The second point is, uh, the submission that the demand does not exist such that any heat is required to be captured from the carbon capture facility.

00:35:24:11 - 00:35:57:17
The first observation is that the heat available from Riverside one and two will suffer a significant parasitic load once uh CCF is established, or circa one third coming on to demand. The fichtner report from June 21, which we supply, is the latest public document. Um, looked only at ten kilometres immediately around the site, which is the planning requirement that it was submitted to fulfil.
Significant further work has been done to look at heat transfer beyond that boundary, as well as within that boundary.

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And within the boundary works also showed an increase. Um, not only is the heat demand within London. Well documented via the London Heat map via other policy documents that have been produced both nationally in terms of advanced zone, which I'll come back to in a moment, but also by by the GLA. There is enormous heat demand within central London, vastly in excess of what is shown in the fichtner report and there is no conflict with the fichtner report in that. It's just, um, it's sort of they they serve different, different points.

00:36:28:18 - 00:37:02:11
Um, Cory has been actively pursuing heat export. We currently have MoUs, uh, either signed or under negotiation with Ultimate Heat network distributors who are bringing forward networks and based on their own forecasts, have in the aggregate, over 900MW of demand, which which is the figure that we've supplied. We only supplied that figure in the recent weeks, because we've only been challenged on the level of heat demand in in recent weeks, and we would have happily shared it earlier if it was, um, if it was requested, uh, in terms of the level of heat available on the site.

00:37:02:16 - 00:37:36:07
Um, I appreciate its significantly larger than was previously looked at. The fichtner report considered a conventional turbine blades, as we indicated, not just in our most recent sort of responses, but actually a little bit earlier. We've been looking at advanced heat recovery techniques, including excess heat in the flue stack, but also recovery of heat by replacing the air cooled condenser with, um, either heat pumps or mechanical vapor recompression, which does indeed allow a very much greater level of heat recovery that's been validated by, um, several layers of independent technical assessment.

00:37:36:22 - 00:38:13:23
Um, there is a typo for which I apologize. It shouldn't be 490, it should be 390. But that is still a very significant figure. The one third parasitic load, uh, would reduce that 390 to circa 260. Um, we've indicated from the start that we believe there's at least 100MW of additional heat capacity within the site, which would take us back to 360 emerging technical work. In fact, um, leads us to believe that we could significantly exceed that, it could be up to 300MW recoverable, again using heat pump or more advanced heat recovery techniques, which would take us to between 360 and 560.

00:38:14:04 - 00:38:44:04
We therefore have active commercial negotiation with counterparties for demand, as I say, up to 900 plus megawatts. We have supply, which can make a very significant contribution to to addressing that. There's then been a submission that it's not technically feasible to get the heat to the locations where that demand exists, that we'd submit incorrect. So we've looked, as has been referenced at moving heat via thermal stores located on barges.

00:38:44:08 - 00:39:06:28
That's been a project in the public domain, uh, with reference from the PLA and numerous other stakeholders for about a year now, with a pilot that was examined looking at supply and strategic undertaking in the City of Westminster, which had been done in cooperation with the City of Westminster. That's a heat network that used to take waste heat from Battersea Power Station. As further large heat networks have come forward in central London,

00:39:08:24 - 00:39:43:15
including some sponsored by central government, for instance. They have also engaged with us on that as a heat supply technique that has been evaluated on an end to end basis and has reached the level of technical maturity required to be granted a subsidy under the successor to the Heat Network Investment Programme, which will receive support for in respect of the local heat network that was previously referred to. The second transmission approach, which is also entirely technically viable and demonstrated to be such by the fact it's been done elsewhere, is long range heat transmission pipelines.

00:39:44:15 - 00:40:03:27
If one looks, for instance, at Copenhagen, there are heat transmission pipelines twice the length that will be required to transmeet transmit heat along the central London corridor and with a significantly lower linear heat density. I would also note that the GLA published a report in December of last year in which they identified that

00:40:05:18 - 00:40:10:12
a pathway to the decarbonisation of London's heat being a key policy goal promoting the approach of the use of strategic heat sources

00:40:12:02 - 00:40:49:16 of promoting the approach of the use of strategic heat sources, including, for example, Corry and strategic heat mains of the source of length and carrying capacity that I have just described. Therefore, it's not only demonstrated to be technically feasible on the basis it has been done elsewhere, but to be supported by policy, including that recent GLA report. Various points have been made as to the financial viability of such networks. I would highlight that as uh as utilities, the key sort of moment of stress in establishing a heat network is sort of critical mass, and that's why it's subsidies that exist and that have been referenced in the documents do exist.

00:40:50:04 - 00:41:20:26
Um, as scale is achieved, um, those, those barriers begin to fall away and the level of demand that's under discussion sort of easily surpasses the barriers required to achieve that. Um, in terms of that sort of central London heat network point, I would highlight not only is the level of heat demand there, but this is supported, uh, very strongly by government policy. So the Energy Act 2023 has significant provisions, um, which were

designed to promote the Climate Change Committee goal of 20% of the UK's heat being supplied by heat networks.