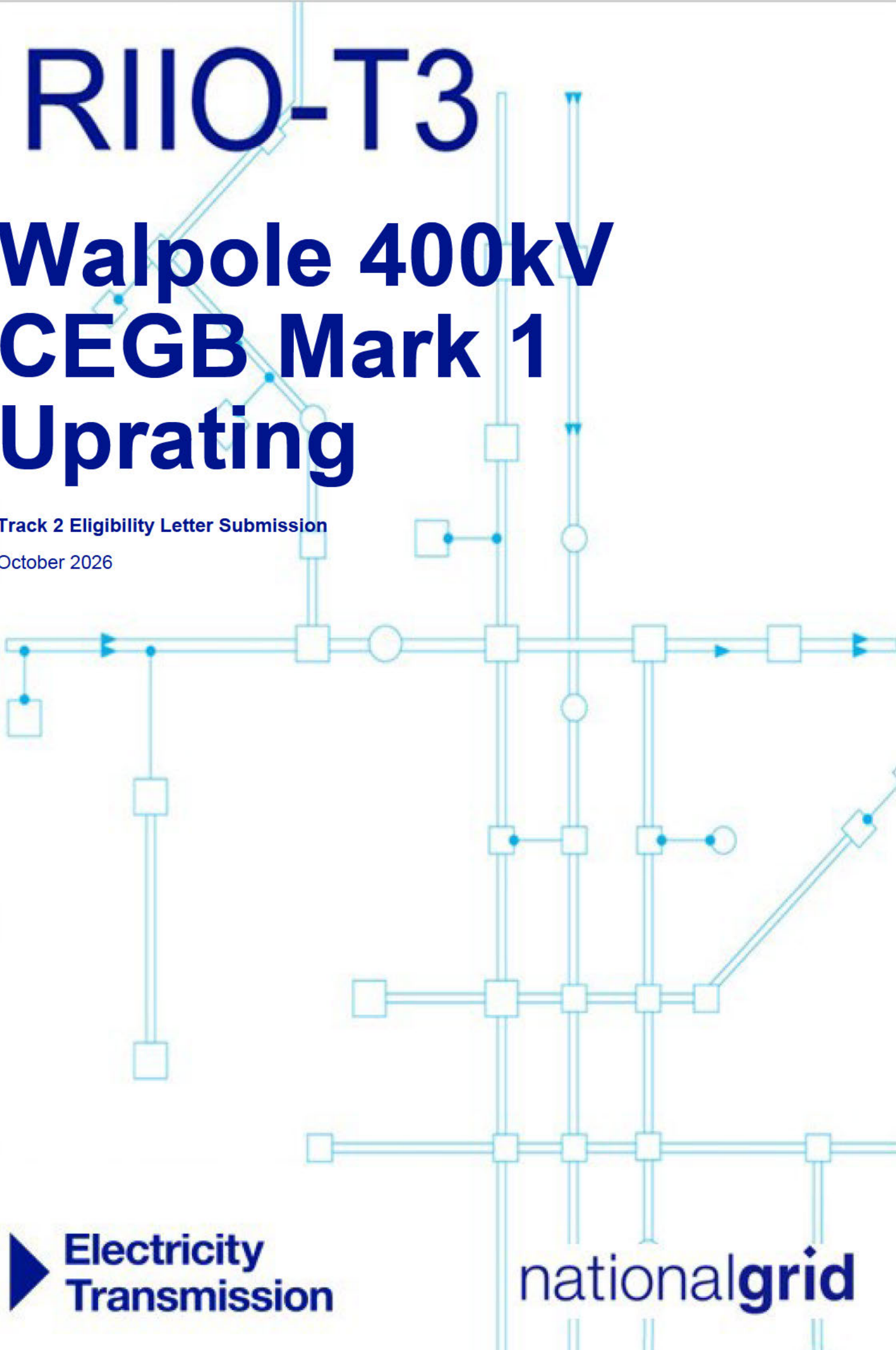
RIIO-T3

Walpole 400kV CEGB Mark 1 Uprating

Track 2 Eligibility Letter Submission

October 2026



Electricity Transmission

nationalgrid

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Reference and summary table

Field	Description
Project name	Walpole 400kV CEGB Mark 1 Uprating
TO's preferred re-opener track	Track 2 Eligibility Letter (EL)
RRP reference	NGT500152
BPDT / Scheme reference number	N/A
Load Board reference	August 2026, project name "Walpole"[1]
Investment driver(s)	Primary: Load: enabling works for customer connections Secondary: Asset health.
Project Outputs	• Fault level capability increased from 50kA to 63kA. • Walpole remains compliant under future fault level conditions. • Capability provided to accommodate forecast increases in network demand.
Short list of strategic options considered	Two main options were shortlisted for detailed analysis: • **Option D-1**: In-situ replacement of existing infrastructure with units rated for 63kA; and • **Option D-4**: A phased OHL transfer in which two circuit transfers will take place in parallel for partial offline rebuild.
Preferred solution and explanatory narrative on the rationale	Our preferred solution is Option D-1: In-situ replacement of existing infrastructure with units rated for 63kA. This option performed best against the assessment criteria for deliverability, environmental, consenting and cost.
PASE alignment	This project is not directly represented by any specific PASE category; however, we consider this should be treated as a PASE variant option.
Cost (23/24 prices)	[redacted]

[1] In previous load boards, this investment was referred to as "Walpole" which included the scope of this investment and its companion Eligibility Letter submission: Walpole West 400kV AIS Extension. These investments have since been split out into two separate Eligibility Letter submissions, in line with Ofgem's Load Re-opener guidance.

Field	Description
Delivery year	2033
Applicable reporting tables	RRP: NGT500152 <Scheme_C&V_Calc_Load_Actuals>.
Interactive projects	A range of other projects at the Walpole site interact with this investment, including: [redacted] • Infrastructure Works for Walpole [redacted] • WALP4 Diversion of [redacted] • WALP4: Generator Extension [redacted] • WALP4: Infra Works [redacted] • 400kV CEGB Mark 1 Uprating • Walpole B Substation construction.
Historic funding interactions	This investment has not received funding previously; however, some assets which will be replaced through this investment did receive non-load funding at Final Determination. Where relevant assets are replaced under this investment, the other funding awarded at Final Determination associated with named asset interventions will be returned, while volume allowance funding will be redeployed against other qualifying asset health intervention needs in accordance with the flexibility provisions of the RIIO-T3 framework.
Spend apportionment	[redacted]

Executive summary

Project summary

The Walpole 400kV CEGB Mark 1 Uprating will increase the fault level rating from 50kA to 63kA by replacing existing infrastructure with units rated for 63kA. This is to accommodate the increased load on the network. This investment strengthens a key transmission node that directly influences boundary flows across B9. This uprating is therefore a critical enabler for new large generation connections across the region, including at Norwich, Necton, Walpole B, Walpole substation, EGL3, EGL4 and GWNC which directly contribute to increasing fault levels at this site.

In parallel, the companion EL submission for the Walpole West 400kV AIS Extension supports the delivery of contracted clean generation connections by providing the 400kV extension at Walpole required to connect [redacted] and undertake the associated circuit reconfiguration.

Submission purpose

We are seeking Ofgem's approval, under the Load Related Re Opener (Special Condition 3.18 of the RIIO ET3 licence), to progress the Walpole 400kV CEGB Mark 1 Uprating project as a Track 2 EL investment and approval of Pre Construction Funding (PCF).

Project need

The Walpole 400kV CEGB Mark 1 Uprating investment is required to support the following:

- Primary: Load (enabling works for customer connections) - the fault level rating must be increased from 50kA to 63kA to accommodate the increased load on the network.
- Secondary: asset health - [redacted]

Optioneering to date

We have undertaken a robust multifactorial optioneering process to identify the most appropriate solution to meet the identified need. We conducted a high-level assessment of strategic options (do nothing, market-based, whole-system, reuse or extension of existing assets, and new-build) to develop a longlist of potential options, which considered 8 options.

Of these, we shortlisted two options: D-1 and D-4.

Our preferred option is D-1 (in-situ replacement of existing infrastructure with units rated for 63kA/1 second) because it allows achievement of the required uprated fault level, maximising reuse of existing assets while minimising outage complexity and environmental impact. It is also deliverable on the most efficient timetable and is the most cost-effective solution for consumers. In contrast, option D-4 performs worse against most factors in our multifactorial analysis (Table 11).

This preferred option is supported by the optioneering assessment and the referenced layouts/Single Line Diagrams (SLDs) in section 3.

In addition to our preferred solution, due to the number of contracted customers that have this investment required as enabling works, we have developed a standalone interim solution that can enable these customers to connect earlier (from 2030) than would be the case if we implemented our preferred solution on its own (in 2033). More detail is provided on this in section 3.6.

Table 1: Summary of longlist options

Option	Details	Drivers met?	New site?	AIS/ GIS?	Shortlist?	Preferred solution?
Option A	Do nothing counterfactual option	No	No	NA	No	No
Option B	Market-based solution	No	No	NA	No	No
Option C	Non-transmission, whole systems solutions	No	No	NA	No	No
Option D-1	In-situ replacement of existing infrastructure with units rated for 63kA	Yes	No	AIS	Yes	Yes
Option D-2	In-situ replacement of V-string arrangement, with high level Main and Reserve bus bar, low level bay equipment and Pantograph type busbar disconnectors	Yes	No	AIS	No	No
Option D-3	A phased OHL transfer moving only a single OHL connection at a time, to alternative bays for partial offline rebuild	Yes	No	AIS	No	No
Option D-4	A phased OHL transfer moving two circuit transfers in parallel for partial offline rebuild	Yes	No	AIS	Yes	No
Option E-1	Constructing a new 400kV GIS substation on the decommissioned 132kV AIS site and transferring circuits from the AIS to the GIS via underground cables	Yes	No	GIS	No	No

Cost estimates

Based on the latest Cost Book (2023/24 prices) and early project estimates, the preferred option, Option D-1, has an estimated total cost of [redacted] including risk and contingency. Pre Construction Funding of [redacted] is requested to progress surveys, land activities, FEED, programme management and obtain third party services.

The alternative shortlisted option D-4 has an estimated cost of [redacted] also [redacted] These costs are reflected in the CBA.

Indicative delivery programme

Our programme has been designed to achieve the project outputs by 2033. The programme timeline is driven by the outages required to complete the works, currently [redacted]. Outage programme optimisation is being carried out as part of the current phase of development, but feasibility is largely driven by system access constraints.

Cost apportionment and final efficiencies will be confirmed through the Project Assessment stage.

1. Introduction

1.1 Walpole 400kV CEGB Mark 1 Uprating

This submission, coupled with its Annexes and Cost Benefit Analysis (CBA), is made under the Load Re-Opener and Price Control Deliverable (Special Condition 3.18 of the RIIO ET3 Licence) for the Walpole 400kV CEGB Mark 1 Uprating.

The application seeks the following determinations from Ofgem:

- approval of project eligibility under the Load Re-Opener and Price Control Deliverable (Special Condition 3.18)
- confirmed acceptance of the preferred solution (Option D-1)
- confirmation that the project should proceed via Track 2 EL of the re-opener process; and
- approval of Pre Construction Funding (PCF) under Special Condition 3.15 (Pre Construction Funding Reopener, Price Control Deliverable).

The investment is primarily load driven. Asset health is a secondary driver to this investment.

Subject to Ofgem confirming eligibility, needs case and PCF applicability, we will continue development and intend to submit a Project Assessment in line with the re-opener process, likely in the April 2028 window.

Eligibility, project track statement and PASE

The project qualifies under Special Condition 3.18 as a load-driven investment scheduled for delivery within the RIIO-ET3 period. This investment has not received funding previously; however, separate non-load funding has been granted at T3 Final Determination for rectification of asset health issues at the Walpole site.

Some of those assets (20 of 53) will be replaced as part of this submission – these are identified in section 2.2 below. Where this occurs, we will not utilise the spend awarded for that relevant asset (the funding awarded through this LRR taking precedence) and there will be a readjustment at the end of RIIO-T3 to reflect the actual T3 spend in this regard. This submission proposes the Track 2 EL Load Re-Opener process for assessment. Track 2 EL is appropriate as a single preferred option is set out.

This project is not directly represented by any specific PASE category. This investment is not building a new substation but rather is replacing existing assets to uprate them; the assets being replaced pertain to a 400kV double busbar AIS substation. We consider this project is a PASE variant option and ask for it to be treated as such. Further detail is provided in the PASE alignment section.

Preconstruction funding request

Under Special Condition 3.15 of the Electricity Transmission licence, this investment qualifies for allowances equal to 8.2% of its total forecasted cost [redacted] at the time of this Load Re-Opener Eligibility Letter submission). We are seeking pre-construction funding of [redacted], as this represents 8.2% of the total forecast cost (rounded down).

Based on our current forecast we have provided below a breakdown of costs amounting to [redacted] for pre-construction activities.

Table 2 below summarises the activities covered by the application of these PCF allowances based on our current progress of PCF and EEW spend. This position will be updated as we continue to mature this investment and ultimately reconciled at Project Assessment stage of the re-opener.

We confirm that no PCF activity included in this submission has been funded through baseline allowances, other re openers, or alternative licence mechanisms.

[redacted]

1.2 Background

Chronology of investment

The chronology for this investment is provided in Figure 1.

Figure 1: Summary of chronology



Regional and network context

The proposed investment site sits in Walpole in the East Anglia region of the network (see Figure 2 and Figure 3). NGET's East Anglia Region is strategically important for the future transmission of renewable energy from the North to Southern England and Europe and is therefore subject to increasing operational and capacity pressures as the electricity system transitions to net zero. Significant increases in offshore windfarm energy are already consented, with new interconnectors and large-scale battery storage for solar and wind farms planned. The landscape also supports a growing number of solar farms.

Forecast changes to demand and generation in East Anglia are driven by a combination of decarbonisation objectives, industrial and economic growth, and committed customer pipelines. These drivers are expected to materially affect the role and loading of the transmission network over RIIO T3 and beyond. These are increasing the requirement for resilient, flexible and

adequately rated transmission infrastructure to ensure timely connection, maintain security of supply and minimise wider system costs for consumers.

Until now, the existing high voltage electricity network has been sufficient to meet demand. However, as electricity needs grow, the capacity of the electricity transmission network will also need to increase.

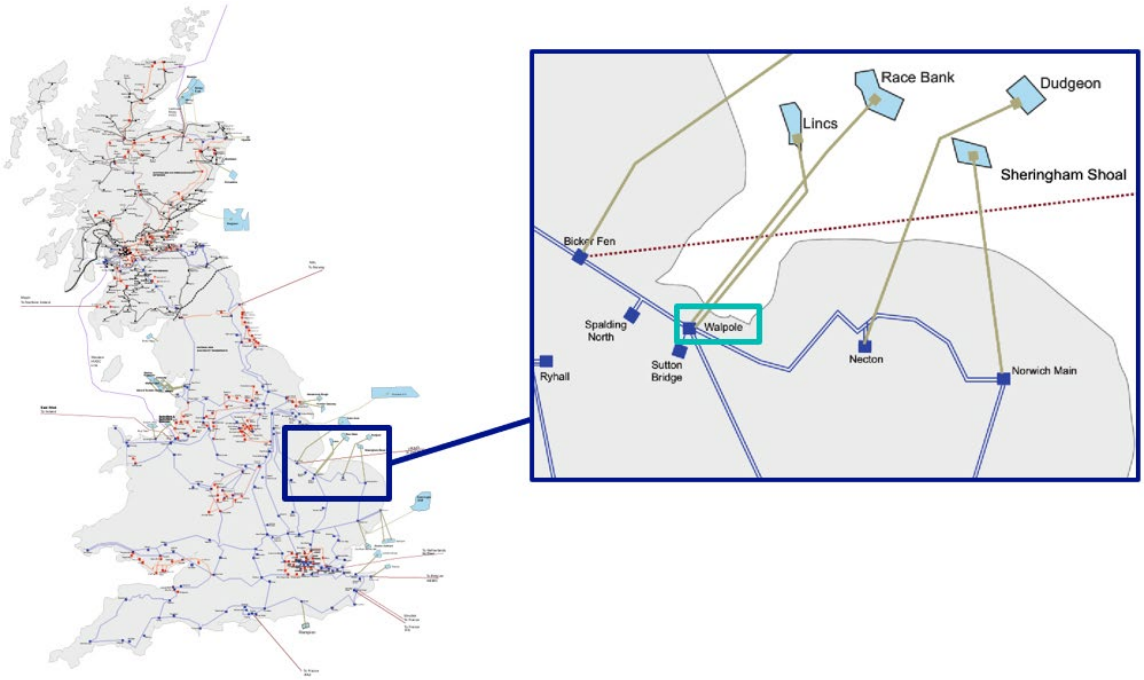
NGET's emerging transmission strategy for East Anglia combines network reinforcement, strategic new substations, and uprating of existing infrastructure. It is aligned to a broader transmission direction of travel in which key hubs are strengthened to accommodate offshore wind, nuclear and wider transfer growth toward London and the Southeast, while remaining consistent with future ASTI and wider network developments. This aims to accommodate forecast changes in system use while protecting long-term consumer value.

At the local level, the Walpole site strategy aims to facilitate new generation and demand connections, maintain system operability and network capability at the site, and increase system strength and fault level capability to support East Anglia network growth.

This investment, the Walpole 400kV CEGB Mark 1 Uprating, contributes toward achievement of these strategies as it is a key enabler for the connection of new generation in the region. This is an enabling reinforcement that ensures the existing substation can continue to accommodate increasing fault infeed associated with wider regional network development.

Taken together, this investment represents a proportionate and efficient response to evolving system needs in East Anglia. By addressing constraints at a strategically important node, it supports whole system operability and facilitates the connection of customers, thereby ensuring consumer value.

Figure 2: NGET network map highlighting the location of the investment in the East Anglia region





Interactive projects

This investment has been developed as part of a wider site strategy at Walpole. Consequently, there are several projects that interact with this investment to make up the overall site strategy at Walpole substation (see Table 3 below). During our optioneering and the design of the preferred solution, we have worked closely with these project teams to ensure that the overall strategy for the site delivers value to consumers. Cumulatively, these projects aim to expand capacity, integrate new energy sources and ensure the substation's readiness for future demands.

Whilst these will be delivered as independent investments, these are being developed in a coordinated manner as the works will be ongoing at the same time as this investment. We are exploring all opportunities for efficiency, including seeking appropriate outage coordination to ensure SQSS compliance is maintained and within our procurement strategy (more detail in section 4.2 below).

The following table sets out a summary of the projects which interact with this investment:

Table 3: Interactive projects

Project	Details	Status
[redacted]	Extending the bars to the eastern end [redacted] This project is currently in delivery	2027
[redacted]	Adding a [redacted] at Walpole 400kV [redacted]. This project is currently in delivery	2028
Infrastructure Works for Walpole [redacted]	New generation connection [redacted] to 132kV substation with cables through the 400kV compound	2030
WALP4 Diversion of [redacted]	Diverts the [redacted] circuit [redacted] to resolve Point on Bar issue	2031
WALP4: Generator Extension	limited to a new main and reserve section and bus coupler necessary for the west extension. This scope was originally part of WALP4: Infra Works for [redacted] but was split into a separate investment	2031
[redacted]	[redacted]	2030
WALP4: Infra Works [redacted]	New generator connection requiring a busbar extension, bus coupler, and section	2031
Walpole B Substation construction	Construction of new substation to accommodate new generation customers [redacted] and overhead line from Grimsby to Walpole in the region	2032

[redacted]

[3] Projects that pertain to the Walpole West 400kV AIS Extension (WALP4 Diversion of [redacted], WALP4: Generator Extension, and WALP4: Infra Works [redacted]) are submitted to Ofgem as a separate Eligibility Letter during this same October 2026 load re-opener window.

Site background

The Walpole site comprises a 400 kV air-insulated switchgear (AIS) substation, and an operational 132 kV gas-insulated switchgear (GIS) substation, as shown in the high-level image in Figure 4. The combined 400 kV/132 kV installation operates as a critical Grid Supply Point (GSP), supplying both UK Power Networks (UKPN) and National Grid Electricity Distribution (NGED).

Land immediately adjacent to the National Grid substation boundary is occupied by a number of third-party generation developers and existing infrastructure, which constrains further expansion. In particular, no further extension of the substation is possible to the east as it is directly adjacent to a public road as well as to the north or south due to the presence of connecting customers developments. The current in construction Walpole East extension for [redacted] has sterilised the East of the site. The option to extend further was discounted due to the costs, land acquisition and disruption of moving the existing road Walpole Bank. That option would [redacted] have [redacted] given NGET [redacted] bay for a further Customer connection albeit we would have been limited by SQSS in-feed loss requirements, which would restrict the amount of capacity we could add to the system on this section.

[redacted]

The original Walpole 400 kV AIS substation was constructed in the 1960s and is of Mark I CEGB design, originally rated at 4,000 A with a short circuit rating of 50kA. An eastern extension was developed and commissioned in the 2010s, designed in accordance with more recent standards and rated to 63 kA, reflecting current technical requirements.[4]

The 400kV double busbar substation currently consists of:

[redacted]

[4] At the time this partial uprating occurred on the East end of the site (east extension), there was not a need to uprate the rest of the substation, hence the rest of this site stayed at 50kA as this was sufficient for the needs.



Through this investment, our preferred solution will entail full in-situ replacement of primary plant that does not meet the required 63 kA/1 second fault rating. All existing bay equipment will be replaced like-for-like with new equipment rated to 63 kA, including:

- Circuit breakers
- Current transformers (CTs)
- Capacitive voltage transformers (CVTs)
- Disconnectors and earth switches
- Main and reserve busbars, including replacement of busbar tubing and bolted A-frames
- V-string assemblies and suspended overhead conductors

Existing busbar support post insulators are replaced as part of the uprate.

Historical funding

This investment has not previously received funding. However, non-load funding was awarded through the RIIO-T3 Final Determination to address asset health requirements at the Walpole site. Some of the assets funded through this programme will be replaced as part of the proposed investment and are identified in section 2.2. These comprise a combination of named asset and volume allowance interventions.

Where the proposed load-related works remove the need for these asset health interventions, funding associated with named asset interventions will be returned, while volume allowance funding will be redeployed against other qualifying asset health intervention needs in accordance with the flexibility provisions of the RIIO-T3 framework.

Early Asset Write Offs (EAWO)

We anticipate an early asset write off (EAWO) value of [redacted] associated with the replacement of assets required by the preferred option. This reflects the remaining accounting value of the assets at the time of replacement. Further information will be provided at Project Assessment stage.

2. Drivers and need case

The Walpole 400kV CEGB Mark 1 Uprating investment is triggered by increased load requirements in East Anglia, both new connections (as enabling works) and new circuits. This has necessitated system operability interventions to address the fault level at the 400kV site. Asset health is a secondary driver.

The customer ACL dates presented in this submission reflect the modelled delivery programme. The testing and setting of ACL dates for customer contracts within scope of connections reform is ongoing throughout 2026. Confirmation of agreed ACL dates will therefore be presented in the next stage of submission which is the Project Assessment.

Table 4: Investment drivers

Summary of drivers		ACL date
Primary: **Load: enabling works for customers in the region**	• The fault level rating must be increased from 50kA to 63kA to accommodate the increased load on the network.	• 2033
Secondary: **Asset health**	• [redacted]	• 2029-33

The Walpole 400kV AIS substation comprises both legacy CEGB Mark I equipment (rated to 50kA) and more recent infrastructure rated to 63 kA. Power system studies indicate that, as a result of increasing fault infeed from large generation connections and new circuits connecting at Walpole and elsewhere in the electrical vicinity, fault levels at the Walpole 400kV busbars are forecast to exceed the 50kA capability of the remaining CEGB Mark I infrastructure [redacted]

If left unmitigated, this would prevent the connection of the relevant contracted customers that have this investment listed as their enabling works and would create a non-compliant condition (SQSS 2.10.5 and 2.10.9) for operation of the 400kV site, increasing safety risk and constraining the ability to accommodate existing and future network requirements. There is therefore a need, driven by the increased customers in the region, to uprate the fault rating of the remaining 400kV CEGB Mark I primary plant at Walpole from 50kA to 63 kA aligning it with the fault level requirement for the site and the rating of adjacent upgraded assets.[6]

[redacted] As this is much earlier than this investment's delivery date, a number of interventions are being developed to mitigate this. [redacted]

[6] The proposed switchgear will be specified [redacted]

[redacted]

Secondly, NGET is implementing an interim solution to bridge the gap between 2030 and this investment's delivery year of 2033 to reduce the impact on customer connection dates. More information on this interim solution is provided in section 3.6 below.

2.1 Customer

The requirement for this investment is not one customer connection but a combination of customers across the region and at this site, combined with wider system changes in the area. These will impact the demands of Walpole substation in relation to its physical ratings. There are ten Gate 2 Phase 1 customers which require this investment as their enabling works. A summary of these customers is contained below in Table 5.

There are a further 25 Gate 2 Phase 2 customers that also require this investment as their enabling works. Due to the quantity, this list has been provided at Appendix E.

Table 5: Details of Phase 1 customers the Walpole 400kV CEGB Mark 1 Uprating enables

Customer name	Project name	Technology type	Demand capacity	TEC	Site and Voltage (kV)	ACL date[7]	Connections Reform Gate / Phase
[redacted]							

[7] Some of these projects have multiple stages; the stage depicted in this table is the connection stage that is directly affected by this investment.

Customer name	Project name	Technology type	Demand capacity	TEC	Site and Voltage (kV)	ACL date[7]	Connections Reform Gate / Phase
[redacted]							
[redacted]							
[redacted]							
[redacted]							

As part of this submission, NGET has assessed whether Connections Reform has materially changed the customer drivers underpinning the proposed intervention.

Connections reform outcomes will not affect the need, scope, cost, programme, preferred option or timing of this proposed network intervention: the connecting customers [redacted] are forecast to exceed the Walpole substation's fault level under intact conditions. The fault level is an enduring issue after connecting [redacted]; NESO has corroborated this finding.[9] These customers are not expected to fall away.

Therefore, this investment remains required given the volume of contracted customers [redacted] would not be sufficient to maintain safe and SQSS compliant operation of the site (adherence to section 2, obligations 2.10.5 and 2.10.9). Without this investment, we would be unable to connect the relevant customers without being constrained by NESO, due to the assets exceeding the fault level.

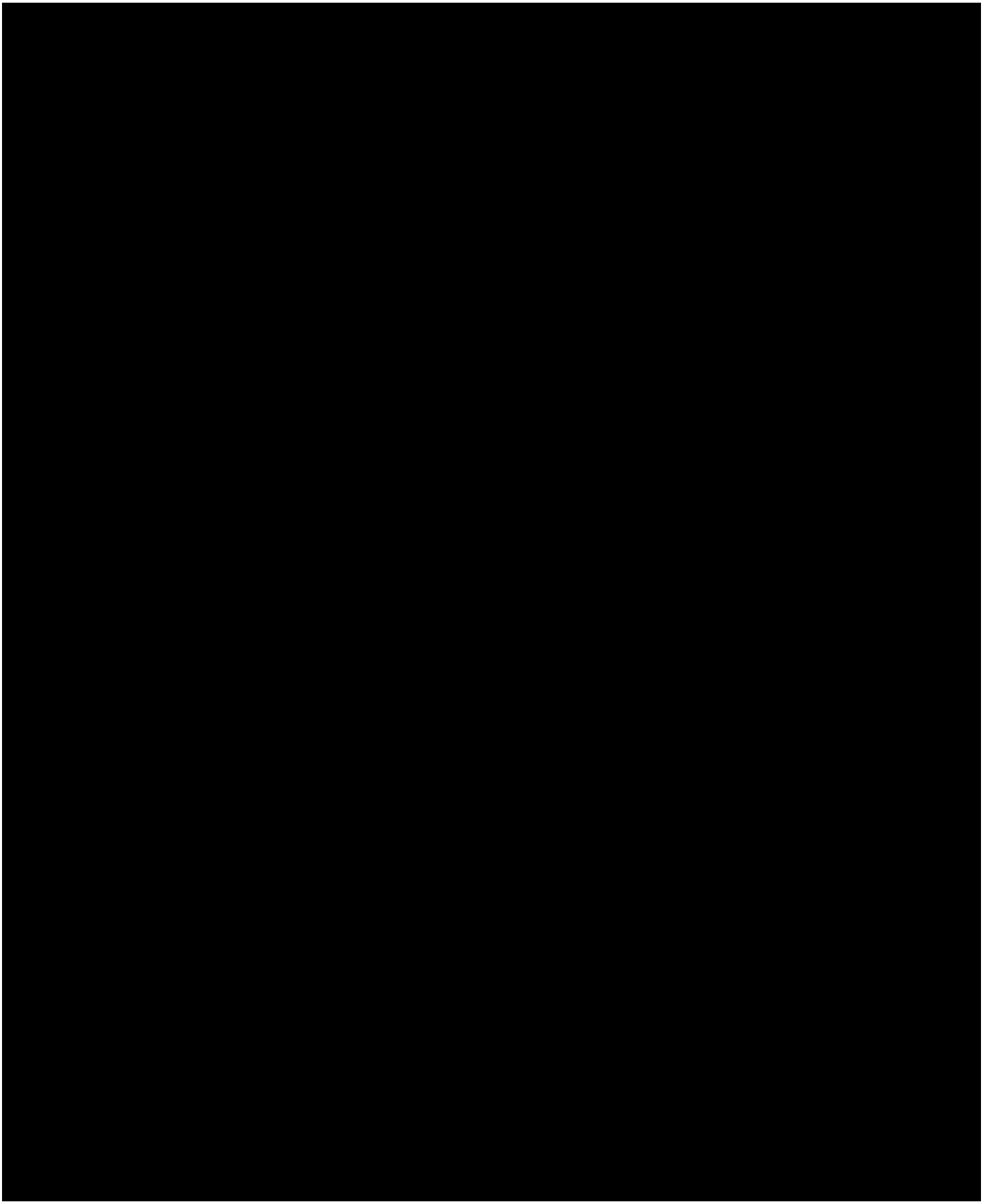
2.2 Asset health

For this investment, there is an interface with the non-load asset health plan delivery.

The asset health information presented in this submission reflects an updated and assured view of asset condition at the relevant sites and is provided solely to support the assessment of the proposed load-related investment.

[redacted]

A summary of the current asset health position at the Walpole 400 kV site is presented in Table 6. This reflects our most recent (2025/26) assured view of asset condition at the site.





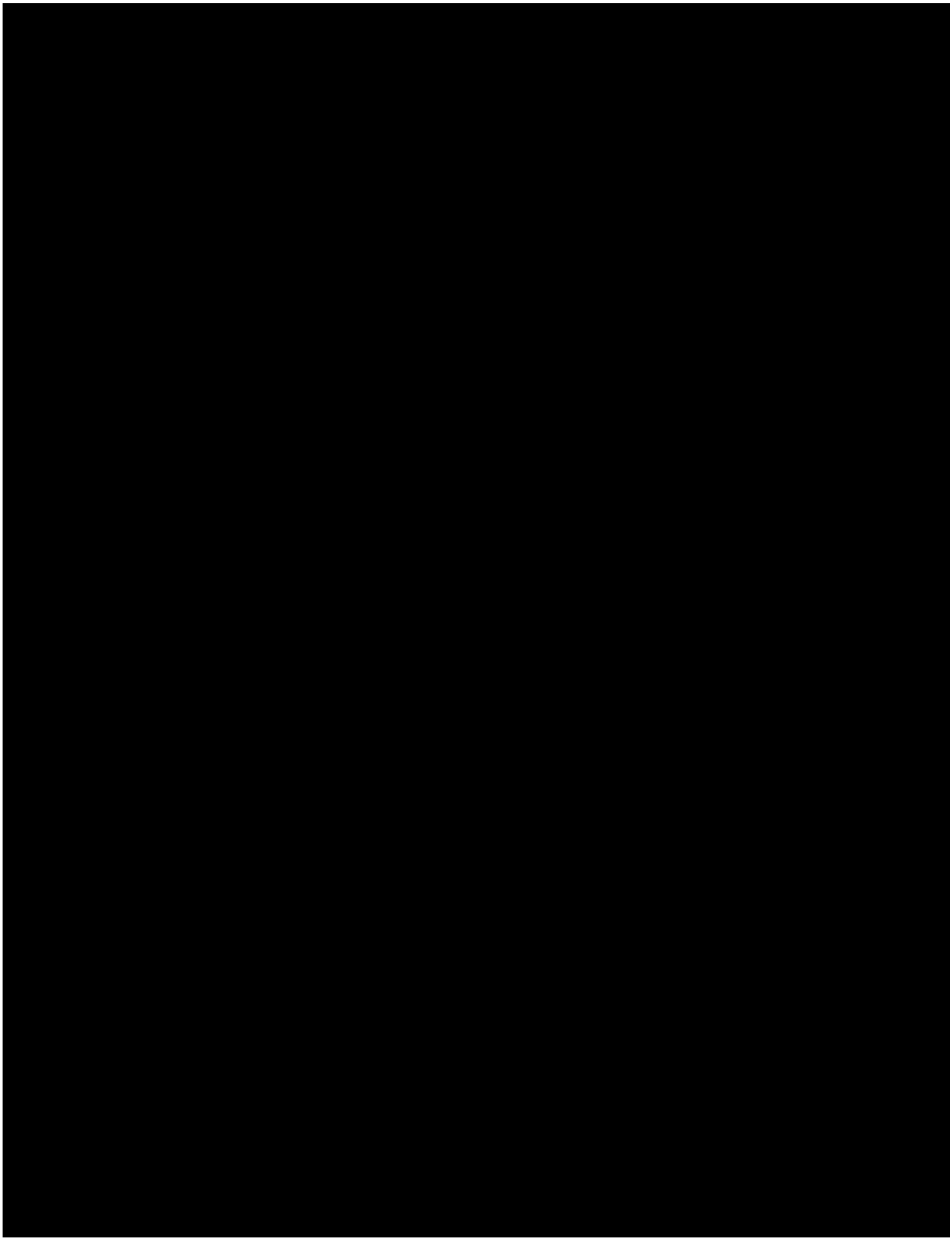
During the construction of the T3 non-load plan, a selection of assets at Walpole met the criteria for an asset health intervention[10] and were included in the non-load plan submission. A summary of the assets that were included in the non-load submission and awarded funding at Final Determination is presented in Table 7.

Table 7: Walpole T3 non-load asset health interventions

Walpole 400 kV Sub Station		
Asset Group	**T3 Baseline**	**T3 Pipeline**
Circuit Breaker	5	1
Disconnectors and Earth Switches	7	16
Instrument Transformers	-	21
Light Current	3	-
Grand Total	**15**	**38**

Of the 53 asset interventions that received non-load funding through the RIIO-T3 Final Determination, 20 are expected to be replaced through delivery of the uprating works proposed within this investment. A full breakdown of these assets is provided in Table 8. All 20 interventions currently comprise refurbishment works.

[10] In accordance with the decision-making framework set out in 'NGET_RIIO3_NGETQ10_Asset Health Decision Making', submitted as part of our RIIO-T3 Draft Determination response.





As project development progresses and the final scope and delivery programme are confirmed, a detailed assessment will be undertaken to determine whether the performance risks associated with these assets can be managed through to completion of the uprating scheme. This assessment will establish whether the planned refurbishment works remain necessary or can be deferred until asset replacement is delivered as part of the uprating project.

Where the asset health risk remains within acceptable tolerances until completion of the uprating scheme, delivery of these interventions through the load-related investment will enable both asset health and network capacity requirements to be addressed through a single coordinated programme. This approach reduces future outage requirements, avoids duplicate construction and mobilisation activities, and delivers improved whole-life value for consumers.

In these circumstances, standalone asset health interventions funded through the RIIO-T3 Final Determination would no longer be required and would therefore be removed from the non-load programme through the relevant regulatory mechanisms. Funding associated with named asset commitments would be returned, whilst funding associated with volume-based allowances would remain available for deployment against other qualifying asset health intervention needs. Any asset health interventions that fall outside the scope of this investment will continue to be delivered through the asset health programme. Where asset health and load-related activities remain concurrent, delivery will be coordinated to maximise outage efficiency, minimise site disruption, and optimise overall programme delivery.

3. Optioneering

This section explains how we assessed the options for this investment.

We have applied a staged, multi-factor optioneering process to identify the preferred option.

1. We start by determining the most suitable strategic option. Strategic optioneering determines the type of investment we should develop.
2. We then consider a longlist of technical options within each investment type, down selecting to a shortlist of options.
3. We then consider a shortlist of technical options, selecting a preferred option based on a qualitative balanced scorecard of considerations: Engineering, environmental, deliverability, economic/consumer value and consenting/stakeholder.
4. We then assess quantitatively all shortlisted options in a CBA to determine which technical option provides greater Net Present Value.
5. We then consider the outputs of both step 3 and 4 to provide a final preferred option.

This paper uses a linked "option" label: lettered design options (A–E) (with sub variants) to describe what could be built. The preferred solution is therefore the selected design option.

3.1 Strategic options

In line with our standard optioneering process, we considered the following broad strategic options:

Table 9: Strategic direction setting

Option	Description
Option A: Do nothing	This option involves making no changes and therefore doing nothing to facilitate the connection of customers.
Option B: Market based solution	This option involves accommodating increased customer demand through the procurement and use of ancillary services only.
Option C: Non-transmission, whole systems solution	This option involves addressing the identified need without constructing new transmission assets, instead relying on coordinated interventions across the wider electricity system.
Option D: Make use of existing assets	This option involves replacing existing substation assets to achieve the required uprating.
Option E: Build a new substation	This option involves construction of a new 400kV substation

We discounted Options A and C due to the inability of these options to facilitate the connection requests and therefore fulfil our licence obligation, Transmission Licence (Licence Condition D4A). We discounted option B as this would not have delivered a solution in end consumer interests, since it would have involved expensive constraint costs to remain within rating.

Option E was ruled out due to its long lead-time and its high overall cost to consumers. The long lead time would prevent project delivery in the time it is required for customers and to meet government ambitions. Option D was taken forward for further assessment at longlist as the key strategic option available.

A descriptive rationale for rejection or progression from the longlist is explained in Table 10.

3.2 Longlist of options considered

Prior to undertaking optioneering for this investment, National Grid commissioned a comprehensive programme of surveys and assessments, including a DH15 assessment and a full condition and fault-rating capability assessment of the existing CEGB Mark 1 AIS infrastructure. These works included site walkovers, detailed visual inspections, intrusive and non-intrusive materials testing, structural assessments, review of historical CEGB design information, and fault-duty and mechanical capability checks against a 63kA design requirement.



On this basis, the assessments concluded that widespread demolition and reconstruction of civil infrastructure was not warranted, and that reuse of the majority of existing foundations and support structures is feasible and beneficial. These findings directly informed the optioneering strategy by then enabling consideration of in-situ replacement and uprating options.

In line with our internal processes and Ofgem's Load Re-Opener Guidance, we have undertaken a proportionate multifactorial assessment of the options to identify the option that offers the best overall outcome for consumers.

We designed options and assessed them based on the balanced scorecard categories. Some of the options developed considered the Walpole West 400kV AIS Extension [redacted] an enabler for this investment. An overview of the assessment of our longlist options is provided in the table below.

Table 10: Assessment of longlist options

Option name and status (progressed/not progressed)	Technical Description	Relevant diagrams, layout or SLD reference	Consenting risk and environmental constraints	Rationale for rejecting or taking forward the option
Option A: Do minimum **Not progressed**	The network remains in its current state, and no new connections are facilitated.	N/A	N/A	**Engineering:** Does not meet the network requirements. Therefore, this option was not taken forward.
Option B: Market-based solution **Not progressed**	Increased customer demand is accommodated through the procurement and use of ancillary services only.	N/A	N/A	**Engineering:** Whilst this option would have allowed for connection of the enabled customers, their generation would have to be significantly constrained. This would lead to significantly higher constraint costs to end consumers. Therefore, this option was not taken forward as it was unable to deliver a solution within end consumer interests.
Option C: Non-transmission, whole systems solution **Not progressed**	The required customer connection is accommodated by a DNO instead of NGET.	N/A	N/A	**Engineering:** Does not meet the network requirements. NGET discounted this option early in the optioneering process [redacted] Therefore, this option was not taken forward.
D-1 in situ replacement of assets with units rated for 63kA **Progressed to shortlist**	In-situ replacement of existing infrastructure with units rated for 63kA, including: circuit breakers; current transformers; capacitive voltage transformers; disconnectors and earth switches; Main and Reserve busbars (with bolted A-frames); busbar support post insulators; V-strings; and overhead conductors. Existing equipment support structures will be reused where possible, with adaptor steelwork to suit new equipment fixings.	Layout in Appendix C	Works are primarily within the existing 400kV AIS substation footprint (in-situ replacement of existing equipment). Any consenting requirements would be limited to standard construction and environmental controls within an operational substation.	**Engineering:** Directly delivers the required increase in fault rating to 63kA via in-situ replacement, aligned with the required timeline to 2033.

Option name and status (progressed/not progressed)	Technical Description	Relevant diagrams, layout or SLD reference	Consenting risk and environmental constraints	Rationale for rejecting or taking forward the option
D-2 in situ replacement of V-string arrangements with new double busbar design **Not progressed**	In-situ replacement of the V-string arrangement, with high-level Main and Reserve busbars, low-level bay equipment, and pantograph-type busbar disconnectors. New structures will be required for this option due to the different bay design arrangement	N/A – not shortlisted	Works would be within the existing substation footprint; consenting impacts are expected to be similar to other in-situ solutions (standard construction/environmental controls).	**Deliverability**: This option was explored because it replaces the original CEGB Mark I arrangement with a more modern, standard configuration (high-level busbar and pantograph disconnectors). However, it requires extensive concurrent outages to demolish existing concrete foundations/structures and install new foundations and steelwork. Due to the interim stages required to maintain busbar continuity, [redacted] circuit can be converted per outage season, resulting in a forecast completion date of 2035. This also leads to a sub-optimal bay width, increasing complexity for maintenance activities.
D-3 phased OHL transfer via single circuit transposition, partial offline rebuild **Not progressed**	A phased OHL transfer, moving only one OHL connection at a time to alternative bays. The approach starts by uprating a designated spare bay (e.g., the [redacted] available after circuit transposition via the west extension). Circuits are then transferred sequentially using this bay, enabling the original bay to be upgraded with reduced outage durations. SGT, bus section and bus coupler bays would be uprated in situ as per Option D-1.	N/A – not shortlisted	Third party agreements will be needed with [redacted] adjacent to [redacted]. Temporary works associated with conductor re-stringing operation may need existing solar panels to be removed/protected for the duration of the works. This has the potential to cause complications with the programming of these works and [redacted] r. Erection of [redacted] may not require planning permission from the local authority if the requirements for Section 37 are met. However current outage programme for this option assumes [redacted]	**Constructability:** This option introduces additional interfaces with the West Extension, as it requires the [redacted] h circuit transposition to be completed before uprating can commence. **Deliverability:** Although circuit outage durations can be reduced, the programme required to complete each transfer stage (including cabling, database and protection changes) means [redacted] bay can be completed per outage season, pushing the overall programme to a 2035 completion.
D-4 phased OHL transfer via multiple circuit	A phased OHL transfer in which two circuit transfers take place in parallel where feasible. SGT, bus section and bus coupler	Layout in Appendix C	Works would be largely within the existing substation footprint; consenting impacts are expected to be similar to other in-situ solutions	**Constructability:** This option introduces additional interfaces with the west extension, as it requires the

Option name and status (progressed/not progressed)	Technical Description	Relevant diagrams, layout or SLD reference	Consenting risk and environmental constraints	Rationale for rejecting or taking forward the option
transposition, partial offline rebuild **Progressed to shortlist**	bays would be uprated in situ as per Option D-1. Move multiple circuits together to achieve a shorter program of works duration than Option D-3.		(standard construction/environmental controls). In addition, this option requires temporary towers to divert some OHLs to the west extension spare bay.	[redacted] circuit transposition to be completed before uprating can commence. **Deliverability:** Although circuit outage durations can be reduced, the programme required to complete each transfer stage (including cabling, database and protection changes) remains significant. As two circuit transfers can run in parallel where feasible, the overall programme gives a completion date of 2034. This option was shortlisted because it delivers an earlier completion date than D-3 and reduces outage durations on the affected circuits.
E-1 Complete GIS offline build **Not progressed**	Construct a new 400kV GIS substation on the decommissioned 132kV AIS site to replace the CEGB infrastructure, and transfer circuits from the AIS to the GIS via underground cables.	N/A – not shortlisted	Although the GIS would be located on National Grid-owned land within the decommissioned 132kV AIS compound, cable crossings beneath the existing 400kV AIS would sterilise the area for any future replacements.	**Constructability**: This option would interconnect existing OHL and SGT circuits to a new GIS substation. There are considerable risks, including installing cables beneath a live AIS (through fire hazard zones) and long GIB runs to connect the new GIS to the existing AIS east and west sections. Cable installation beneath the live site would be complex. To retain the OHL rating, [redacted] which are difficult to route between the existing 400kV AIS foundations and would also drive additional 132kV cable crossings. **Deliverability and cost**: Longest overall project lead time; unable to meet delivery year of 2033. Highest overall cost.

In summary, Options A-C were rejected due to their inability to meet the load and system need drivers.

On option C, we considered whether this investment could be addressed through alternative whole-system measures, including operational measures, generation management and network reconfiguration. While such measures may influence short-term fault contributions, no credible whole-system alternative could provide a permanent and compliant reduction in fault level sufficient to maintain operation of the existing CEGB Mark I infrastructure beyond 2033. The preferred option therefore represents the most appropriate whole-system solution because it resolves the limitation at the point where the constraint arises whilst supporting wider generation and transmission connections already progressing within East Anglia and the wider transmission network.

Options D-2 and D-3 were rejected due to their engineering complexity and outage complications, which would push the delivery year into 2035.

Options D-1 and D-4 were selected for shortlisting due to their more favourable engineering characteristics that made delivery more feasible than the other options.

Option E-1 was rejected due to its long lead time and highest overall cost to consumers.

Stakeholder influence on shortlisting

No formal objections have been received to date. NGET has undertaken ongoing engagement with local communities, councils and other key stakeholders throughout the development of the investment. This included a public consultation between May and June 2024 comprising both face-to-face and virtual events, alongside continued engagement through local authority briefings and community liaison groups. Local authorities were informed in early 2026 of the upcoming planning permission application (for Walpole West 400kV AIS Extension), and briefing discussions were held with councillors – reference to this investment was also made. Engagement has also continued through other projects in the area, including updates provided via [redacted].

In addition, [redacted] until our interim solution (described in section 3.6 below) can be put in place from 2030.

3.3 Shortlisted options

As part of the optioneering process, a range of technical options were assessed to achieve compliance with required fault levels while maintaining system security and deliverability. From this assessment, Options D-1 and D-4 were shortlisted for further consideration as they provide technically feasible uprating solutions without the need for wholesale replacement of the existing substation arrangement.

Option D-4 was shortlisted as an alternative approach that achieves the required fault rating compliance while reducing the requirement for long term outages on the bay and related circuit or SGT for the whole duration of the works.

The Walpole fault level uprating scheme incorporates future-proofing through the specification of higher-capability circuit breakers than required under current standards. The proposed switchgear will be specified for a [redacted] This reduces the derating applied under high X/R network conditions, increasing the usable fault level capability of the

installed plant and providing additional headroom for future network growth without the need for further circuit breaker replacement.

The shortlisted options are listed below and described in the following subsections:

- **Option D-1:** In-situ replacement of existing infrastructure (as required) with units rated for 63 kA.
- **Option D-4:** A phased OHL transfer in which two circuit transfers will take place in parallel for partial offline rebuild (multiple circuit transposition).

Description of short-list options considered

Option D-1: In-situ replacement of assets with units rated for 63kA

Proposed works:

Under this option, the existing bay layout, conductor geometry and busbar arrangement are retained, with full in-situ replacement of primary plant that does not meet the required 63 kA/1 second fault rating. All existing bay equipment is replaced like-for-like with new equipment rated to 63 kA, including:

- Circuit breakers
- Current transformers (CTs)
- Capacitive voltage transformers (CVTs)
- Disconnectors and earth switches
- Main and reserve busbars, including replacement of busbar tubing and bolted A-frames
- V-string assemblies and suspended overhead conductors

Existing busbar support post insulators are replaced as part of the uprate.

Where practicable, existing steel support structures and foundations are retained and reused, with minor adaptor steelwork introduced where required to accommodate new equipment interface geometry.

Civil, Structural and DH15 Considerations:

[redacted]

How it addresses need:

- Directly delivers the required increase in fault rating to 63kA via in-situ replacement, aligned with the required timeline to 2033.

Drawings:

- Example layouts of the equipment replaced with this option for a typical feeder bay, SGT bay and for the bus sections are listed in Appendix C.

Option D-4: A phased OHL transfer in which two circuit transfers will take place in parallel for partial offline rebuild (replacement via multiple circuit transposition)

Proposed works:

Option D-4 adopts a phased delivery strategy, combining in-situ uprating of equipment with temporary circuit diversions and staged circuit transpositions to enable parallel working and reduce overall circuit outage duration.

Primary plant within the SGT, bus section and bus coupler bays is uprated in-situ, consistent with Option D-1. However, instead of progressing on a single-circuit basis for the feeder bays, multiple circuits are transferred concurrently to spare bays, also making use of [redacted] West Extension, allowing [redacted] bay [redacted] taken out of service [redacted].[11]

Optioneering indicates that the overall uprating works could be delivered in five defined stages, as illustrated in the layout drawings referenced in Appendix C.

Spalding North Circuit Diversion:

A key differentiator for Option D-4 is the requirement for temporary diversion of the Spalding North circuit to facilitate staged works.

[redacted]

To achieve the required thermal rating large conductor sizes [redacted] are required with multiple cables per phase.

The route is assumed to be installed using standard trenching and positioned close to the site boundary to minimise clashes and excavation. However, key constraints to this are:

- Proximity to live 400 kV overhead lines and tower foundations significantly constrains the available corridor
- The cable trench must remain outside the tower foundation uplift influence zone
- Potential interaction with buried earthing spurs and existing or parallel UKPN circuits may reduce achievable cable rating and require further survey or diversion

[11] A companion EL submission has been made in the October 2026 window for the Walpole West 400kV AIS Extension.

Option D-4 was developed as an evolution of option D-3 looking to reduce the duration of feeder circuit outages. This option offers a programme-optimised delivery strategy compared to Option D-3 through staged circuit transpositions and parallel works. While technically feasible, it introduces significant additional complexity, temporary cable works outside the substation boundary, and higher delivery risk compared to Option D-1.

How it addresses need:

- Delivers the required increase in fault rating to 63kA; although the overall programme gives a completion date of 2034. This option was shortlisted because it delivers an earlier completion date than D-3 and reduces outage durations on the affected circuits.

Drawings:

- Example layouts and SLDs describing the stage of works for this option are listed in Appendix C.

The System Design Table (SDT) for each option is provided within Appendix B.

In appraising these two options, we undertook a proportionate, multi factor qualitative assessment to determine which option delivers the best overall outcome for consumers, while meeting the investment drivers. The results are summarised in Table 11.

3.4 Qualitative assessment of shortlist

Table 11: Multifactorial analysis

Option	Optioneering categories				
	Engineering	**Environmental**	**Deliverability**	**Economic / consumer value**	**Consenting / stakeholder**
All shortlisted options			Heavily rely on system access due to the type of asset intervention and works explored in the options.		
Option D-1: In-situ replacement of existing infrastructure with units rated for 63kA	This option delivers the required fault-rating. The approach is technically feasible and builds directly on the findings of the condition, fault-rating and structural assessments. [redacted] However, engineering activities must be carefully managed within a constrained live substation environment and rely on successful integration of new equipment with retained legacy infrastructure.	Maximises reuse of existing foundations and support structures, significantly reducing demolition, waste generation and embodied carbon associated with new civil works. Localised replacement works limit ground disturbance and material use, aligning well with sustainable development principles and reducing carbon construction emissions.	Deliverable within the existing substation footprint [redacted] However, deliverability is sensitive to outage planning and construction sequencing within a live operational environment. The approach requires careful interface management but benefits from reduced scope and a more contained worksite. This option has the shortest overall programme for delivery.	More cost-effective, as it avoids widespread demolition and reconstruction of civil infrastructure and minimises the extent of new foundations and structures. Capital expenditure is reduced through asset reuse, and construction costs are lower due to the more targeted scope of works.	Minimises consenting and stakeholder risk by retaining the majority of existing infrastructure and limiting works to the established substation boundary. All works are covered under permitted development. Reduced construction scope lowers the likelihood of stakeholder objections and simplifies engagement with statutory and operational stakeholders
	Neutral	Benefit	Benefit	Benefit	Benefit
Option D-4: phased OHL transfer in which two circuit transfers will take place in parallel for partial offline rebuild	As per Option D-1, this option achieves fault-rating compliance. This option benefits from shorter outage durations required on the feeder circuits connecting at Walpole 400kV by transposing them to a spare bay on site to reduce overall system operation impact.	Results in a greater environmental footprint (carbon emissions) due to the increased extent of primary works and associated overhead line interventions. Additional construction activity and removal of existing assets increase material consumption and waste generation when compared with Option D-1, leading to higher carbon impacts.	Increased delivery risk due to the broader scope of works, including overhead line outages and a higher number of interfaces with system operations. The larger construction footprint and greater coordination requirements increase programme complexity and reduce flexibility in outage sequencing, even though outage durations are shortened overall. This option does not allow completion of uprating works by 2033; pushes delivery into 2034	Requires higher capital expenditure driven by additional primary works and overhead line modifications and is not in the interest to consumer.	Additional considerations associated with overhead line interventions and a broader construction footprint. Increased interface with external parties and system operators may lead to greater consenting complexity and stakeholder engagement requirements.
	Benefit	Detractor	Detractor	Detractor	Detractor

Qualitative assessment output

As set out in our multifactorial qualitative analysis (Table 11) above, whilst both options meet the required rating, option D-1 tests most positively against the assessment criteria.

On engineering, both options D-1 and D-4 provide a technically compliant solution that meets the required fault-rating. Option D-4 tests most positively against this criterion as it has shorter outage durations. Option D-1 tests neutrally against this criterion as the engineering activities must be carefully managed in a live substation environment.

Option D-4 tests negatively on environmental, due to its increased carbon impacts. Option D-1, in contrast, tests positively on this as it maximises use of existing foundations and support structures, significantly reducing demolition, waste generation and embodied carbon associated with new civil works.

Option D-4 tests negatively on deliverability, due to increased complexity associated with the OHL and cable works involved (pushing the delivery year into 2034). In contrast, Option D-1 performs best as it is deliverable within the existing substation footprint and aligns with the assessed condition of the existing infrastructure; it also has the shortest delivery programme, enabling delivery in 2033.

Option D-4 tests negatively against economic/consumer value and consenting / stakeholder criteria, as this option features higher costs and increased interaction with external parties due to the additional works involved. In contrast, Option D-1 tests positively on economic/consumer value and consenting/stakeholder criteria as it is the most cost-effective solution overall and has no additional stakeholder considerations (all works covered under permitted development). Consequently, this option best supports consumer value in the long term and for these reasons Option D-1 is our preferred option.

PASE alignment

This project is not directly represented by any specific PASE category. Option D-1 retains the existing bay layout, conductor geometry and busbar arrangement. It provides full in-situ replacement of primary plant that does not meet the required 63 kA fault rating. All existing bay equipment (which is part of a 400kV double busbar AIS substation) will be replaced like-for-like with new equipment rated to 63 kA.

On this basis, whilst it is technically not a new substation build or an extension, because this option remains consistent with the existing substation arrangement, there is no obvious departure from the PASE framework. Further, given the companion EL submission for the Walpole West Extension is PASE aligned, we consider option D-1 on this investment (for which our preferred solution is to replace assets of the same substation to achieve the uprating) is also PASE aligned as a variant option.

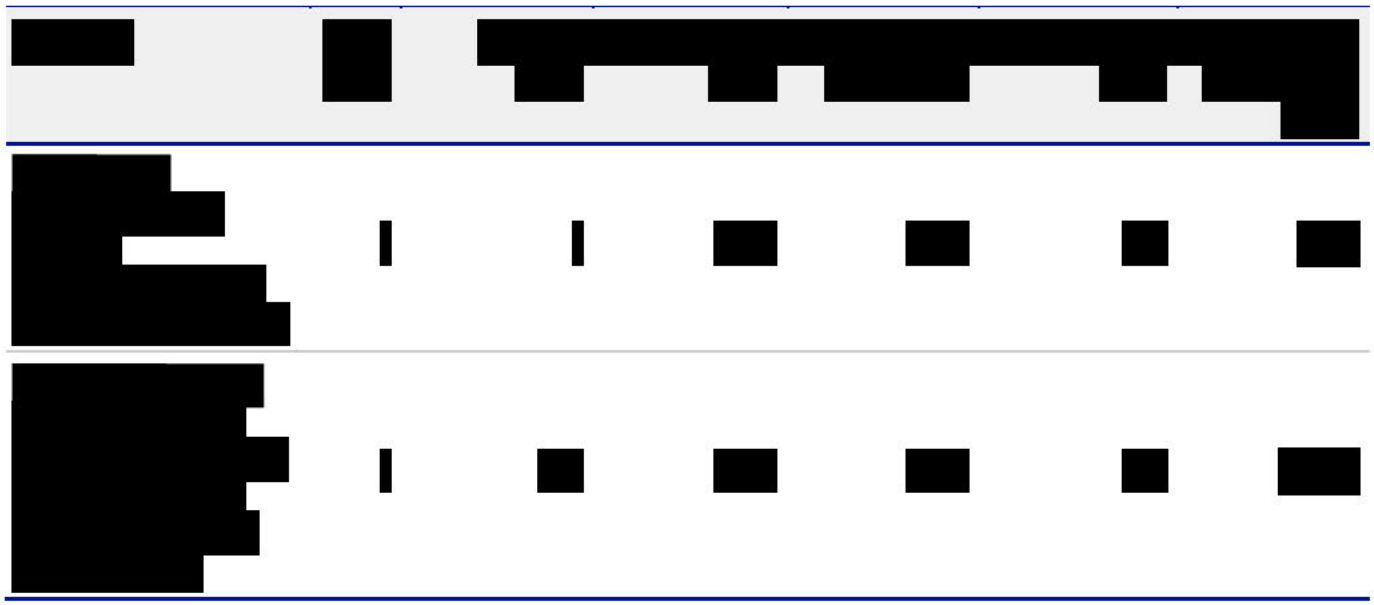
3.5 Quantitative analysis of shortlist options

Cost estimates of shortlist options

To assess the shortlisted options, cost estimates have been created for quantitative economic comparison. All cost estimates have been determined using a parametric cost estimating methodology suitable for the stage of development and option selection based on the scope of work and the new assets to be acquired for each option.

At each stage of project development, there are uncertainties associated with construction, commercial, stakeholder and supply chain activities, as well as external events, which may impact cost and schedule outcomes. Consistent with the level of project maturity at EL stage, the current estimate includes a [redacted]. This allowance has been informed by National Grid's experience of previously delivered projects and the risk events encountered during delivery, providing a proportionate representation of project uncertainty at this stage. Detailed QSRA and QCRA assessments will be completed as part of Project Assessment to further quantify project-specific risks and update the allowance where appropriate.

[redacted]



Option D-1 is significantly more cost effective due to the reduced complexity of works when compared against option D-4.

Option D-4 adds significant circuit diversion works which are not required for Option D-1. It involves multiple circuit transfers: OHL diversions, new temporary tower works, additional foundations, and HV cable route for the Spalding North circuit. Added cost is also due to P&C changes required at each stage after transposition. All of which contributes to option D-4's increased overall costs.

Cost Drivers

The project's cost estimates are based on current market conditions, with ongoing work to refine requirements:

- **Design development costs**, including FEED development, detailed design, validation of the retained Mark 1 arrangement, and finite element / mechanical assessment of the existing V-string and busbar support arrangement.
- **Survey and investigation costs**, including condition assessments of existing structures and foundations, intrusive surveys where required, and any pre-construction checks to confirm reuse of existing concrete and steelwork.
- **Primary plant procurement**, including replacement with higher specification 63kA-rated circuit breakers SF6-free, CTs, CVTs, disconnectors, earth switches, post insulators, busbars and associated fittings.

- **Construction, installation and commissioning**, including removal of existing equipment, replacement of busbar sections, V-strings and bay equipment, installation of adaptor steelwork, minor foundation/structure repairs, and works within a live 400kV AIS substation.

Cost Benefit Analysis (CBA)

Purpose and approach

Our Cost Benefit Analysis (CBA) evaluates the economic efficiency and consumer value of the proposed transmission investments. This analysis aligns with Ofgem's Load Re-Opener Guidance and Submission Requirements.

The CBA process integrates monetised benefits such as constraint cost savings, system efficiency improvements, and consumer bill impacts, alongside a comprehensive Whole-Life Cost Analysis (WLCA) that captures capital expenditure, replacement cycles, carbon impacts, and future extendibility. This dual approach ensures a balanced assessment of both short-term economic benefits and long-term cost efficiency, avoiding the risk of asset stranding or future inefficiencies.

Our CBA considers:

- Robust optioneering and sensitivity testing: We have evaluated credible alternatives, including 'do nothing' and 'do minimum' scenarios, to confirm that the preferred solution delivers the optimal balance of technical performance, environmental impact, and economic benefit.
- Quantification of constraint cost reductions: Using system operator modelling outputs and historical data, we quantify expected savings from reduced system constraints, which translate into direct consumer bill benefits.
- Assessment of delay impacts: The financial consequences of potential project delays on constraint costs and consumer bills are modelled through risk-adjusted scenarios, providing a clear understanding of the value of timely delivery.
- Inclusion of socio-economic benefits: Where quantification is challenging, qualitative evidence supported by stakeholder engagement and regional development plans highlights the wider economic benefits, including job creation and inward investment.
- Consideration of non-monetised benefits: We explicitly identify benefits that are qualitative or not readily monetisable, such as enhanced system operability, resilience, and environmental improvements, ensuring full transparency of the value proposition.
- Alignment with policy and government targets including Net Zero and AI Growth Zones: The CBA reflects the influence of national and local policies, including Clean Power 2030, net zero commitments, and economic growth plans demonstrating how the investment supports the broader energy transition.

We have assessed consumer value by comparing the whole-life costs and benefits of two shortlisted connection and substation delivery options using Ofgem's RIIO-ET3 CBA template. The assessment is completed relative to a counterfactual and on a discounted basis over a 50-year appraisal period (2027–2076), consistent with the CBA methodology.

For each option considered, we have quantified:

- Initial CAPEX investment required.

- Future end of life replacement cost.

The supporting CBA model quantifies the costs and benefits for this project. Using the Ofgem RIIO-ET3 CBA template spreadsheet, the CBA compares the discounted cost and benefits for consumers for the following two shortlisted options.

- **Option D-1:** Uprating of existing CEGB Mark 1 Equipment - Upgrade existing infrastructure as required, i.e. in-situ work.
- **Option D-4:** Multiple circuit transpositions leading to sequenced partial Offline Build - Implement partial offline construction to transfer multiple circuits for larger section replacements, reducing impact on transmission network due to long term outages.

CBA outcome

Lifetime Cost-Benefit Analysis: The lifetime costs and benefits refer to a 50-year period starting from 2027 until 2076.



On the basis of the discounted lifetime CBA results (Table 13), Option D-1 delivers the highest NPV and therefore represents the preferred option on consumer value grounds. Options D-4 delivers a lower NPV than D-1 This recommendation analysis is subject to confirmation through deliverability, consents/land, outage and risk considerations, and any CBA sensitivities (e.g. carbon price trajectories) set out in the assumptions below.

Assumptions of the CBA analysis

The CBA results are based on the following high-level assumptions (with sensitivities used to test robustness where appropriate):

- Appraisal period of 50 years (2027–2076), with costs and benefits discounted and presented relative to the counterfactual.

  Price base: 2023/24 prices, aligned to the Ofgem RIIO-ET3 CBA template inputs (including treatment of replacement CAPEX and maintenance).
- Carbon: central base case carbon price applied for monetising construction carbon, SF6/alternative gas leakage and losses, with scenario testing for alternative carbon price trajectories.
- Benefits scope applied consistently across options; where option-specific benefits exist (e.g. constraints), the basis and evidence are documented and applied consistently.
- Key sensitivities considered (as applicable): timing/phasing, CAPEX uncertainty ranges, delivery/outage risk, and benefit parameter uncertainty (including losses and leakage assumptions).

Costs



Benefits

The following benefits have been included within the CBA:

- SF6/Alternative gas leakage.
- Carbon cost of construction.
- Transmission loss.

Table 15 presents the summary of all (undiscounted) benefits, including environmental and non-environmental benefits, considering the central base case carbon price.



3.6 Preferred solution

Based on the outputs of our multifactorial analysis and CBA, our preferred option is to deliver Option D-1 as this option offers the most optimal whole-life value and is a technically compliant solution. This option delivers consumer value through targeted intervention only where it is required.

Detailed condition, structural and fault-rating assessments identified that the primary limitation relates to fault-duty capability of the CEGB Mark I primary plant rather than civil or structural deficiencies. As a result, the preferred option maximises reuse of existing foundations, support structures and gantries whilst replacing only those assets required to achieve 63kA compliance (i.e. that constrain future fault-level capability), rather than reconstructing the wider substation. This significantly reduces cost, embodied carbon, programme duration and construction risk, and avoids unnecessary replacement of assets with significant residual life when compared with rebuild alternatives whilst achieving the same operational outcome. Consequently, the preferred option delivers technical fault-level compliance at the lowest whole-life cost to consumers.

Further, our preferred solution represents a least-regret intervention because it delivers compliance with identified fault-level requirements while maximising utilisation of existing assets and preserving future development flexibility at Walpole. The approach ensures that future generation and network developments are not constrained by the remaining CEGB Mark I equipment. It therefore provides an appropriate balance between present system requirements and future network uncertainty.

In addition, this solution secures asset health benefits by replacing relevant assets at the site, which will address asset health issues for 20 of the 53 assets identified in section 2.2 above.

Engineering acceleration opportunity (interim solution from 2030-2033)

In addition to our preferred solution Option D-1 above, in 2026 we identified an opportunity to better meet customer needs and maximise end-consumer value by reducing the impact of the current 2033 delivery year of the investment, allowing acceleration of customer connections ahead of this date (relevant customers contained in Table 5).

This additional solution was devised due to connections reform and revised CPAs indicating the fault levels at Walpole would impact connection dates for customers. Due to this and the volume of contracted customers that would be affected accordingly (see section 2.1 and Appendix E for Phase 1 and Phase 2 lists), this has accelerated the requirement to uprate ahead of the 2033 delivery year. To ensure we are able to offer customers the best possible connection dates, this solution has been devised, in addition to our preferred option D-1.

This interim, standalone intervention will enable these customers to connect earlier than would be the case if only the preferred solution (Option D-1) is implemented. This allows customers to connect from 2030. Without this additional intervention, these customers would be unable to connect at full TEC until the works associated with Option D-1 are fully completed in 2033.

[redacted]

Ultimately, this is not a lasting solution [redacted] Accordingly, this can only be an interim solution — Option D-1 will be needed to achieve [redacted] uprating to 63kA, to avoid connection customer or end consumer detriment.

Therefore, this does not remove the need for the full 63kA uprating by 2033 but instead provides a targeted interim solution to manage forecast fault levels and reduce the impact on customer connection dates and constraint costs. This does not change or impact the features or costs of option D-1, or any of the other options. Once this investment's works are completed in 2033, the interim solution will no longer be in place as the replacement assets will then be able to natively run at 63kA.

We will implement this intervention for the benefit of contracted customers and end consumers as this has no detriment to these stakeholders, this investment, or any of the overall Walpole site strategy. The design of this solution concluded in July 2026. Indicative forecasts put the approximate cost of this at [redacted] At this stage, we are seeking for the cost of implementing this interim solution to be included as part of this load re-opener submission at the Project Assessment stage, due to the significant benefit it provides to customers in the region. The cost for this solution is not currently accounted for in the [redacted] estimate for Option D-1 or our CBA, reflecting that this a separate intervention to our preferred solution.

We welcome Ofgem input and engagement on this matter and the inclusion of the funding request at Project Assessment stage.

[redacted]

Project benefits and outputs

Table 16: Summary of outputs and benefits

Output:	Description
Outputs and benefits	• Replacement of existing infrastructure with units rated for 63kA/1 second. • Enables new large generation connections across the region, including at Norwich, Necton, Walpole B, Walpole, EGL3, EGL4 and GWNC which directly contribute to increasing fault levels at this site. • Leads to increased operability of the Walpole substation and maintains SQSS compliance by allowing the assets to operate within fault level ratings (achieving adherence to section 2, obligations 2.10.5 and 2.10.9). • By managing rising fault levels, the investment removes a critical constraint. The increased fault level capability should ensure that windfarms in the region are subject to less curtailment, thus consumers face lower constraint costs.

4. Delivery

4.1 Delivery year and indicative timeline

This programme will complete by 2033. The programme timeline is driven by the outages required to complete the works and is aligned with the customer connection and new overhead line commissioning dates in 2033 which require these as enabling works. Currently, these are due to span across [redacted] Outage programme optimisation is being carried out as part of the current phase of development, but feasibility is largely driven by system access constraints.

As noted above in section 3.6, the interim engineering acceleration opportunity does not alter this investment's delivery year: it remains 2033.

In addition, the Walpole B Substation project, which is currently in development, has outages planned [redacted] There will be a need to closely coordinate with these outage works, as works for this investment also include outage periods; we will coordinate the works to avoid overlap of the outages to maintain SQSS compliance. Outage plans are currently in development, and we will re-sequence works for this investment once these outcomes become known.

Figure 5 details the high-level program for Option D-1. Key assumptions with this program are:

- Uprating outages are assumed to be secured through the normal outage planning process.

[redacted]

- The outage sequence remains subject to [redacted] confirmation and may affect the final delivery date if outages are not secured.

[redacted]





4.2 Procurement and contracting strategy

To ensure robust contract management and cost control, the works at Walpole have been separated into distinct work packages.

- Package 1 – Walpole West 400kV AIS extension (contained in a separate EL submission).
- Package 2 – Walpole 400kV CEGB Mark 1 Uprating.

[redacted]

Front End Engineering Design (FEED) work is already being undertaken for this investment (Package 2) [redacted]

The Circuit Breakers for this investment (Package 2) which are long lead time are being procured via [redacted].

As noted above, this investment forms part of the overall Walpole Site Strategy, which comprises a companion EL submission: Walpole West 400kV AIS Extension. Whilst these are being delivered as independent investments, these are being developed in a coordinated manner. We are exploring all opportunities to maximise efficiencies, including outage coordination to ensure SQSS compliance is maintained. Additional information regarding our procurement strategy and supplier selection will be presented in the Project Assessment.

4.3 Risks and risk management

An overview of current delivery risks is listed below along with mitigations. As risks continue to evolve, an updated detailed view of risk and mitigations will be supplied within the Project Assessment submission.

Table 17: Summary of risks and mitigations

Risk	Mitigation
Long lead items not secured in line with programme due to supply chain constraints, leading to delays and additional cost.	• Early identification of long-lead equipment and procurement risk. • Early engagement with suppliers and use of framework or bulk purchase arrangements where available. • Alignment of procurement strategy with delivery programme.

Risk	Mitigation
Interface risk with adjacent projects, customer works, or parallel National Grid schemes, leading to clashes, sequencing issues or inefficient site access.	[redacted] • Regular interface and coordination meetings with all relevant stakeholders. • Integrated programme reviews to identify and manage conflicts early.
Working at height and near live HV equipment (overhead conductors, V-string insulators, bus bar disconnectors and switchgear on Mark 1 substations), including exposure to hazardous substances (PCBs, SF6) and vibration from demolition/construction.	• Develop and trial safe methodologies before use – e.g. Mark 1 conductor and V-string replacement proven through trials at Penwortham AIS substation. • Work to single bus bar / circuit outages with maximum clearance from live equipment, using safe systems of work, stage-by-stage clearance drawings, and SAP-led switching and proximity outages. • Appropriate PPE and controls for hazardous substances (PCBs, SF6), with regular leak and condition inspections. • Contractor to review equipment tolerance limits and select methods that avoid outages, managing vibration effects.
Construction activities introduce safety risks, restrict access to live assets, or disrupt ongoing operations, potentially causing delays or incidents.	• Clear demarcation of work zones and exclusion areas. • Development of construction management plan upon completion of FEED. • Regular safety assurance, audits and reviews throughout delivery. • Isolation, earthing and voltage controls maintained throughout, with safety distances observed at all times.
Unforeseen ground conditions, contamination, archaeology or environmental constraints encountered during construction, leading to re-design, delays and additional cost.	• Early and comprehensive site investigations and surveys. • Allowances and contingencies within programme and cost estimates. • Agreed procedures for managing discoveries (e.g. contamination, archaeology). • Early engagement with environmental specialists and regulators as required.

5. Conclusion

This submission outlines a preferred solution to satisfy the investment drivers. It seeks confirmation of eligibility under Special Condition 3.18, confirmation of eligibility of PCF under Special Condition 3.15, confirmation of re-opener Track 2 EL and formal Ofgem approval of the Needs Case and preferred solution. We will request allowances at the Project Assessment.

The preferred option D-1 consists of In-situ replacement of existing infrastructure (where required) with units rated for 63kA.

Table 18: Submission summary

Submission summary	
Main drivers	Primary: Load (enabling works for customer connections): the fault level rating must be increased from 50kA to 63kA to accommodate the increased load on the network. Secondary: asset health. [redacted]
Preferred option	D-1 consists of In-situ replacement of existing infrastructure (where required) with units rated for 63 kA.
Estimated cost and timing	[redacted] estimated delivery year of 2033.
Outputs	• Fault level capability increased from 50 kA to 63 kA. • Walpole remains compliant under future fault level conditions. • Capability provided to accommodate forecast increases in network demand.
Proposed PCD	An evaluative Price Control Deliverable (PCD) to deliver the fault level uprating investment by 2033, increasing fault level capability to accommodate forecast network conditions and maintain safe and compliant operation of the site.

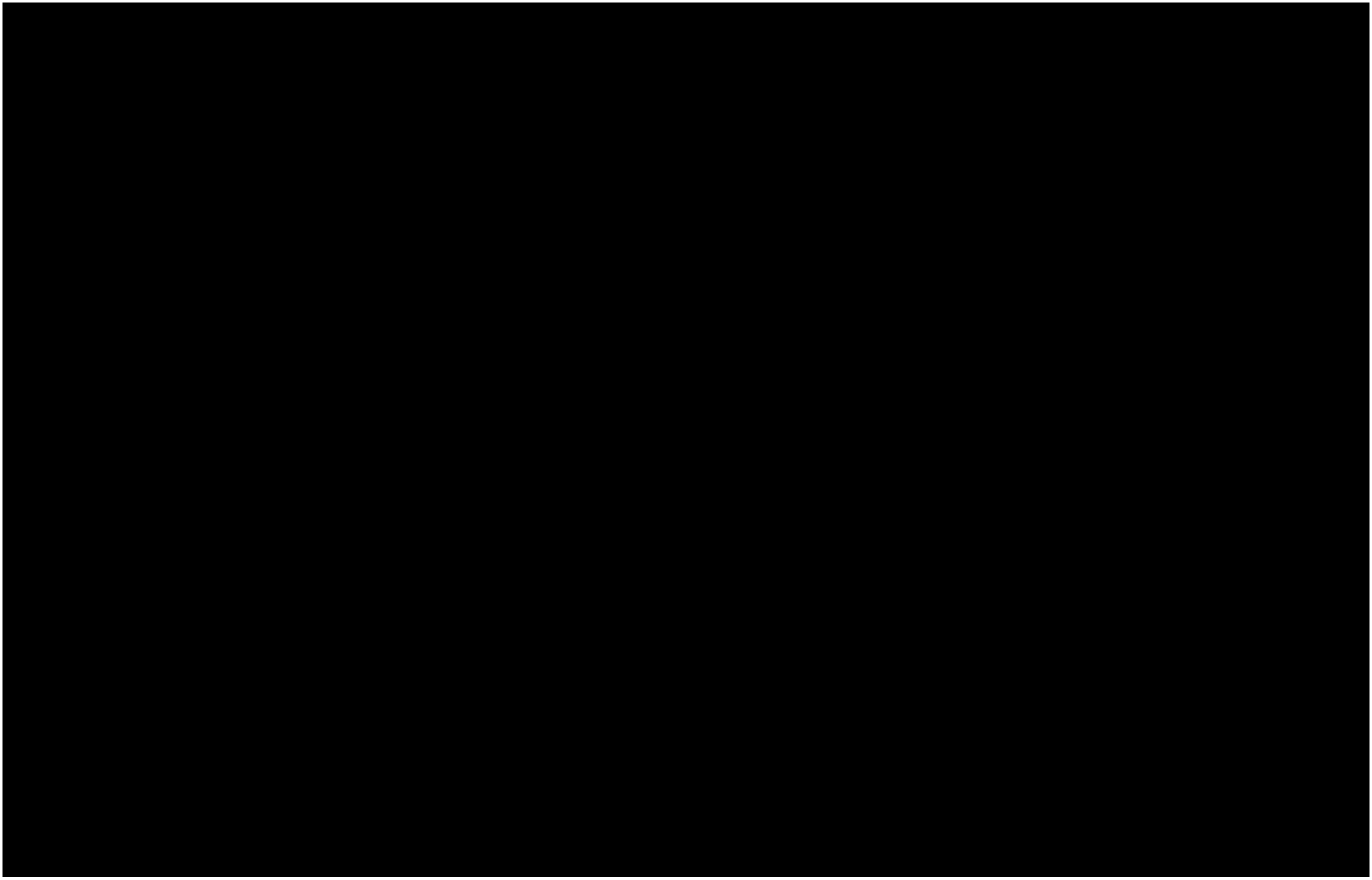
Appendix A
Glossary

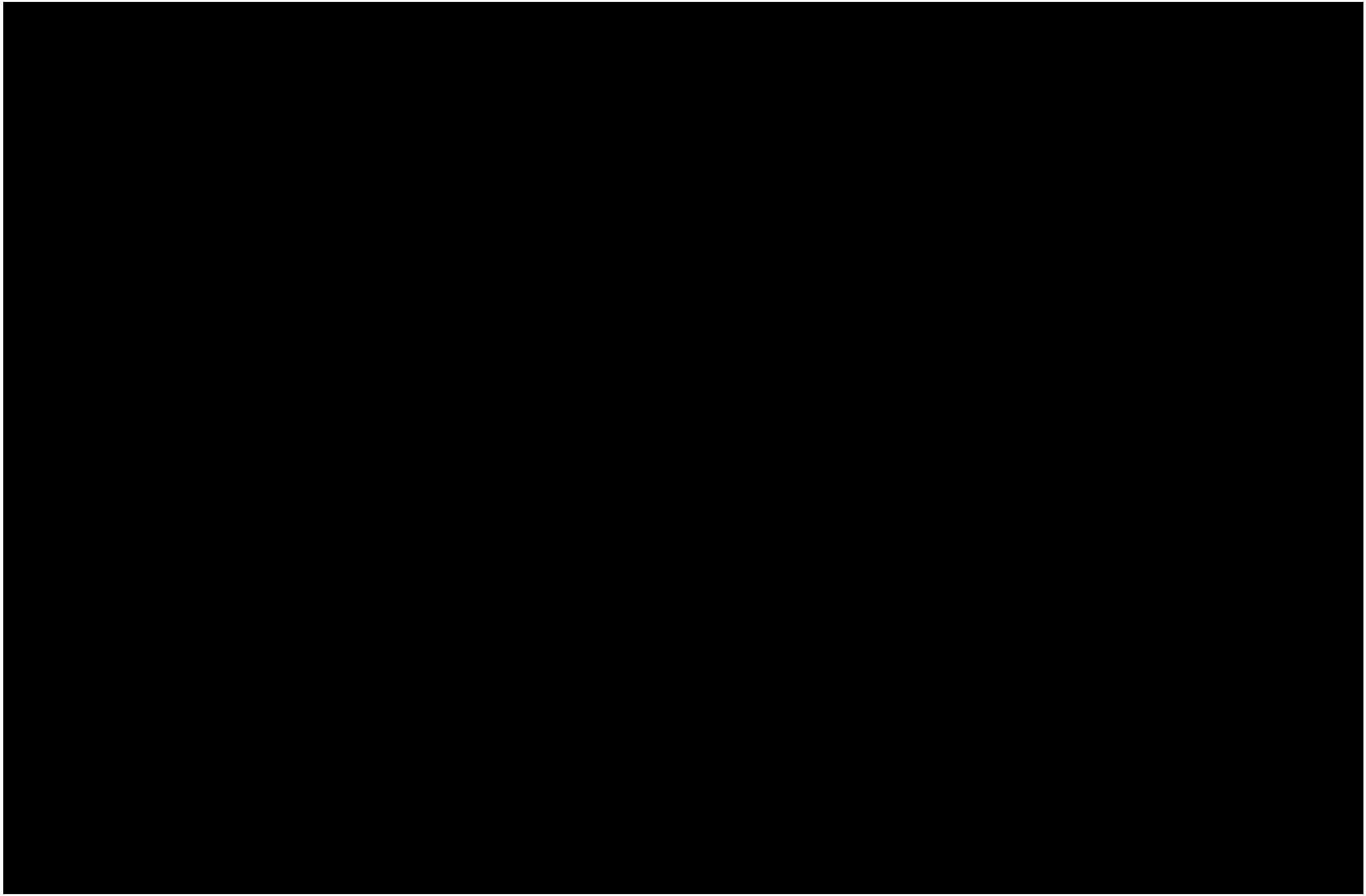
Table 19: Table of abbreviations and definitions

Abbreviation	Description
ACL	Available For Commercial Load
ACSR	Aluminium Core Steel Reinforced
AIS	Air Insulated Switchgear
APM	Advanced Procurement Mechanism
ASTI	Accelerated Strategic Transmission Investment
BESS	Battery Energy Storage System
BP	Business Plan
BPDT	Business Plan Data Template
CAI	Closely Associated Indirect
CBA	Cost Benefit Analysis
CEGB	Central Electricity Generating Board
CPA	Construction Planning Assumptions
CPO	Compulsory Purchase Order
CSNP	Centralised Strategic Network Plan
CT	Current Transformer
CVT	Current Voltage Transformer
DC	Direct Current
DCO	Development Consent Order
DESNZ	Department for Energy Security and Net Zero
DISC	Disconnector
DNO	Distribution Network Operator
EAWO	Early Asset Write Offs
ECC	Estimated Cost of Construction
EEW	Early Enabling Works
EJP	Engineering Justification Paper

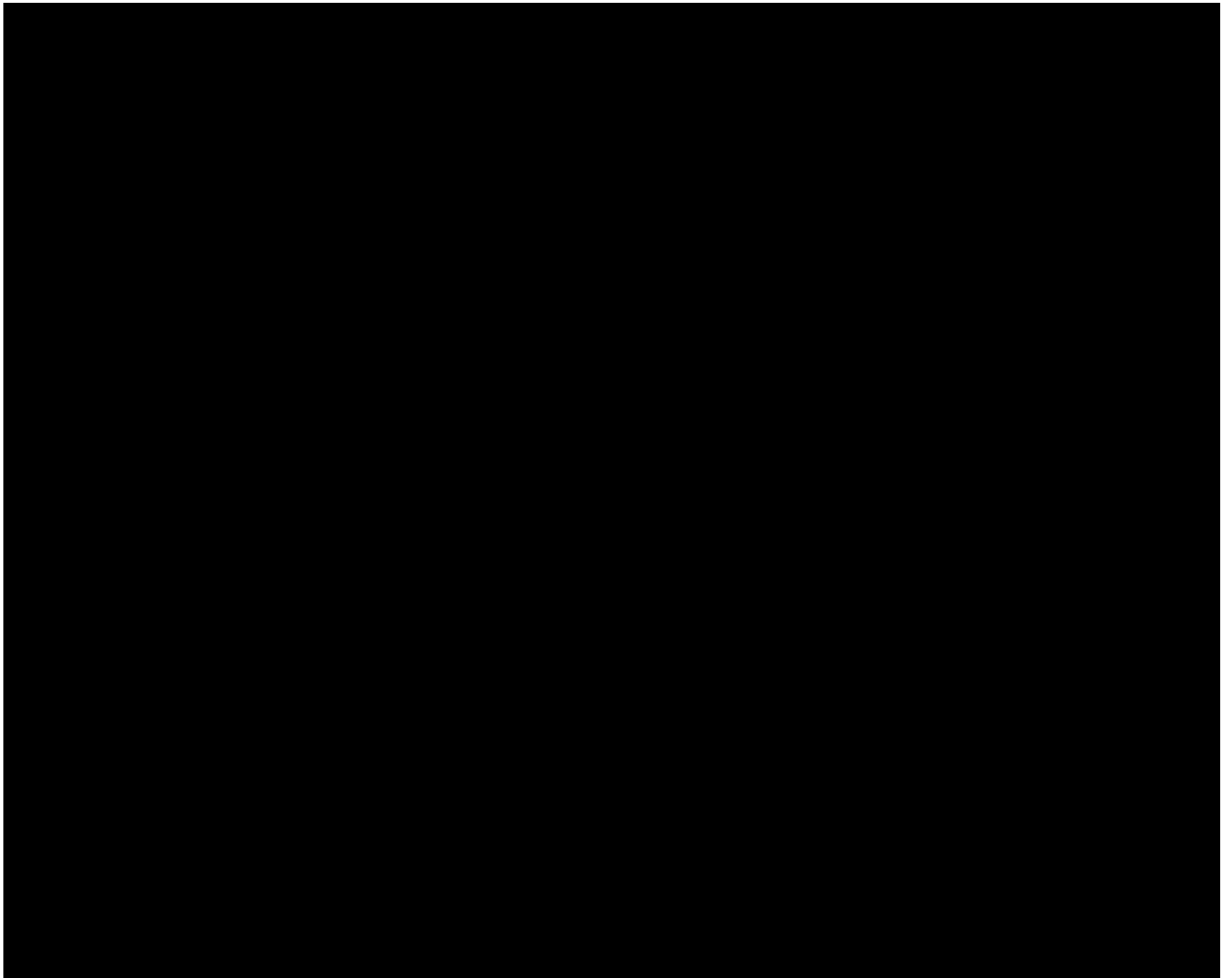
Abbreviation	Description
EL	Eligibility Letter
EoL	End-Of-Life
EPC	Engineering, Procurement and Construction
ESO	Energy System Operator
ET	Electricity Transmission
ETP	Electricity Transmission Partnership
EU	European Union
EUL	Estimating Units Lines
ESW	Earth Switch
FEED	Front End Engineering Design
FES	Future Energy Scenarios
FY	Financial Year
GIB	Gas Insulated Busbar
GIS	Gas Insulated Switchgear
GLA	Greater London Authority
GSP	Grid Supply Point
GW	Giga Watt
HND	Holistic Network Design
HV	High Voltage
iDNO	Independent District Network Operator
kW	Kilo Watt
LLTI	Long Lead Time Items
LRR	Load Related Re-opener
LTDS	Long-Term Development Statement
LV	Low Voltage
MSIP	Medium Sized Investment Project
MVA	Megavolt-Amperes
MW	Mega Watt
NESO	National Energy System Operator
NETS	National Electricity Transmission System

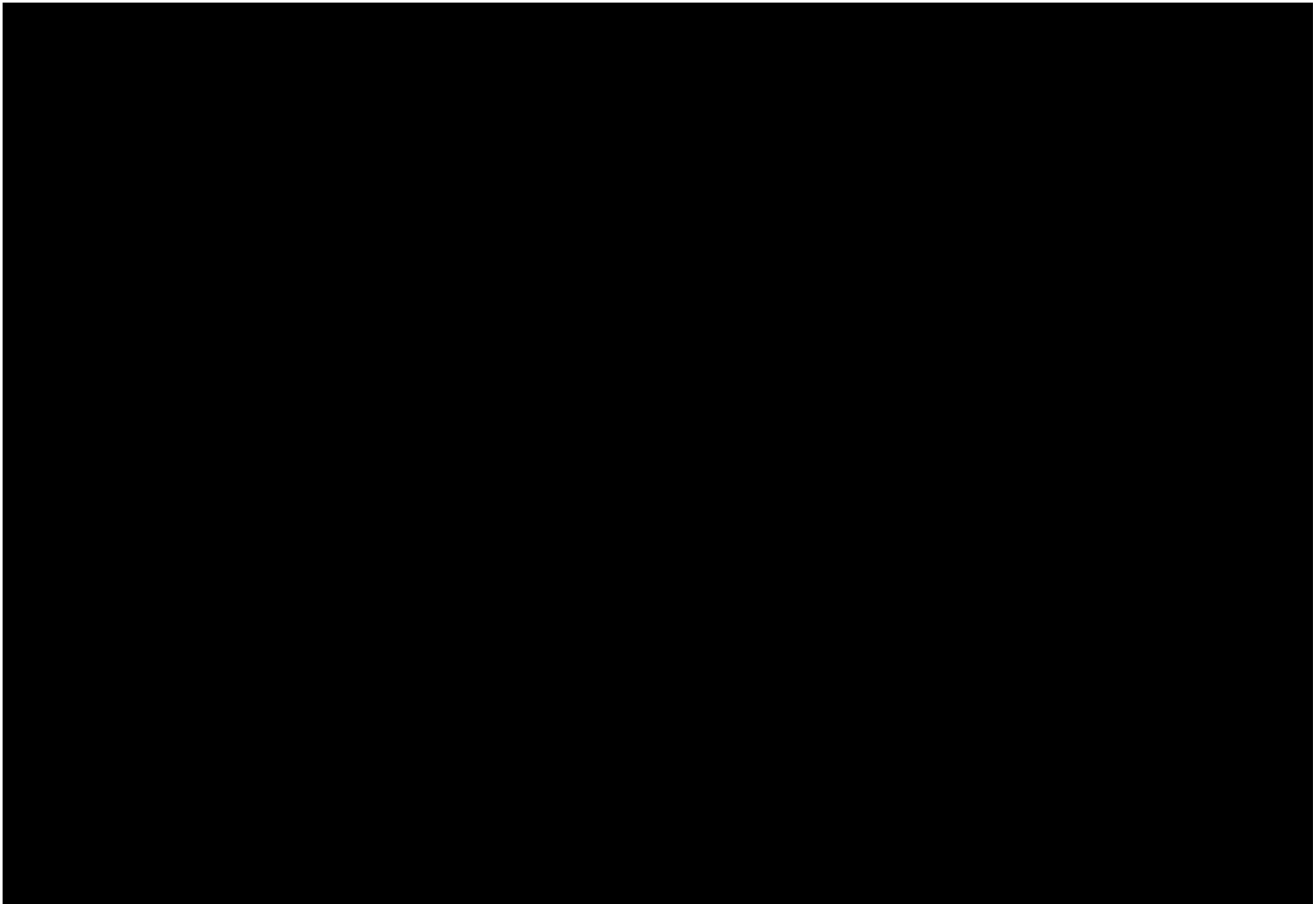
Abbreviation	Description
NG	National Grid
NGED	National Grid Electricity Distribution
NGET	National Grid Electricity Transmission
NOA	Network Options Assessment
NPV	Net Present Value
OHL	Overhead Line
P&C	Protection and Control
PASE	Pre-Approval of Solution Engineering
PCB	Polychlorinated Biphenyl
PPE	Personal Protective Equipment
PCD	Price Control Deliverables
PCF	Pre Construction Funding
QCRA	Quantitative Cost Risk Analysis
QSRA	Quantitative Schedule Risk Analysis
SDS	System Design Specification
SDT	System Design Table
SQSS	Security and Quality of Supply Standard
SF6	Sulfur Hexafluoride
SGT	Super Grid Transformer
SLD	Single Line Diagram
TEC	Transmission Entry Capacity
TBC	To Be Confirmed
tCO2e	Tonnes of Carbon Dioxide Equivalent
TCPA	Town And Country Planning Association
TCSNP	Transitional Centralised Strategic Network Plan
UIOLI	Use It or Lose It
UK	United Kingdom
UKPN	UK Power Networks
WLCA	Whole-Life Cost Analysis

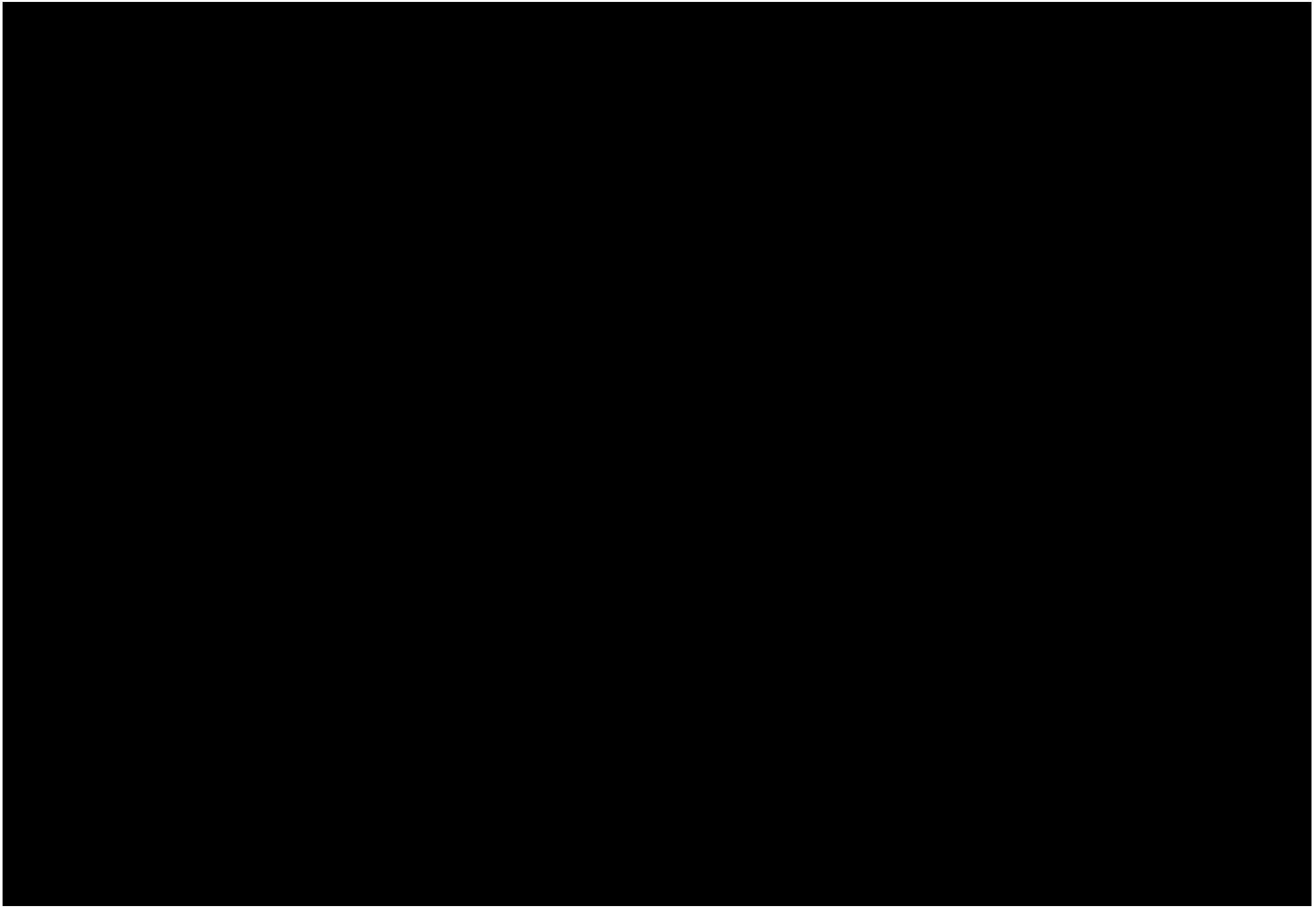


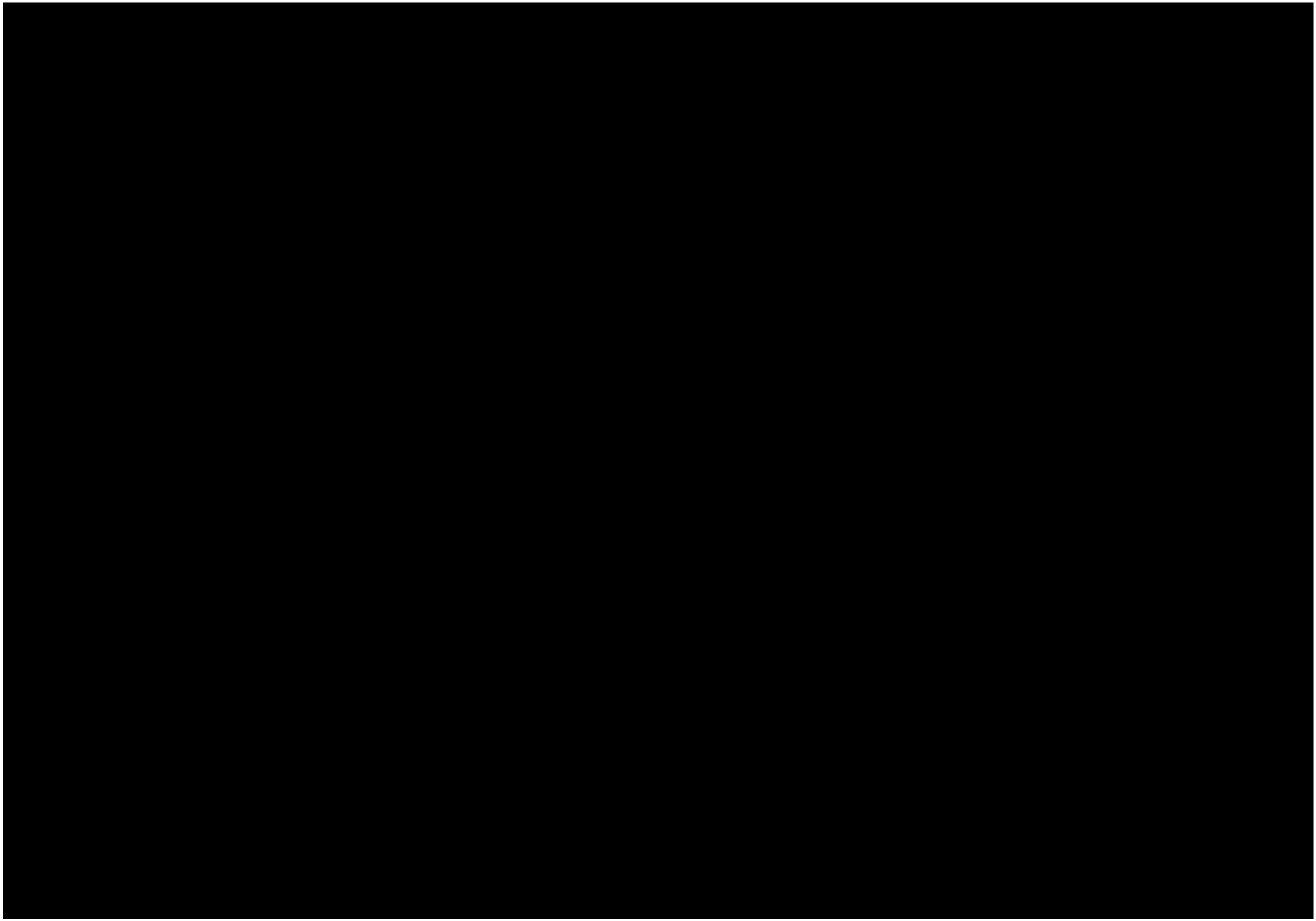


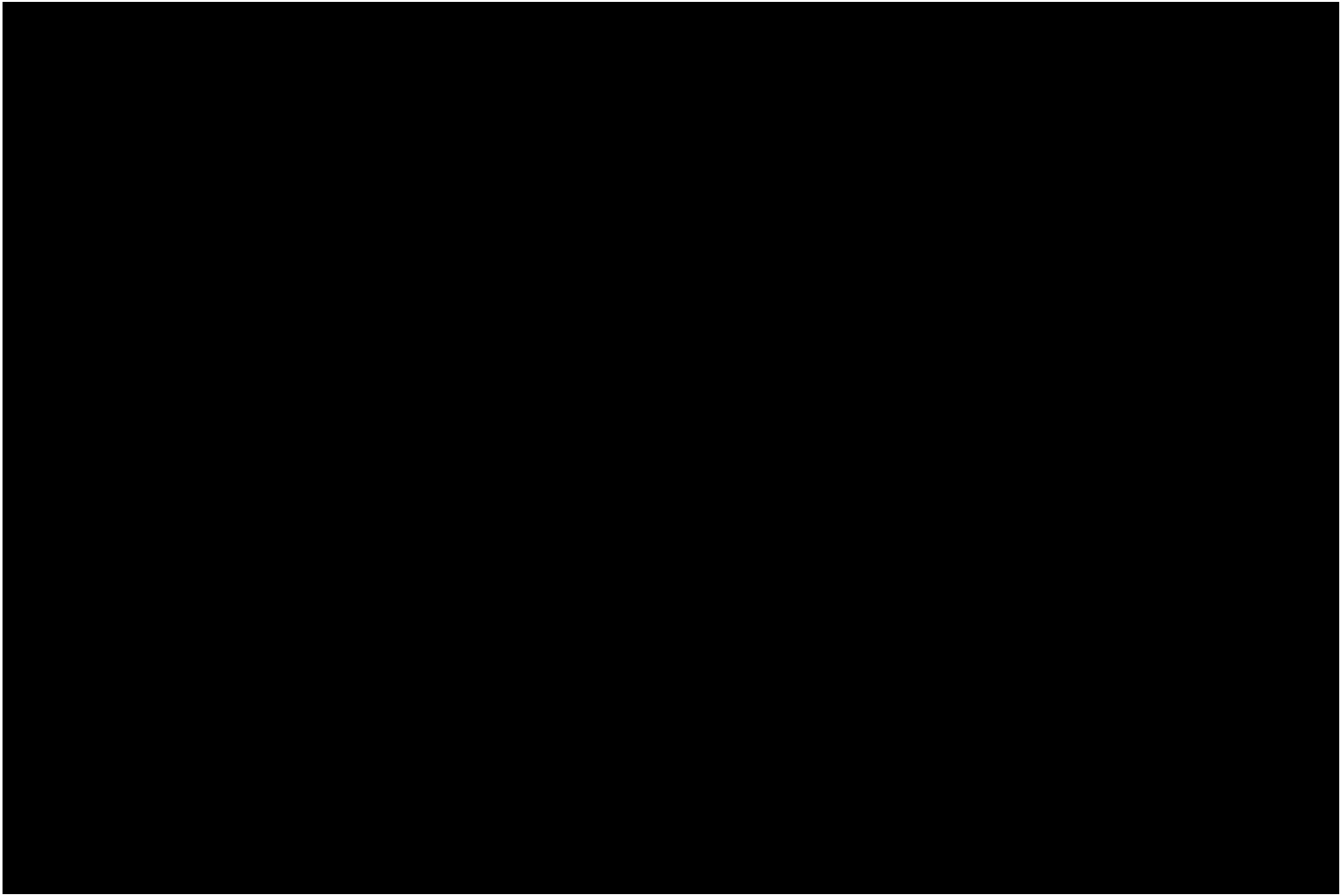


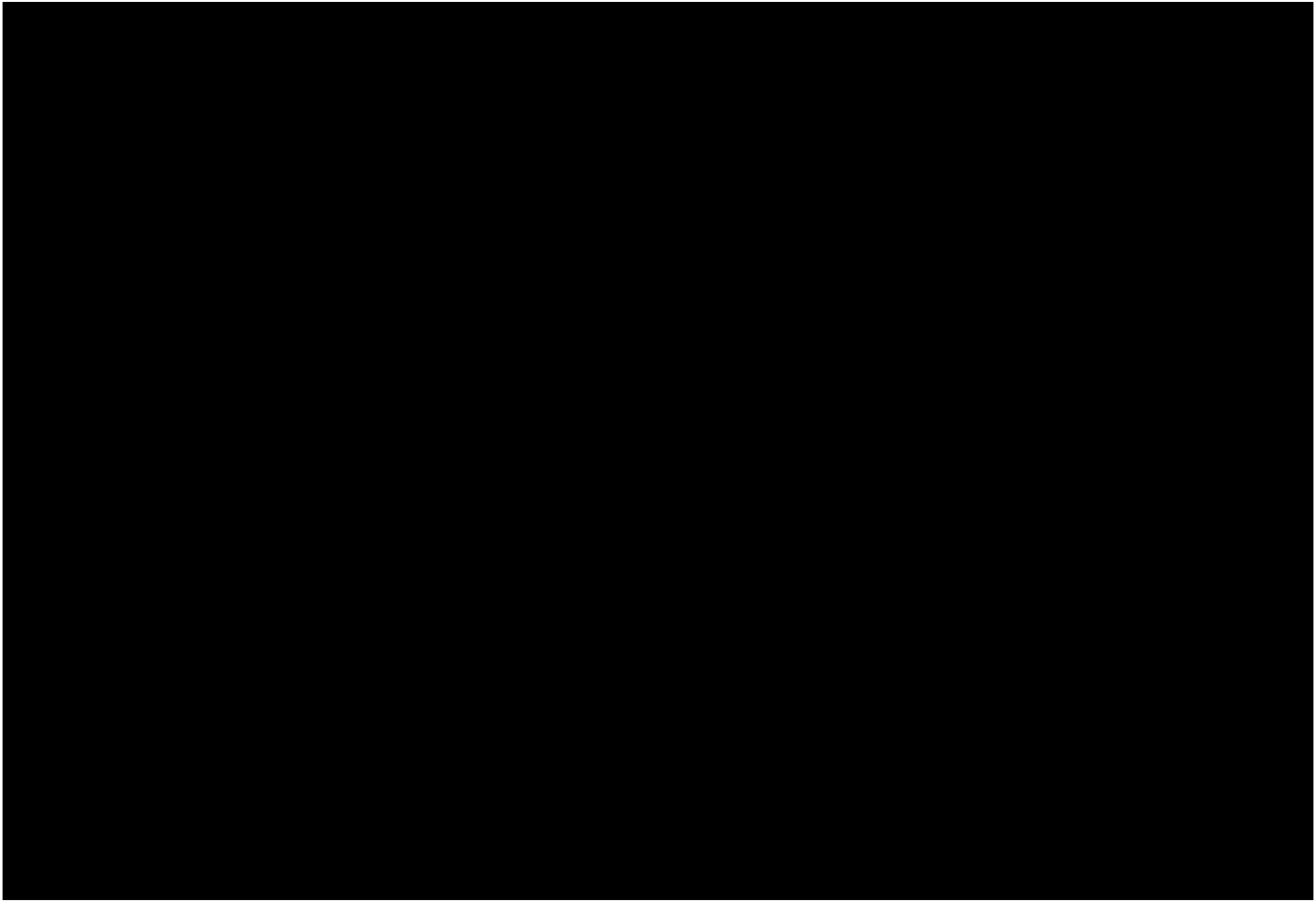


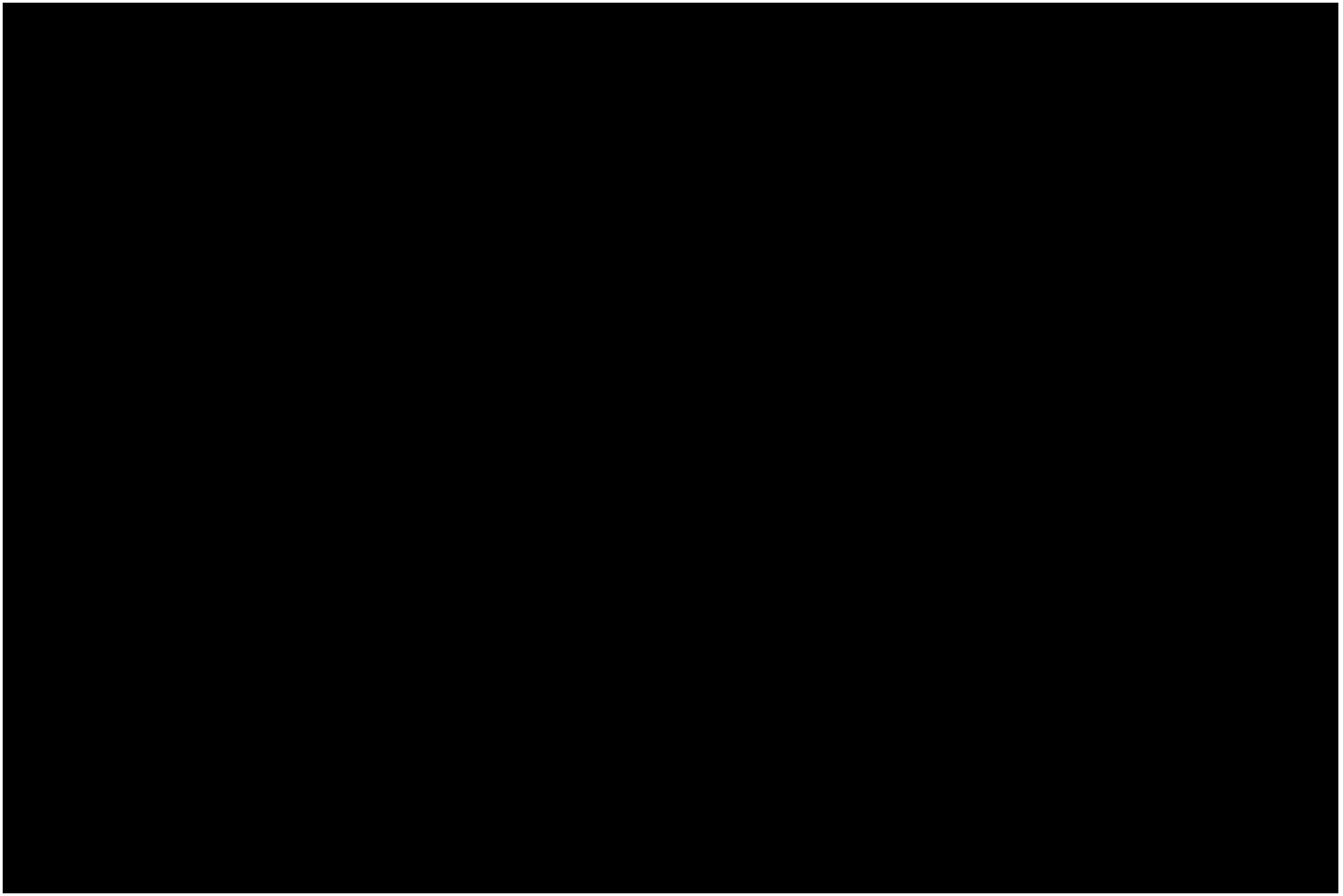


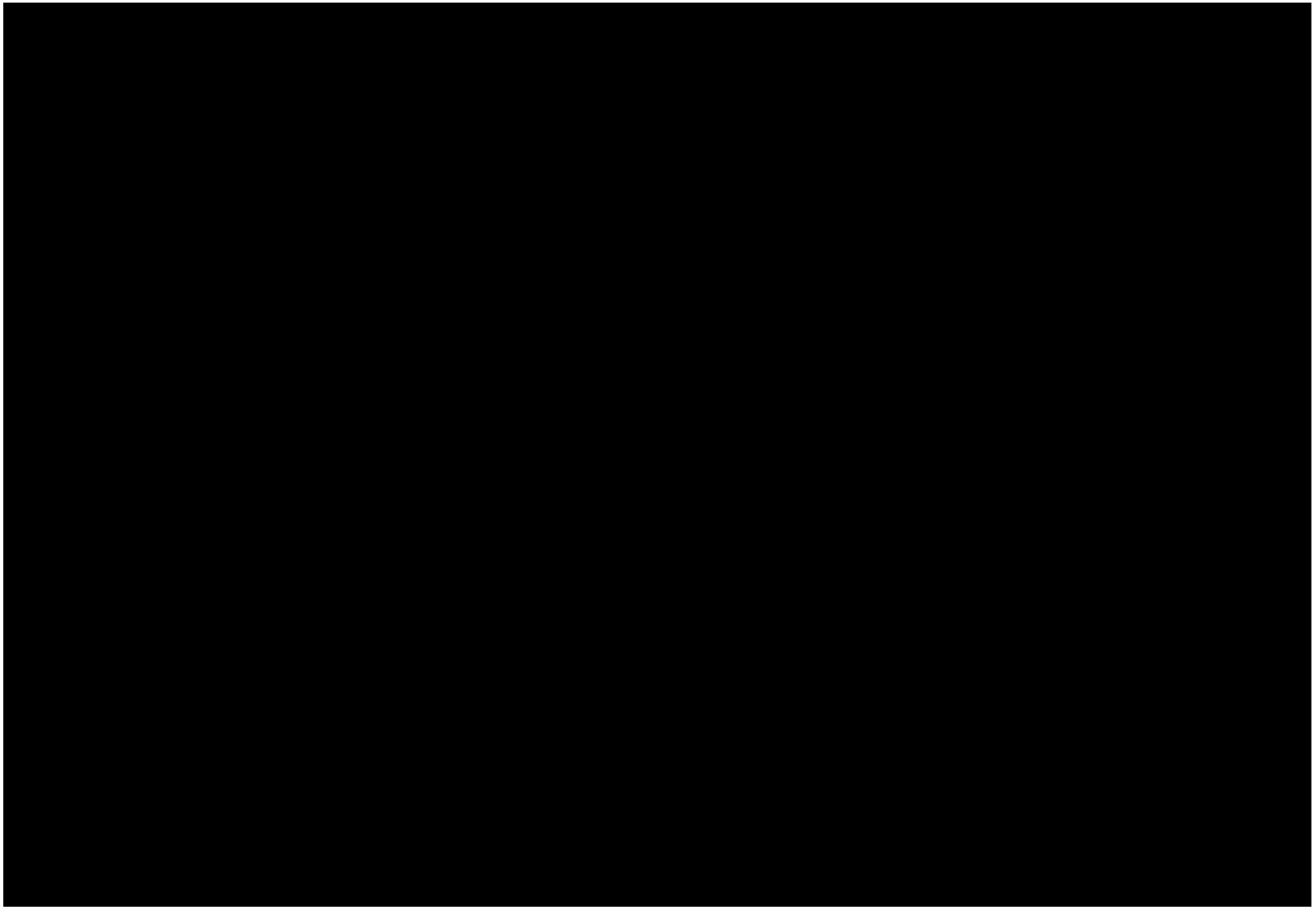


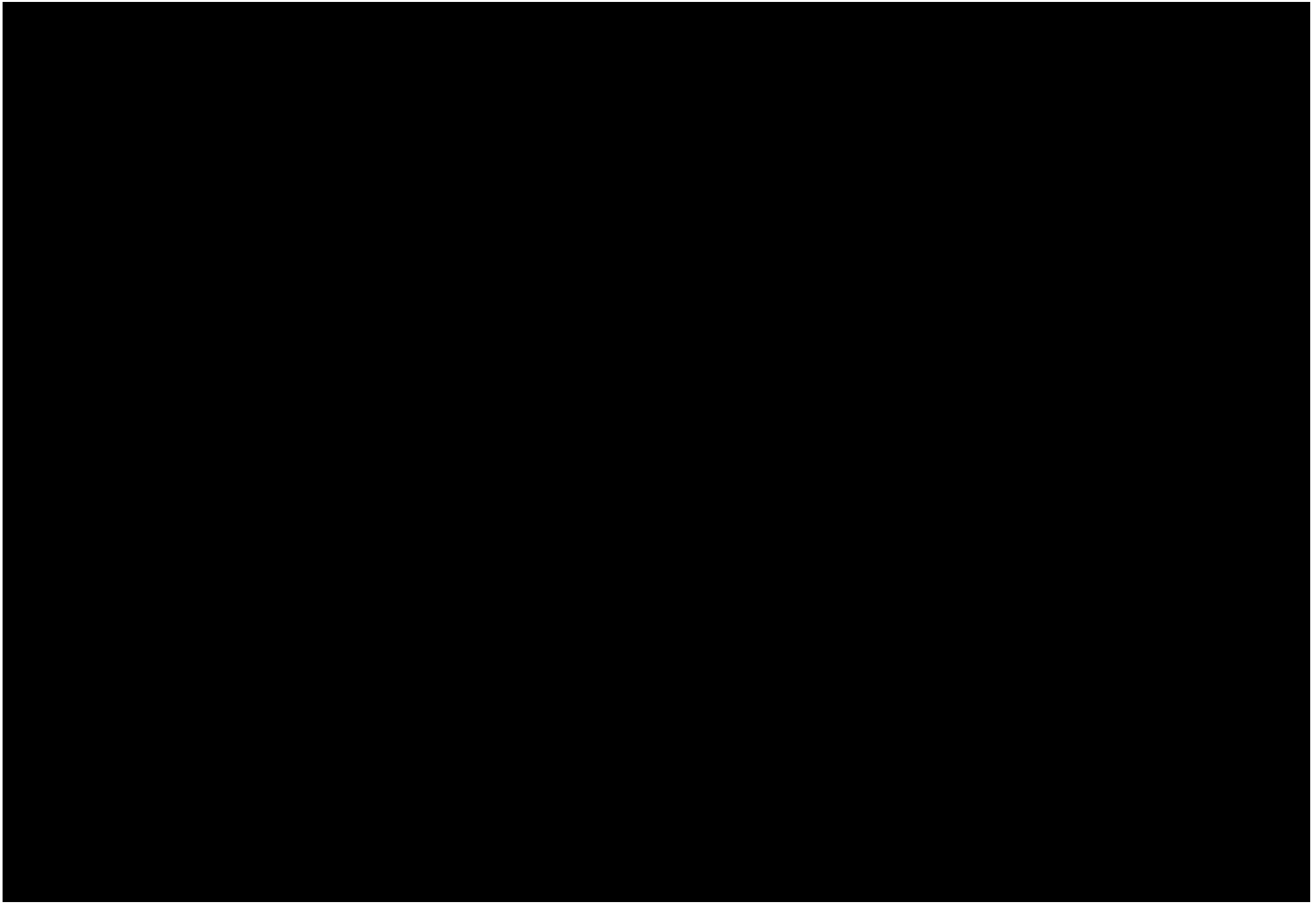


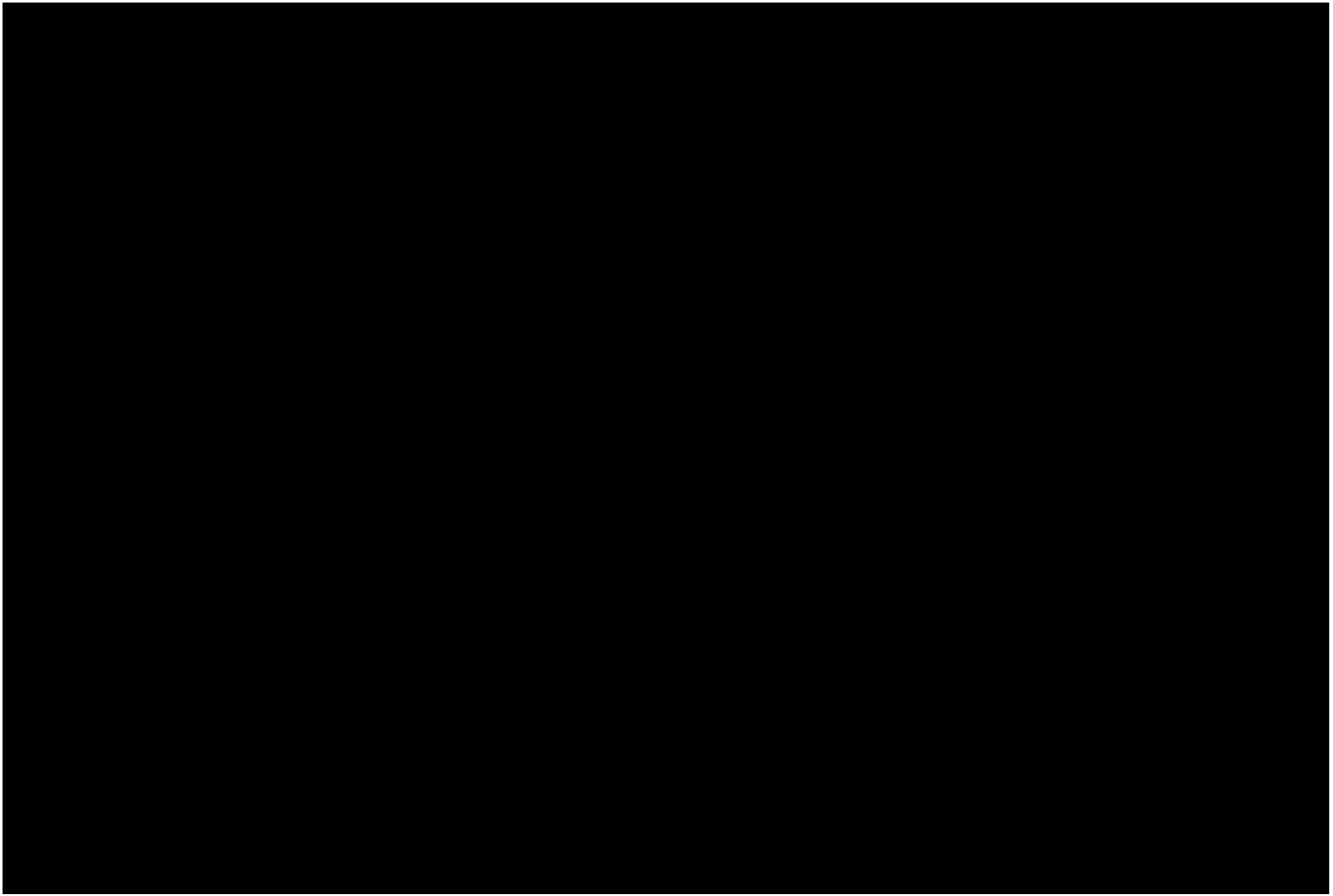


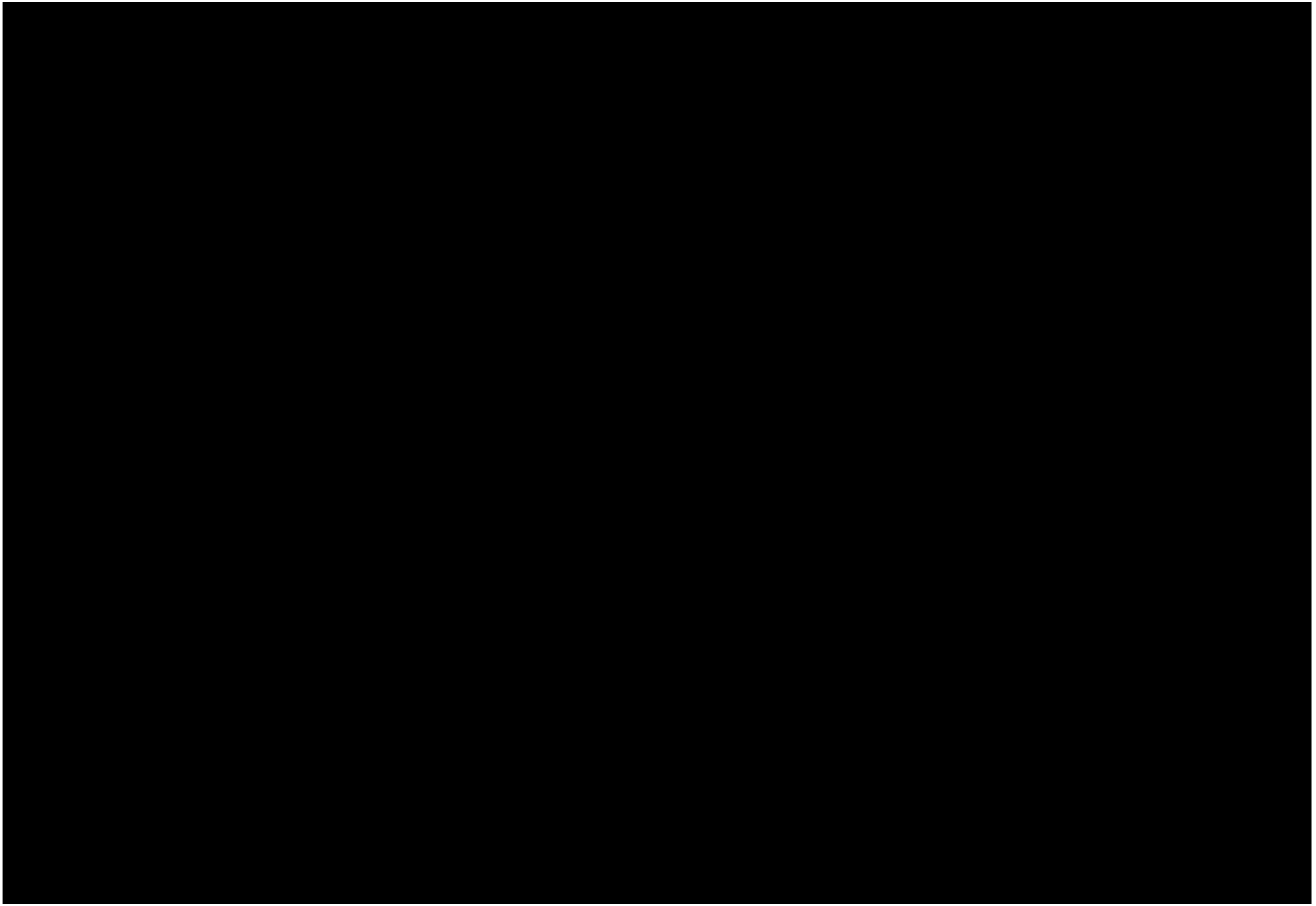


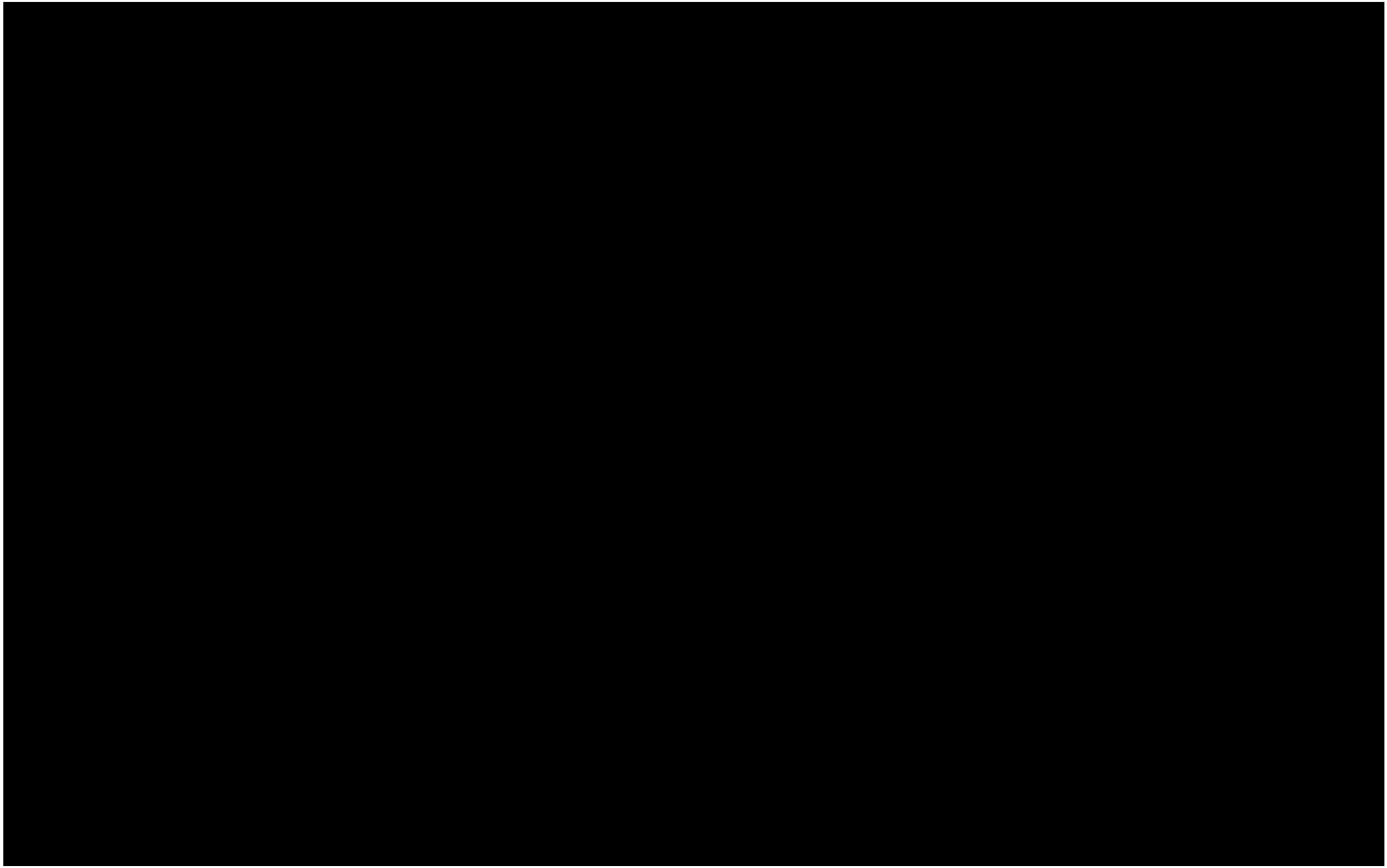


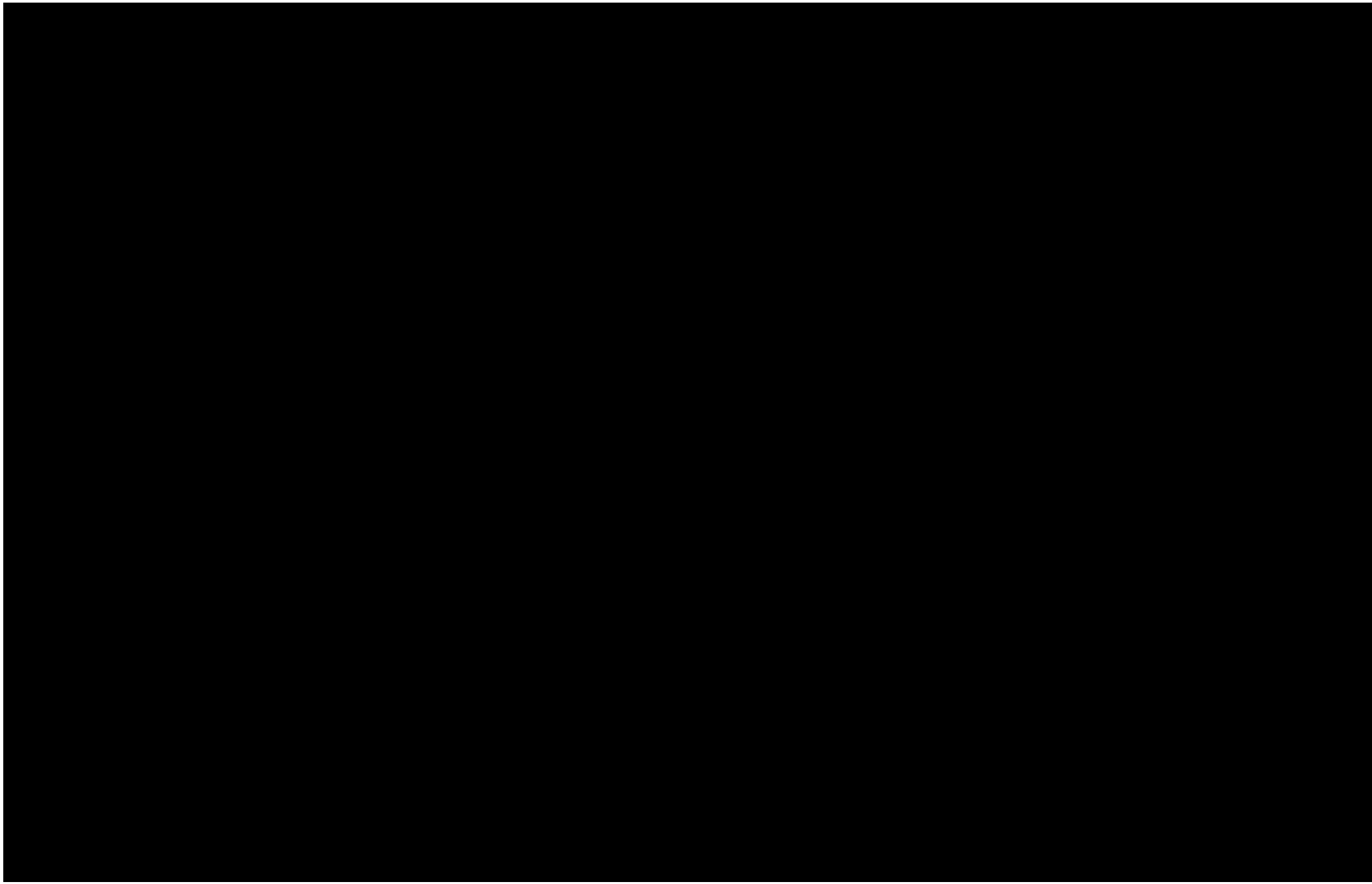


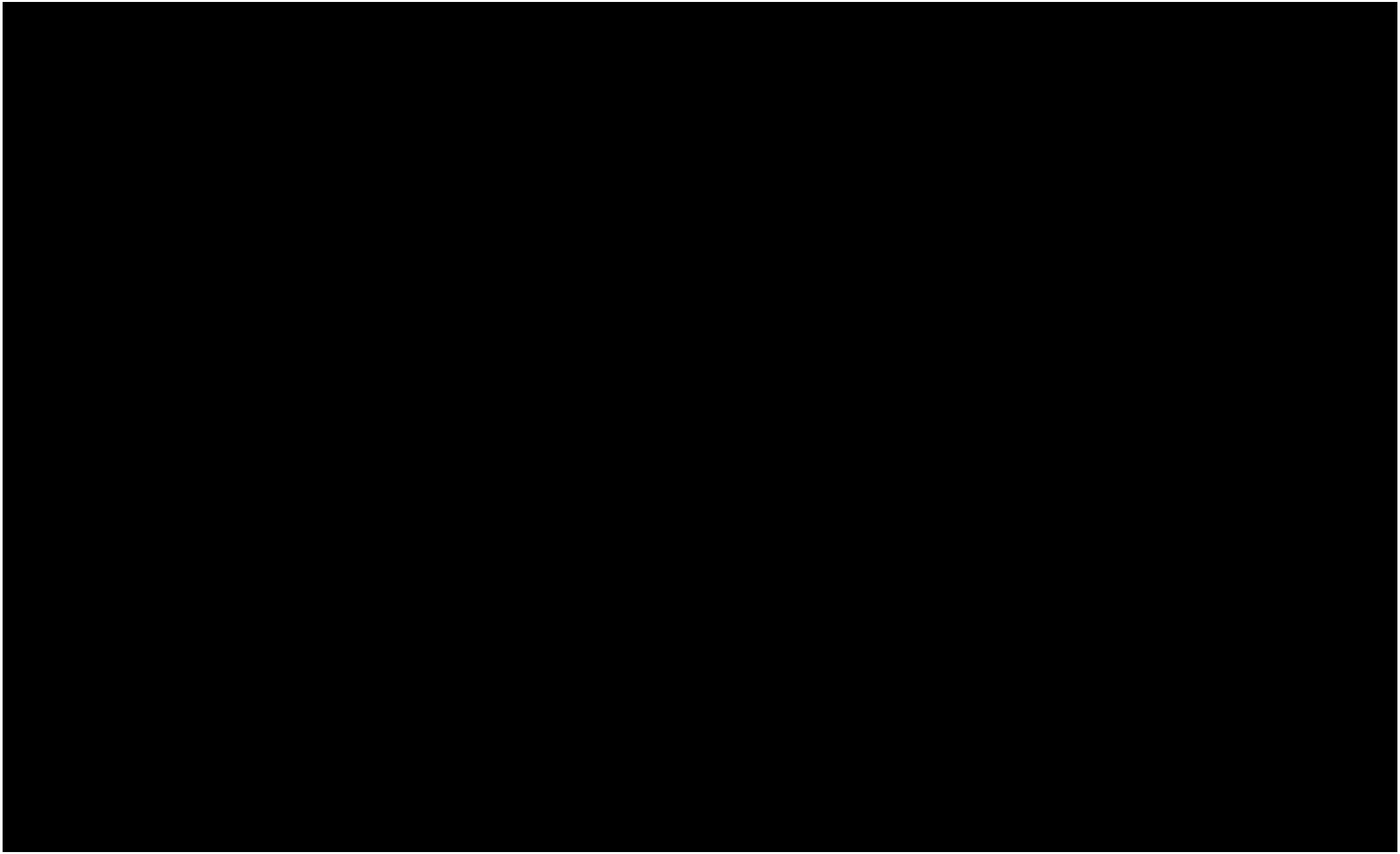


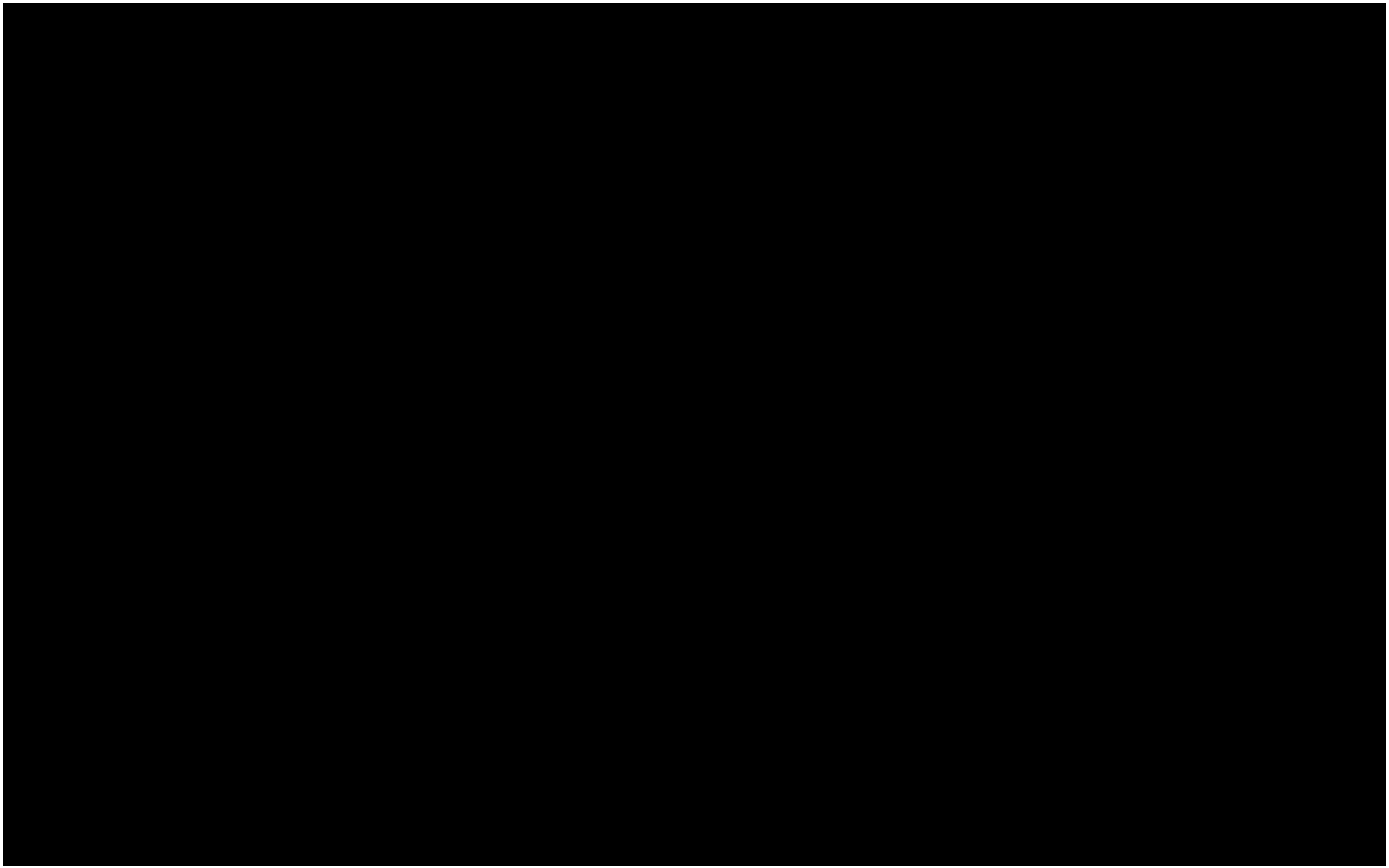


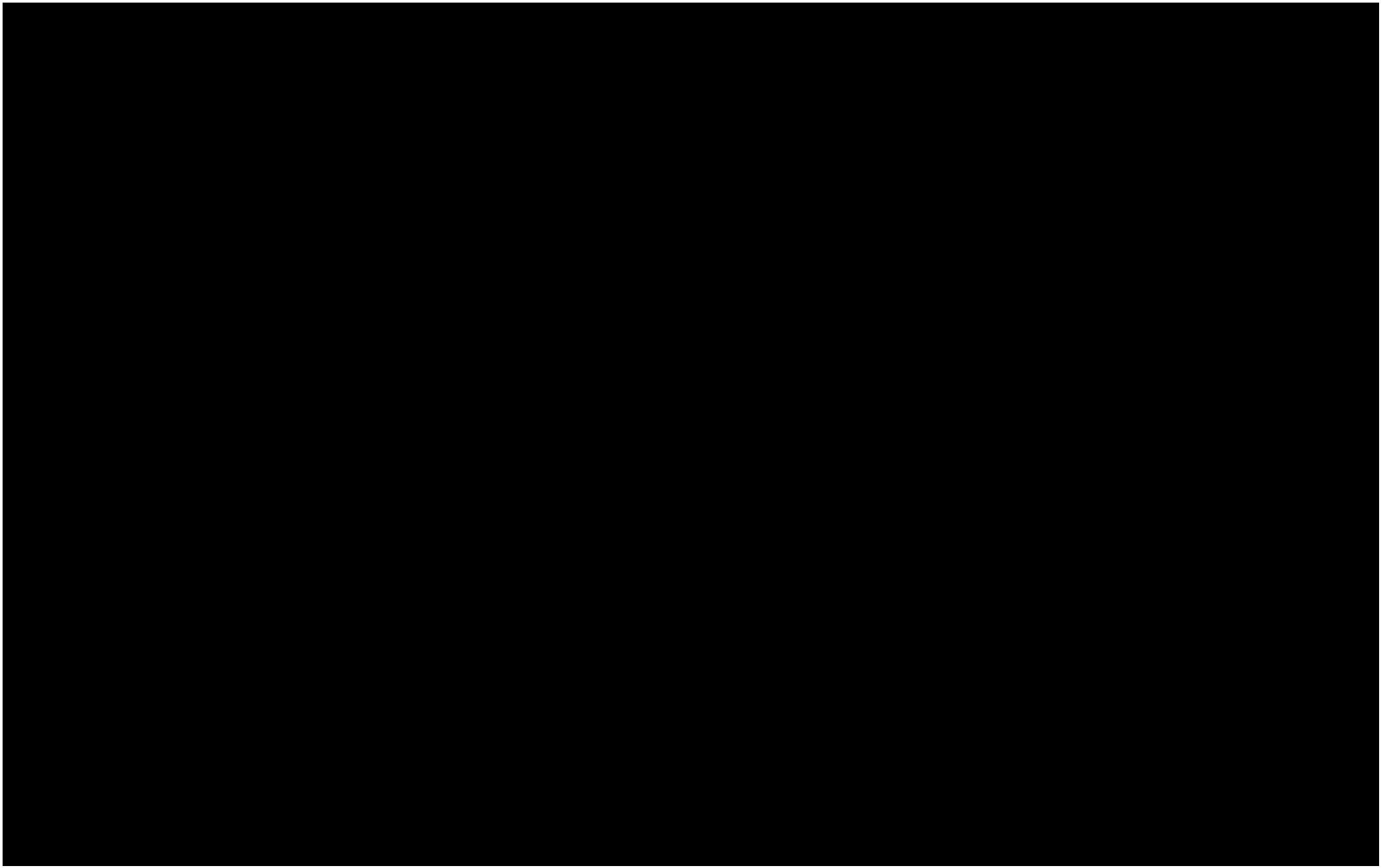












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