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Theme 3:
Information And Communication Technologies

Challenge 6:
ICT for Safety and Energy Efficiency in Mobility
Logistics for Life
ICT-2009.6.1

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Observatory Report
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Contribution

Partner Insiel (Coordinator)

Research / work
Italian regional projects

Partner DPDHL

Research / work
Description of internal projects

Partner Chalmers

Research / work
Description of several project at national regional and international level

Partner VOLVO

Research / work
Description of several project at national regional and international level

Partner VTT

Research / work
Description of several project at national and international level

Partner SingularLogic

Research / work
Description of projects

Partner TREDIT

Research / work

Description of projects as well as EURIDICE matching with ARKTRANS framework

Partner FHV

Research / work

Description of projects, feedback on deliverable

Partner MARLO

Research / work

Description of projects

Partner SINTEF

Research / work

Information and functional description of the ARKTRANS framework

Partner COSCOEL

Research / work

Information on projects

Partner Intel

Research / work

Project search for the Area of UK and Ireland as well as international projects within the knowledge field of intel

Deliverable process schedule

No	Process step	Responsible	Timing (working days)	Involved persons	Notes
1	Deliverable plan Initial planning of process including: - Identification of individual contributors and peers. - Draft table of contents. - Detailed planning of timeline.	Leader		Jannicke Baalsrud Hauge, BIBA	Leader must propose schedule, identify involved contributors and peers.
2	Structure and guidelines Initial drafting of the Deliverable including structure, guidelines and first basic content to be sent to the Contributors.	Leader		Jannicke Baalsrud Hauge, Cemile Cabuk, BIBA Paolo Paganelli, Insiel	Initial drafting from leader.
3	Leader to organize contributors input and distribute updated version to Contributors, Internal Peers and SP leader	Leader, Contributors		Jannicke Baalsrud Hauge and Cemile Cabuk partners representative	Input on relevant projects from the partners
4	Full concept Leader to consolidate contributors input and result.	Leader		Jannicke Baalsrud Hauge, Cemile Cabuk, BIBA	
5	Reviewing Quality check	Peers Coordinator		Paolo Paganelli and Hans Westerheim	Review by internal peers including cross reading by external peer.
6	Submission to Commission	Coordinator		- Coordinator	Final stage of process.

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Executive Summary

Logistics for LIFE (L4L) aims at bringing together different stakeholders dealing with innovative ICT solutions to ensure the long-term sustainability of the European logistic sector. The efficiency of logistic operations is crucial for the competitiveness of small and medium sized manufacturers still forming the back-bone of the European economy. The logistic sector, esp. the freight transport, is not only vital for the competitiveness of the European industry, its contribution to the Co2 and NoX emissions is tremendous. Consequently, a more efficient freight transport would contribute to the European industrial competitiveness as well as have a positive impact on the environment. The European Commission has realised this several years ago and, hence, launched several strategies like the Green Paper - Towards a new culture for urban mobility [113] The Strategic Research Agenda ICT for Mobility[114]).Subsequently, in order to support the implementation of these strategies, several slots of previous and present work programmes do offer research possibilities within this area. These activities are not limited to EU level, equal trends can be found at company (like DHL and COSCO) regional and national level within the European Union as well as from non European countries or the EFTA countries.

There are many research activities within efficient ICT based freight transport and mostly results are available for public access, but there is no structured database containing the results in such a way that they are easily searchable. Hence, it is quite difficult for an interested organisation to identify the results as relevant. Consequently, some project results remain undiscovered and double work needs to be carried out. The problem of identification is leveraged by the fact that it is hardly possible to search for a suitable solution of a problem in any database, since no common terminology has been defined and project information is stored at several different places in different languages. The objective of WP 1 – Survey, Observatory and Synergy is to collect as much information on relevant projects and initiatives, analyse the content and potential impact this may have for L4L stakeholders and then provide this information, not only to the consortium but also back to the projects and to the public. In a first step, D1.1 the observatory report will collect information and make a first classification based upon the framework under development in WP 2. This will result in a short gap analysis, which will serve as input for the future work in L4L.

1 Introduction to the Workpackage 1

A main objective of L4L coordinated action is to provide an overview of all initiatives and projects dealing with ICT for energy efficient transport.

1.1 Scope and objective of this workpackage

Workpackage 1 lays the foundation for most of the activities carried out in the project. Workpackage 1 will work as catalysator, gathering, analysing and providing information to the other WPs.

All other workpackages rely on the community and information-exchange links built and managed in this WP, but WP 4 will also give contribution to WP 1 via Forum activities. The main goal of this workpackage is to achieve synergy between the existing regional, national and international research and projects with a particular attention to ICT/IST, DG Energy and DG for Mobility & Transport.

In order to disseminate the information and to ensure a smooth utilisation in the other workpackages all partners will participate in the work of WP1. The work is distributed geographically between the partners to get an efficient collection of information and to get contacts to initiatives in different European countries. WP 1 collects information and best practices from all these related activities and sources, and consolidates it in the form of observatory reports on industry **requirements** and available **best practices**. Once processed and enriched by WP 2, formalized knowledge is returned back as input to the **Roadmap** that constitutes the main result of WP 1.

1.2 Relation to other workpackages

The main objective of the L4L project is to establish a common research agenda for energy efficiency. It involves transport industry stakeholders and research organizations working on key ICT-based innovations for the logistic sector. The work plan is designed to support parallel development in different directions, corresponding to the four coordination workpackages (survey, observatory and synergy, catalyzing knowledge, forum and supportive actions, dissemination and exploitation).

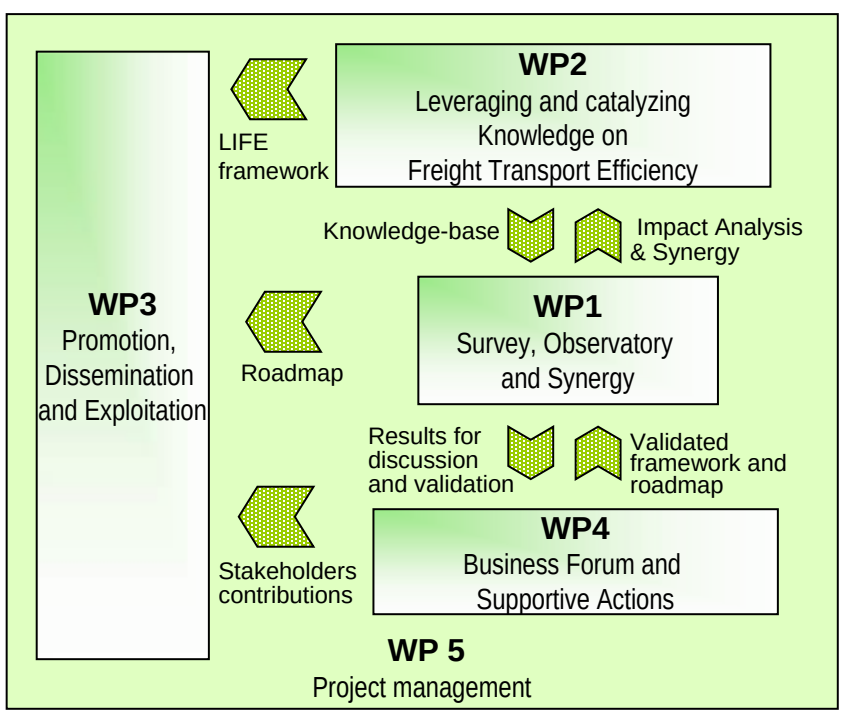

Figure 1:WP overview and dependence

To achieve results in the four areas within the project timeframe, the workpackages run in parallel and the dependencies between them are managed by sharing outcomes and interacting on common topics. In particular, as shown in Figure 1. WP1 will feed the other three workpackages with impact analysis

and different versions of the roadmap, and will in return get formalized knowledge from WP2 and validated results from WP4. WP1, WP2 and WP4 will all contribute to promotion and dissemination in WP3 by providing results that can be presented and will contribute to the creation of the network. In the current phase of the project WP 1 and 2, working in parallel, exchange information, thus a separate chapter in this deliverable deals with the needs of WP 2.

Classification needs for input to WP 2- ARKTRANS framework

A main objective for L4L is to provide a framework, so that industry, researchers and governmental stakeholders can get an easy access to already existing solutions and research results for ICT based energy efficient freight transport. The framework is basically developed in WP 2. It is based upon the already existing ARKTRANS framework, developed within the Norwegian project ARKTRANS (http://arktrans.no/). This framework will be adapted to also fit the L4L needs. The main objective of this deliverable is to give an overview of relevant projects, but taken into account, that we already have the ARKTRANS framework, it seems reasonable, that we do not only provide the collected information on the projects and initiatives, but that we also make a first approach in combining this information with the structure provided by the framework. This exercise will not only decrease the risk for collecting less information than we need later, but it will also add a value at an early stage and be helpful for the next deliverables in this WP. This mapping is in chapter 4.

1.3 Objectives and structure of deliverable 1.1

This deliverable contains the state of the art analysis in the field of ICT-based energy-efficiency in logistics as well as an overview of the main related projects and initiative. The Observatory Report will provide a map supporting the subsequent L4L work, by identifying and providing references to all the sources of information, available technologies, results and ongoing initiatives of relevance to the L4L activities.
The deliverable will start with definitions of characteristics of the dimensions what is relevant for L4L.
The deliverable contains:

- Overview of direct indirect related projects at regional, national and international level
- Classification of projects regarding long term sustainability according to the dimensions listed in the L4L DoW:
    - Environment
    - Societal
    - Financial
- Description of the corresponding ICT solutions:
    - Green and cost-effective freight transport
    - Collaborative models for the logistic business
    - Transparent freight traffic control and enforcement
    - Shared technology infrastructure (L4L)
- First matching of the functionalities offered by the identified projects with the ARKTRANS framework
- A short gap analysis as outcome of the observatory

The annex of this deliverable comprises more detailed information on

- Relevant information received from the projects, especially regarding ICT- based energy-efficiency in logistics
- Available technologies: state of the art technologies used in related projects that can be relevant for the L4L stakeholders

1.4 Terms and conventions used in the document

Abbreviation	Explanation
Esp.	especially
CA	Coordinated Action
CORDIS	Community Research and Development Information Service
DB	Database
DLR	Deutsches Zentrum für Luft- und Raumfahrt
DoW	Description of Work
EU	European Union
FP	Framework Programme
FTMS	Freight Transport Monitoring System
ICT	Information and Communication Technologies
ITS	Intelligent transport System
Logistics for LIFE-	**Logistics** Industry Coalition **for L**ong-term, **I**CT-based **F**reight Transport **E**fficiency
L4L	Logistics for LIFE
RFID	Radio Frequency Identification
TCMS	Transport Chain Management System

Table 1: Abbreviation in use

2 Introduction to the classification methodology

2.1 Collection of project information approach

This section describes briefly the structured approach used in order to identify, collect and analysing relevant projects and their content. The objective was to collect information on projects and initiatives covering all areas relevant for ICT-based efficient freight transport. The approach comprises two main steps:

1. Searching and collecting the information
2. Classifying and analysing the information

The first step comprises the search for projects and initiatives with its descriptions (flyers, project homepages or description from DBs) as well as a first very brief analysis of the projects results regarding the relevance for L4L objectives. This decision is only a pre selection. EU funded projects and initiative do mostly host websites containing enough information on research work carried out allowing a pre- decision on the projects´/initiatives value for the L4L objectives. This is not always the case for several national or regional projects some of them do not have an own homepage. Hence, the information is mostly based on different types of sources:

- National and European databases (example: CORDIS DB[18] and DLR sites[115])
- Information from the project participants and other contacts known personally
- Information search based on key words on the internet, in journals and newspapers as well as on web sites of logistic associations or on national funding organisations
- Based on searching in published articles from conferences and journals
- Information provided by the specific project or initiative

There is no given terminology available. However by using a structured search with relevant key words a broad range of projects can be identified. Projects on EU level are offered on special EU project databases, CORDIS [18]. The information is precisely ordered by topic, framework, involved nations, etc. The general availability of project information on EU level is better than of national or regional projects. Another advantage is that the descriptions and homepages of projects on EU level are available in English. In contrast to this, there are a number of national or regional projects only providing information in local language, if any online information at all. The availability on information on company driven initiatives and projects is very inhomogeneous. It depends on the information and marketing policy of the company.
Consequently, the availability of information depends on who is funding them. In L4L this problem could partly be solved by letting the different partners identify and assess relevant information, not only on the web, but also on fares and trade shows as well as on regional conferences. Collecting national or regional projects is possible, by using public search engines and by looking on the homepages from research institutes and governmental research funding sites. Thus, it was possible to identify several different relevant projects and initiatives.

The challenge in the second step arises from the problem of having unstructured information. Hence the information has to be structured in such a way, that it is possible to analyse and match the information. The identified information is from different sources, in different formats and offers a different detailed level of information. In this phase of gathering the information the work can be separated in different sub-tasks:

- Dividing into groups: The tables in the Annex show how the projects are divided: Projects on EU, regional and national level. Thereafter the information is sorted in different types of information, acronym, objectives, coordinator, technologies etc. This will later help any interested stakeholder to search for the information in the DB provided by WP 2 and also in the future work on WP 1.
- Based upon the structuring of information, the main analysis was carried out. First, objectives of the projects were matched with those of L4L in order to see the relevance.
  Secondly, in order to evaluate the relevance in more detail of each specific project, the projects were assessed regarding sustainability dimensions focused upon the L4L sustainability dimensions: -Environmental sustainability, -Financial sustainability and societal sustainability

as described in section 2.2. A project can contribute to more than one sustainability dimensions, what is the usual situation,

- The majority of identified projects offer specific ICT solutions. L4L defines four groups, described in section 2.3:
  - Solutions for green and cost-effective freight transport
  - Collaborative models for the logistic business
  - Transparent freight traffic control and enforcement
  - Shared technology infrastructures

  Thus, each project was mapped onto at least one of the four ICT solution areas described in the L4L DoW. With the knowledge of the sustainability solution aimed at within the specific project, the type ICT solution group can be detected and the projects can be clustered in relation to that.
- The projects were also categorised further in direct and indirect related projects and initiatives. Direct projects are projects in which at least one partner of the L4L consortium is involved. Indirect do not have any investment of the L4L consortium.
  - Direct Projects on
    - EU level
    - Regional level
    - National level
  - Indirect projects on
    - EU level
    - Regional level
    - National level

One main object in L4L is to develop a L4L framework. This will be based upon the ARKTRANS framework [L4L DOW, www.arktrans.no]. Consequently in a last step, the conclusion of each project to the functional view of the ARKTRANS framework was assessed.

The tables of projects in the Annex include information about the status of the project. In relation to this the information and solutions offered by the specific projects are not relevant on the same level. "Older" projects, from the Fifth Framework Programme or earlier do not have the same relevance level as the actual projects. Especially in ICT area the innovation goes very fast, and hence the use of state-of-the art technology has got a special priority.

Finally with the described approach the information is structured and reprocessed in the tables in the annex.

2.2 Logistic industry sustainability dimensions

The L4L Coalition is built on the assumption that operational efficiency is the key for the long-term sustainability of the logistics industry, and that sustainability has a broader meaning than just environmental friendliness. In our vision, sustainability must be pursued simultaneously along the three dimensions:

- *Environmental sustainability*

Research along this dimension aims at solutions for reducing emissions and making freight transport more energy-efficient, like, e.g.: technologies for vehicle and fleet efficiency, ICT support for modal shift from road to other modes, and environment-aware route optimization solutions.

- *Financial sustainability*

Research along this dimension aims at solutions for saving costs and protecting market shares of individual logistic/logistics firms, like, e.g.: improved planning and execution systems, e-business tools simplifying management of multi-modal door-to-door shipments.

- *Societal sustainability*

Research along this dimension aims at solutions to reduce freight transport impact on the community and on citizens' life, e.g., by improved traffic management, more efficient infrastructure operation, as well as enhanced security and safety control.

Figure 2 shows these sustainability dimensions and their combination possibilities. Furthermore the picture shows the corresponding ICT solutions described in section 2.3

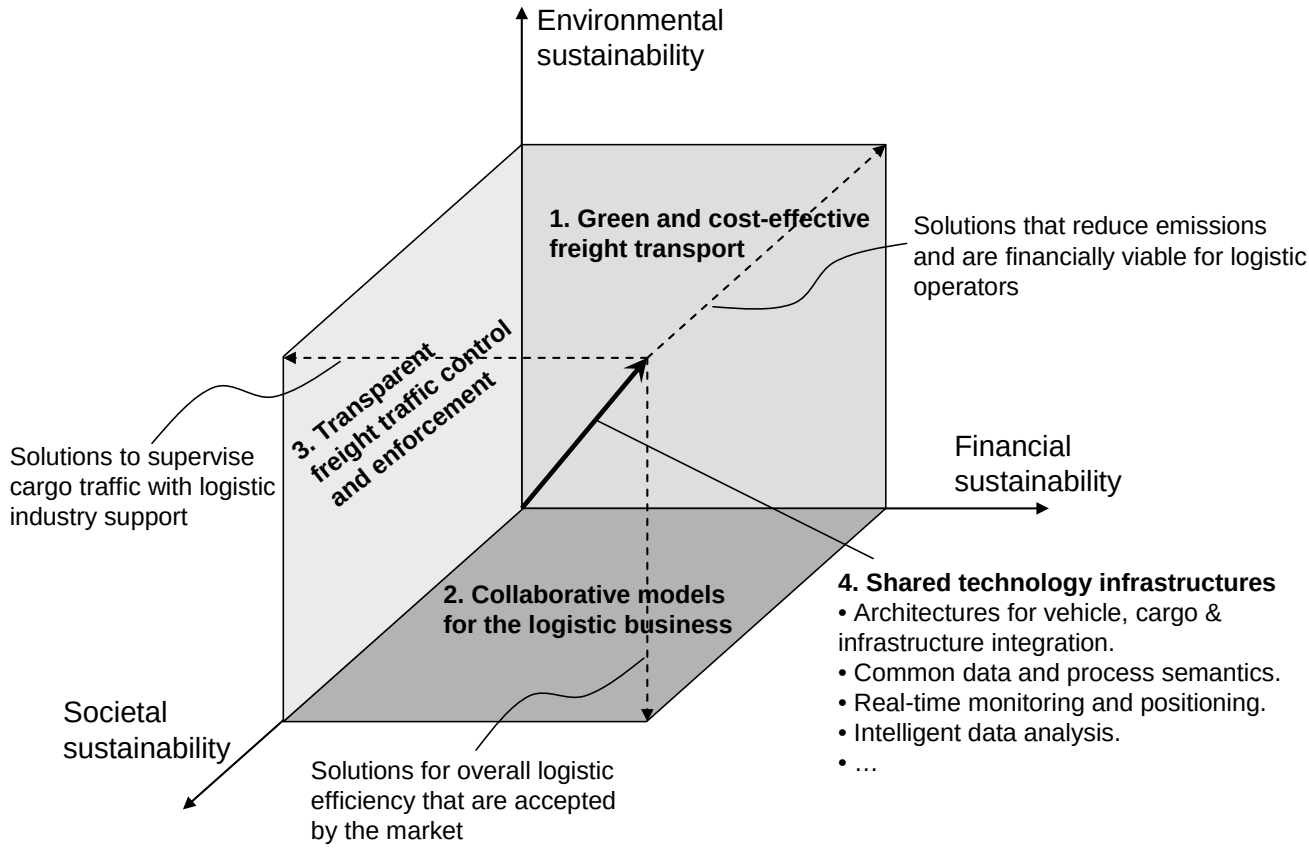

Figure 2: Logistics industry sustainability dimensions and related ICT solutions [L4L DOW]

2.3 Related ICT solutions

To achieve long term sustainability, new ICT solutions for transport research should imply the aim of achieving sustainability within all three dimensions. This can be achieved by developing solutions that use information integration and real-time communication technologies to address simultaneously the requirements of business, society and the environment. Solutions aiming at long term sustainability in all three dimensions can be divided in four solution areas [1]:

- *Solutions for green* and *cost-effective freight transport*

The combination of "green business" and freight transport is inconsistent, because obviously moving goods means consuming energy and creating emission. But nevertheless there are technologies available creating financial benefits and are at the same time environmental friendly.

- *Collaborative models for the logistic business*

Overall efficiency of freight transport necessarily requires the sharing of information about demand and availability of transport resources, as well as forms of load optimization across operators. These kind of solution models require communication systems to optimize freight transportation as well as systems that ensure an optimal communication within any individual company,.

- *Transparent freight traffic control and enforcement*

To supervise the flow of goods for security and safety control, infrastructures management and enforcement of environment protection laws public bodies need technologies that are able to

support this action. The needed solutions have to be transparent in the acquisition and use of data, and are not in any way disruptive of logistic operations efficiency.

- *Shared technology infrastructures*

To achieve the above mentioned solutions a shared ICT infrastructure is needed able to link processes and data of the different involved stakeholders, providing transversal functionality needed in different application domains. This ICT area includes following functionality that mainly can be characterised through: a common framework, cooperative architectures for vehicle, infrastructure and cargo data integration, common ontologies for transport and logistics, monitoring infrastructure based on sensor networks and satellite positioning, tools for cross-domain intelligent data analysis and knowledge discovery.

3 Overview of related projects and initiatives

This chapter provides an overview of the identified projects. Regarding the objectives of L4L the first task is to identify several projects from different areas covering areas important for ICT-based efficient freight transport. Thus this chapter is separated in two main sections, which describe different projects from two different points of view.

The first section describes projects that can contribute to the L4L project by offering ICT solutions based on energy efficiency. Energy efficiency is one of the main requirements aimed at within the project. Hence the project analysis implies a number of projects aiming at solutions to achieve energy efficiency. Additionally there are projects that do not focus on energy efficiency, but which in combination with other ones can have an energy efficient effect. These are also analysed.

The second part deals with projects relevant for the sustainability dimensions, listed at the beginning of this deliverable.

Figure 3 shows the identified projects clustered in direct and indirect related. Direct related projects are projects in which at least one of the L4L consortium partner is involved. The indirect projects are characterised through the fact that no of the L4L partner is involved in. Figure 3 shows that the consortium partners are involved in several relevant projects. This ensures an easy access to several other projects and will also be helpful in order to collect feedback on the roadmap and the gap analysis.

It is also a lot of relevant indirect projects. Obviously, this area already offers a large number of ideas and technical as well as non- technical solutions that need to be structured and provided to interested companies, institutes and governmental organisations, for further developing instead of developing completely new.

Figure 3: Direct and indirect related projects

3.1 Projects relevant for ICT based energy efficiency

This section comprises an overview of relevant projects for L4L focussing on ICT- based energy-efficiency in freight transport. ICT based energy efficiency comprises various ICT solutions that enable environmental friendly use and production. Furthermore only technologies that enable sustainability in all mentioned dimensions are able to ensure energy efficiency. The intention of L4L is to combine the best ICT solutions and energy efficient technologies.
The analysed projects are clustered in direct and indirect related projects as well as in national and regional projects. The mentioned relation is characterised through the related partner. The following section contains a description of the projects and their corresponding ICT solution, clustered in direct and indirect related.

3.1.1 Direct related projects

Figure 4 shows all projects in which at least one of the consortium partners is involved. Because of the direct relation to several projects the process of getting information is facilitated. Depending on the needs of workpackage 2 there is the possibility to contact also the indirect related projects for more specific information. Figure 4 shows the involvement of each partner. Consequently, there are projects related to a number of the consortium partners. The projects in the figure will conduce as a connection to other relevant projects for us. By first analysing the projects of the L4L project consortium members there is the possibility to find linked projects with similar topics, or basic information as well as further information.

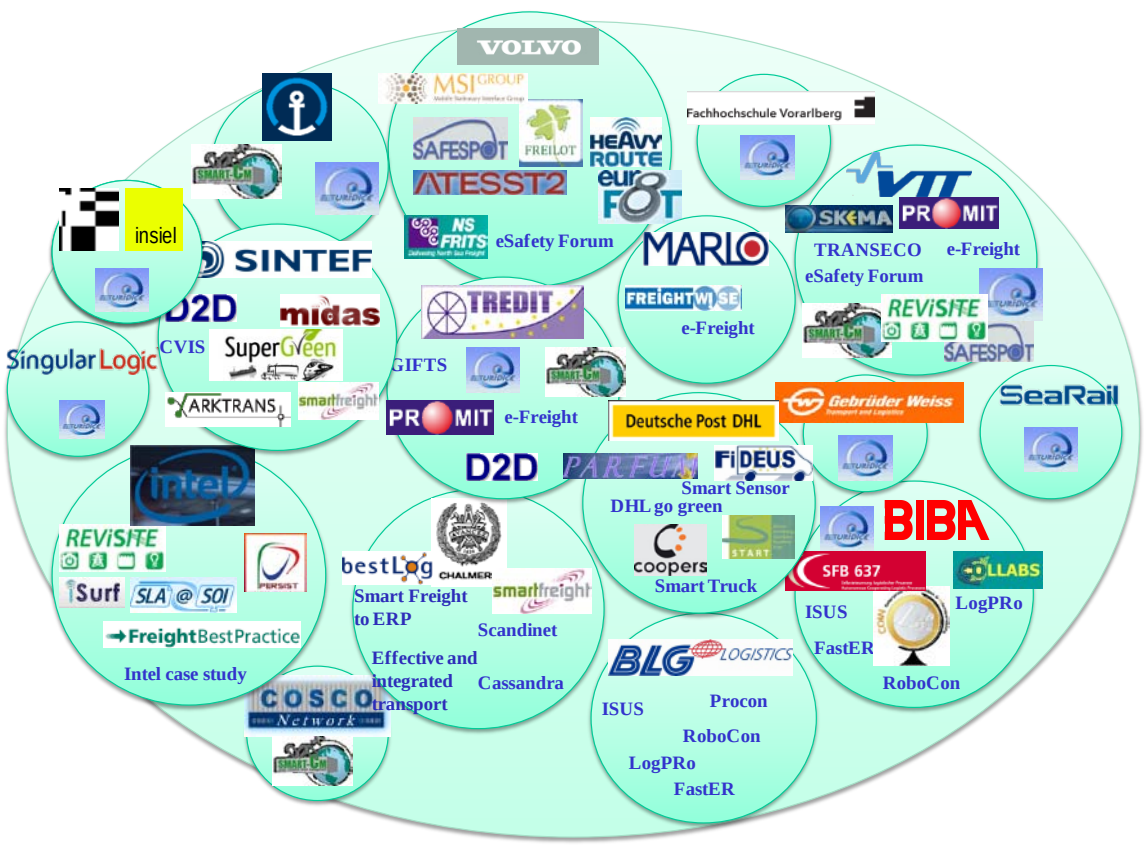

Figure 4: direct related projects pro partner

The L4LCoordination Action is built around a group of *core projects* and initiatives that are closely linked to the project participants. These will be used as main channels for networking and multiplying the outcomes.

One of the core projects is the ***EURIDICE*** [9] project. Several L4L partners are involved in EURIDICE. ***EURIDICE*** can be clustered in the solution category "Shared technology infrastructure". Projects of this kind of solution category often offer:

- Architecture for vehicle, cargo and infrastructure integration
- Common data and process semantics
- Real-time monitoring and positioning
- Intelligent data analysis

ARKTRANS [24] is a multimodal framework for ITS and thus offering collaborative models for the logistic sector. ***ARKTRANS*** contribution to L4L is above all its framework but also the following aspects are important.

- Provides a holistic and mode-independent understanding of the responsibilities, relations and dependencies within the transport sector.
- Defines multimodal terminology and concepts (semantics) for the transport sector.
- Supports specification and implementation of ITS solutions that are in compliance with a common and holistic view of the transport sector.
- Supports analyses and simplifications of transport solutions by different abstraction levels and views.

DHL GO GREEN [25], PARFUM [15] and TRANSECO [46] make their contribution by offering ICT solutions for green and cost effective freight transport. The general idea of projects concerning "green solution" is the application of new technologies to save the environment and at the same time reducing costs. The input to take from these projects could be new "green" ICT solutions.

TRANSECO concerns within the project with:

- High level: strategic decision making tools for the public sector
- System level: renewable energy and transport systems.
- Interface level: combination of technologies, e.g. information technology and materials sciences, with energy savings in transport
- Technology and component level: development of ICT for the transport sector, bio-fuels and technology for reducing the fuel consumption of vehicles.

Especially the last point, the technology and component level is interesting for Logistics for LIFE, because the reduction of fuel consumption of vehicles is a challenge not only in "green" solutions.

DHL as a partner of the consortium also concerns with "green" ICT solutions within the ***DHL GO GREEN*** projects.

- Carbon efficiency assessment.
- ICT systems, processes and know-how related to emissions reduction.

Like ***DHL, PARFUM*** is also interested in the emission reduction and further more ***PARFUM*** concentrated as a focussed project on the field of urban transport (freight, public and private). The project seeks to bridge the gap between research & development results and widespread implementation/market introduction with relation to integrated technological/policy solutions for the reduction of transport induced air pollution, notably particulates (PM10/2.5) Nitrogen Oxides (NOx).

CVIS [7] offers ICT solutions that can be clustered in "Transparent freight traffic control and enforcement "

- create a unified technical solution allowing all vehicles and infrastructure elements to communicate with each other in a continuous and transparent way using a variety of media and with enhanced localisation;
- enable a wide range of potential cooperative services to run on an open application framework in the vehicle and roadside equipment;

- define and validate an open architecture and system concept for a number of cooperative system applications, and develop common core components to support cooperation models in real-life applications and services for drivers, operators, industry and other key stakeholders;
- addresses issues such as user acceptance, data privacy and security, system openness and interoperability, risk and liability, public policy needs, cost/benefit and business models, and roll-out plans for implementation.

The solution of the ***CVIS*** project is already used by other direct related projects ***of Logistics for LIFE***: ***SMARTFREIGHT [20]. SMARTFREIGHT*** has already implemented the CVIS technology so that L4L can profit from following outcomes:

- The architecture and logical aspects;
- Development of on board and on goods units;
- The use of the CVIS technology for communication with vehicles;

Another direct related project is ***BestLog [3]***, in which Chalmers is involved in. The project is similar to ***Logistics for LIFE***, it is a cooperation project. It aims to:

- Collect and disseminate logistics best practice knowledge across Europe
- Create a platform for an ongoing exchange on logistics best practice (beyond the duration of the project)
- Develop a certificate for European best practice in logistics
- Regularly publish a report on the state-of-the-art in logistics education
- Develop training packages

BestLog and its successor will serve as input with its high number of analysed projects in the field of applied logistics.

Similar to ***BestLog***, ***SKEMA [19]*** aimed at establishing a Sustainable Knowledge Platform for the use of stakeholders in the Maritime Transport & Logistics industry.

Since Logistic for LIFE is a Coordinated Action of the Seventh Framework Programme, the analysis of another Coordinated Action of the Sixth Framework Programme, called ***PROMIT [16]*** can be helpful. The results of ***PROMIT*** can be used as a support for the L4Lproject.

PROMIT is an European Coordination Action (CA) for intermodal freight transport initiating, facilitating and supporting the coordination and cooperation of national and European initiatives, projects, promotion centres, technology providers, research institutes and user groups related to this most complex transport form. The strategic ***PROMIT*** objective is to contribute to a faster improvement and implementation of intermodal transport technologies and procedures and to help promoting intermodal logistics and mode shift by creating awareness on innovations, best practices and intermodal transport opportunities for potential users as well as for politicians and for the research community.

Coin IP [4], which is related to ***L4L***contributes to the mission of our projects by offering a collaborative model for the logistic sector and innovative ICT solutions. Mainly the mission of ***Coin IP*** is to study, design, develop and prototype an open, self-adaptive, generic ICT integrated solution to support the above 2020 vision, starting from notable existing research results in the field of Enterprise Interoperability and Enterprise Collaboration. This is an example of a project which in combination with other projects can contribute to energy efficiency through ICT.

The direct relation to the projects also got an input on the topic road safety, for example through intelligent vehicles or services. For this reason the combination of different project outcomes is necessary, so as ***COOPERS [6]*** and ***EuroFOT [21]***. The goal ***COOPERS [6]*** is the enhancement of road safety by direct and up to date traffic information communication between infrastructure and motorised vehicles on a motorway section. While the goal of ***EuroFOT*** is to identify and coordinate an in-the-field testing of new Intelligent Vehicle Systems with the potential for improving the quality of European road traffic. This permits assessing their effectiveness on actual roads, while determining how they perform towards the intended objectives. In addition, this offers an early publicity of the

technologies, and enables the analysis of the user acceptance and its subsequent potential for market penetration.

Additionally there is on project to that many of the L4L consortium members are related to, it is a project funded under the European Seventh Framework and concerns an overall system for the logistic sector. Generally project called ***Smart-CM [22]*** aims to make trade and transport more efficient, secure, visible and competitive across the world in a global intermodal context, working along with existing initiatives such as that of AEO and the Green Lanes implementation. ***Smart-CM*** offers a shared technological infrastructure. Although there are not a plenty of projects offering all-round solutions these ones identified have significant contribution because the ***L4L***project will collected different approaches demonstrate combinations of different solutions.

The ***D2D [8]*** system is made up of three interoperable system components that improve the several process of the supply chain by different systems:

- A system for overall management of the transport chain, the TCMS, short for Transport Chain Management System
- A system for recording detailed information about transport activities and progress, the FTMS, short for Freight Transport Monitoring System
- A communication platform for facilitating efficient communication

3.1.2 Indirect related projects

The indirect related projects are characterised through the fact, that no one of the L4L consortium is related to them. But anyhow also these projects are analysed and used within the ***Logistic for LIFE*** project. As described in section 2.2he long term sustainability can be clustered in different dimensions.

RETRACK is one of the indirect related projects analysed. The research topic of thus projects pursues to all three dimensions of long term sustainability, like for example ***EURIDICE***. Overall, the ***RETRACK*** project addresses the issues arising from transforming vision into practice and will establish a clear demonstration to the rail freight and wider logistics industry that pan European continental rail freight can be competitive, reliable and value for money.

In most cases the projects on EU level offer general solutions that can be adapted to various situations. In contrast to that projects on regional or national level focus on problems and challenges arising from locational situations. To complete the overview of the available technologies it is important to take a look at the more specific solutions of national and regional projects in section 3.1.3.

3.1.3 National and regional projects

Beside the projects financed and supported by the EU, there are additionally regional and national projects. The funding of such projects can be EU, national, regional or company based. Important is that it looks at the research from a national/ regional perspective.

Similar to the projects, financed and supported by the EU, there are national and regional projects, which are direct or indirect related to our consortium and thus to the L4Lproject. Since the number of relevant, analysed projects on national and regional level is not that high as the projects on EU level, this chapter comprises the direct related as well as the indirect related projects.

The consortium partner DHL is related to at least three national projects ***DHL Go GREEN***, Smart Truck and Smart Sensor***. DHL Go GREEN*** is a project offering a solution for green and cost- effective freight transport. It can contribute in following areas:

- Carbon efficiency assessment.
- ICT systems, processes and know-how related to emissions reduction.

Smart Truck and Smart Sensor are not directly aiming for a green solution, but through the application of new intelligent technologies, such as intelligent vehicles in Smart Truck and RFID sensor systems in Smart Sensor sustainability and effectiveness can be achieved.

Another national project DHL is related to is ***START***. ***START*** is a project, aiming at green solutions, by making goods distribution more energy efficient by combining access restrictions, incentives and the development of consolidation centres.

The Norwegian project ***ARKTRANS*** is one of our core projects and especially ***ARKTRANS*** because L4L will take and use their Framework. The following description will give an overview, of what ***ARKTRANS*** does.

- Provides a holistic and mode-independent understanding of the responsibilities, relations and dependencies within the transport sector.
- Defines multimodal terminology and concepts (semantics) for the transport sector.
- Supports specification and implementation of ITS solutions that are in compliance with a common and holistic view of the transport sector.
- Supports analyses and simplifications of transport solutions by different abstraction levels and views.

The ***ARKTRANS*** project with its corresponding framework can be used because it addresses the whole transport sector, additionally the freight and passenger transport with all possible transport modes (road, sea, rail and air). ***ARKTRANS*** provides a multimodal (common to all transport modes) specification of responsibilities, functionality, processes, and information flows in the transport sector.

In the area of shared technology infrastructure there are at least 3 projects on national area to mention that are direct related: ITS-Support for combined transports**,** ***IIFEG*** and ***CASSANDRA***.

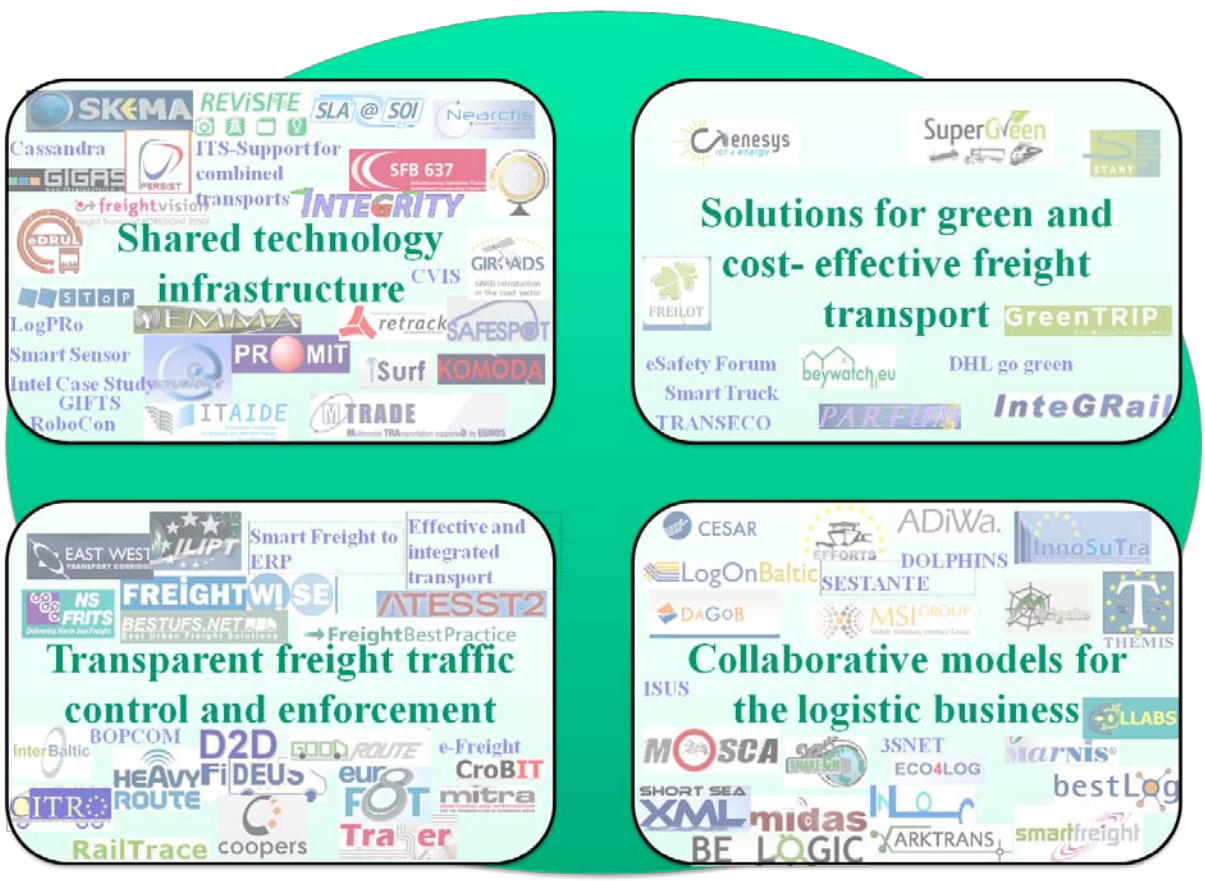

Figure 5: ICT solutions

Figure 5 shows in conclusion the identified projects matched to their related ICT solution. Obviously there is a gap in the area of "solutions for green and cost-effective freight transport". In this solution area, the number of identified projects is not as high as in the other solution area. Within the other solution areas, there are projects identified, but not all the projects are on the same relevance level. For example in the area of "Transparent freight traffic control and enforcement" the project D2D is from the fifth Framework Programme, and hence not that important.

Regarding this one additional objective for L4L is to find out these gaps in solutions areas, so that upcoming projects can refer to this and make their decisions about research topics in order to the results. Although there are gaps to find in the single solution areas, Figure 5 clarifies that the area of "Shared technology infrastructure" is represented by a number of different projects. Especially this solution area offers sustainability in the entire four mentioned dimension (section 2.2).
However the matching of the projects to the specific ICT solutions is not conclusive for the L4L objectives, because the definitely relevance of each projects will be analysed in following deliverables.

3.2 Projects relevant for the sustainability dimensions

Regarding the sustainability dimensions we often face the situation that the sustainability dimensions are coupled. The optimal situation for long term sustainability of the logistic sector is combination off all the three mentioned characteristics. L4Laims to provide a solution pursuing simultaneously all three dimensions.

There are only a few aiming at this. One of these is the integrated ***EURIDICE*** project. The main aspects of the project that can be used within Logistic for LIFE are:

- Cargo mobility services infrastructure.
- Intelligent data analysis for energy efficiency.
- Joint dissemination initiatives.

Furthermore the Logistic for LIFE consortium is involved in some more projects offering sustainability in: societal, financial and environmental dimensions, like for example ***SAFESPOT [17]***, ***POROMIT [16]***, ***GIFTS***. Mainly all these projects are characterised through the type of their solutions, by using a shared ICT infrastructure and working with state-of-the-art technology. By applying this type of solution sustainability in all three dimensions can be achieved.

In contrast to the above mentioned type of projects, there are several projects basically aiming at providing solutions ensuring environmental sustainability. Environmental sustainability is often coupled with financial or societal sustainability.

Projects ensuring environmental and financial sustainability are projects that are mainly interested in creating "green" solutions for the logistic sector. Here there are to mention projects like ***TRANSECO*** or the projects of the consortium partner DHL, like for example ***DHL go green***. Through pursuing the aim of environmental sustainability, financial optimisation is achieved through for example reducing fuel consumption of several goods.

Projects ensuring environmental and societal sustainability are also represented by the consortium members. ***FREIGHTWISE [11]*** offers these sort of solution, by aiming to support the modal shift of cargo flows from road to intermodal transport using road in combination with short sea shipping, inland waterways and rail. Interesting and usable for Logistic for LIFE are:

- Framework for freight transport management
- Standards for describing transport services
- Distributed freight transport management

But also e-freight and for example ***HEAVY ROUTE [13]*** are projects from this sustainability area.

The last one sustainability combination possibility is, as to see in Figure 2 societal and financial. Especially to mention here is the ***ARKTRANS*** project. It is a national project, which offers the framework for Logistic for LIFE. But as well as ARKTRANS there are other projects ensuring societal and financial sustainability, for example ***SMARTFREIGHT*** [20] by offering:

- The architecture and logical aspects;
- Development of on board and on goods units;
- The use of the CVIS technology for communication with vehicles;

  Possible impacts of the new technologies to be prototyped in SMARTFREIGHT.

3.2.1 Project at EU level

Figure 6 shows that there are projects relevant from different Framework Programms. L4Lis in the actual Framework programme. Projects of this and the sixth Framework Programme can be used without exceptions. But by using outputs or results of the Fourth or Fifth Framework Programme we have to take care of the actuality of the results, because of the runtime of the projects is some time ago.

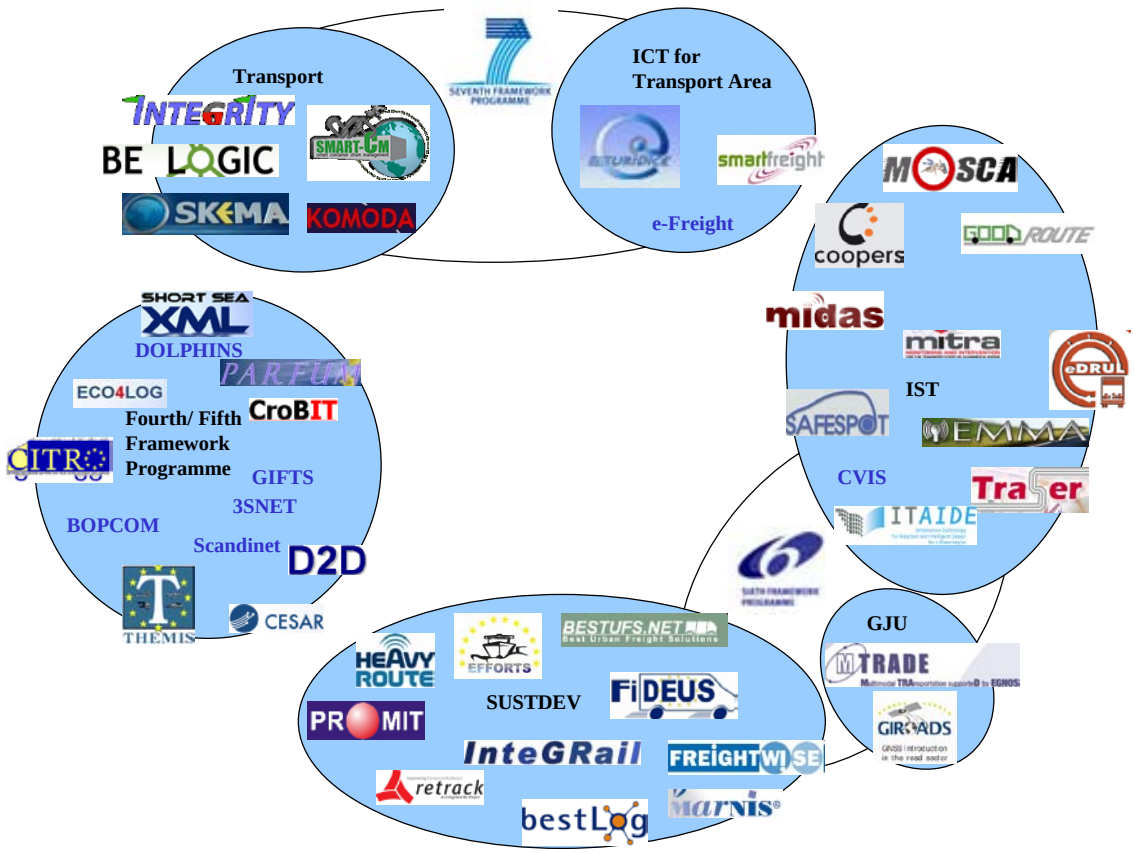

Figure 6: Projects at EU level

The following section describes the EU Framework Programmes and those themes relevant for L4L. Results delivered by projects within the fourth or fifth framework need a more detailed analysis. As already mentioned the possibility that technical solutions may have gone out on date, is much higher than for references and business models. Consequently, technical projects from these programmes are mostly less relevant.

The Seventh Framework Programme includes several themes, but Figure 6 shows only those topics interesting for the work within the L4L project. L4L has the general goal of driving European ICT for transport research in the direction of making logistic operations more efficient. For these reason necessary themes of the EU´s Seventh Framework Programme are “Transport” and “ICT for Transport Area”.

The topic transport aims at achieving developing safer, greener and smarter transport systems for Europe that will benefit the citizens, respect the environment, and increase the competitiveness of European industries in the global market. The transport of people and goods within the EU is of very higher relevance for the economic growth sustainability, but in general has a negative impact on the environment, energy usage, safety, security and public health. It is therefore new objective of the transport industry to find alternatives reducing the negative impacts.

The Transport theme covers all four different transport modes [http://cordis.europa.eu/fp7/transport/about-transport_en.html]

1. Aeronautics and air transport - Funding priorities:

- The “greening” of air transport
- Increasing time efficiency
- Customer satisfaction and safety
- Improving cost efficiency
- Protection of aircraft and passengers
- Air transport of the future

2. Road - Funding priorities:

- Creating 'greener' road transport
- Encouraging modal shift and decongesting transport corridors
- Ensuring sustainable urban mobility
- Improving safety and security
- Strengthening competitiveness
- Air transport of the future

3. Rail - Funding priorities:

- Interoperability
- Intelligent mobility
- Safety and security
- Environment
- Innovative materials and production methods

4. Waterborne transport - Funding priorities:

- Safe, sustainable and efficient waterborne operations
- A competitive European maritime industry
- Managing and facilitating growth and changing trade patterns

5. Multimodal

Research undertaken under the Seventh Framework Programme will also seek more efficient use and better integration of all four modes by funding research in multimodal transport.
In addition, transport research under FP7 will provide support to the European global satellite navigation system Galileo and EGNOS.
Logistic for LIFE will identify solutions that cover all the mentioned transport modes and the corresponding requirements.

The other important Framework topic for L4L is “ICT for Transport Area”. The objective of this research area is to improve the competiveness of European industry and shape the future developments of technologies so that the demands of its society and economy are met. Within the research in this area the FP7 wants to ensure Europeans global leadership in ICT, in order to help drive and stimulate product, service and process innovation and creativity through ICT use and ensure that ICT progress is rapidly transformed into benefits for Europe’s citizens, businesses, industry and governments.
For L4L the especially Challenge 6: ICT for Mobility, Environmental Sustainability and Energy Efficiency is important. The solutions developed by research projects within this challenge are usable for the L4Lideas. The ICT solutions developed here should help to improve our situation in sustainability din all three dimension: societal, financial and environmental.

3.2.2 National level projects

Projects on national or regional level do often focus on specific regional and national needs. Nevertheless there are a number of projects that are more general, so that L4Lstakeholder and subsequently others can profit from the results. On the other side also projects that focus on a specific country can often be adapted to a more general solution, or are adaptable to other countries, too.
Nearly every logistic research project consider sustainability dimension, but they do not always cover all the four relevant for L4L. Looking at the long term sustainability in the environmental dimension there is to mention the Swedish research project: ***New business models for sustainable logistics.*** The project focus on the situation and interaction in food supply chains, and from this point of view suggest

new models for collaboration between the actors for optimising the processes, especially regarding the environment. Generally they are working on reducing the environmental impact caused by food supply chains.
A solution for this problem is very important for Logistics for LIFE, because the transportation of food is a big market and the food transportation is not avoidable. Furthermore the transportation of food requires special treatment what has got a negative impact on the environment, for example on the energy demand that can arise from extra cooling systems. Additionally the solutions developed within the projects are not only usable for the food supply chain, but instead also for the non-food supply chain with some adaptations.
Another national project financed and supplied by Switzerland, called ***C23 - Strategies for a Low Carbon Built Environment*** contributes to long term sustainability in the environmental dimension, by investigating how carbon reductions can be achieved through appropriate design and management of the urban environment. The project is carried out by experts from different scientific fields, so the achieved results are multifaceted. For Logistics for LIFE, the results of reducing carbon can be used as a general way of environmental friendly method that can be used in different

Another projects aiming at environmental friendly solutions and hence on achieving long term sustainability in environmental dimension is a project funded in Switzerland. The mentioned research project is called ***Instantaneous energy consumption and emissions of road vehicles, especially of heavy duty vehicles*** and the acronym says a lot about the objectives aimed at within the project. Within the project an improved methodology for estimating emissions and fuel consumption from commercial road transport operated with heavy-duty vehicles in Europe was developed. The goal was to estimate the emission [g/km] from single vehicles as well as from vehicle fleets [tons/year], e.g. for national or regional inventories. Reducing emission is a fundamental objective today, and not only in the area of logistics. As already mentioned in the beginning of this section emission and transport of freight belong together. That is the reason for reducing the emission by using environmental technologies if they cannot be prohibited.

Long term sustainability is not only aimed at in environmental dimension, a national research project supported and financed by Germany is ***Objektbildungsverfahren zur erfolgreichen Einführung neuer technischer Logistikkonzepte in robuste Distributionssysteme*** what means: method for object creating for the implementation of new technical logistic concept into robust distribution systems. This projects aims at sustainability in two dimensions. On one hand the objectives of the project aims at financial sustainability, because with the implementation of new technical components, the whole system is able to work more efficient. But there is another factor that aims at achieving long term sustainability. This time not in financial but in social dimension, because the method for implementing new technical systems in for example in an individual company or as well as in a complex supply chain requires also social factors. The society has to accept the new technology and this is one of the main requirements for the functionality of a new technique.

One national project is particularly of interest for L4L***ARKTRANS.*** It is a Norwegian research project that did not developed an own IT solution but it is like L4La cluster project. ***ARKTRANS*** designed a multimodal framework for ITS and this framework will be used by our consortium with a few adaptations. The chosen framework covers all necessary aspects we face in today logistics and supply chain. In chapter 4 we will allocate the various analysed projects to the topic of the adapted framework. The main characteristics that represent the framework and that are simultaneously the advantages of this framework are summarized in the following: The ***ARKTRANS*** multimodal framework:

- Provides a holistic and mode-independent understanding of the responsibilities, relations and dependencies within the transport sector.
- Defines multimodal terminology and concepts (semantics) for the transport sector.
- Supports specification and implementation of ITS solutions that are in compliance with a common and holistic view of the transport sector.
- Supports analyses and simplifications of transport solutions by different abstraction levels and views.

The L4L consortium members are involved in a number of projects investigating on technical topics. National projects investigating technical solution are easier to contribute from, as topics that are specialised on a specific country or region, because often we face the problem of adapting these specific research results to a general result. In technical topics we face another situation. Technical results can be always adapted under normal conditions, no matter if it is a national, regional or EU project. Hence in the following some projects are described that achieved results in technical areas of transportation and logistics. By creating results of this kind the project stakeholder created sustainability mainly in financial dimension. Because usually the implementation of new technologies means simultaneously more efficient process and hence more cost efficient- financial processes.

3.2.3 Regional projects

Regional projects can be funded by the EU, regional, or national organisations. Information on such projects are often less available both either because they do not have an own project web or due to the fact that all relevant information are in local language. Hence only a few projects on regional level were analysed. Regional means that the members of the project consortium are from dieffernt countries within a region, furthermore the project is supported and financed by an non-Eu organisation.

One of these projects is ***InterBaltiv,*** which is initiated by the CPMR Baltic Sea Commission and seconded by the Baltic Development Forum**.** The background of the project is that there will be a huge increase in transportation and logistics related to the Baltic Sea region. ***InterBaltic*** developed solutions to handle the coming situation, especially regarding the business sector and the living conditions of the private sector. Here long term sustainability in social and financial dimension is aimed at, because of the to find solutions for industry, what means long term sustainability in financial dimension and also long term sustainability in social dimension through aiming at increasing the living conditions of the private sector.

In conclusion the number of relevant regional project is not as high the number of projects on national or EU level. The possibility of adapting the solutions emerged from regional problems is not always given. This is one reason for the fewer projects on regional level.

In addition regional projects are in most cases defined as EU projects, because there are no comparable institutions that could finance and support these kinds of research projects.

4 Identified projects and matching with the ARKTRANS reference model.

As described in chapter 1, the L4Lframework will be an extension of the existing ARKTRANS reference model. In this deliverable we use the functional descriptions and match the projects described in chapter 4 against these functionalities. It is obviously that a number of projects cannot be definitely allocated to only one functionality, one crucial reason for, is that we analysed a number of projects aiming at optimising a whole supply chain system, and all its including processes. Hence we allocated the projects to that group of functionality where think the main focus of the project is at. The objective is to provide the readers with useful information. I.e. if someone looks for solution on for example on board support, he can look in the matching table and find relevant projects.
ARKTRANS is a complete framework describing several functionalities not belonging to the core topic of Logistics for LIFE, hence in a first step; the most relevant functionalities were listed. An overview of this can be found in Figure 7 to Figure 10
An overview of the complete functional description of the ARKTRANS framework can be found in D2.1 and on the ARKTRANS web site.

4.1 On-Board Support and Control functionality

On board Support and Control functionality implies all functionalities that are connected with the actual condition while transportation. Hence the projects that can be find here help optimising the transportation process and the management of the conditions we face while transporting.

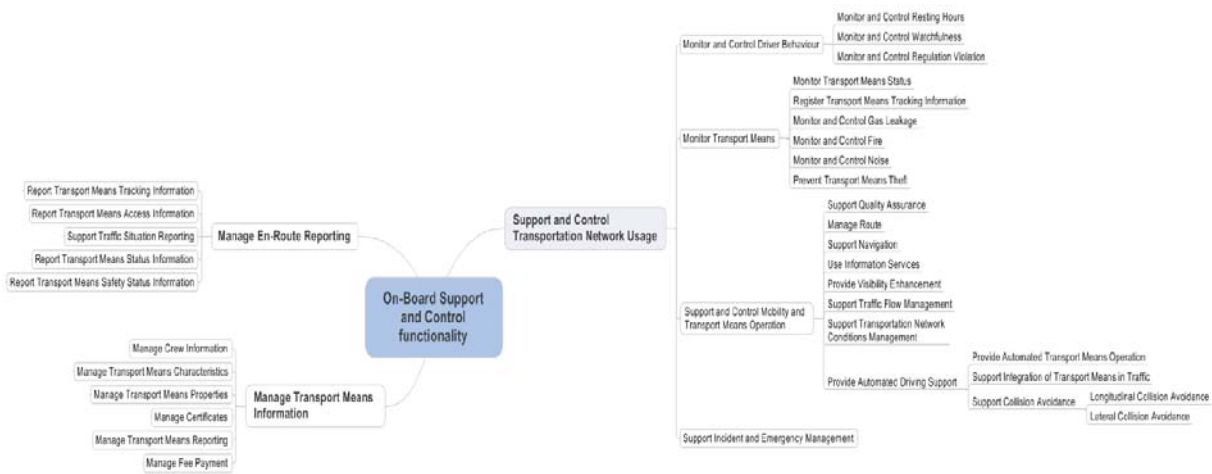

Figure 7: On- Board Support and Control functionality

4.1.1 Support and Control Transportation Network Usage

CVIS

By creating a unified technical solution in that all vehicles and infrastructural elements can communicate with each other, the condition of the transport means can be controlled all the time and if necessary be supported. The results of the ***CVIS*** project can help to monitor and manage the on board condition, because the stakeholder can monitor the actual condition of the transport all the time.

4.1.2 Manage Transport Means Information

EuroFOT

The goal of ***EuroFOT*** is to identify and coordinate an in-the-field testing of new Intelligent Vehicle Systems with the potential for improving the quality of European road traffic. Intelligent Vehicles enable the management of transport means information at- real time en-route.

Smart Truck

Smart truck develops intelligent vehicles which are able to monitor their consignment with implemented RFID systems. Transport means information can be detected and controlled, this allows real-time route planning. Thus we achieve a more efficient control of delivery vehicles.

Mobile IT

Mobile IT studies within its research project the potential of integrating a position based road user and other ITS services, especially for vehicles transporting heavy goods. For this reason they analysed various solutions and interviewed stakeholders. With the awareness of Mobile IT we can improve the management of transport means information.

GIROADS

GNSS Introduction in the Road Sector shows how GNSS systems can be used to optimise the transport process. Thus GNSS cause that the position of the transport means can be detected at real-time.

4.1.3 Manage En-Route Reporting

SMARTFREIGHT

SMARTFREIGHT will implement and evaluate Information and Communication Technology (ICT) solutions that integrate urban traffic management systems with the management of freight and logistics in urban areas. Through this the en-route information arising by actions of the freight distribution vehicles can be reported, controlled and supported.

ProKon

ProKon developed an automated system for positioning and status recording of cargo carriers (Mafi roll-trailers) and loads (rolls) in seaport terminals by combining innovative information and communication technologies for identifying, tracking and communications. The application of this system the process control by the current permanent documentation of local and state changes of logistical objects in traffic can be improved.

CASSANDRA

CASSANDRA studies how to use new technologies to achieve a higher degree of security and effectiveness in transportation. The technologies used are Intelligent Cargos and Trucks. Intelligent objects create the ability of en-route reporting at real-time.

4.2 Transport Demand functionality

Transport demand functionality is a class of functions required for the planning, managing and administration the transport. There are not only functions that are necessarily required, but there are also single functions integrated to improve the process before the main transport process.
Hence the projects listed in this section help optimising this kind of planning, managing and administrating process.

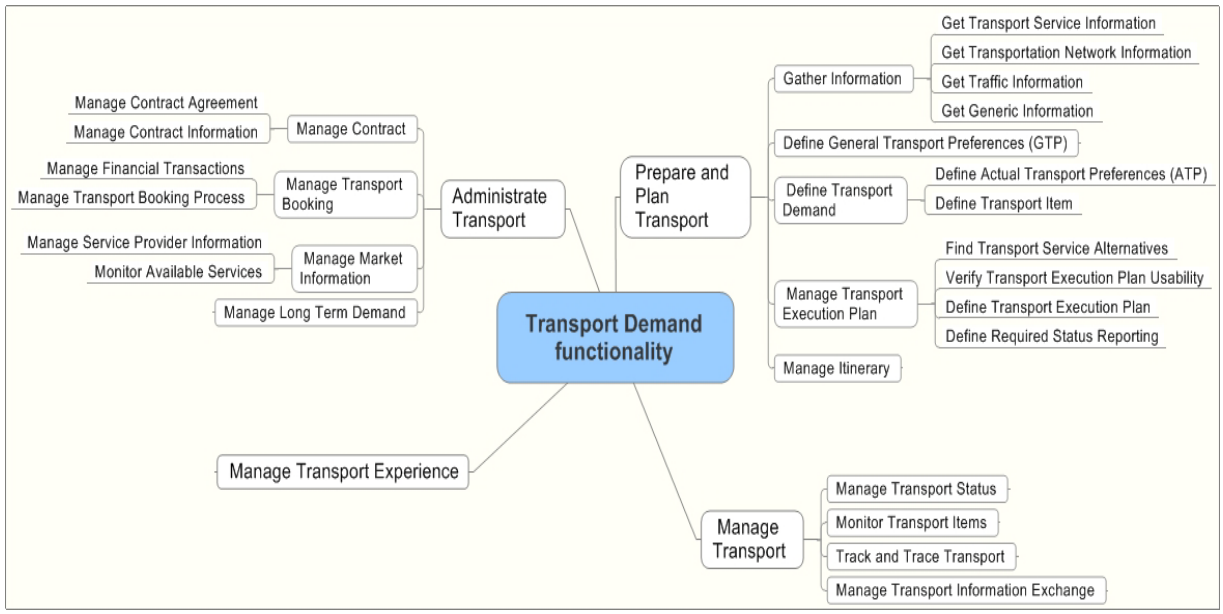

Figure 8: Transport Demand functionality

4.2.1 Prepare and Plan Transport

ECO4LOG

The project aims at optimising transport logistics minimise expected capacity problems, especially Brandenburg-Saxony-Austria axis with Accession Countries. The solution of ECO4LOG to minimise capacity problems can be used within the planning and preparing process of transport.

KOMODA

One of the first outcomes of ***KOMODA*** is a multifaceted idea of a possible future e-Logistics system (landscape) throughout Europe with the specific target to support the co-modal approach. Komoda should help to plan transport by using different modes on their own and in combination with in the aim to obtain an optimal and sustainable utilisation of resources.

HeavyRoute

The ***HeavyRoute*** project aims to develop an advanced route guidance system for HGVs as a tool for deriving the safest and the most cost effective routes for road freight transports throughout Europe. This can support the planning of the transport process.

INTEGRITY

Intermodal Global Door-to-door Container Supply Chain Visibility project is the development of the so-called Shared Intermodal Container Information System (SICIS) allowing authorised companies and authorities to access planning and status information of selected transports. This enables the preparing and planning of transports with the adequate number of information

M-TRADE

The main goal of ***M-TRADE*** (Multimodal TRAnsportation supporteD by EGNOS is to explore and promote GNSS (EGNOS /Galileo) use in Freight Multimodal Transport. The application of GNSS in transport processes enables the use of transport alternatives, like the planning of transport routes with different transport modes. Hence benefits can be created in the area of effectiveness and costs.

CITRO

The aim of the ***CITRO*** project is to support the clustering of individual truck owners and their growth, by means of the use of modern organisational models, as well as the use of innovative Information and Communication Technologies (ICT). These clusters can be used within the preparing and planning of transport to optimise the whole process.

BE LOGIC

BE LOGIC wants to improve the situation of transports across different modes, by improving the efficiency within and across different modes. And further more support the development of a qualitative logistic system. The ability of transportation across different modes creates a number of new opportunities within the planning and preparing of transports.

GREENTRIP

The technology developed within ***GREENTRIP*** is aimed at optimising and co-ordinating road transport logistics that targets companies and virtual enterprises, both at the organisational and operational levels

4.2.2 Manage Transport

InLoC

The project creates better conditions for logistics operations in the Baltic Sea region by enhancing networking between logistics centres and their interest groups. Through creating a network between the involved stakeholders the communication between them can be improved.

SESTANTE

The ***SESTANTE*** projects aims at increasing whole interoperability and inter-modality of the freight logistic chain through open and interoperable communication networks between different users (Institutional Agencies as Harbour Harbours-office, Authorities, Ministry, shipping operators, etc) and the main nodes of the intermodal chain.

MarNIS

MarNIS developed E-Maritime, a meeting of services and systems, in response to the need for a more transparent and harmonized approach within the maritime sector in general in order to secure its position as a leading transport mode. The focus is placed on the improved exchange of information and provision of services and the required infrastructure to meet the requirements placed on both the authority and business level.

MSI- Group

MSI- Group developed a general guideline for how information systems should be developed and used based on the needs of road haulage organizations. With this guideline and the resulting solution the transport items can be controlled and managed.

EMMA

By building a middleware platform that should increase the connectivity of involved parties, ***EMMA*** aims at facilitating the sharing of information especially in the area of transports. L4Lcan benefit from the results by offering an application that makes the management of transport information exchange possible.

SToP

SToP creates a solution for product authentication, which satisfies a complex set of requirements. This is achieved through the application of RFID systems that ensure a high degree secure against manipulation and/ or cloning. This solution can help to monitor the transport items.

Effective and integrated transport

The purpose of the project is to develop models of business collaboration between all actors involved in transport setups. Hence these models should ensure the information exchange between all involved parties of the supply chain.

D2D

D2D developed a system for recording detailed information about transport activities and progress, the FTMS, short for Freight Transport Monitoring System. This allows to manage the transport at real-time.

SAFESPOT

Use the infrastructure and the vehicles as sources and destinations of safety-related information and develop an open, flexible and modular architecture and communication platform. Hence, through this application the management of transport information exchange is possible.

Integration von Logistikdaten zur Unterstützung selbststeuernder Logistikprozesse

The project offers a technical approach which provide persistent and platform independent access to and exchange of data on the basis of generic services within autonomous cooperating logistics systems. Hence through this application the management of transport information exchange is possible.

RailTrace

RailTrace facilitates better control over the goods by combining online status information from various European railway operators and other logistics service companies. The outcomes of RailTrace can be used to monitor and manage the transport items.

4.2.3 Administrate Transport

DOLPHINS

The ***DOLPHINS*** project builds an e-commerce platform, able to:

- combine booking, scheduling, negotiation, brokerage, payment and invoicing data in a timely and effective manner;
- Connect users (MTOs, transport operators, ship-owners, shipping companies, forwarders, SMEs, etc.) together and allow them to share dynamically.

With this service the management of contract, booking and the whole communication between the stakeholders is supported.

3SNET

3SNET defines implements and assess an information, booking and management system, providing a single interface between shippers, carriers, transport operators, etc. With this service the management of contract, booking and the whole communication between the stakeholders is supported.

4.3 Transport Service Management functionality

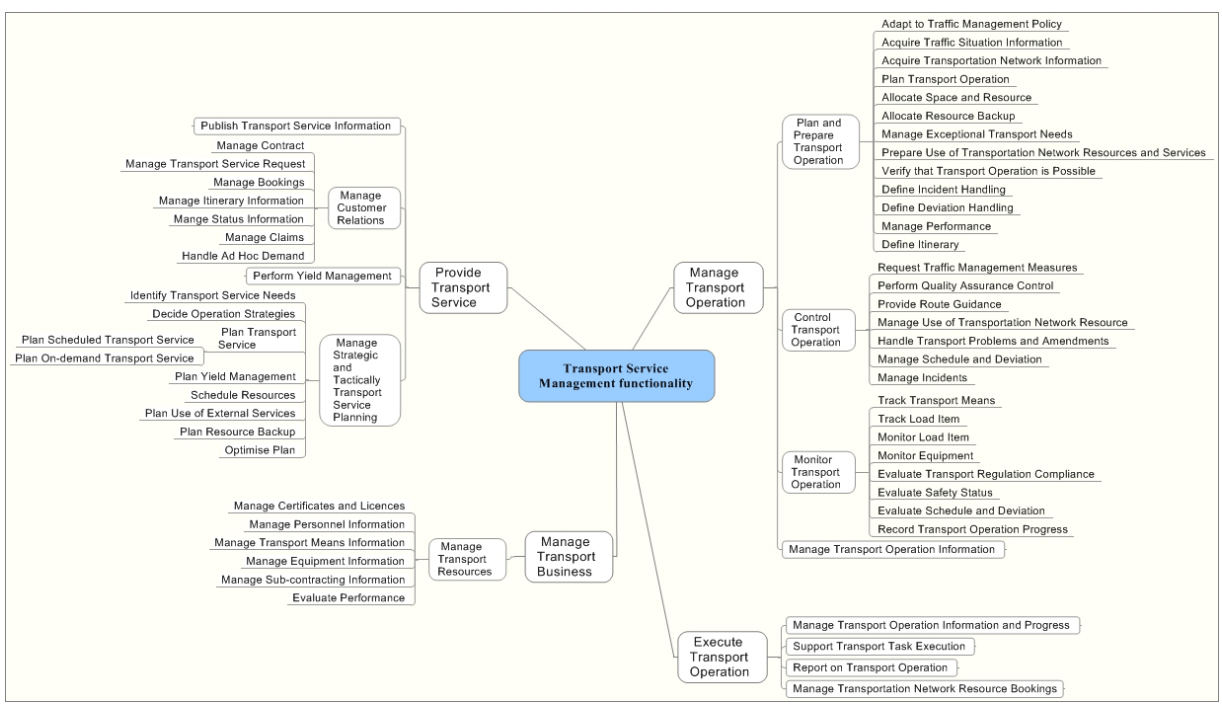

Figure 9: Transport Service Management functionality

The Transport Service Management functionality group aims at management of the whole system. The functions of this group are services for the management, but on a higher layer then the management in the transport demand functionality. The observed area is wider than only the transport process, the whole business is regarded. The Transport Service Management functionality group can be described as a strategic management tool. In the following the corresponding projects are listed.

4.3.1 Manage Transport Operation

EURIDICE

The EURIDICE project offers a solution to manage the whole transport operation process, by:

- Supporting the interaction of individual cargo items with the surrounding environment and users on the field
- Improving logistic performances through application of the intelligent cargo concept and technologies in the working practices of operators and industrial users
- Developing collaborative business models to sustain, promote and develop an intelligent cargo infrastructure
- Realizing more secure and environment friendly transport chains through the adoption of intelligent cargo to support modal shift and door-to-door inter-modal services

FREIGHTVISION

FREIGHTVISION will develop a long-term vision and a robust and adaptive action plan both for transport and technology policy for sustainable long-distance freight transport, which are supported as much as possible by the relevant stakeholders. This action plan can help then to create an effective transport plan.

MIRTO

This project aimed at designing and implementing state of the art telematics solutions for the automatic monitoring of cargo/vehicles in the context of Hellenic Railways Organisation (HRO), Thessaloniki Port Authority (ThPA) and Heraklion Port Authority (HePA) operations, which are major representatives of the Greek transport industry. The main objective is to improve the ability of using alternative modes of transport (sea and rail) with respect to road transport through the dynamic monitoring and control of transport means and cargo.
Hence ***MITRO*** offers a solution for dynamic monitoring of transport means and items.

Smart Sensor

The SmartSensor is linked to an RFID system with which the transport operation, for example the loading of an item can be monitored.

FREIGHTWISE

FREIGHTWISE's overall objective is to support the modal shift of cargo flows from road to intermodal transport using road in combination with short sea shipping, inland waterways and rail. With this approach of combining different transport modes the whole transport operations process can be managed.

4.3.2 Execute Transport Operation

GILDANET

GILDANET introduced an integrated and open information network between the partners of the transport chain and other relevant parties. Emphasis was put on the real time electronic transactions, Tracking and Tracing of cargo and vehicle, information dissemination, Decision Support Systems, interfacing with the end users, interconnected/ interoperable ICT systems at a transnational level and adoption of advanced communication protocols. Hence this network optimises the transport execution phase, by making it more transparent for all involved stakeholder.

New business models for sustainable logistics

The project focused on studying collaboration and interaction in food supply chains, suggesting new models of collaboration between the actors. The new models included improved information sharing in order to reduce environmental impact from food supply chains.

FastRCargo

The project ***FastR Cargo*** aims at developing a new small-scale horizontal transhipment technology for automated transhipment between rail wagons and lorries below active contact lines. It is based on automatic handling of the intermodal transport units in vertical, transversal and lateral directions. The transhipment of intermodal transport is one of the main challenges in intermodal road-rail transport. Hence this project offers a solution for this key problem.

SKEMA

For facilitating the exchange of information amongst stakeholders in the European maritime transport and in logistic industry, ***SKEMA*** gives an overview and detailed information on current technologies and best practices at European, regional and national levels. The exchange of information in the execution phase can be achieved with the results of ***SKEMA.***

4.3.3 Manage Transport Business

TraSer

The scientific objective of TraSer is to develop through iterative actions innovation an understanding of how network partners could be motivated to participate in supporting network level information services deployed by SMEs. The motivation of the network partners can contribute in the effectiveness of the transport process.

LogOn Baltic

LogOn Baltic aims at improving spatial integration by transferring knowledge in ICT and logistics competences. ***LogOn Baltic*** produces and disseminates information to improve ICT and logistic competences. Hence with these competences the management of transport business can be supported.

4.3.4 Provide Transport Service

ITS-Support for combined transport solutions

"ITS-support for combined transport solutions" is a research project addressing the issue of how transportation can be made more efficient, flexible, and secure by the help of distributed technology support. With the knowledge of the project the strategic planning can be improved.

COIN IP

Coin IP studies, designs, develops and prototypes an open, self-adaptive, generic ICT integrated solution, starting from notable existing research results in the field of Enterprise Interoperability and Enterprise Collaboration. With this ICT solution the phase of strategic planning can be improved.

INNOSUTRA

The main objective of the ***INNOSUTRA*** project is 'to assess the conditions, including policy support, under which innovative concepts have a high chance of getting adopted and being successful'. With the assessment of the projects the strategic planning can be improved.

RETRACK

The ***RETRACK*** project is applying an innovative rail freight service concept to the movement of rail freight across Europe. This is being achieved through the design, development and implementation of a commercial trans-European rail freight service along the rail corridor between Rotterdam (Netherlands) and Constanza (Romania) on the Black Sea. With the implementation of a commercial trans-European rail freight service, there is the opportunity to manage strategic and tactically new routes between the mentioned regions.

4.4 Transportation Network Management functionality

The Transportation Network Management functionality group implies functions for managing the network a system is in. External objects or situations, as well as authorities are handled with this number of functions.

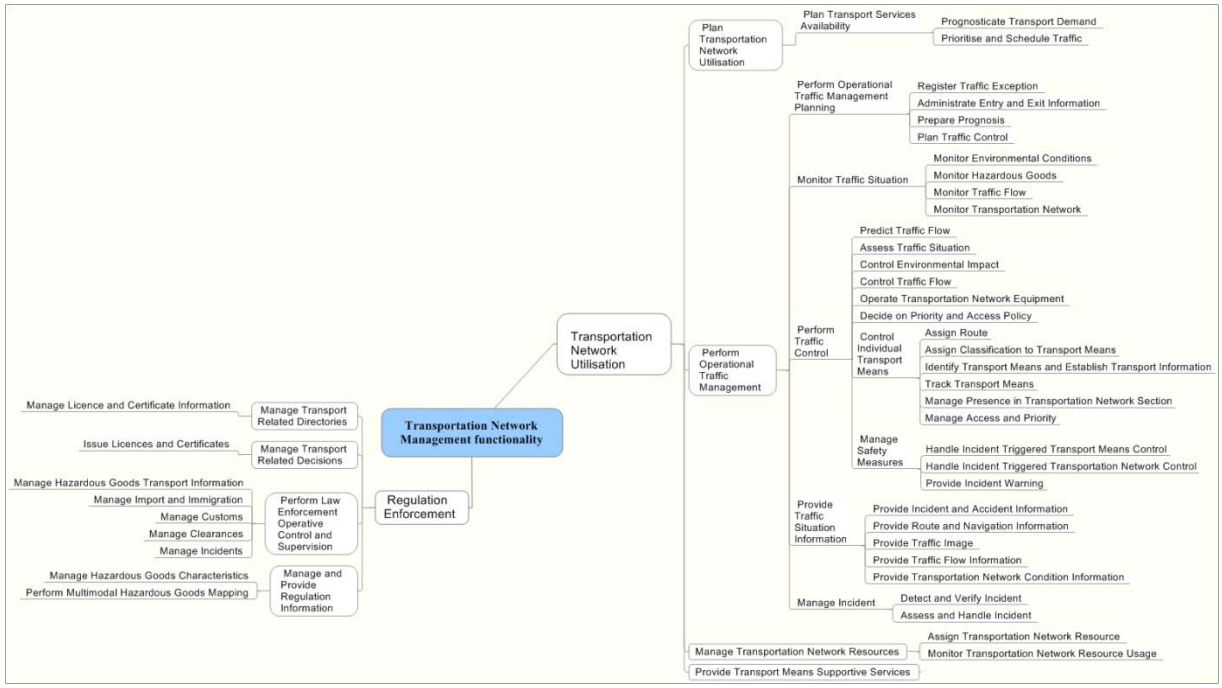

Figure 10: Transport network Management functionalities

4.4.1 Transportation Network Utilisation

IIFEG

The project ***IIFEG*** creates an intelligent Infrastructure to support freight transportation by achieving political goals such as safety, environment and accessibility for the transport. Thus the network the freight transport takes place in becomes an active and at the same time intelligent actor.

CESAR

CESAR is created a plat form with following functionalities relevant within the L4Lproject:

- integration of services: timetables, service offers and prices for unaccompanied traffic;
- integration of additional status events.

The platform enables the management of the extern network, and hence the planning with these factors.

CroBIT

CroBIT is a new system that provides the railways with a tool to track consignments and calculate ETAs for their traffic throughout Europe. The benefits created with this approach:

- improved service reliability and data exchange
- cross border freight trains
- in a corridor of the Trans European Rail Freight Network
- using advanced IT-Technologies.

NGIL: Subproject Design and control of sustainable supply chains

NGIL The research will result in a number of concrete models, both conceptual and analytical, as well as in software tools that can be of direct use for companies that aspire to simultaneous achieve cost efficient and sustainable supply chain solutions. Hence the project aims at creating a overall solution for the logistic sector by comprising the whole network.

COOPERS

The goal of the project is the enhancement of road safety by direct and up to date traffic information communication between infrastructure and motorised vehicles on a motorway section.

Smart Freight to ERP

The purpose of this study is to identify how the connection between intelligent freight and business information systems can create more effective transports and reduce costs, environmental impact and pressure on existing infrastructure. This project connects two objects of the network to improve effectiveness: intelligent freight and business information.

FREILOT

The ***FREILOT*** service aims to increase energy efficiency drastically in road goods transport in urban areas through a holistic treatment of traffic management, fleet management, the delivery vehicle and the driver, and demonstrate in four linked pilot projects that up to 25% reduction of fuel consumption in urban areas is feasible.

GOOD ROUTE

GOOD ROUTE aims to develop a cooperative system for dangerous goods vehicles routing monitoring, re-routing (in case of need), enforcement and driver support, based upon dynamic, real time data, in order to minimise the Societal Risks related to their movements, whereas still generating the most cost efficient solution for all actors involved in their logistic chain.

MITRA

MITRA will implement an operational system that handles dangerous vehicles, goods and situations. The project aims at kind of crisis management information in case of an accident: associated risks, potential consequences, applicable regulations and protection measures.

SuperGreen

The ***SuperGreen*** project can contribute improving the network by supporting the development of sustainable transport networks by fulfilling requirements covering environmental, technical, economic, social and spatial planning aspects.

***INTRO*- Intelligent Roads**

INTRO can contribute improving the network by making the roads intelligent. This Intelligence ensures the following:

- Reduce the number of road accidents,
- Reduce the maintenance costs of these infrastructures, which are constantly increasing in Europe, in relation to the volume of traffic and in particular heavy vehicles,\
- Optimise the capacity of existing infrastructure.

DaGoB

DaGoB diffuses best practices across authorities and industries in line with EU transport policy, Safety and Security issues and Competitiveness of Transport Chains. The project aims at developing solutions to handle hazardous goods.

4.4.2 Regulation Enforcement

PARFUM

PARFUM concentrated as a focussed project on the field of urban transport (freight, public and private) and develops there solutions for the reduction of transport induced air pollution, notably particulates (PM10/2.5) Nitrogen Oxides (NOx).

InterBaltic

InterBaltic focuses within the project to develop practical actions in a partnership between the public and private sector based on a common strategic platform, because of the huge increase in transportation and logistics related to the Baltic Sea region and the impacts this will have on the private and public sector.

SMART-CM

It will provide a simple - transparent - neutral - easy to handle solution for the interaction between public administrations (primarily customs) and the market players involved in the container transport chain management and administration business.

4.5 Example

The ARKTRANS framework offers various opportunities to attach the project topics to different functionalities. Of course projects offer solutions covering more than one of the available functionalities. The following example makes clear how a project can supply solutions for different functionality areas. EURIDICE is adequate to show the diversity of a single project, because it aims to provide an overall solution for the logistic sector.

In the field of on-Board Support and Control functionality EURIDICE enables:

- Monitor Transport Means Status
- Register Transport Means Tracking Information
- Manage Transport Means Characteristics
- Manage Transport Means Properties
- Manage Certificates
- Manage Transport Means Reporting
- Manage Fee Payment
- Report Transport Means Tracking Information
- Report Transport Means Access Information
- Support Traffic Situation Reporting
- Report Transport Means Status Information

Additionally with the results of EURIDICE the following processes of the area Transport Demand functionality can be facilitated:

- Activate Transport Product
- Receive Context Related Information
- Manage Transport Status
- Monitor Transport Items
- Track and Trace Transport
- Manage Transport Information Exchange

In the field of Transport Management functionalities EURIDICE covers following functionalities:

- Plan Transport Operation
- Define Deviation Handling
- Manage Schedule and Deviation
- Track Transport Means
- Track Load Item
- Monitor Load Item
- Manage Transport Operation Information and Progress
- Support Transport Task Execution

From the functionalities of Transport Network Management there is only one functionality that can be enabled with the solutions offered by EURIDICE:

- Track Transport Means

A number of functionalities of the Transport Sector Support area are supported by the project:

- Collect and Process Travel Time Data
- Monitor Item Condition
- Track and Report Item Position
- Track and Report Item Handling
- Manage and Report Item Condition and Deviations
- Manage and Report Item Information
- Provide Information Transformation Service

- Provide Single Window Service

The ARKTRANS framework can and will be used in the same way for all other relevant projects analysed.

5 Gap analysis

This gap analysis will only serve as an input to the main impact analysis (D1.3) and the roadmap (D1.4) as well as for the identification of where the consortium needs to allocate more efforts. There are some gaps identified:

1. The number of regional / national initiatives and projects is quite low. It needs to be analysed why so few and why there is clear difference between regions- the Northern Europe seems to focus much more on research for efficient freight transport than the south. The reason for this is still not clear to us- it might be because the North publishes much more online and coordinated as well as in English, or that we, even though we looked at national research funds for Spain, Portugal and France for instance, did not manage to identify all, since there are no partners from these countries. Is it because we cannot find them or because they are not necessary for those regions? It could also be that the regional projects deal with so specific solution that is only relevant for this region and thus seldom presented in international accessed publications and web sites. This appears to be quite unlikely. In the case of company based research, this seems a much more relevant explanation for why we did not find as much as expected at national level- many companies implement solutions for receiving a competitive advantage. Consequently, they do not describe the solutions in such a detail that we can identify and assess the relevance.
2. A second very important observation, esp. for the best case deliverable (D1.2) is that it seems to be several interesting ICT solutions so the technology is available, but the practical application, information on ROI and efforts needed in order to implement seems to lack. One main reason for this is that we identified a large number of research projects delivering solutions at a pre competitive level. These projects need to be taken to the next steps and the solutions need to be more explored at one hand side. On the other hand side, the results of such pre competitive research projects needs time to penetrate the supply chain and transport sector, before it will reach the critical mass. L4L will support this process by leveraging the information to a broader audience.
3. Looking at the different ICT solutions- there seems to be much less projects and initiatives for green and cost effective freight transport. Compared with the three other groups of ICT solutions, this is the newest one and thus, there are not so many old projects supporting this. Interesting is thus, that this seems to have an increasing relevance for the logistic service providers and freight carriers, both caused by public relation interests, but mainly due to pure economic interest- such solution reduces the use of fuel and thus contributes to reduced costs and negative environmental impact.
4. Sustainability- most of the identified projects deal with one to two dimensions, but hardly any to all three. It will therefore be necessary to analyse if a combination of projects supporting different dimensions will have a more positive impact or if it only leads to additional complexity and increased cost for the potential users.

6 Conclusions and further steps

This observatory report gives an overview over relevant project dealing with ICT based solution for the long term sustainability of efficient freight transport. More than 100 projects have been identified and analysed on international, national and regional level. The results are not static, research projects will change over the life time of the project; soothe work of identifying new and relevant projects will be continued also in the future. D1.1 lays the foundation of the future work in the work packages as well as for WP 2-4. Based upon the projects identified here, the best practice projects will be chosen and the short gap analysis will be the starting point for the roadmap activities. The matching of projects with the ARKTRANS framework has shown that this is a good starting point, but did also show that it acquires high knowledge of the specific project results.

The observatory shows that the topic has been relevant for several years esp. at European level, and that several solutions supporting at least one sustainability dimension- both on a software level as well as on a business model and framework level are available. The work carried out has however also shown that the access to such projects results is difficult which again often lead to a lack of collaboration among related projects. Furthermore, it can be stated that this topic seems to be more driven from a European perspective than from a national or regional. One reason is the high use of resources as well as the fact that esp. the freight transport does have impacts on the environment and is not restricted to national borders.

Not all identified projects seem to be relevant for L4L, but since most of the projects are still under development, we will keep an eye on these in case the relevance changes in the future. The next deliverable (D1.2) however will focus on those projects being very relevant

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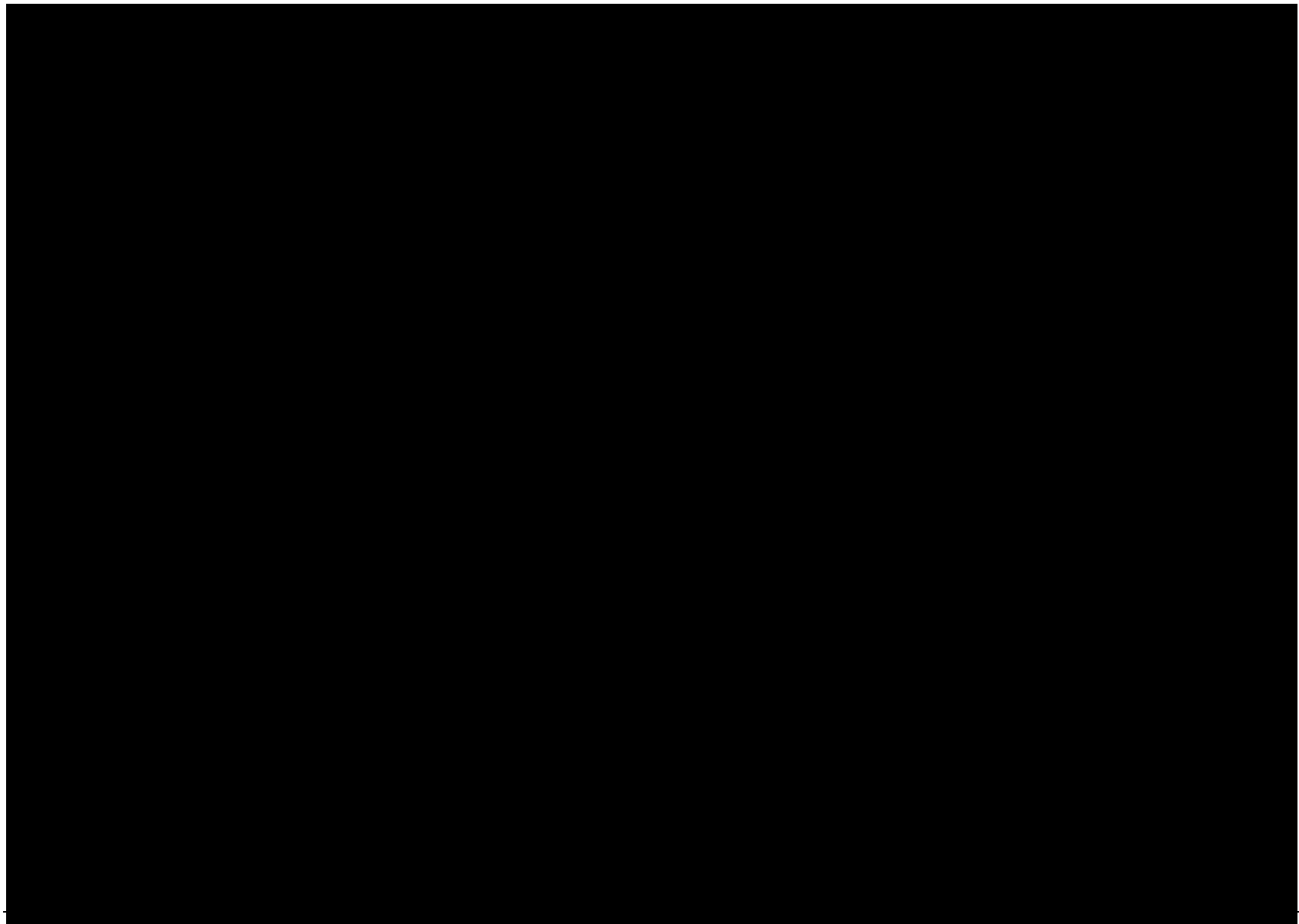
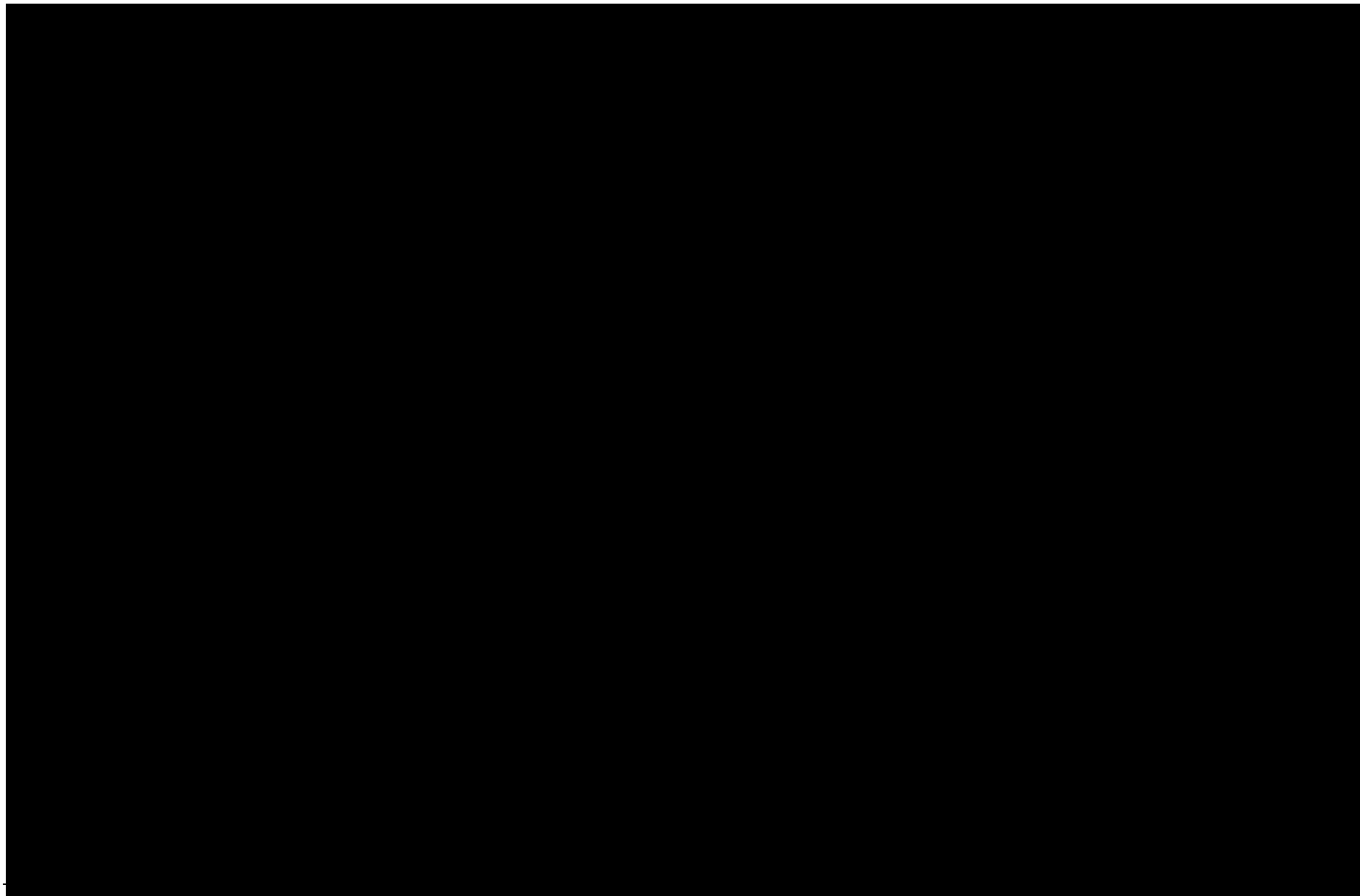
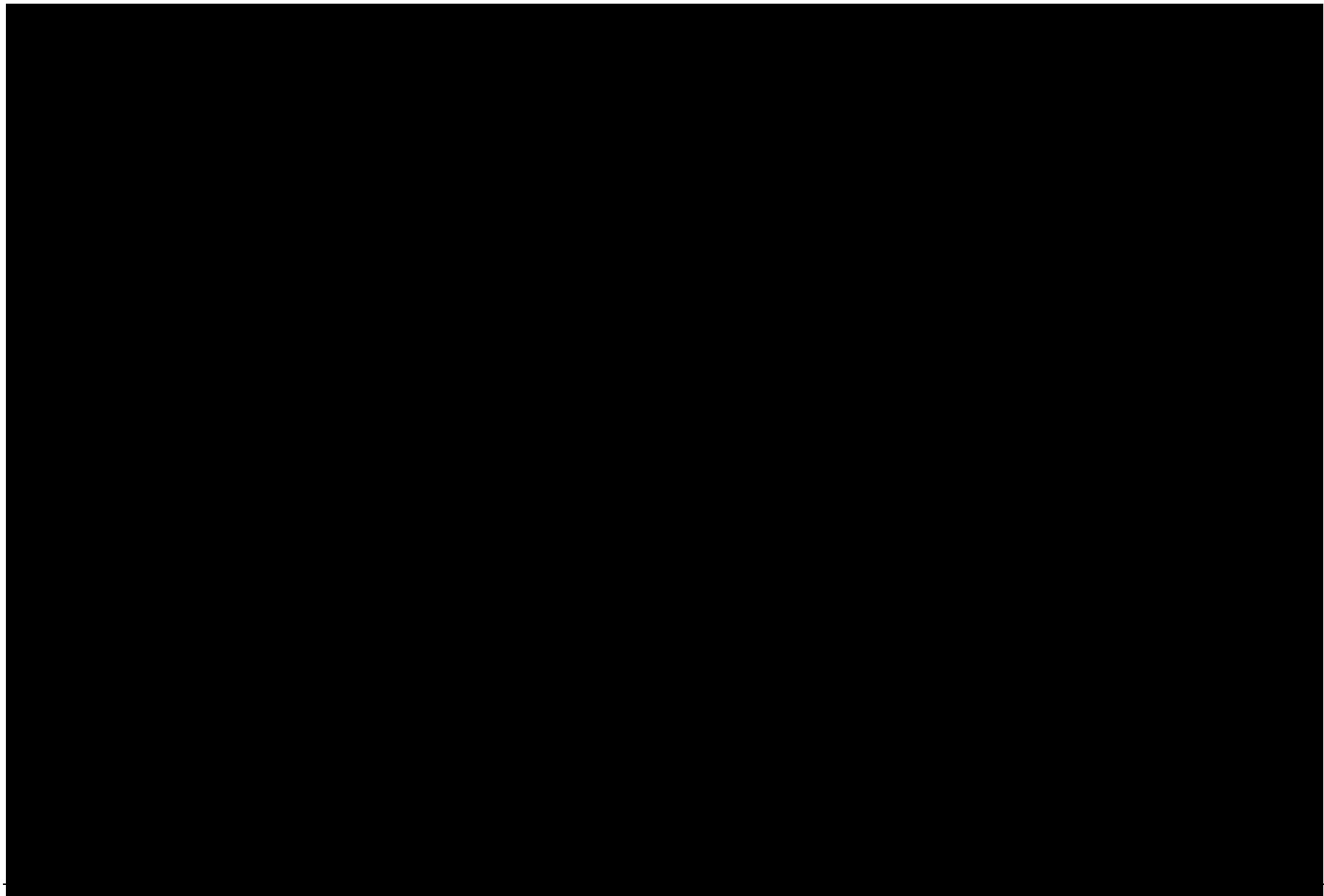
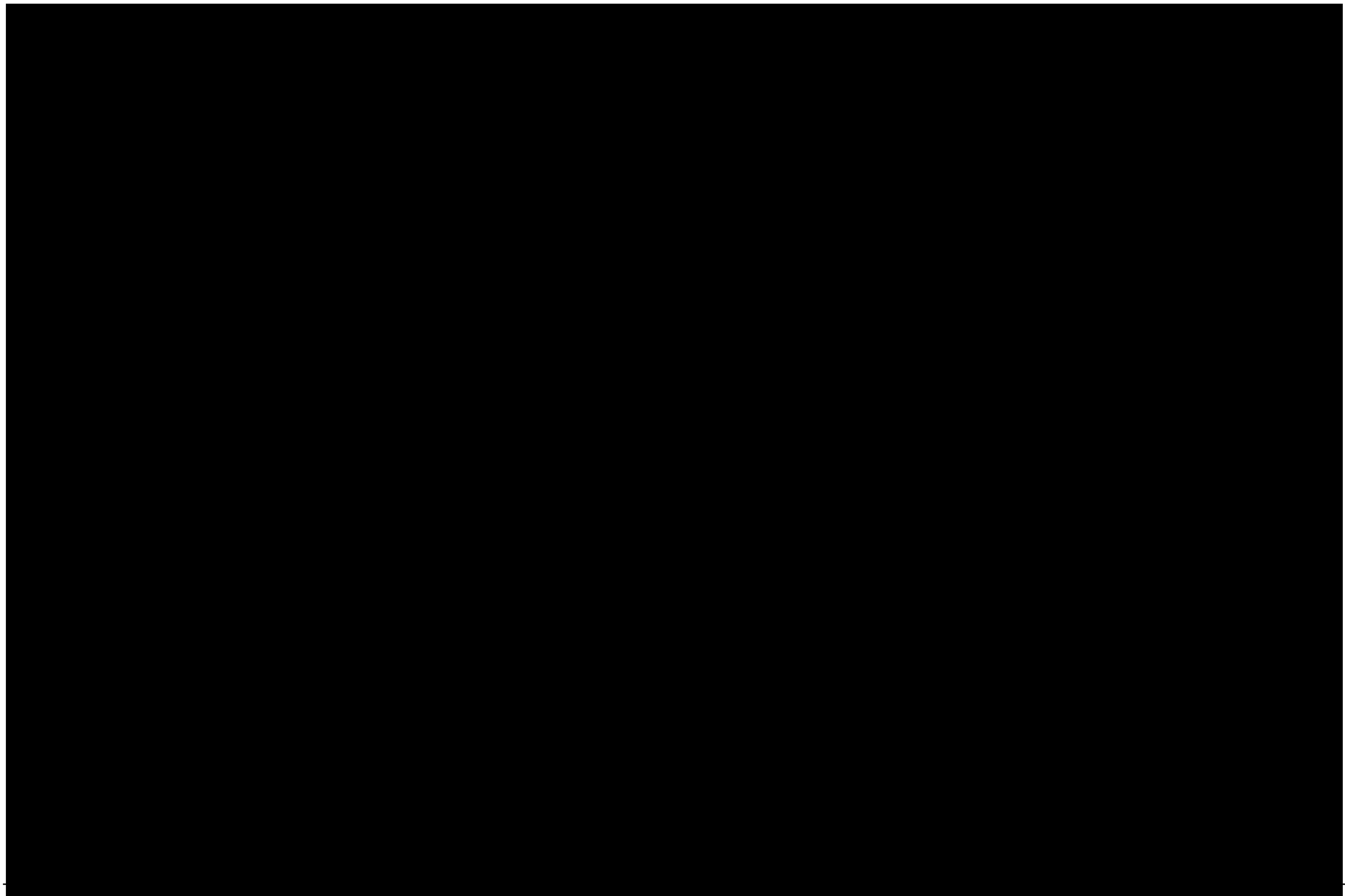
8 Annex

8.1 Direct- EU General Information

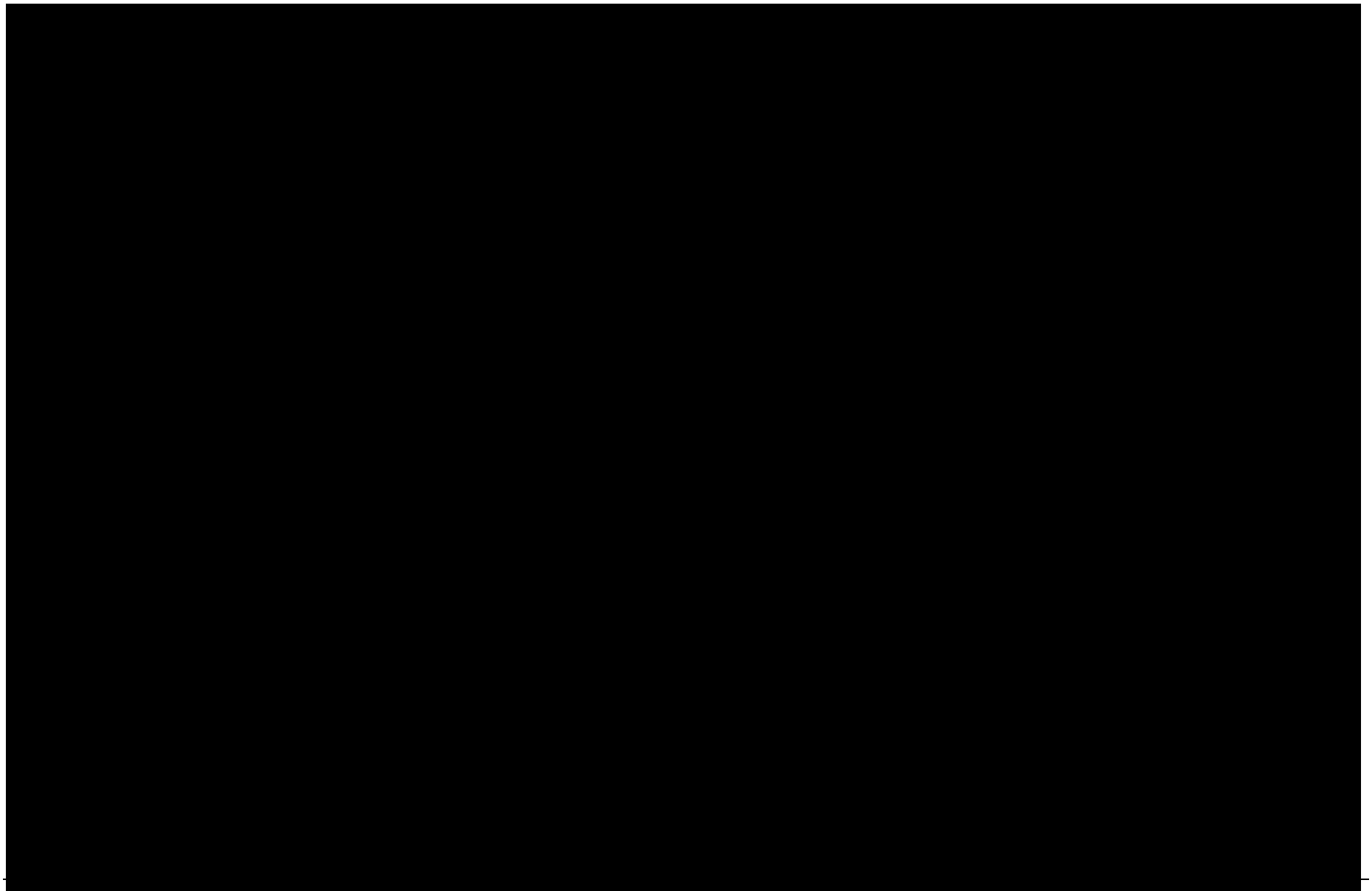


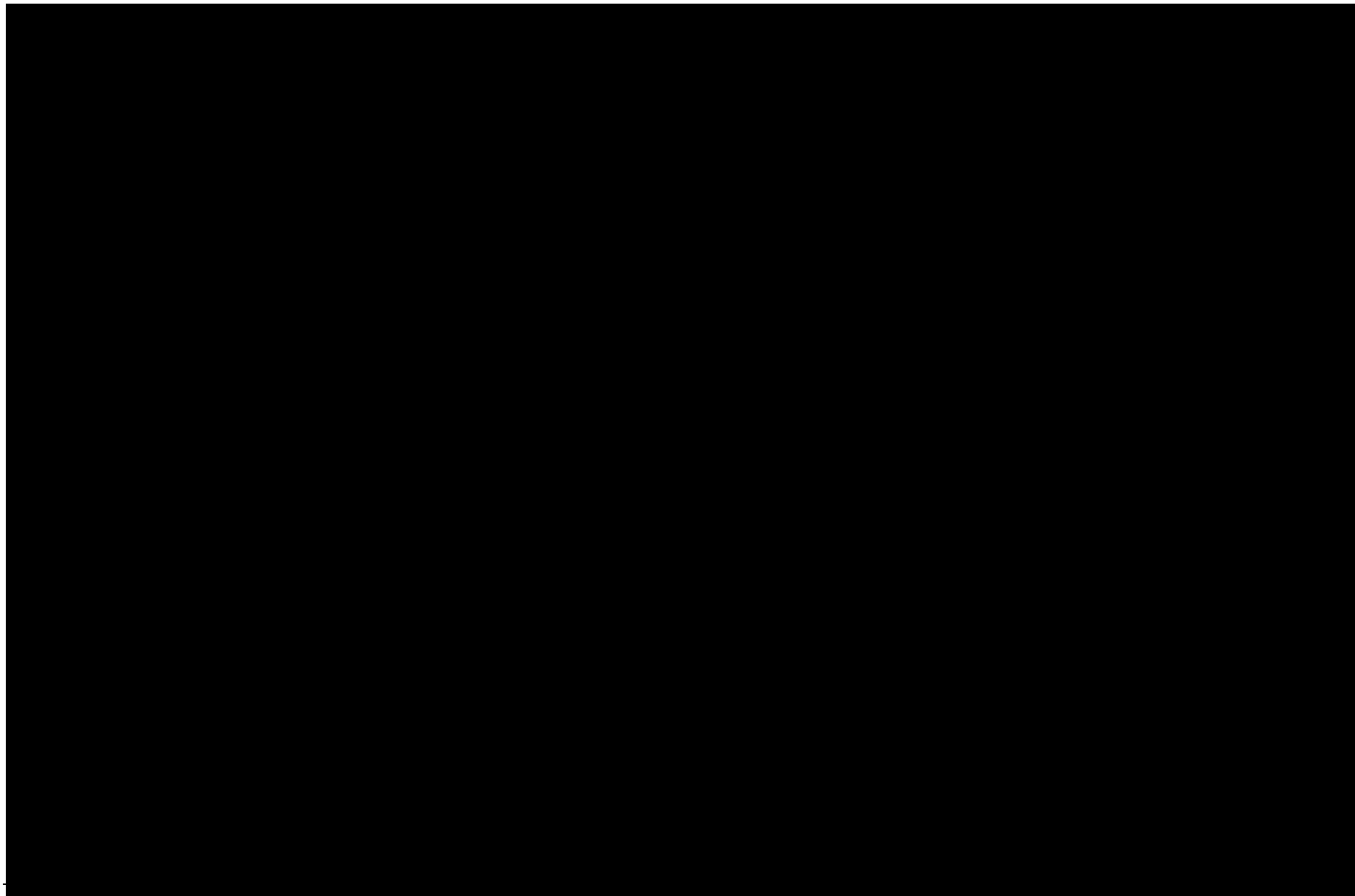


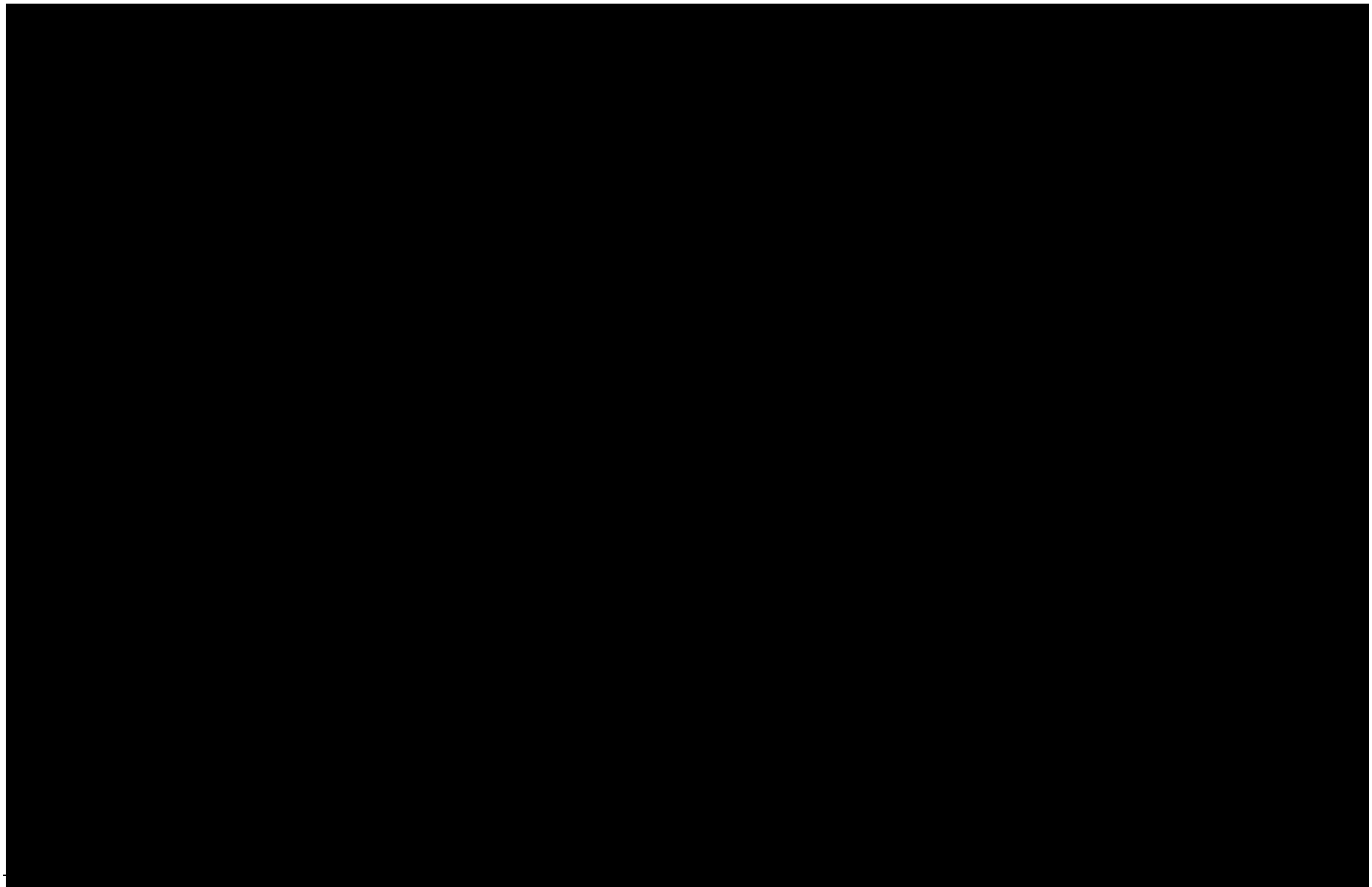


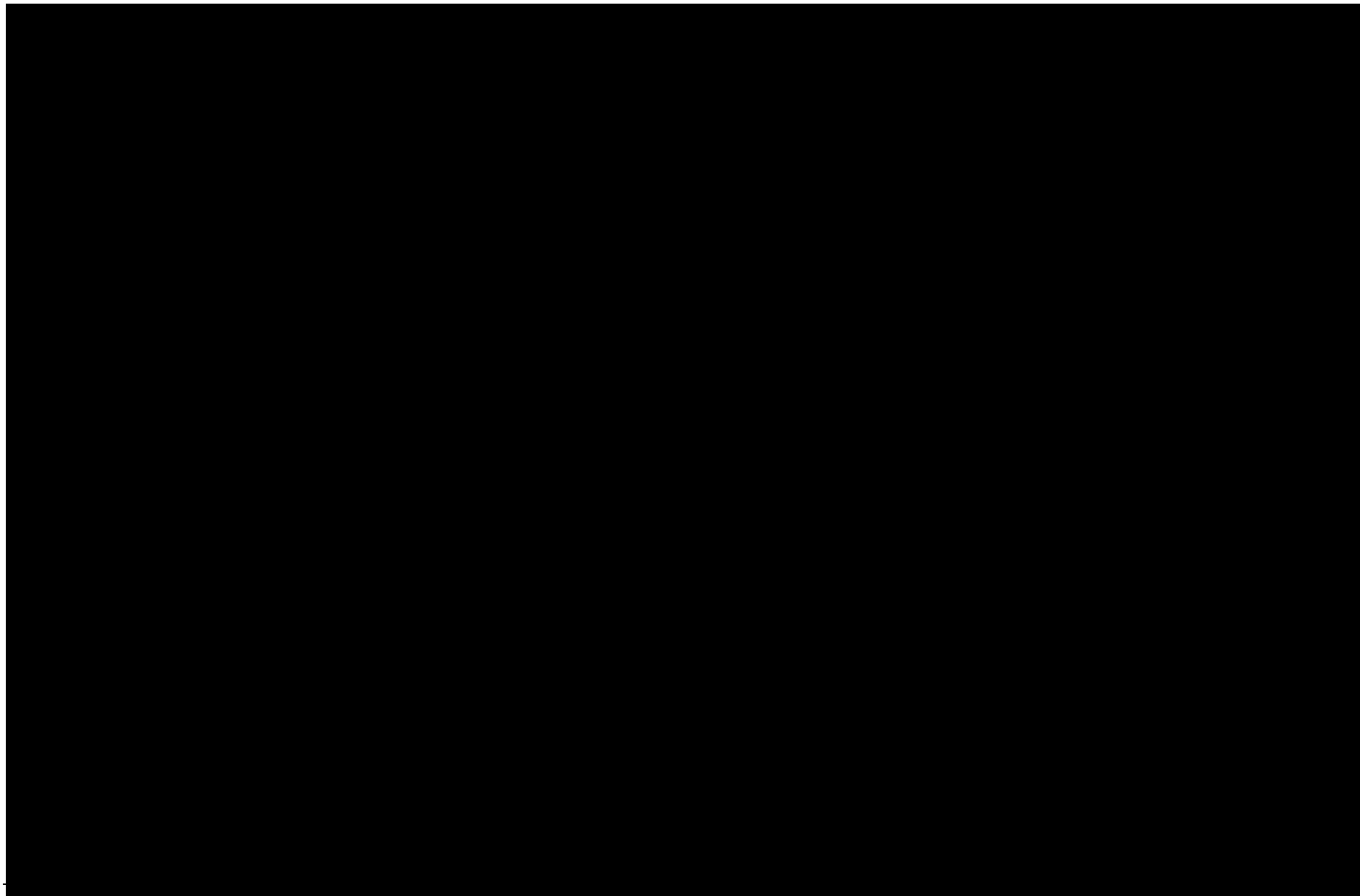


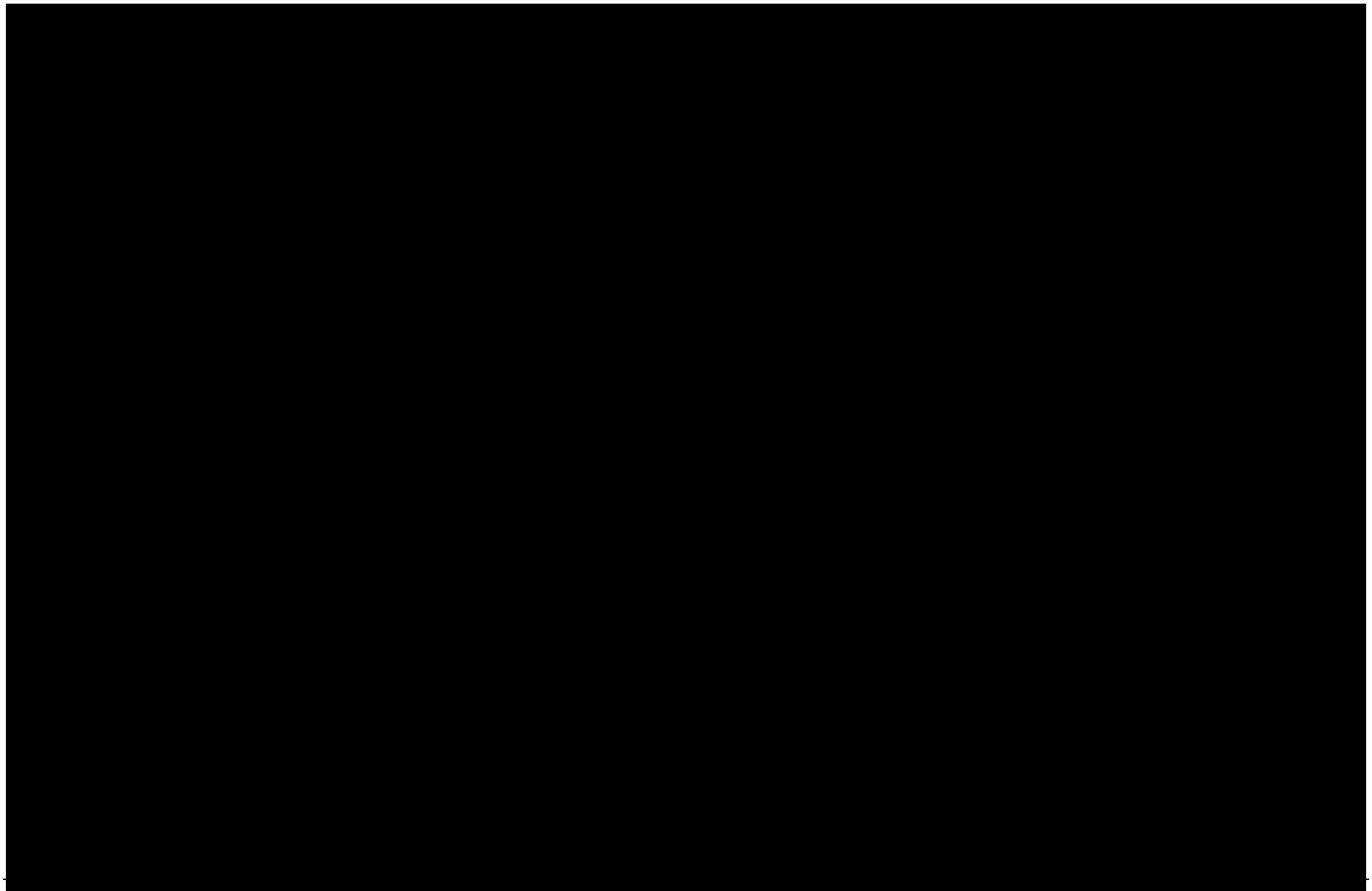
8.2 Direct Eu projects- sustainable dimension and ICT solution

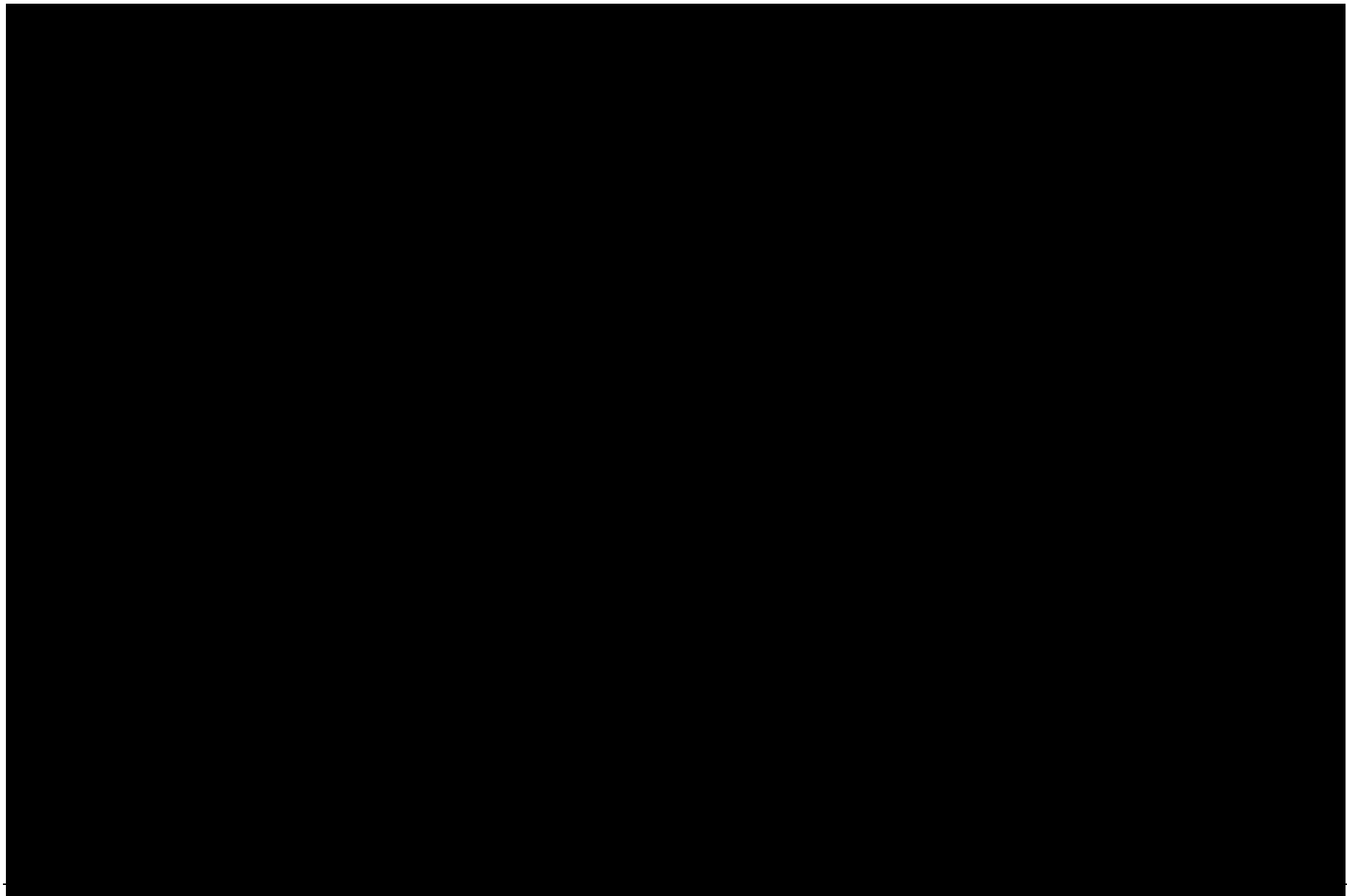












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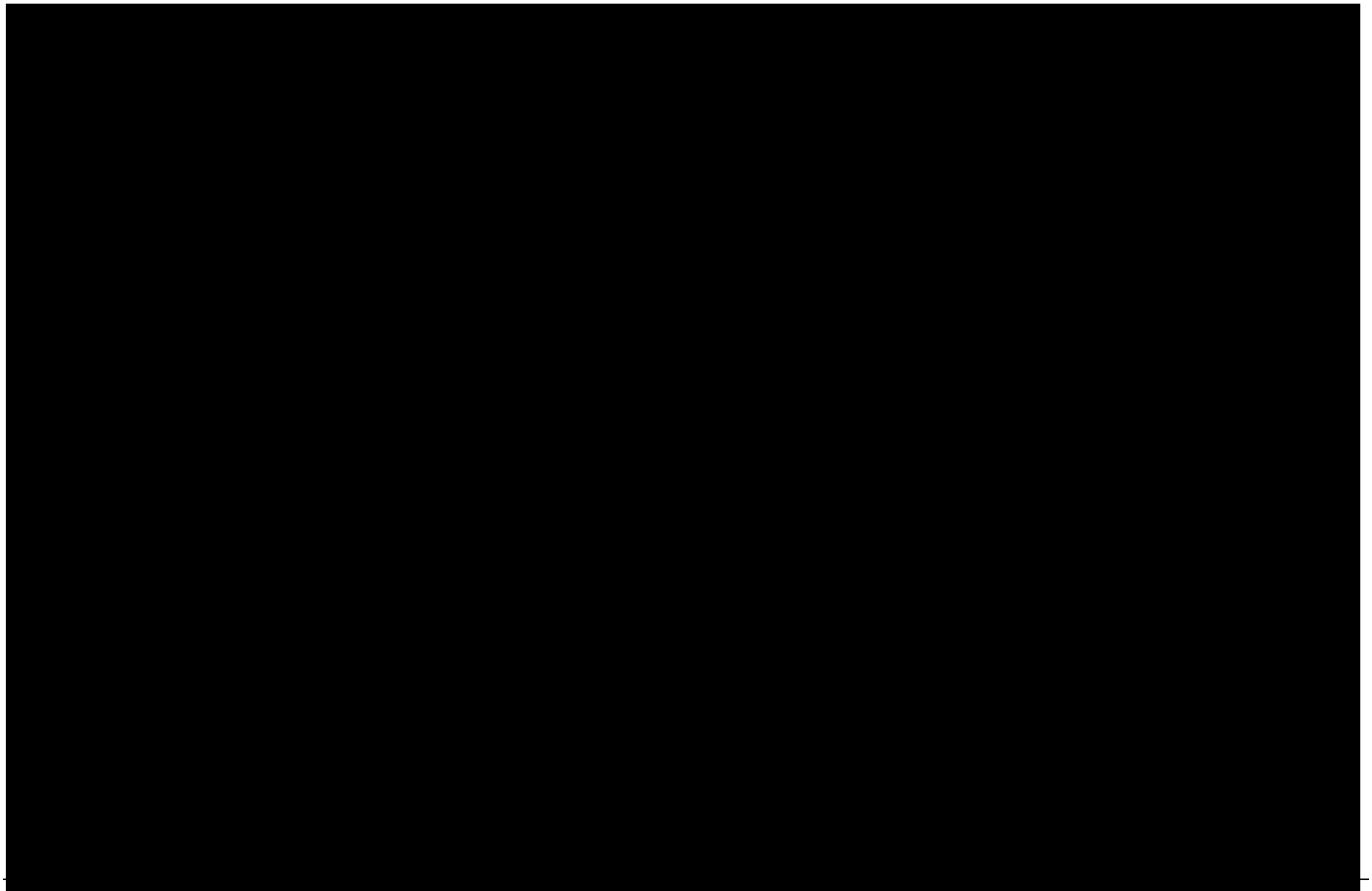

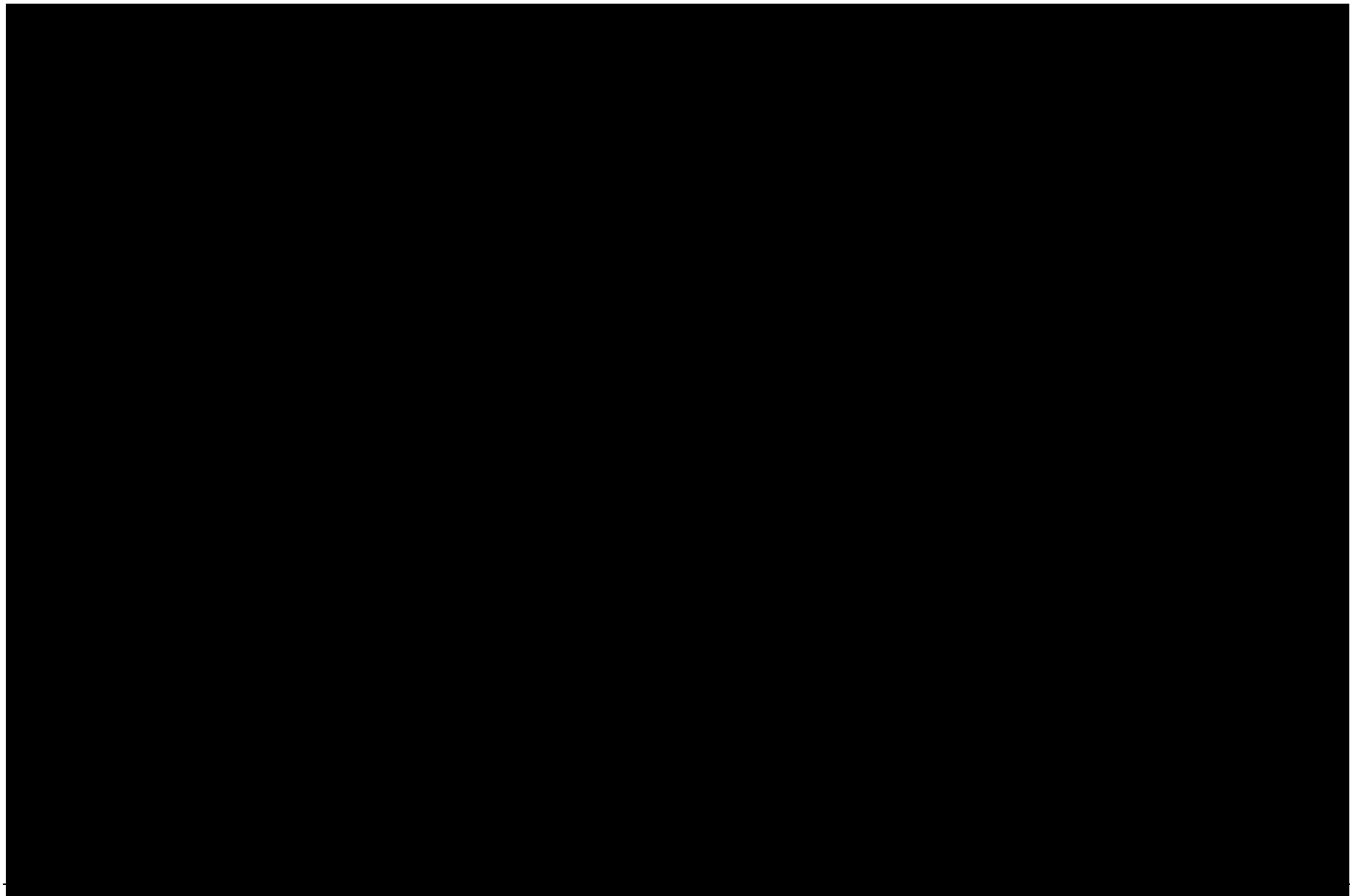

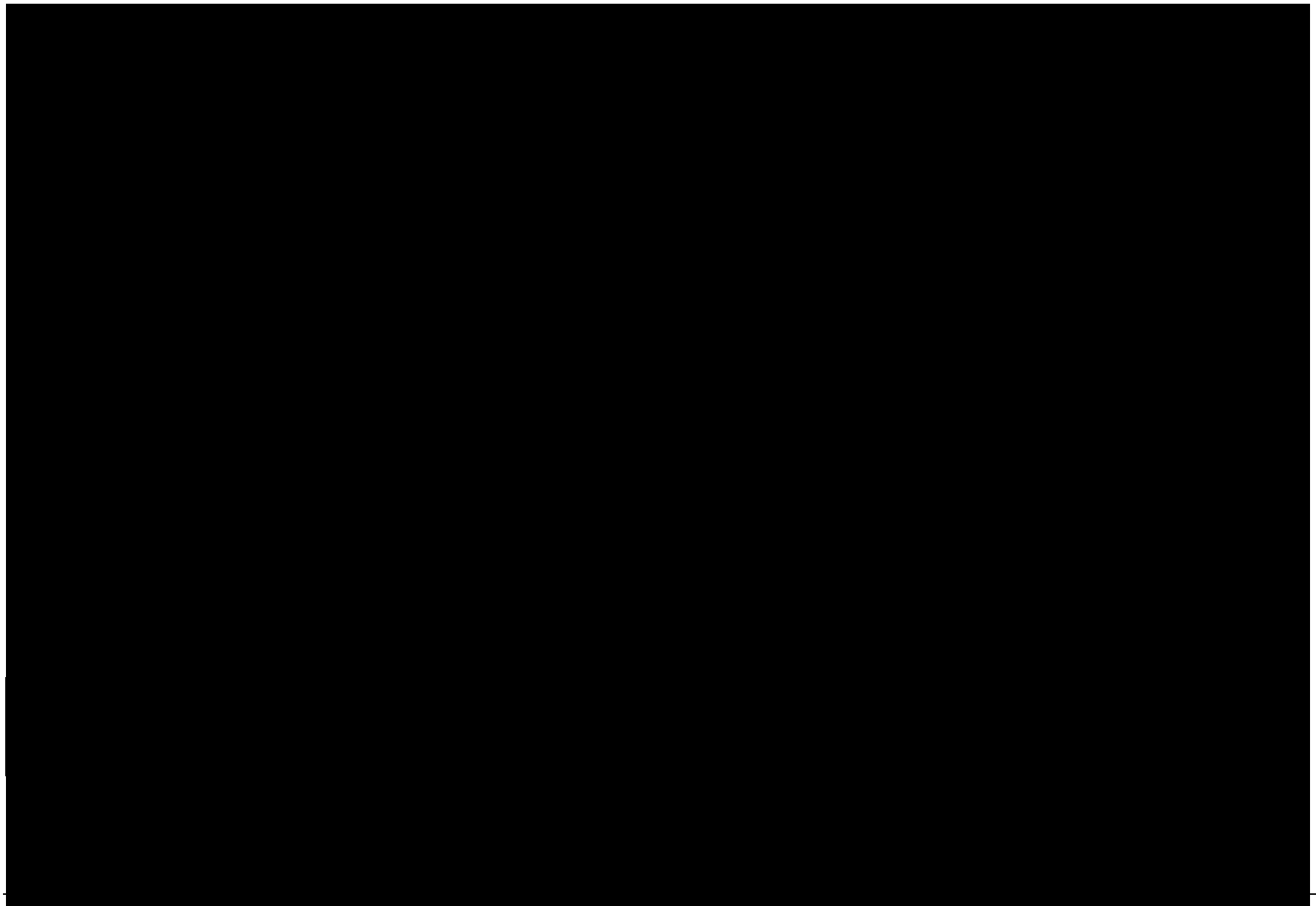

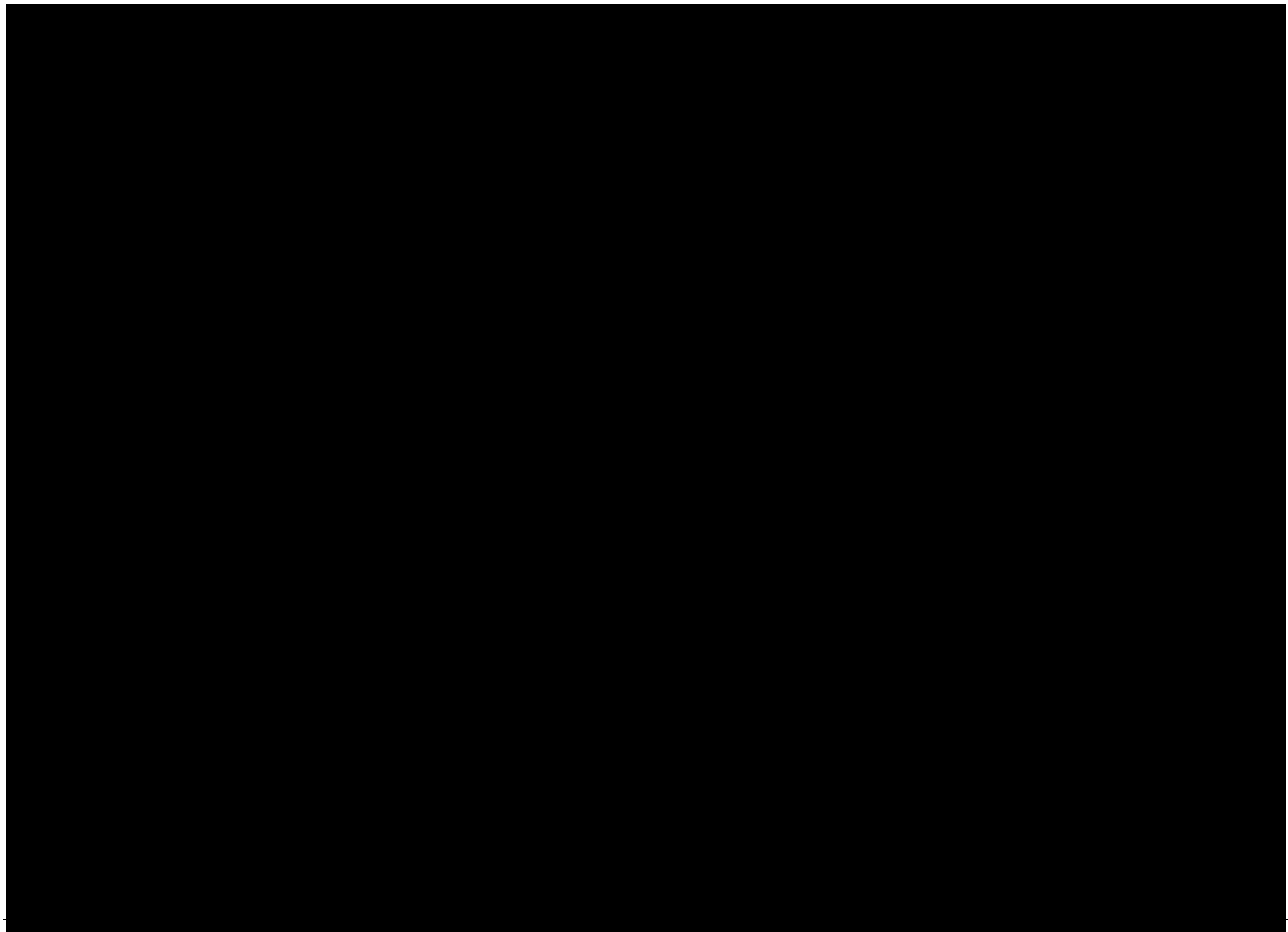

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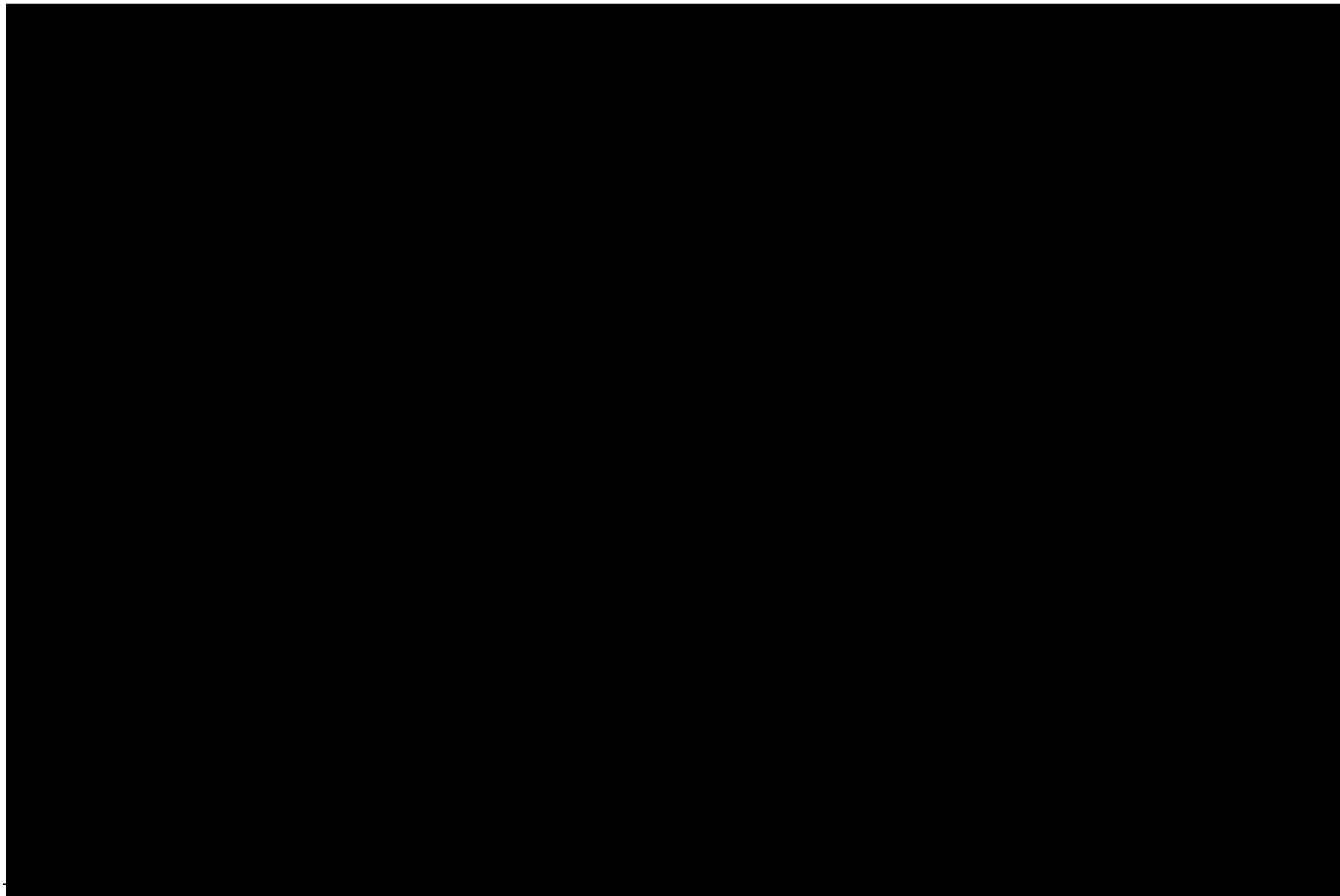
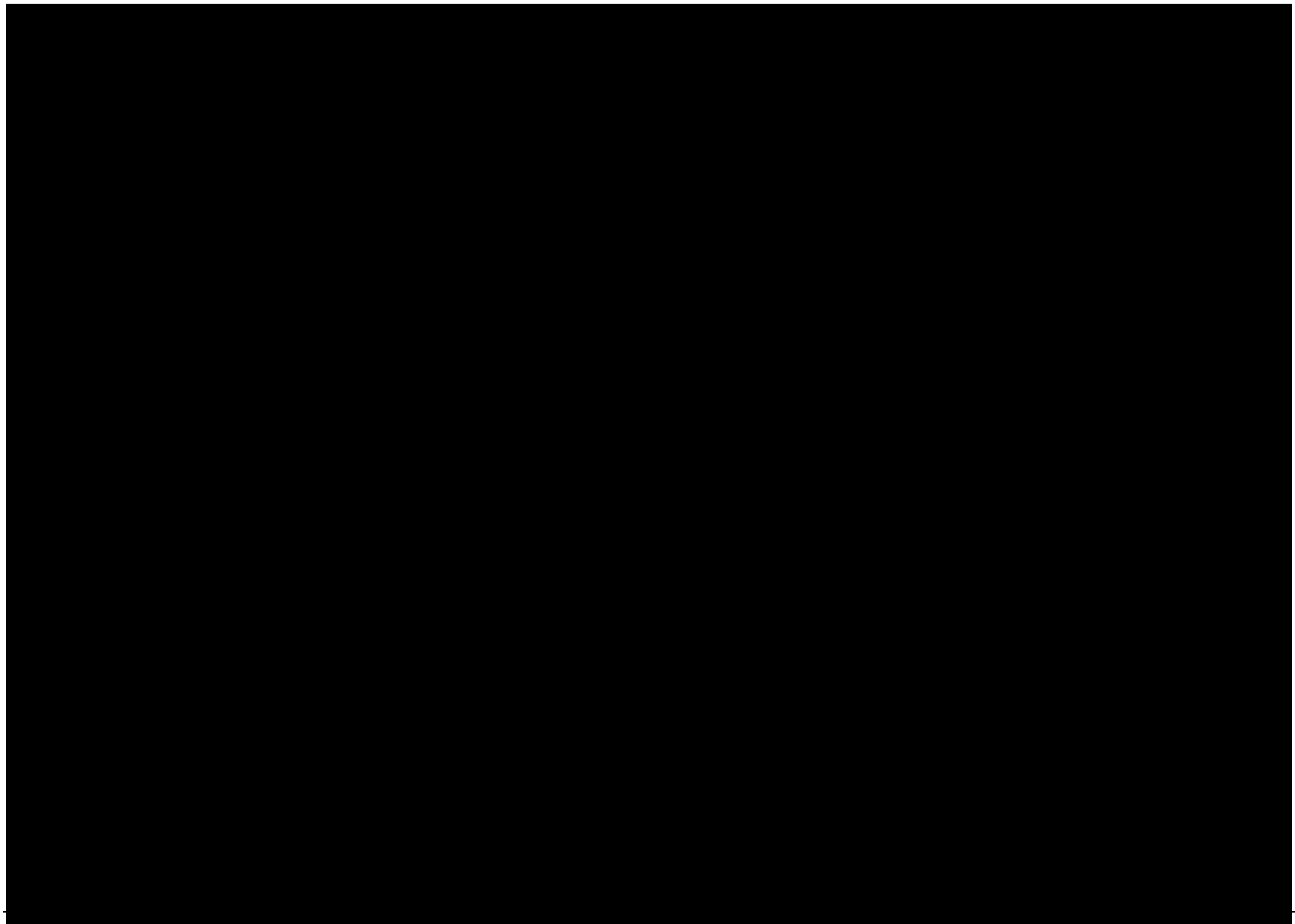
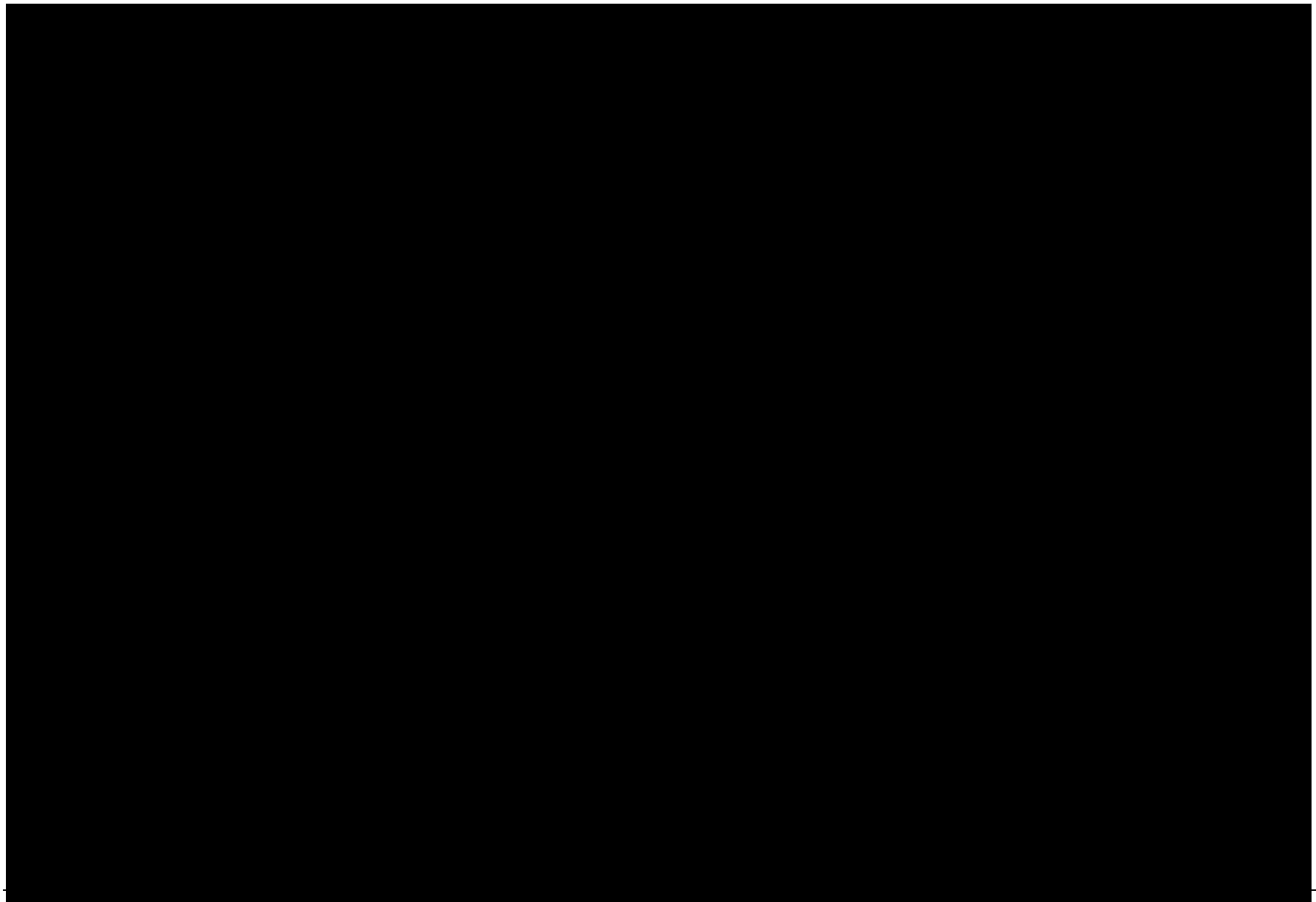
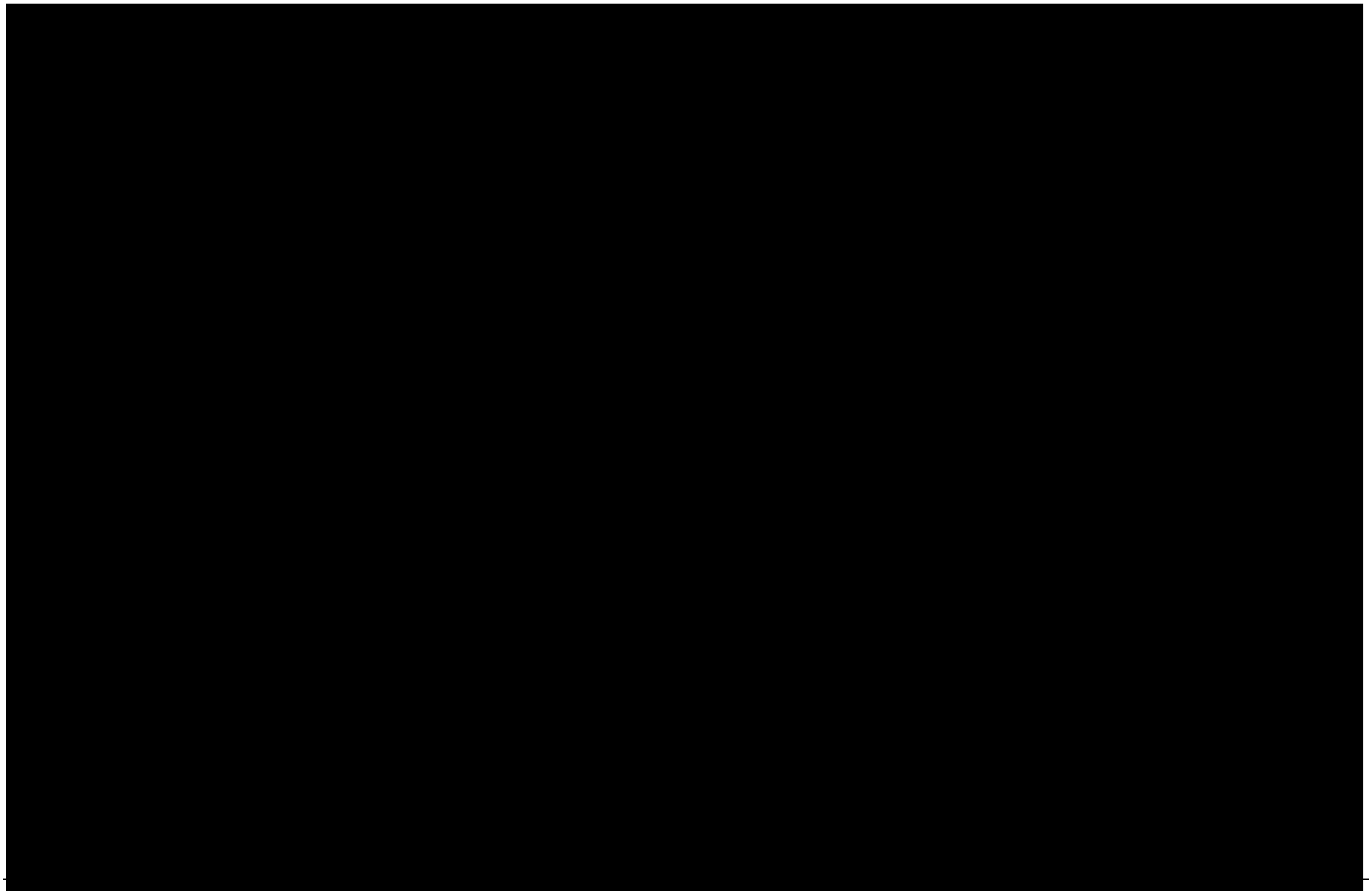
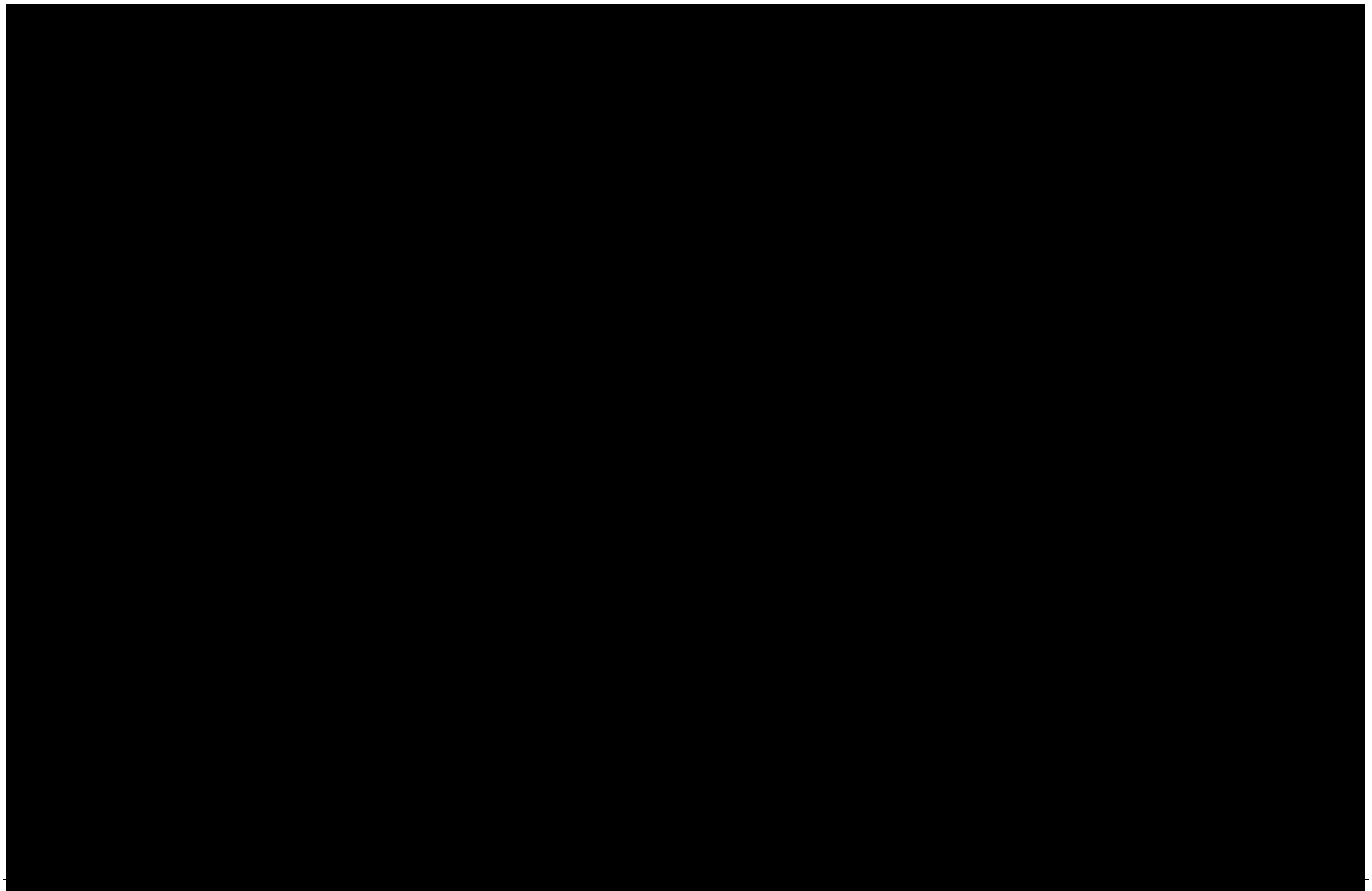




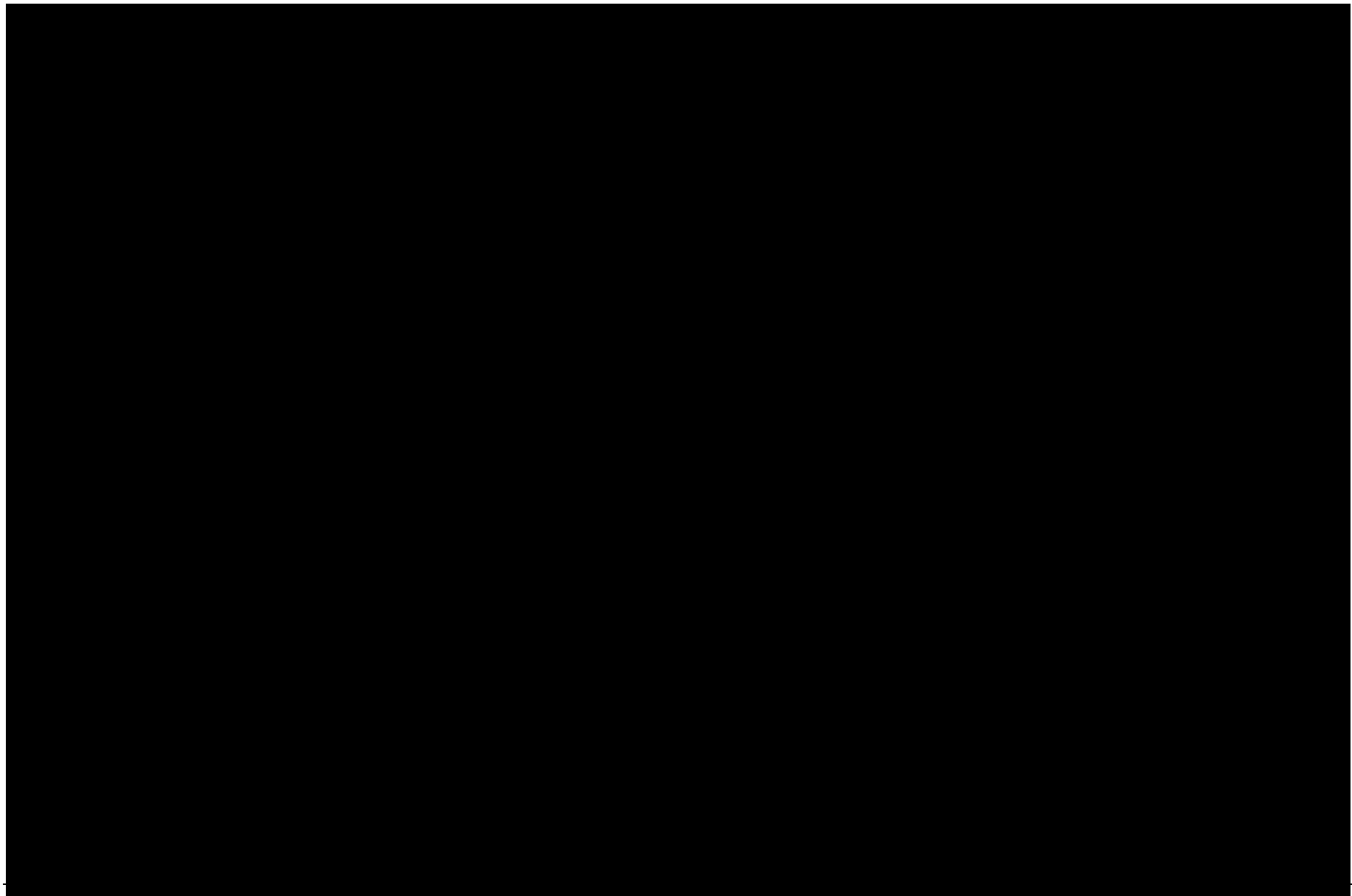


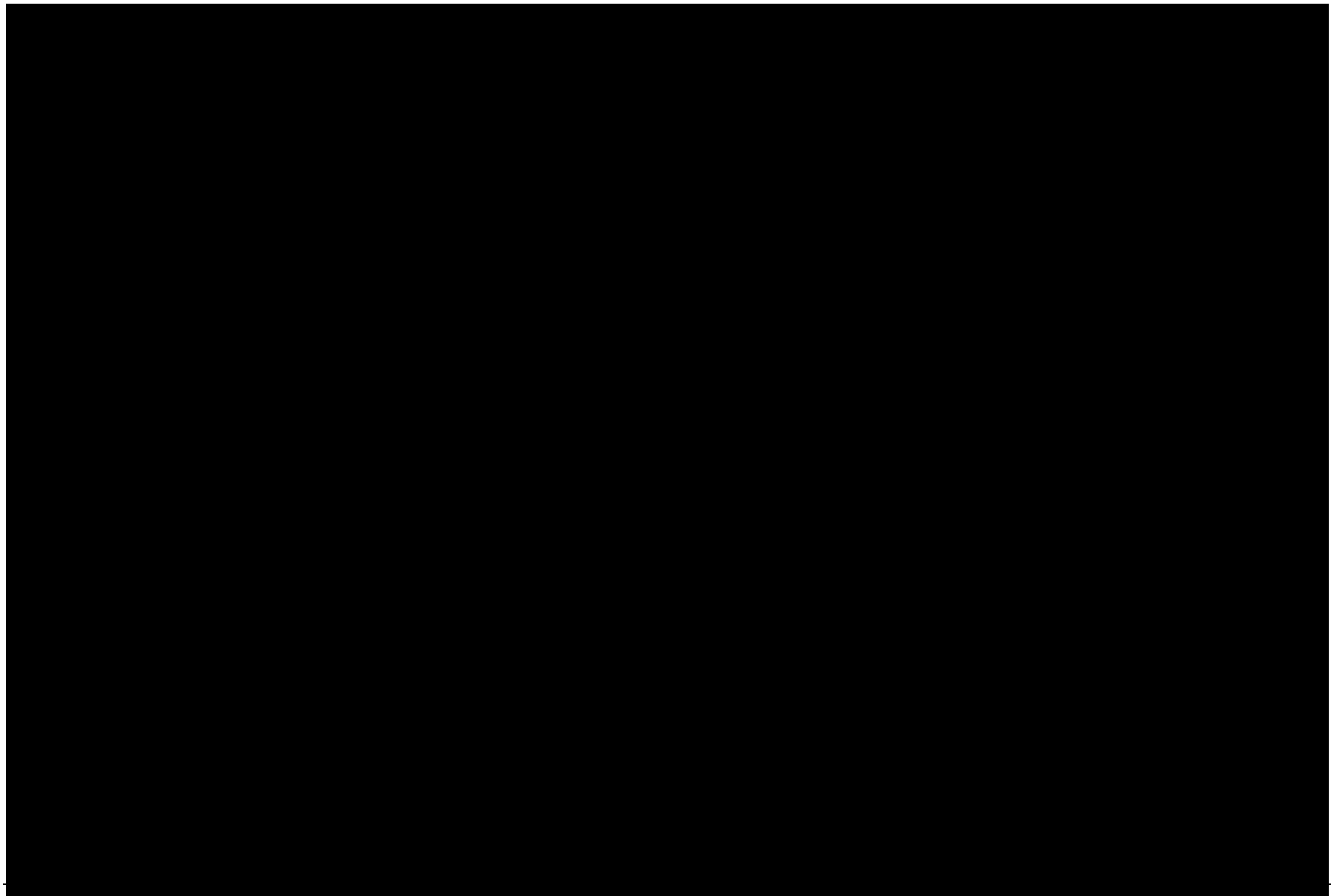


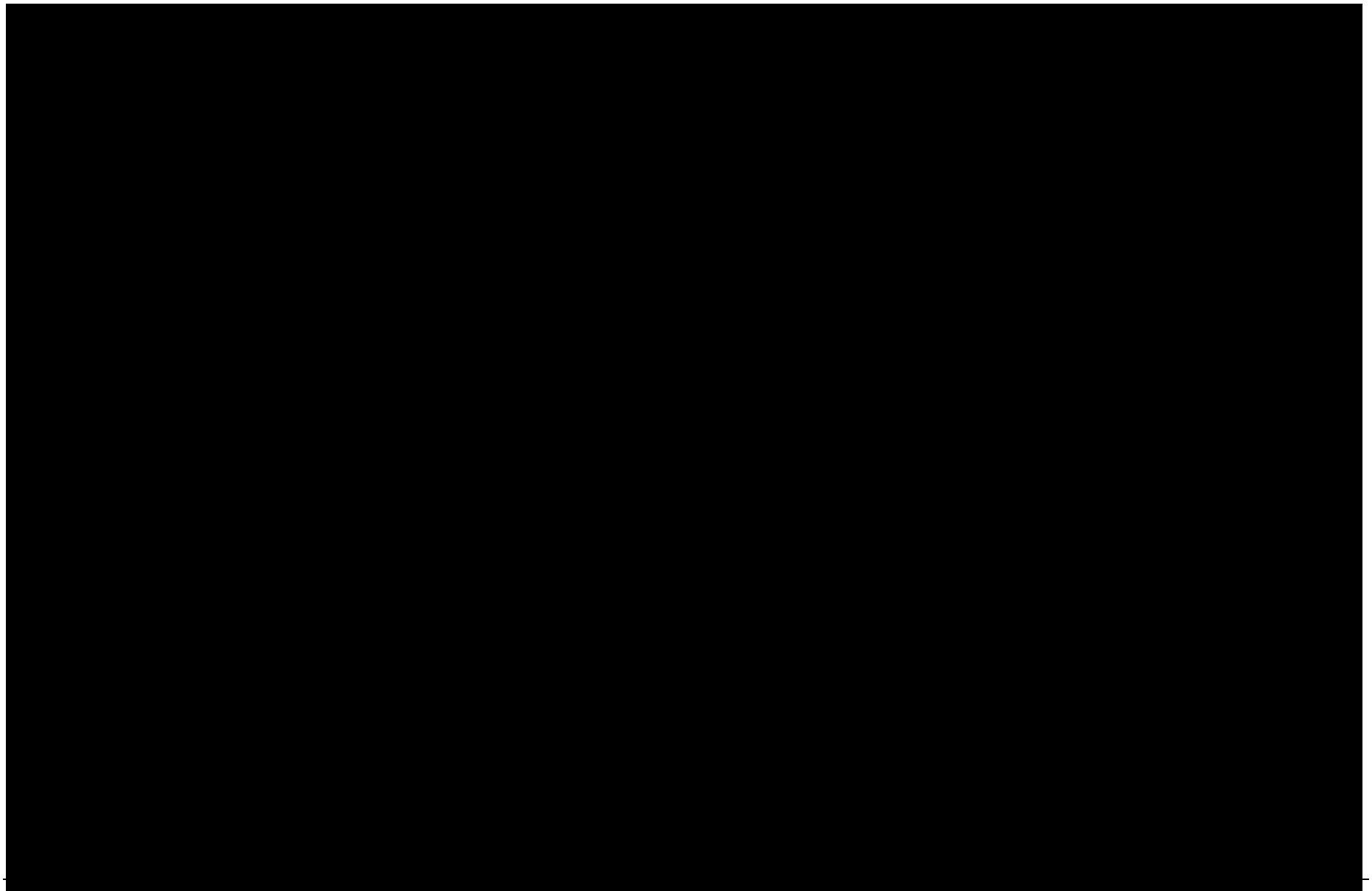
8.5 Direct regional general information

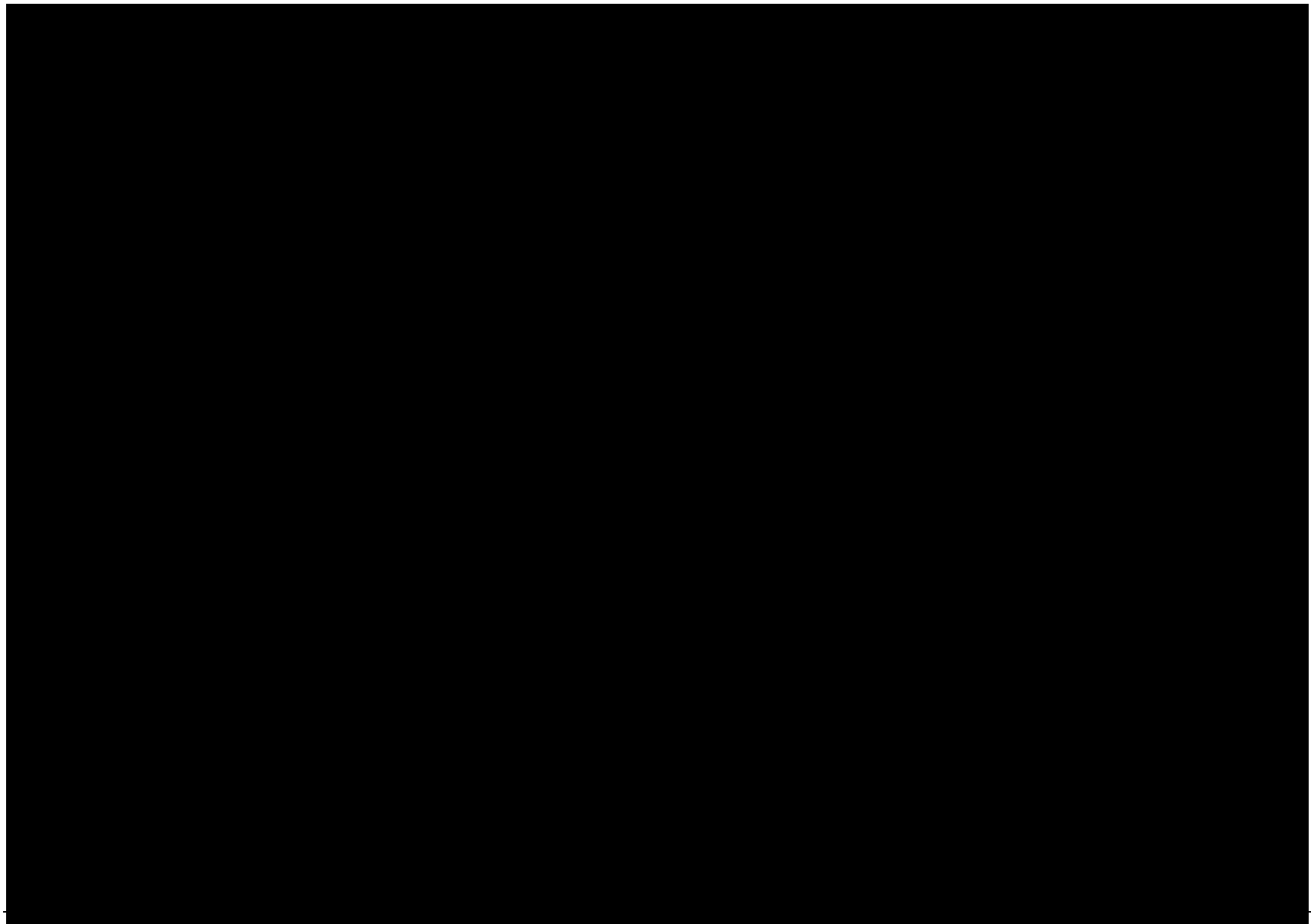


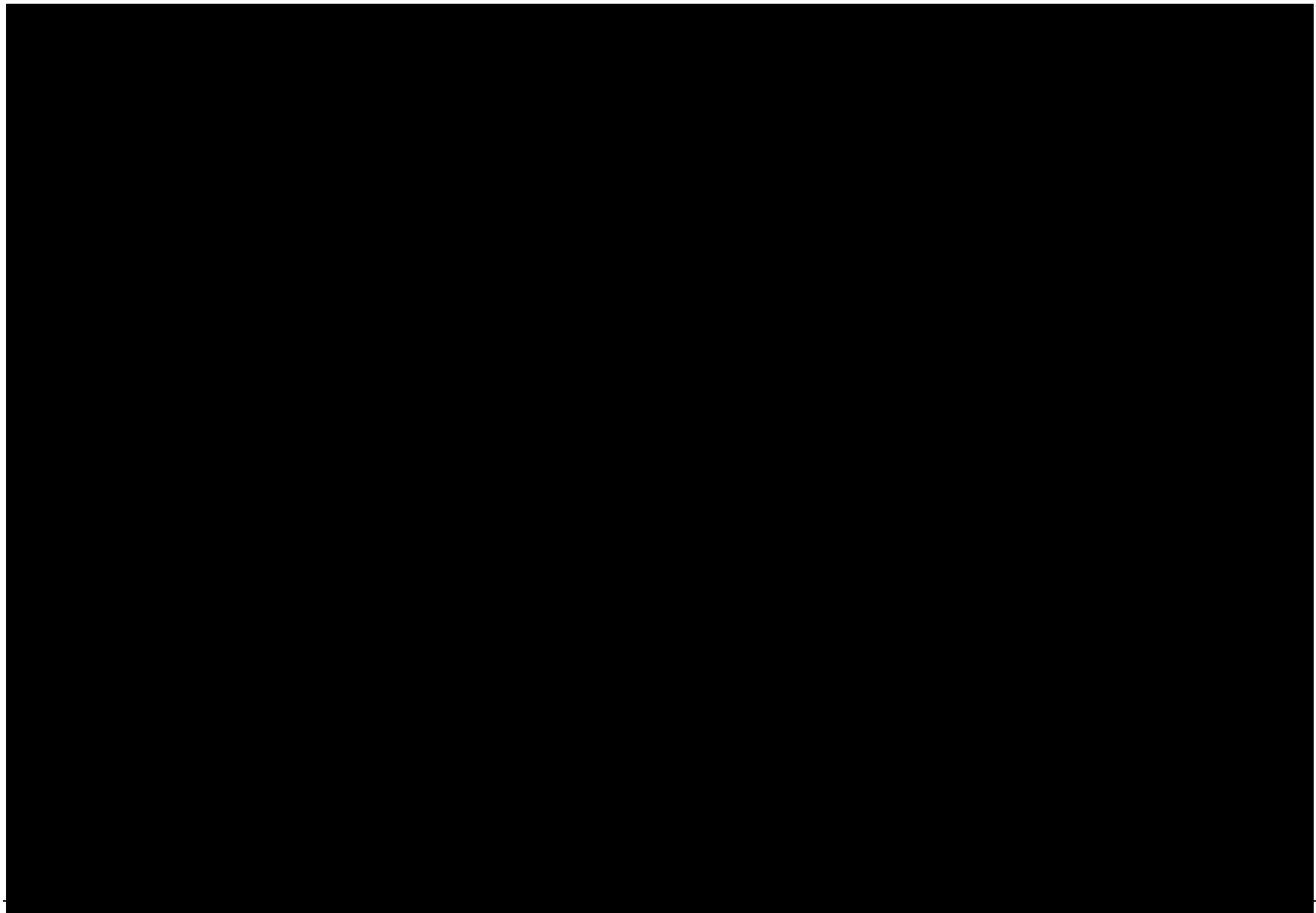
8.6 Indirect projects on eu level- general information

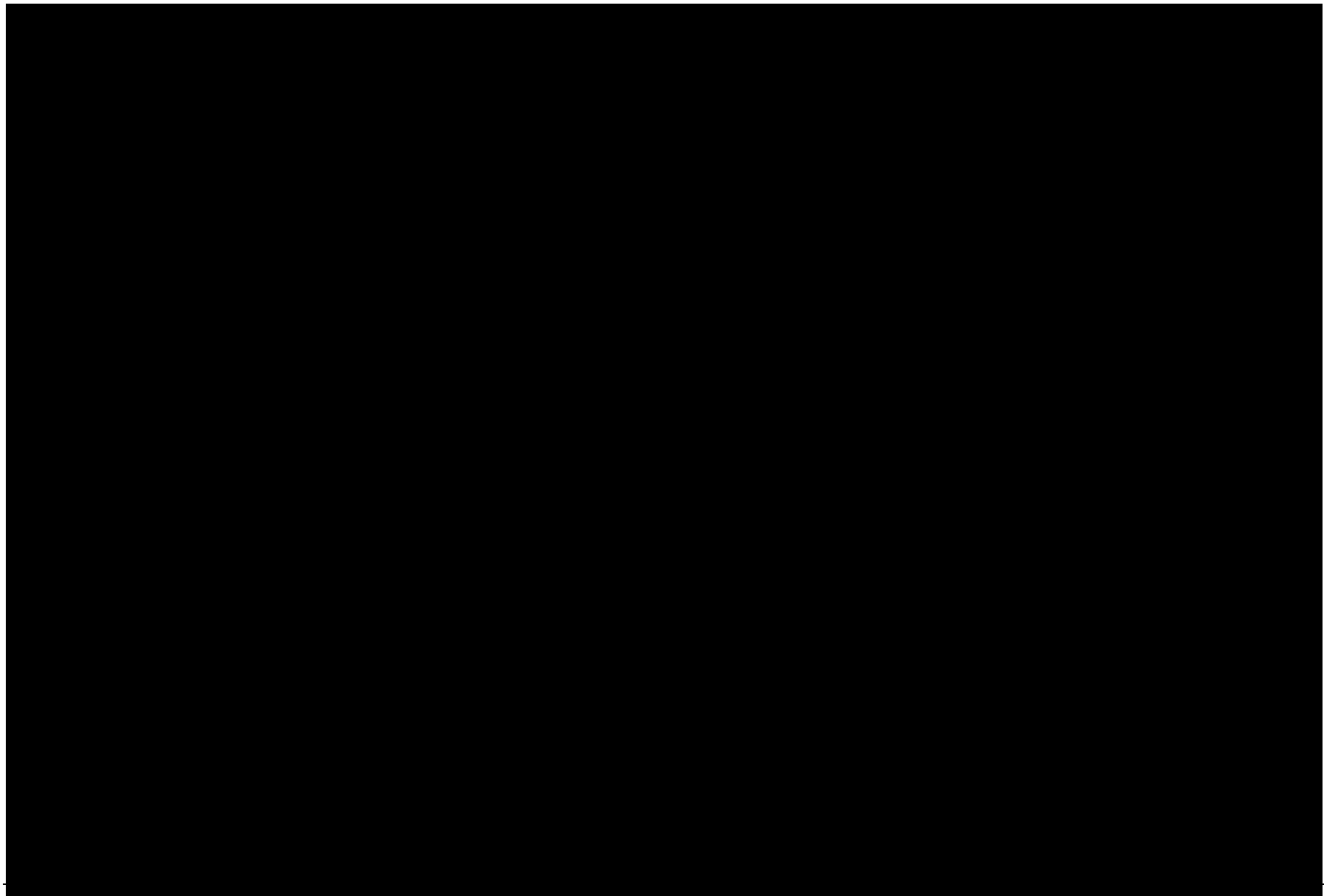


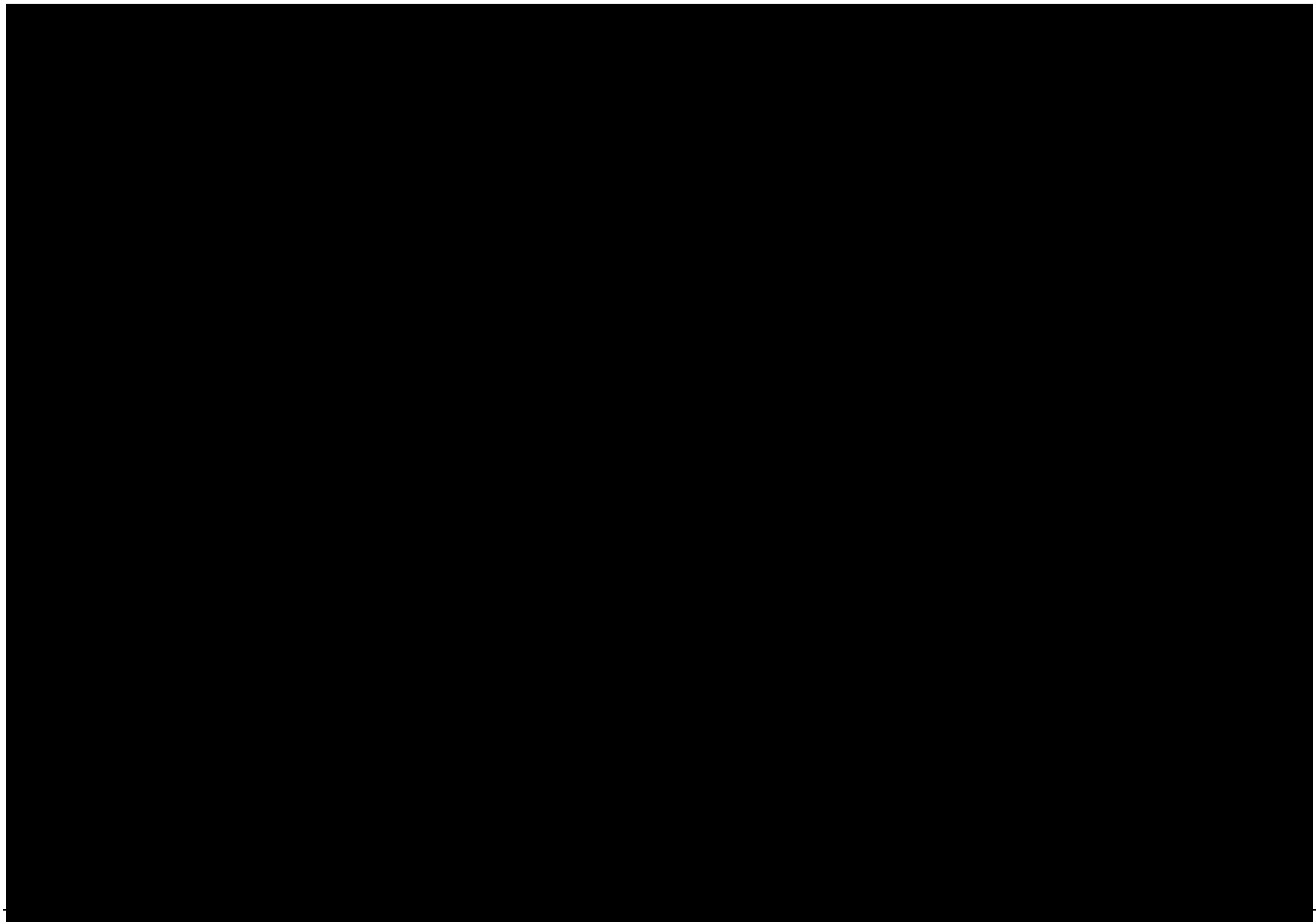




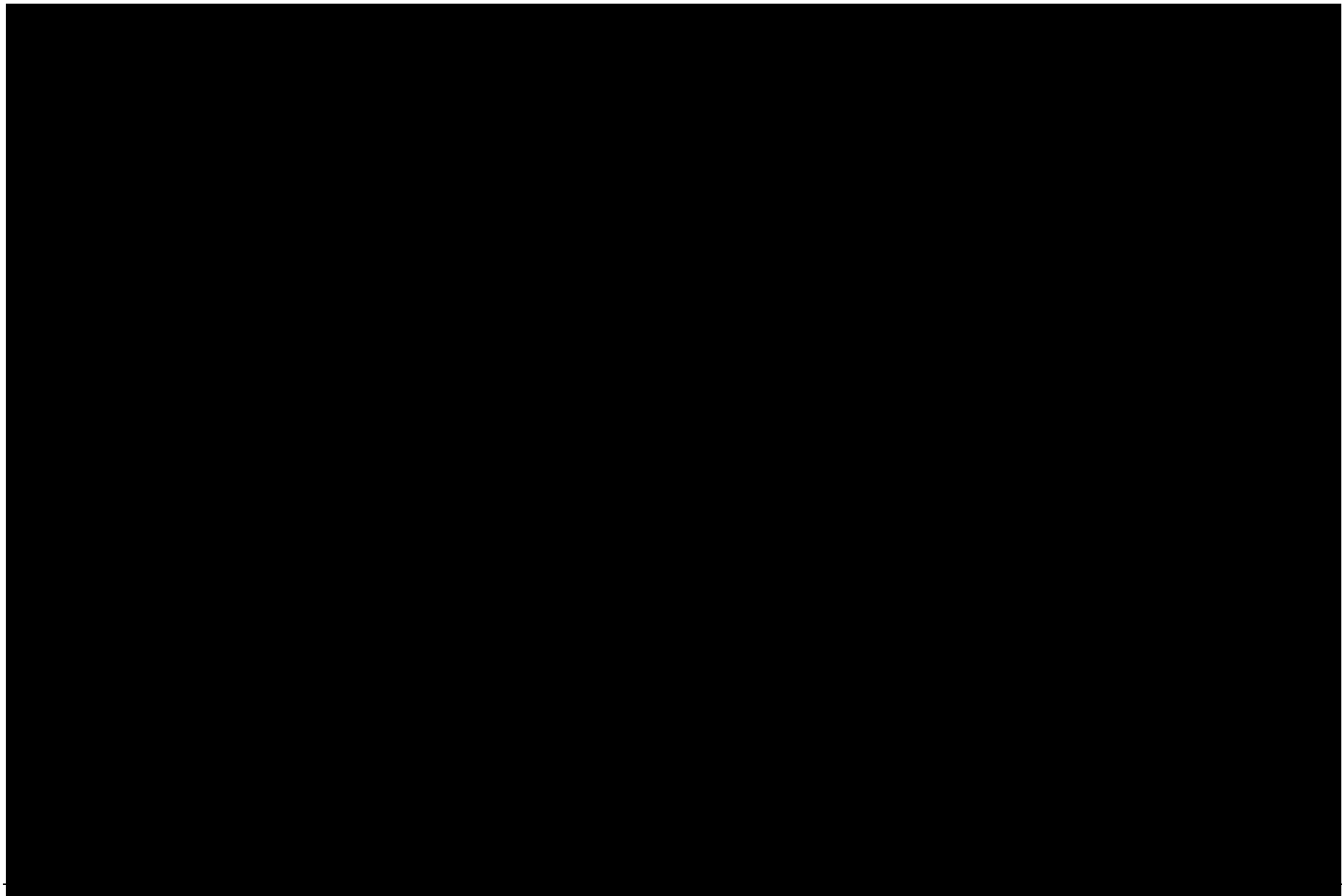


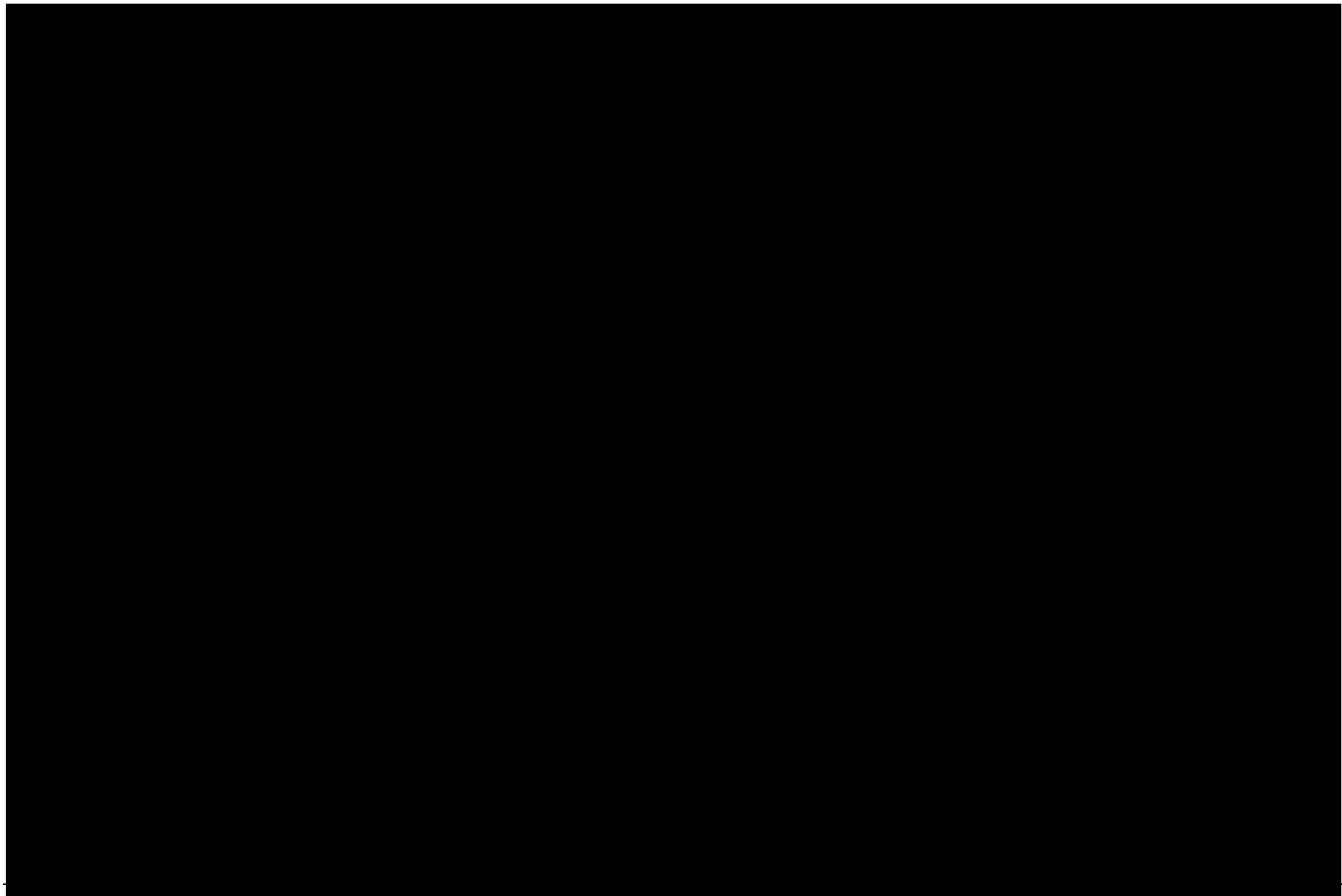


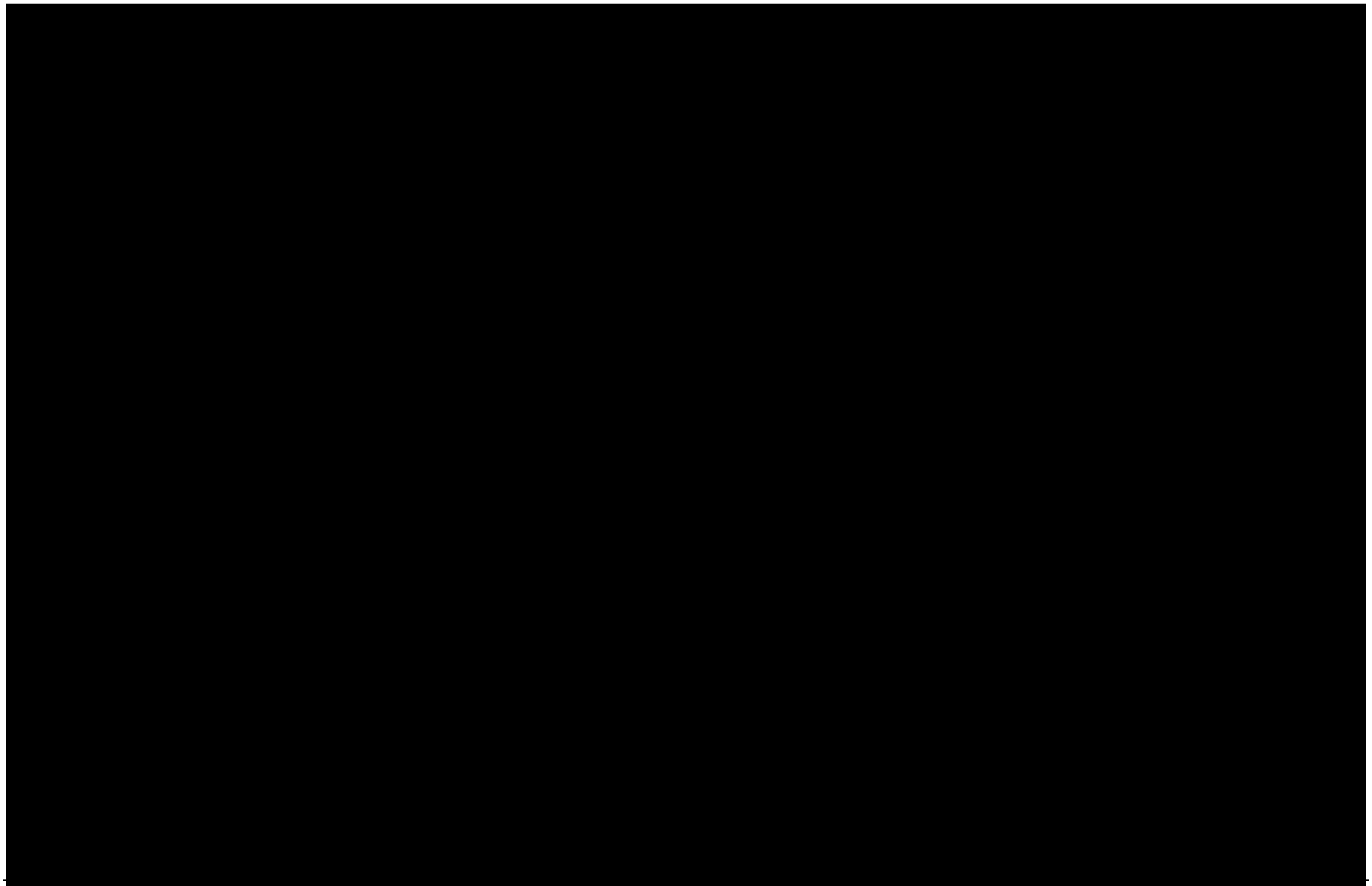


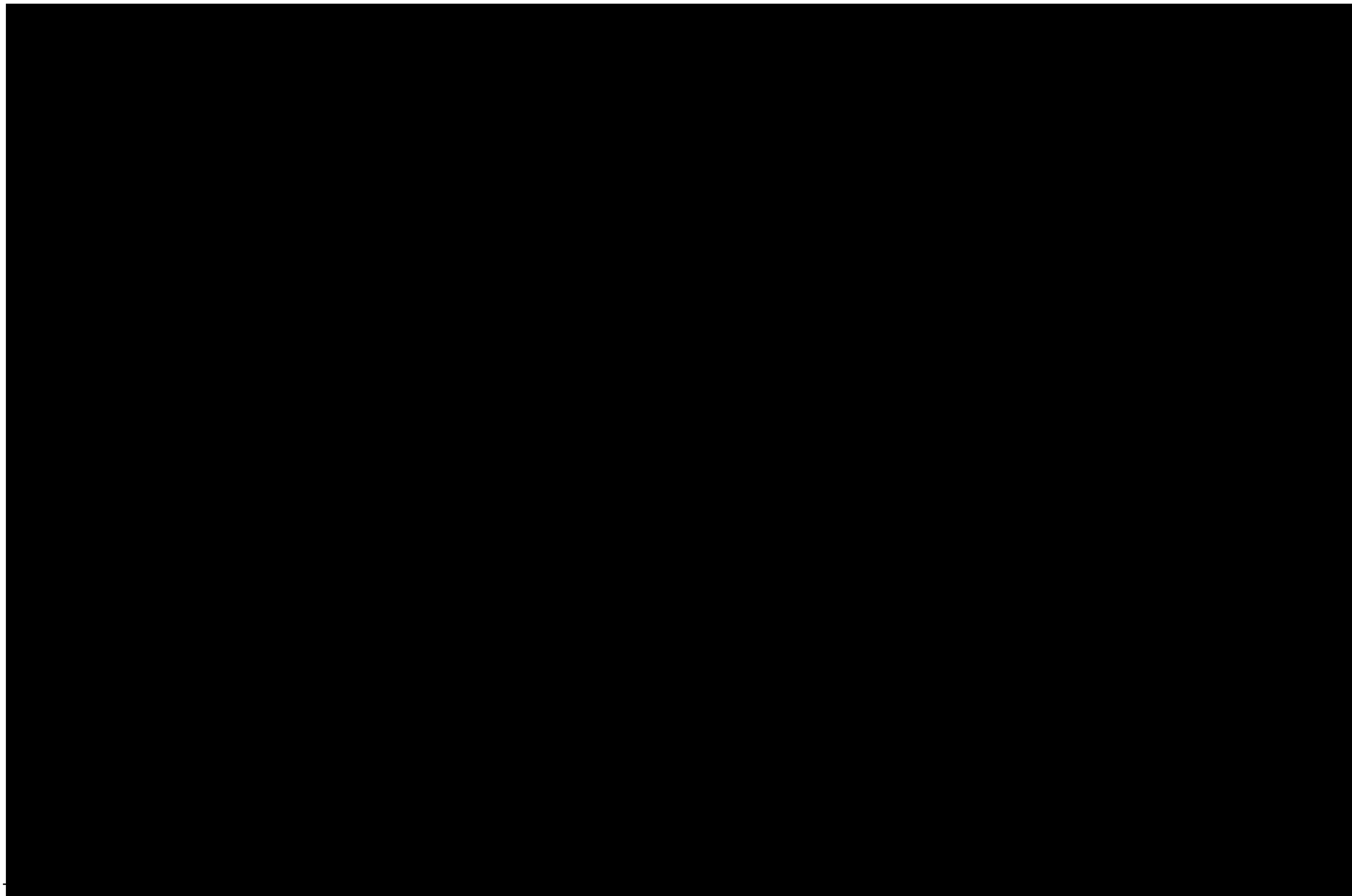


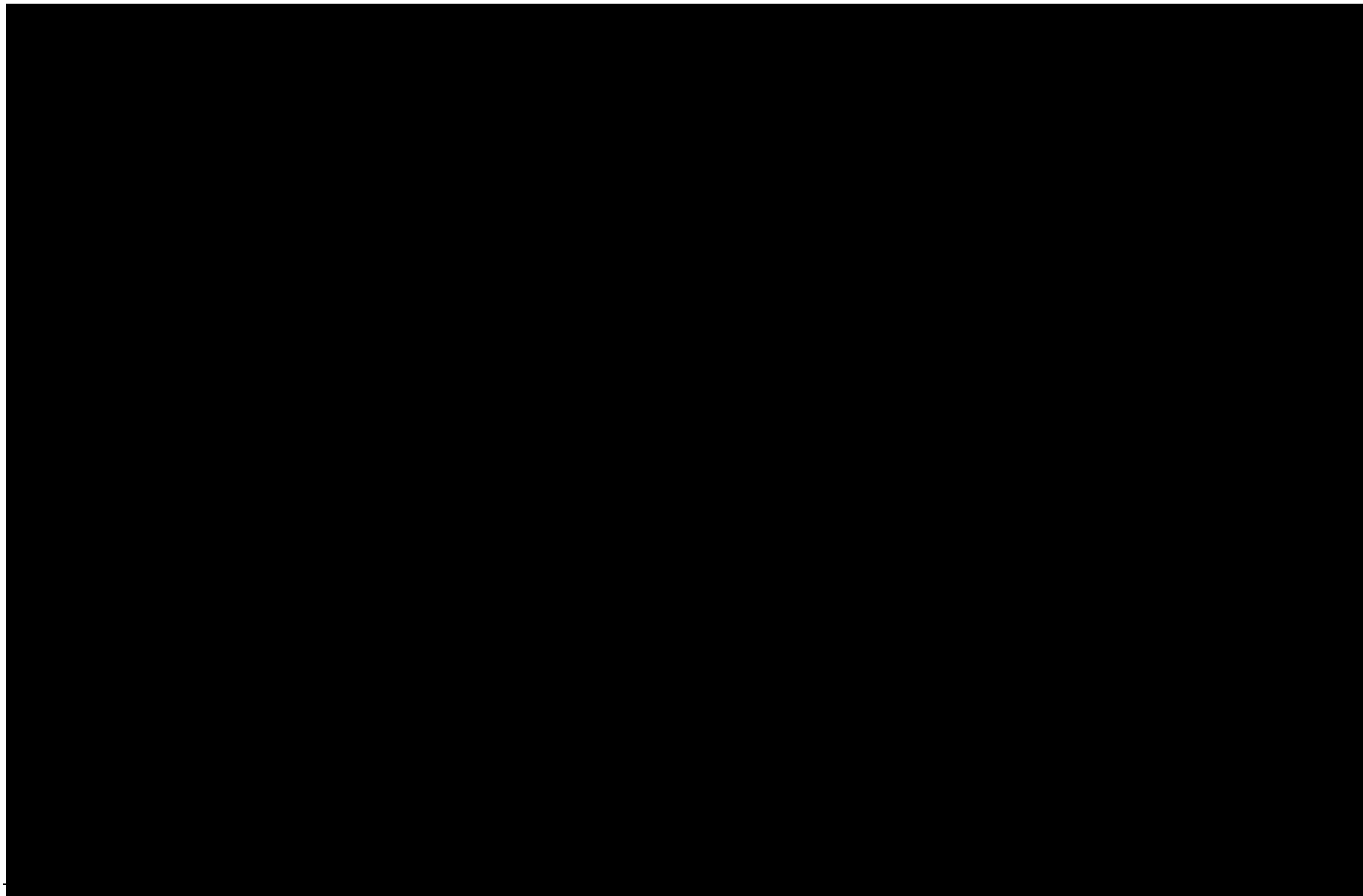
8.7 Indirect projects on EU level- sustainability dimension and ICT solution

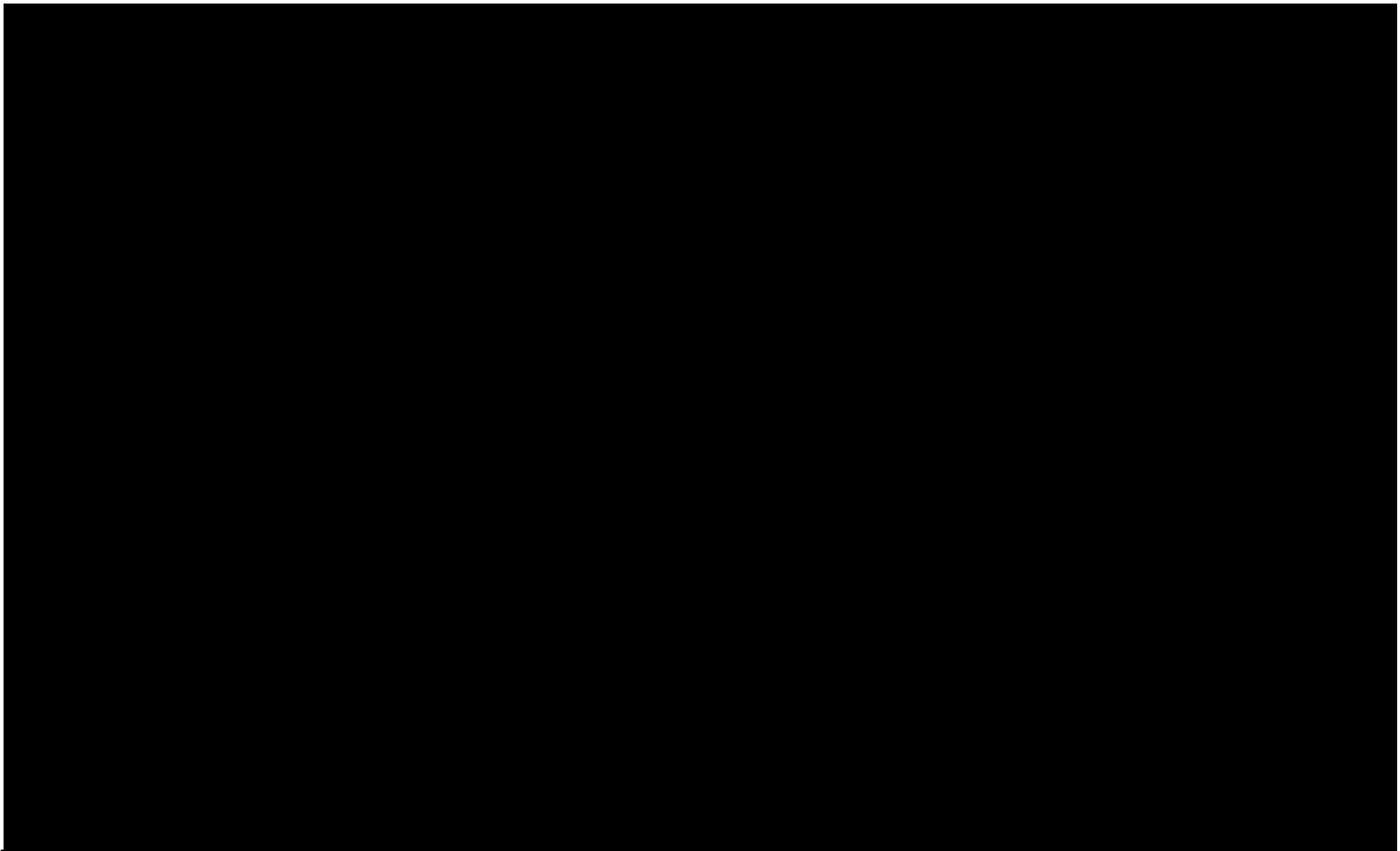


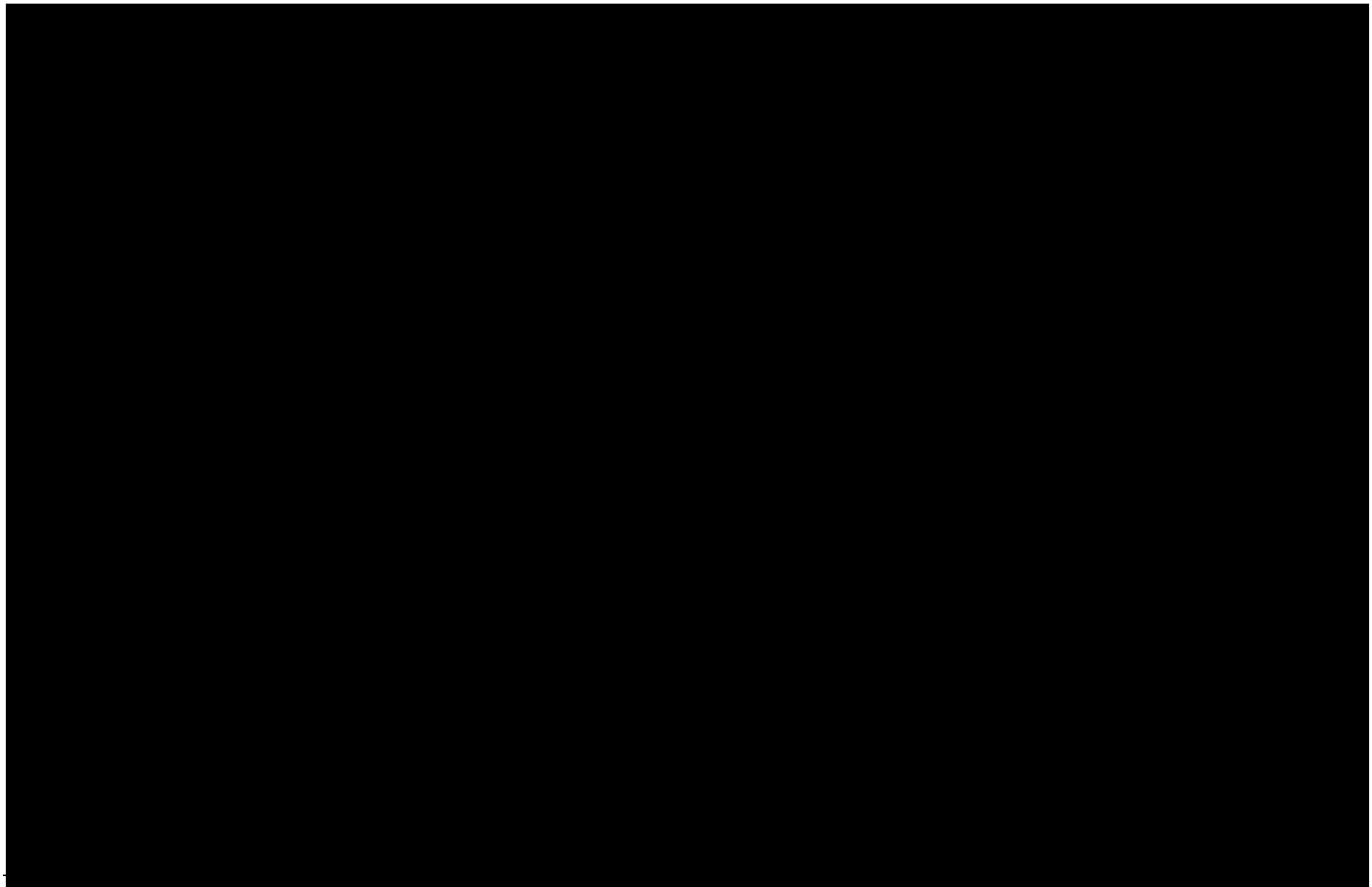


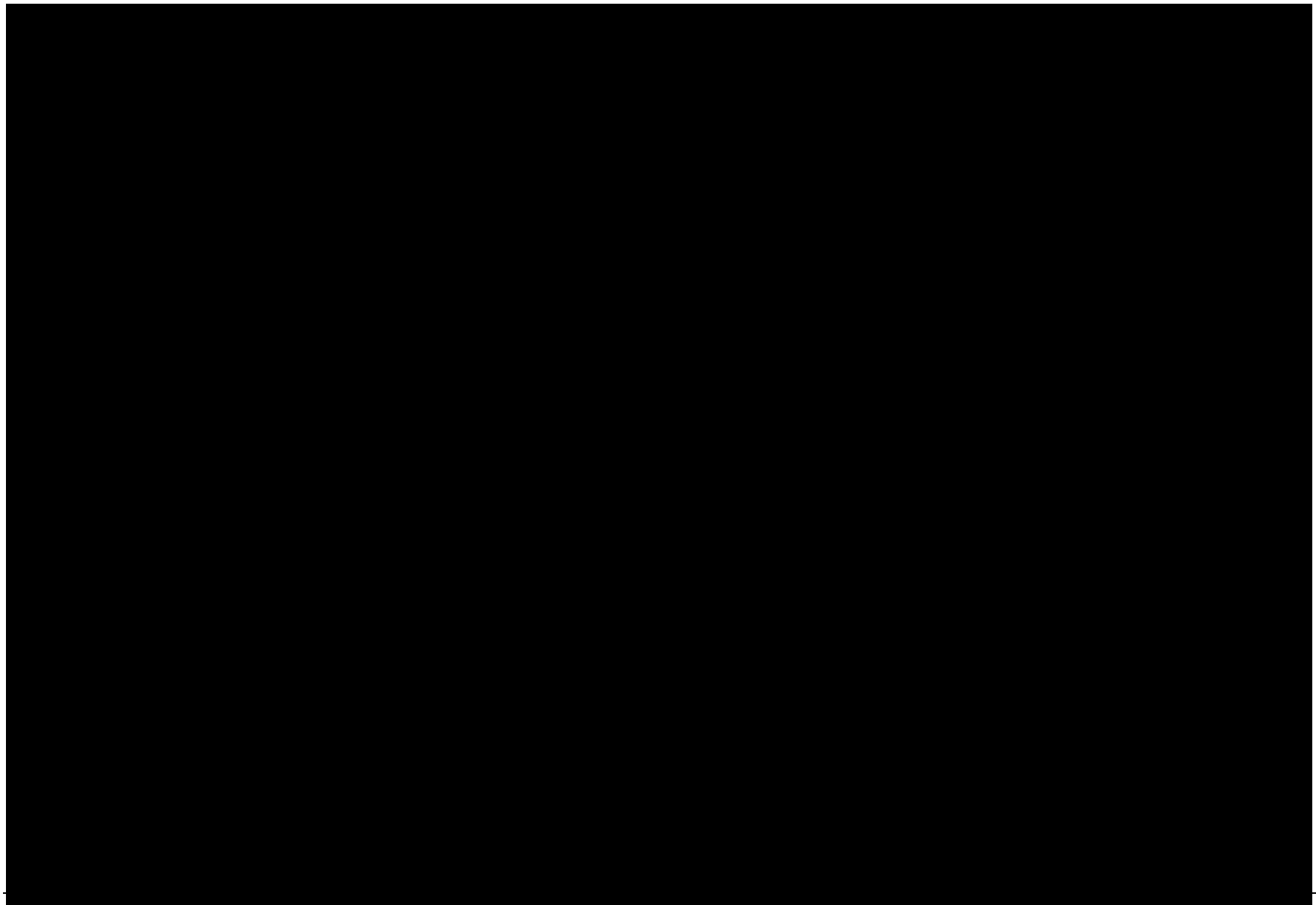


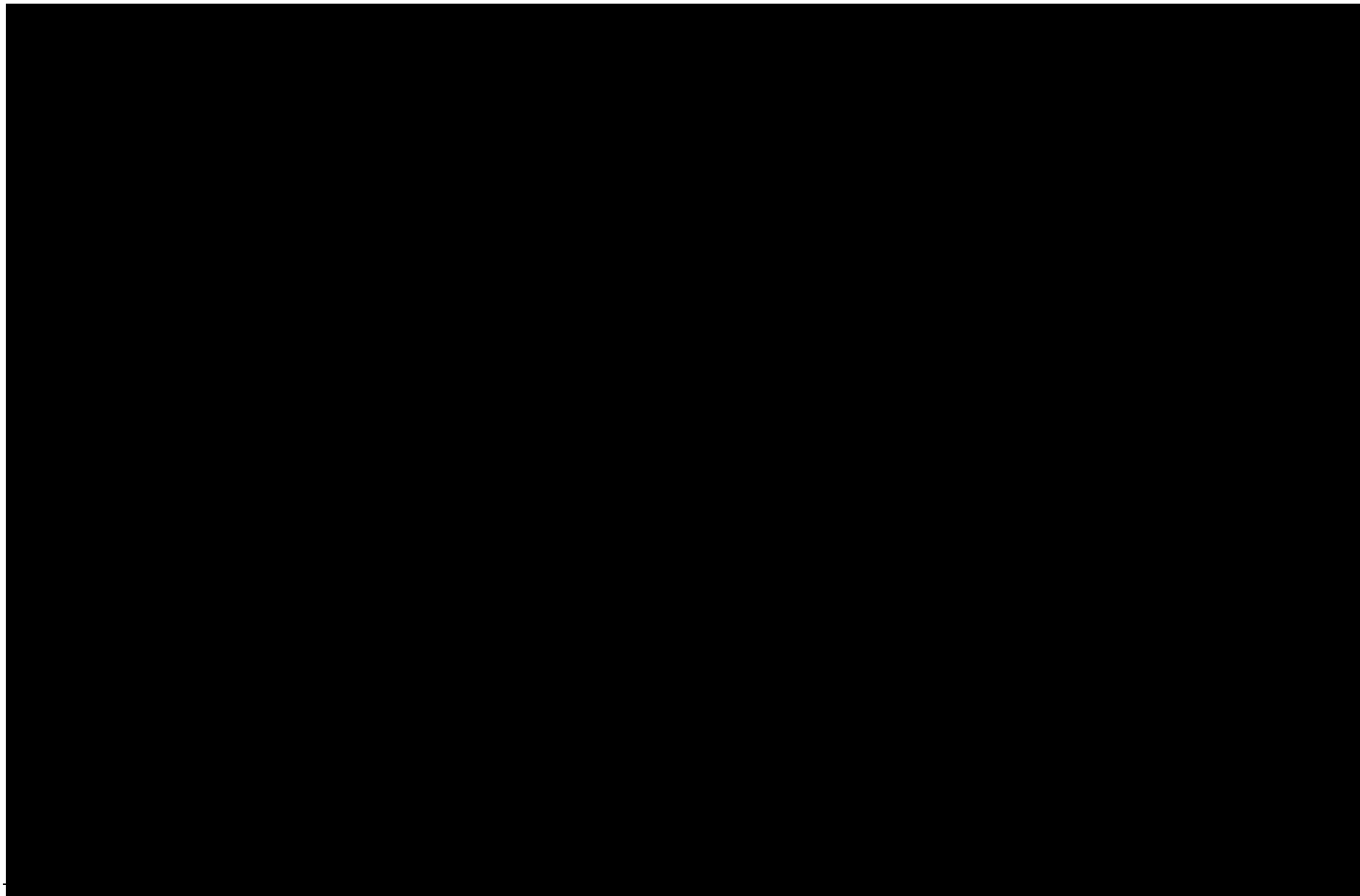




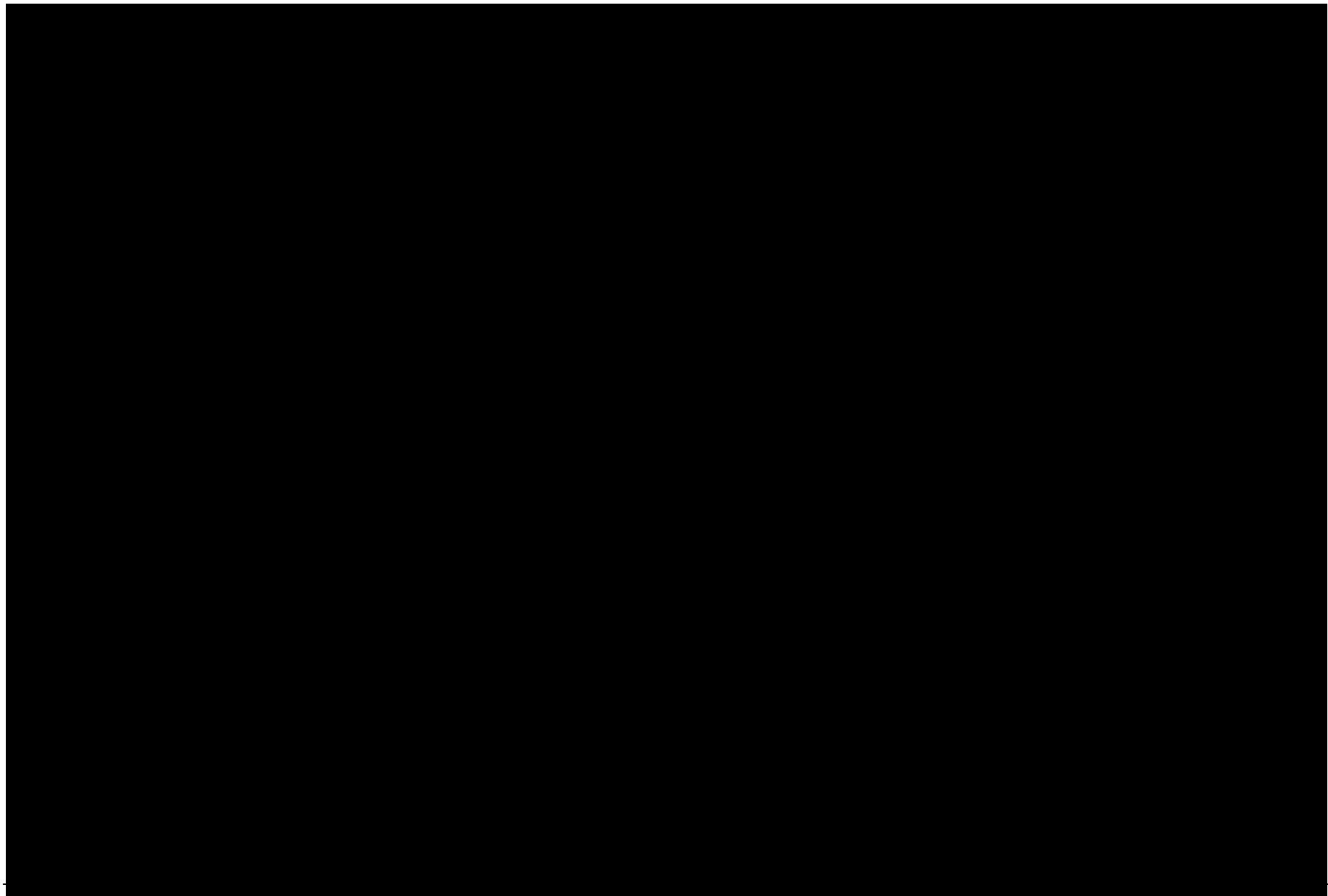


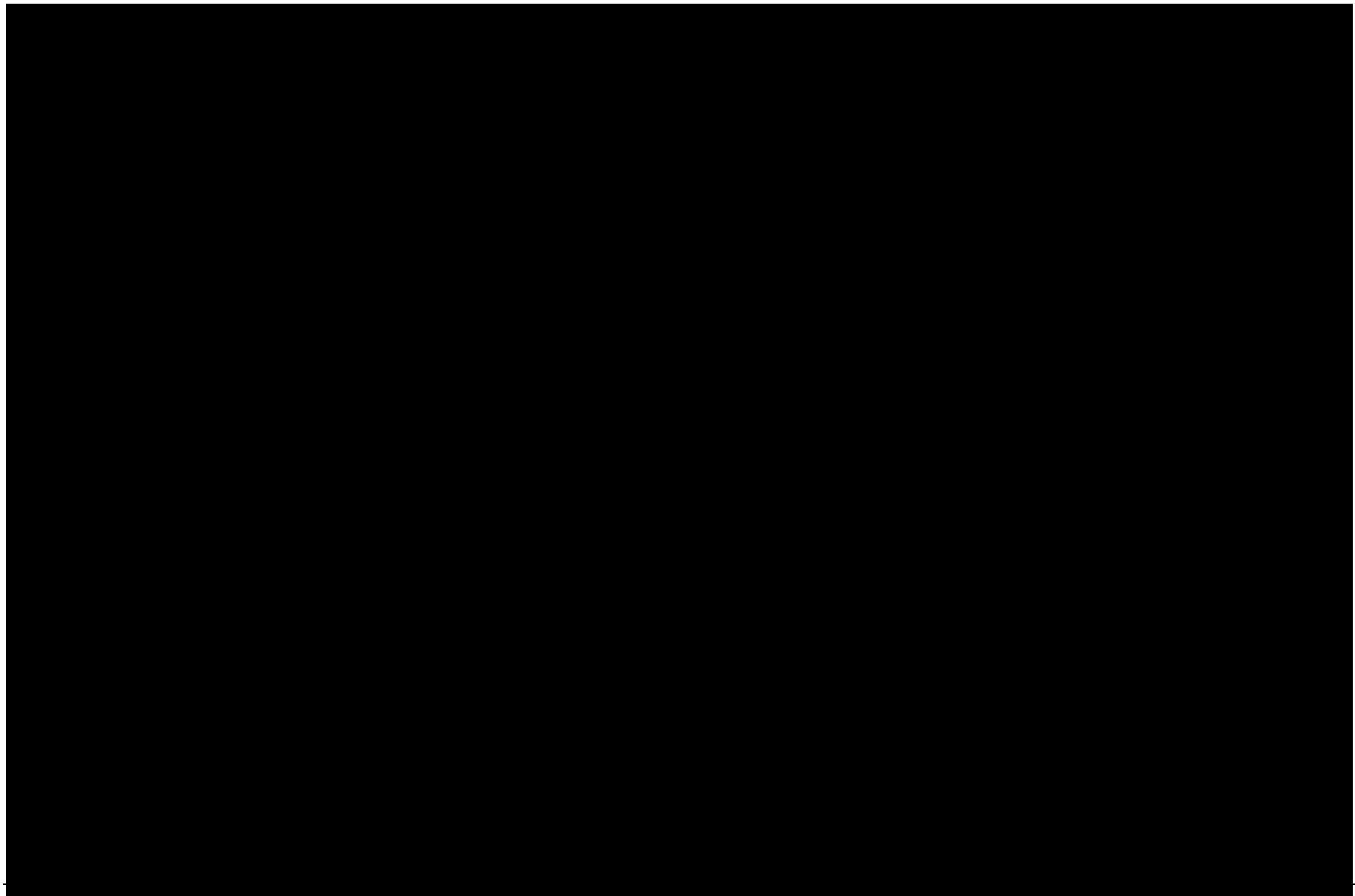




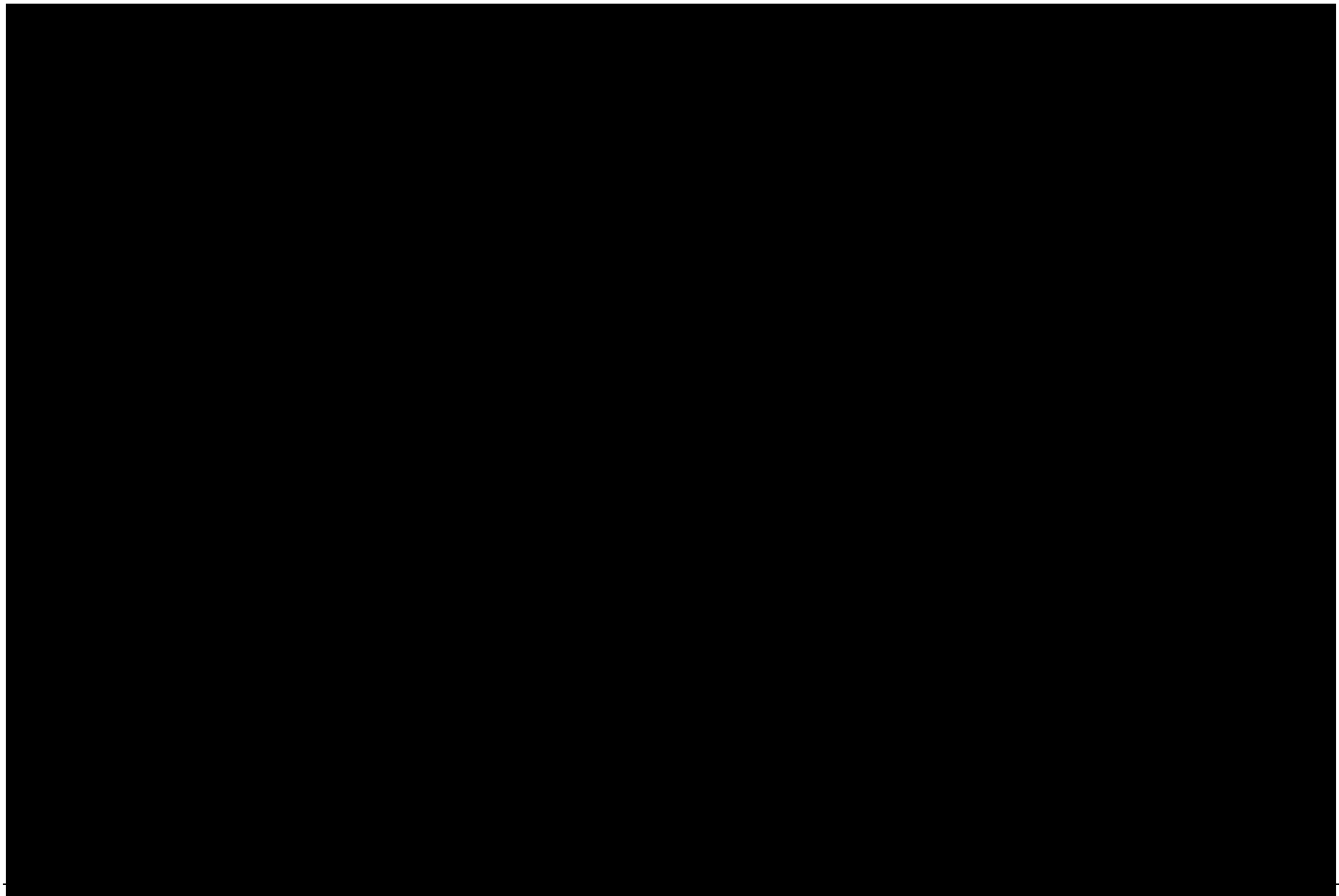


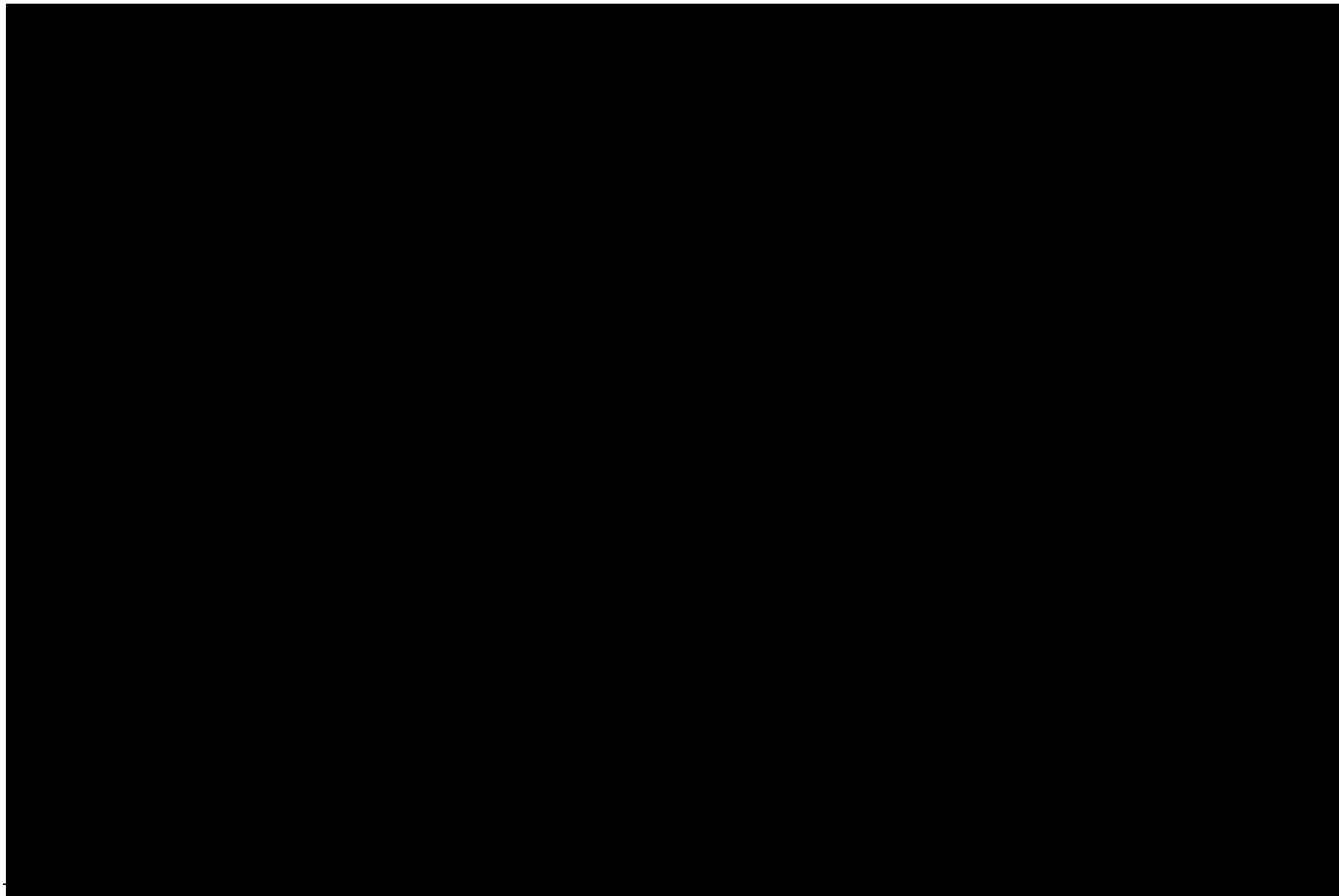
8.8 Indirect projects on national level- general information

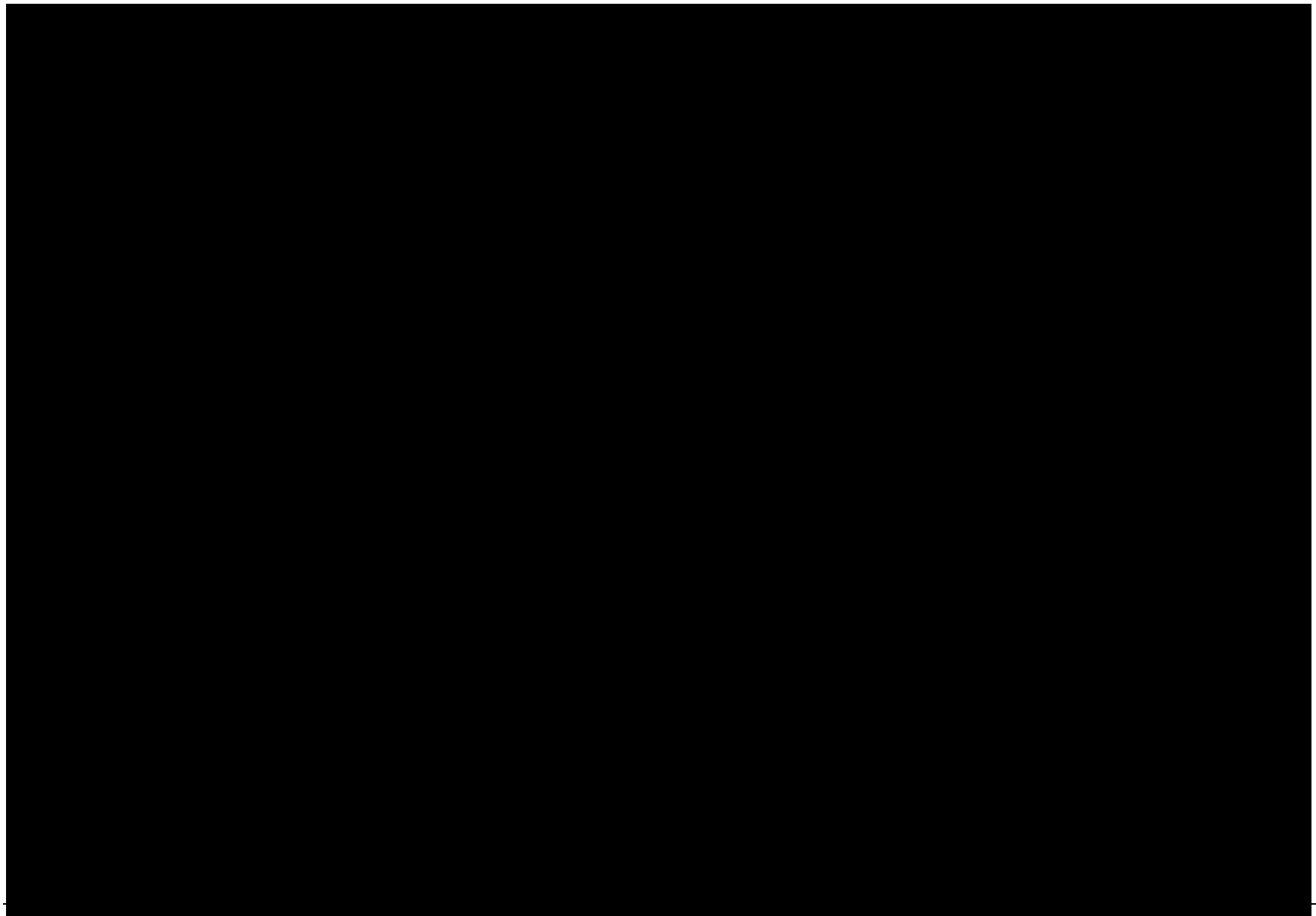


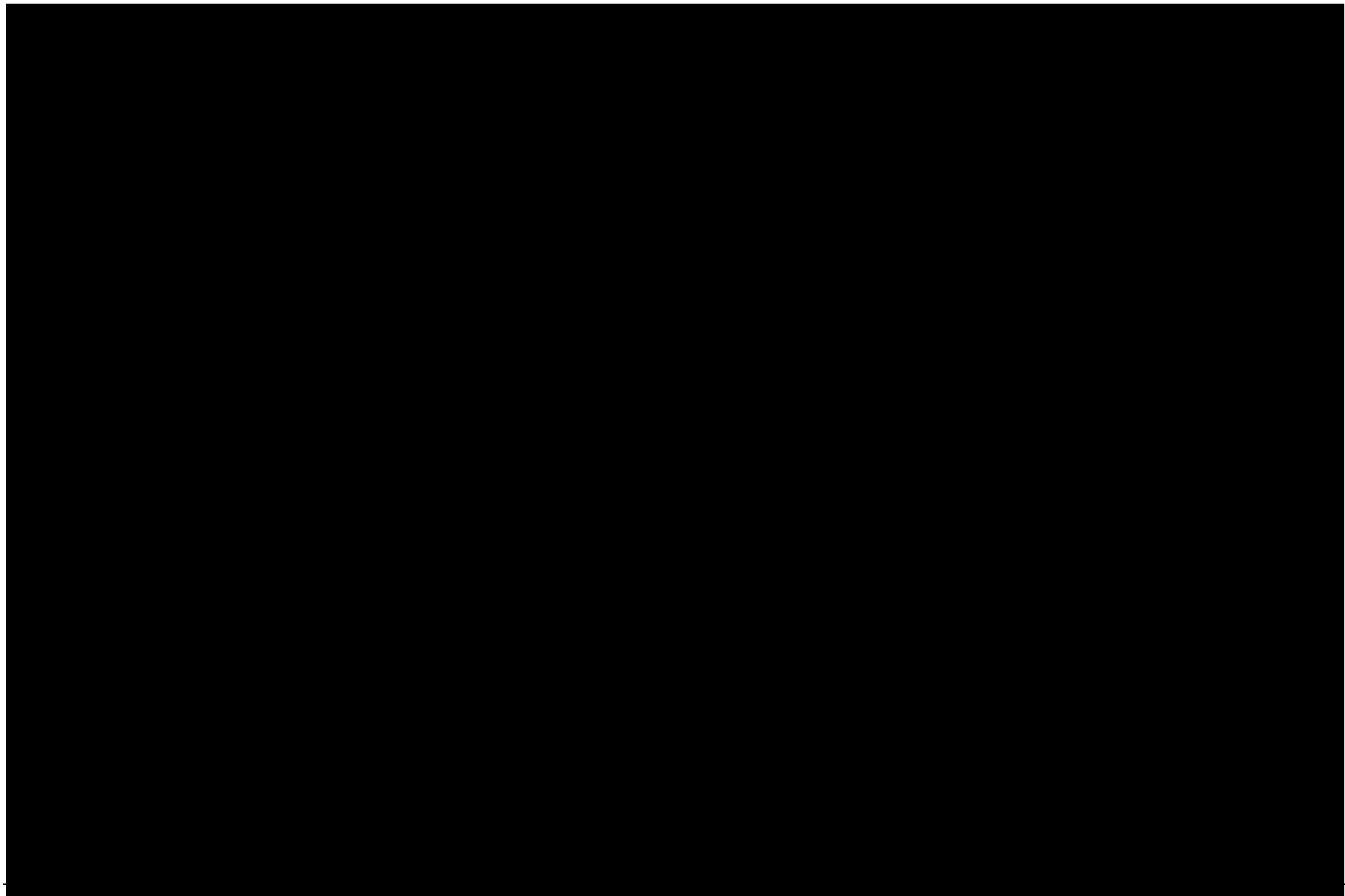


8.9 Indirect project on national level- sustain and ict

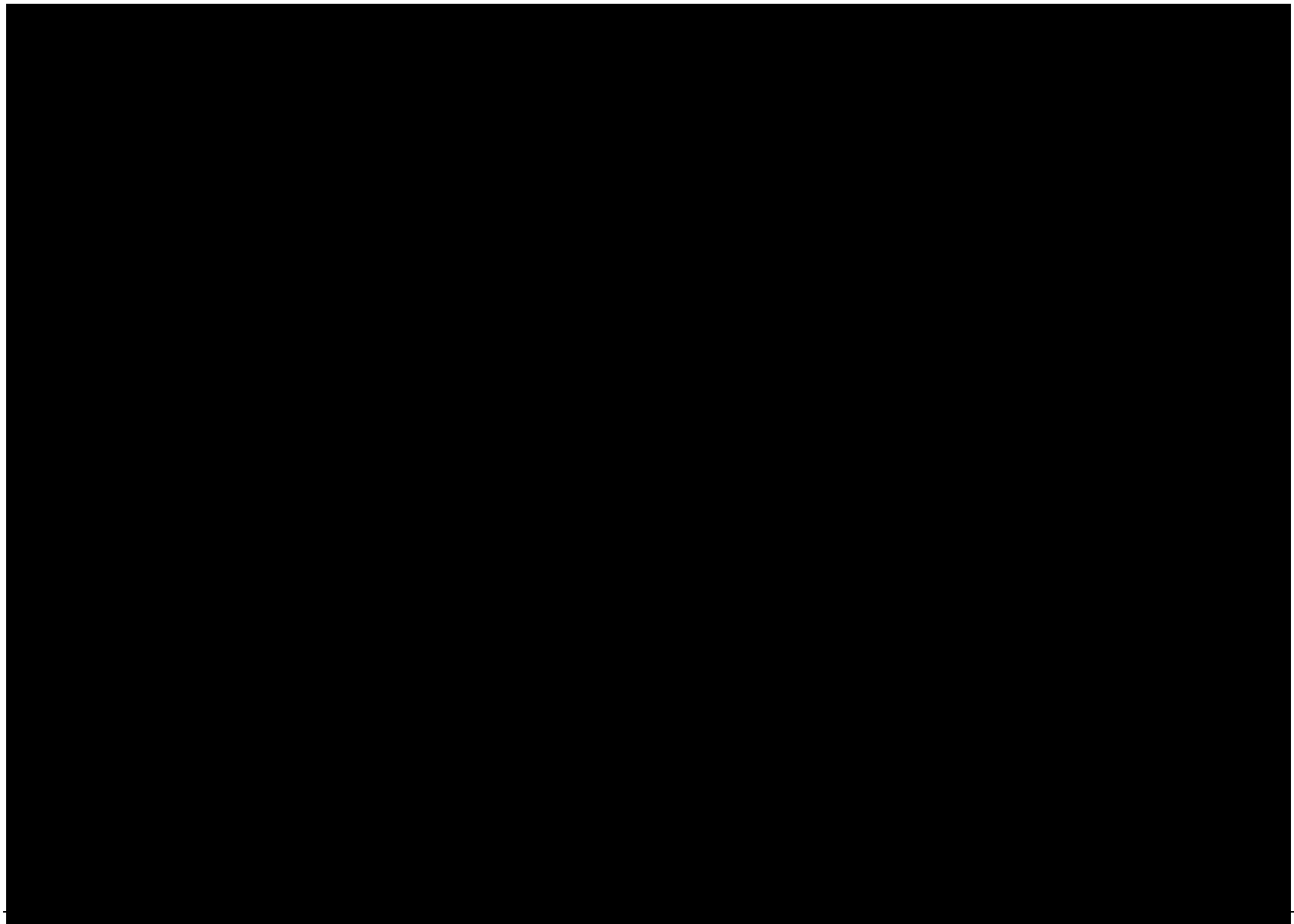


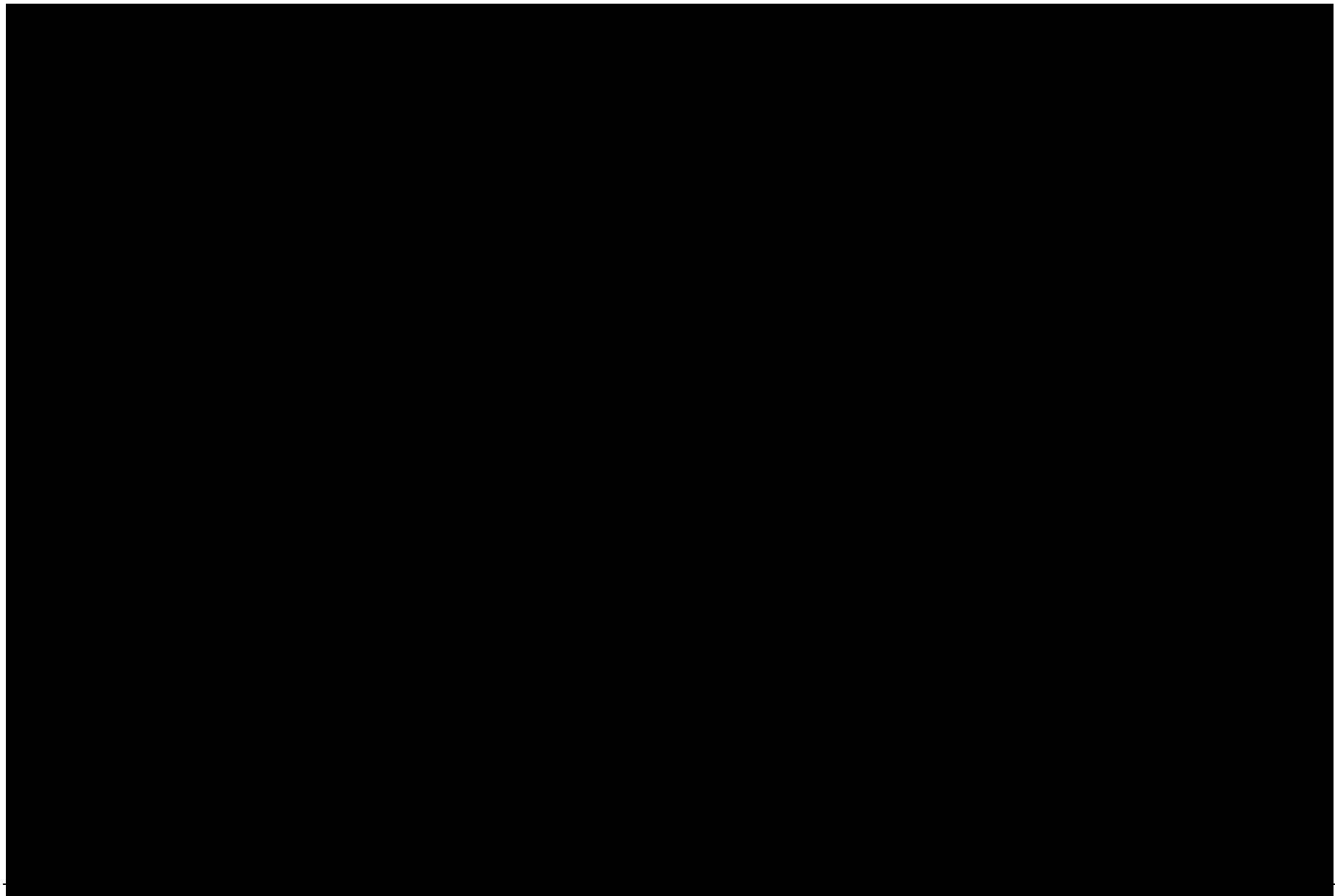


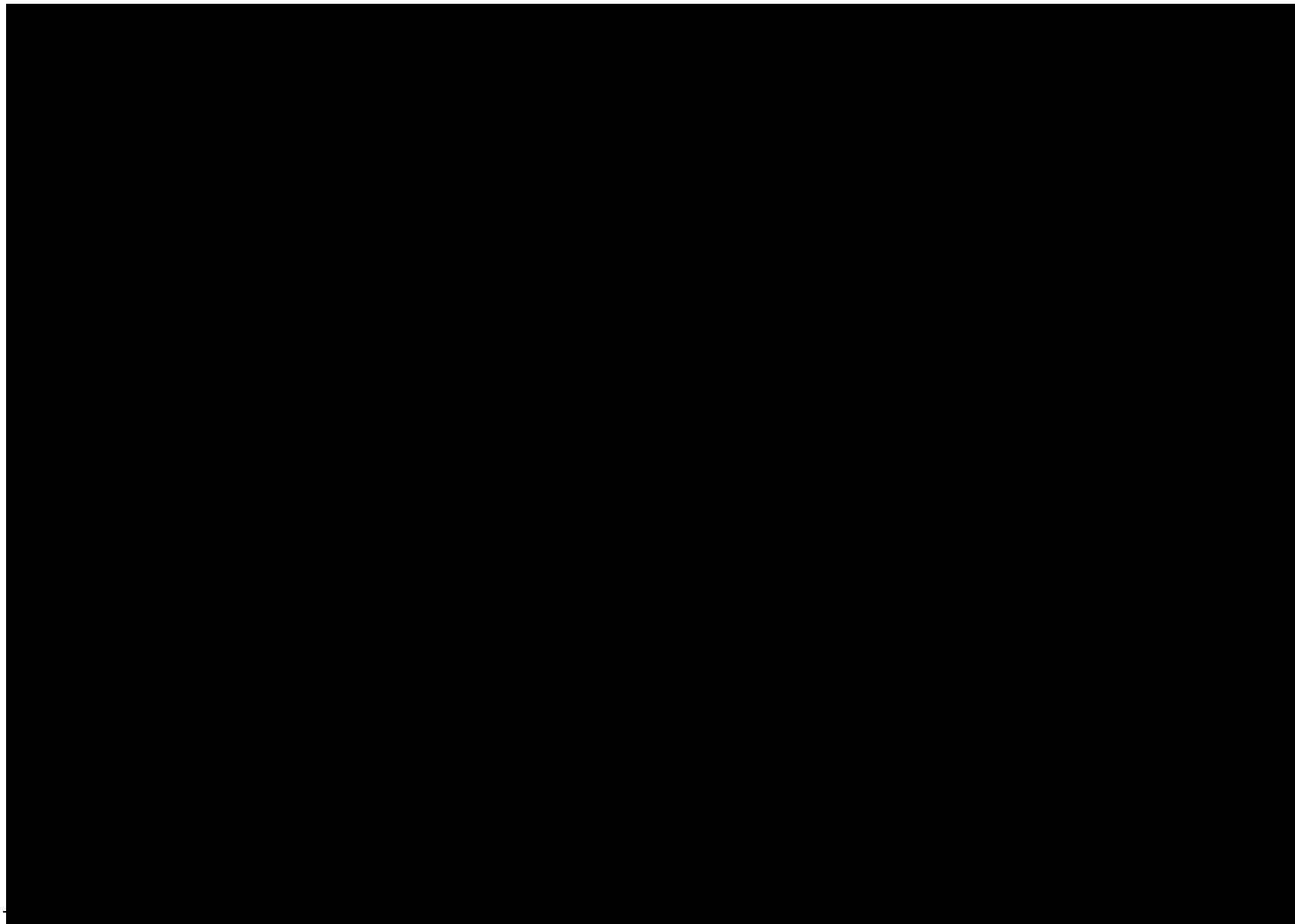




8.10 Indirect projects on regional level- general information







8.11 Inditrect projects on regional level- sustainability dimension and ict solution