

# GRIDLINES.EU



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## **Gridlines Engineering S.L.**

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<https://www.gridlines.eu>

## ABOUT US

Since its foundation in 2017, Gridlines has been closely involved in the development and expansion of electricity transmission networks in Germany. Gridlines is a team of engineers, GIS experts and project managers based in the Tech Park Malaga (Spain), specialised in the planning of power lines. With more than **5 years of experience and around 50 projects throughout Germany**, we offer a wide range of planning services.



As an international company, we place special importance on human well-being, excellence, high-quality results, teamwork and close collaboration with our clients.

**Gridlines Engineering S.L. can help your company to face new challenges, optimise resources and improve your engineering and planning costs.**

# OUR SOLUTIONS

## Surveying services



### **RANGE OF SERVICES:**

We support your project for new construction, dismantling and revision in the technical preparation and implementation.

### **Rough and fine stake-outs**

Implementation of the planned design on the field.

### **Design survey**

Terrestrial surveying services for the calculation of a digital terrain model.

### **As- Built survey**

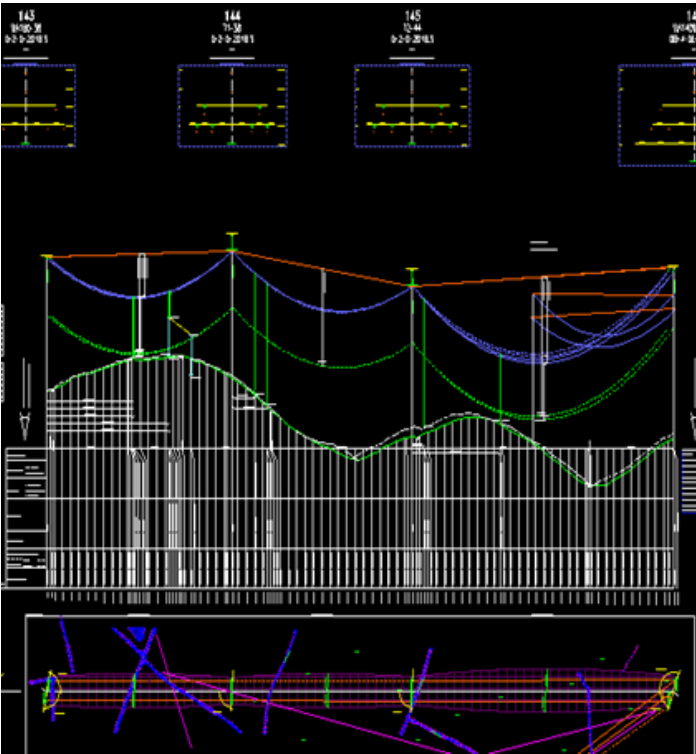
Recording of the actual situation according to its position and height. Surveying of utility installations.

### **Digital processing with GIS and CAD**

Edition of survey data with GIS and CAD.

# OUR SOLUTIONS

## Overhead lines



### RANGE OF SERVICES:

We carry out the project planning of overhead lines for different stages: new construction, dismantling, replacement construction, network reinforcement, upgrading or revision for the high and medium voltage range. For the successful implementation of the planning, we use modern software, whether for the pole design or for electric and mechanical calculations of the conductors.

#### Feasibility study

Identification of the optimal route, comparison of alternatives/costs estimation and initial coordination with the authorities.

#### New construction planning

Calculation and planning of overhead lines including preparation of the documents for the planning approval procedure.

#### Replacement planning

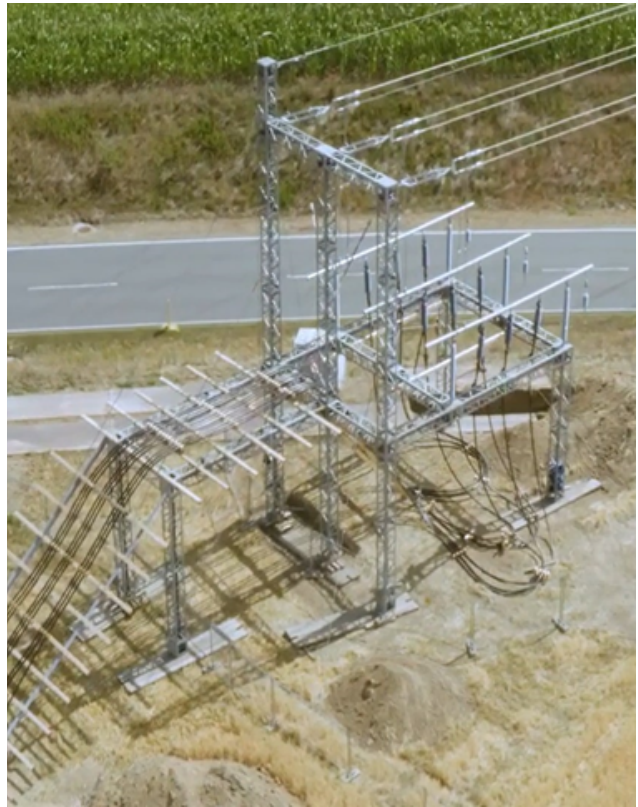
Optimisation of the existing route after adjustment of mast heights, field lengths and number of electric systems.

#### Revision

Review of the existing condition of the overhead line (sag, minimum distances, etc.), problem identification and assessment, selection and advice on corrective measures.

# OUR SOLUTIONS

## Overhead lines design



### RANGE OF SERVICES:

#### Temporary towers planning

Planning of cable and overhead provisional lines to secure the exiting electricity supply. Evaluation of the optimal routes and distribution of the temporary towers.

#### Dismantling

Planning of access roads, dismantling areas, temporary storage areas and the necessary protective measures.

#### Preparation of construction schedules

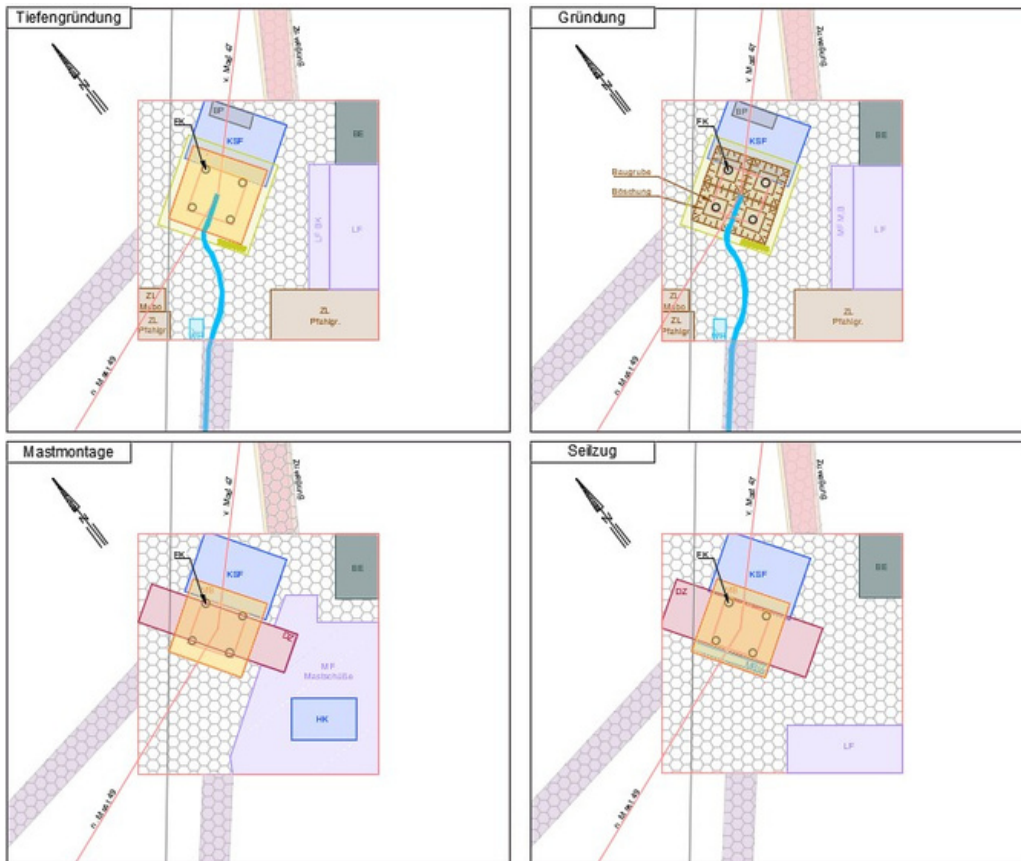
Based on the results of the route survey, the tower distribution and the mechanical calculations of the conductors, various documents will be generated which will meet with the customer specifications as well as the technical regulations.

#### Among other documents, we provide the following planning documents and lists:

Overview maps, site plans, profile plans, cross-sections, road use plans, right of way acquisition plans, mast list, crossing list, land acquisition list as well as construction list.

## OUR SOLUTIONS

### Overhead lines design



#### RANGE OF SERVICES:

##### Static

Foundations and towers loads calculations as well as special constructions.

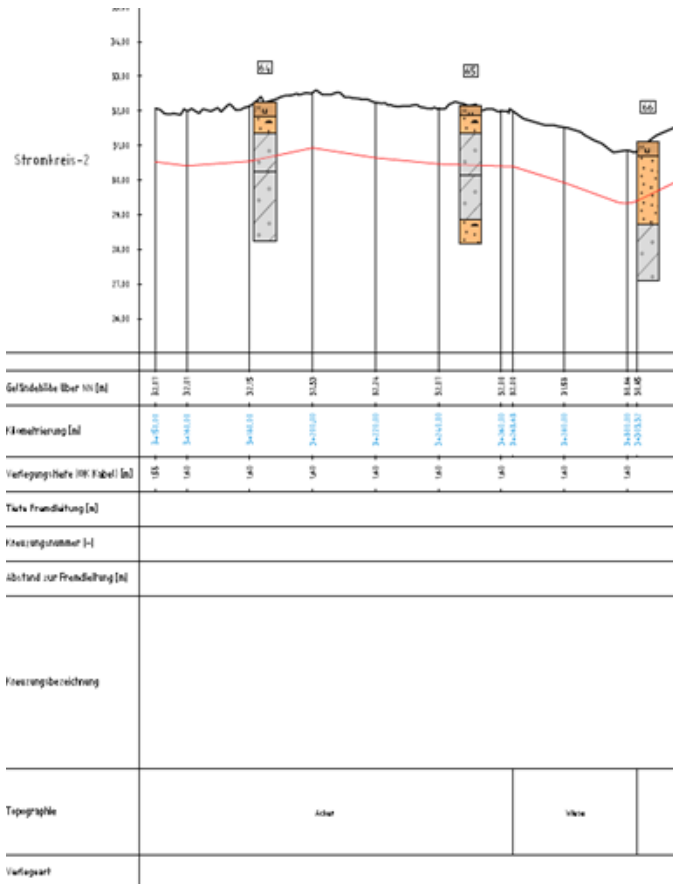
##### Execution planning

Planning of soil protection measurements for all construction steps. Detailed elaboration with execution and detailed plans

Gridlines provides support for the structural analysis of foundations, tower or tower reinforcement constructions and temporary structures.

## OUR SOLUTIONS

### Cable planning



#### RANGE OF SERVICES:

##### Definition of the cable route

Realisation of the cable route, including the connection in cable transition structures "KÜA".

##### Determination and consideration of existing facilities, landscape and soil properties.

Dimensioning of the underground cable systems taking into account the requirements and specifications of the client.

##### Creation of technical plans

Preparation of overview plans, profile plans, site plans, longitudinal and cross profiles.

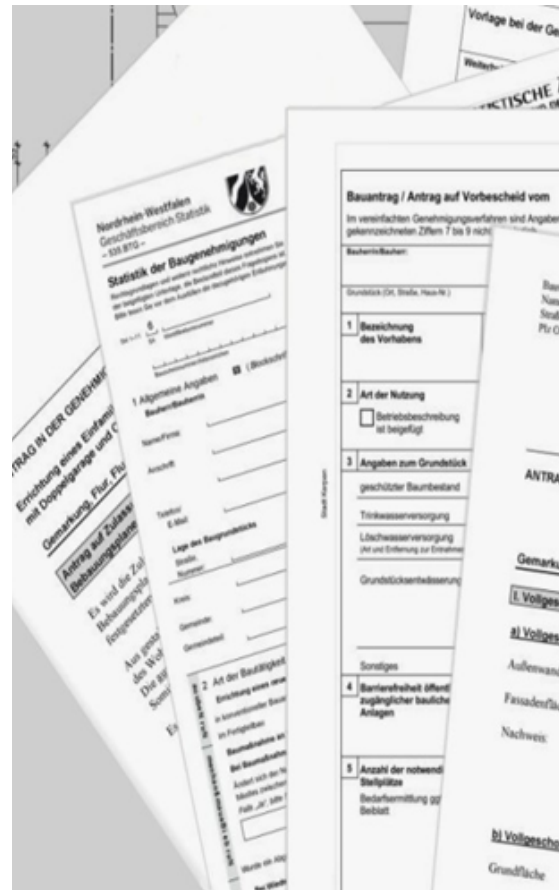
##### Execution planning

Detailed and construction drawings to the required extent and level of detail.

OUR SOLUTIONS

Planning and approval procedure

GRIDLINES.EU		Grunderwerbsverzeichnis Rückbau 220-kV-Leitung										
Flur	Flurkatastr.	Fläche	Nr.	Größe (m x m)	Anzahl (%)	Ermittlung						sonstige Schutzstrahlen
						Grundstück		Verkehrsgüter				
						Schutzstrahlen	sonstige Flur	Schutzstrahlen	Schutzstrahlen	Schutzstrahlen	Schutzstrahlen	
36	593	9530										
47	79	11430										
32	15/12	2380										
2	336/62	67758	29	4	100						393	
2	642	4278										
22	174/6	16384										
32	15/17	13904									849	
47	13/1	88424										
47	24	67365	6	7	100						1336	108
47	25	77013	6	7	0						49	
48	46/3	98962	3/4	9/7	100/100						3884	
48	51	20774									44	
48	52	31221										
48	53	22843										
32	15/17	13904									849	
32	15/12	2380										
32	15/16	13382										
32	15/16	13382										
36	826/29	20636									836	
33	19/2	94305										



**RANGE OF SERVICES:**

We support our clients' projects with professional approval management. This includes the overall coordination of the approval process.

**Coordination with public interest entities/identification of legal bases.**

**Creation of intersections list/identification of owners, users and land registration data.**

We will obtain all the necessary permissions for you, whether from the local authorities, the land owners, the tenants or the respective crossing operators.

**Negotiation of right of way easements and tenant consents.**

**Preparation and evaluation of plan information requests to third parties**

**Participation in public information events**



## OUR SOLUTIONS

### Substation planning



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#### **RANGE OF SERVICES:**

##### **New construction/conversion and extension of substations**

Consulting and individual concept creation depending on the requirements of the capacity and characteristics of the line.

Creation of the technical plant concept for the primary and secondary equipment.

## OUR PROJECTS

### Overhead lines design: construction

**Client:** SPIE SAG GmbH / TenneT

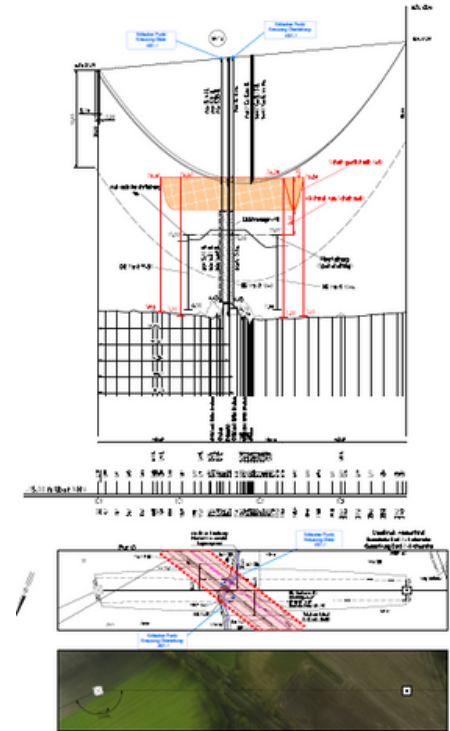
**Project:** 380 kV overhead transmission line

**Location:** Lower Saxony, Germany

**Length:** 125km

**Execution period:** 2018-2023

**Description:** New construction planning of a 380 kV overhead line (2 systems) partially planned with underground cable, as well as the planning of dismantling the existing 220 kV overhead line.



Gridlines supported this project in all project levels, i.e. project management, engineering and drawing work, during the approval and execution phases of the dismantling and new construction of the overhead line.

#### RANGE OF SERVICES:

- Preparation of project documents: planning documents, crossing books, access roads concepts and technical lists;
- Mechanical calculations of conductors with calculation software;
- Technical verifications such as component checks and verification reports; Data processing/evaluation with GIS (area calculation and creation of a project-related database);
- Detailed planning of the access road concept, considering and calculating trailing curves as well as soil protection measures. Estimations of the required quantities of building materials.
- Detailed planning of tower construction areas taking into account all construction phases such as deep foundation, foundation, tower erection and pulling and tensioning of conductors

# OUR PROJECTS

## Overhead lines design

**Client:** SPIE SAG GmbH / TenneT

**Project:** 380-kV overhead transmission line

**Location:** Bavaria, Germany

**Length:** 225km

**Execution period:** 2019-2023

**Description:**

New construction planning of the 380 kV overhead line (2 systems), with the integration of a 220 kV overhead line during approx. 11 km.

Dismantling the existing 220 kV overhead line.



Gridlines supported this project in the approval phase with engineering and drafting work.

**RANGE OF SERVICES:**

- Preparation of all necessary project documents: planning documents, crossings and technical lists.
- Support with the mechanical calculations of conductors.

Challenges of the new replacement project:

Steep terrain in this area of Bavaria along the entire route, resulting in significant unevenness not only longitudinally but also transversely.

A large number of crossings, as well as the services affected and their respective protection measures and necessary auxiliary constructions.

## OUR PROJECTS

### By-Pass projects: Overhead lines and construction cable

**Client:** SPIE SAG GmbH / TenneT

**Project:** 380-kV temporary construction cable

**Location:** Bavaria, Germany

**Length:** 42 km

**Execution period:** 2019-2021

**Description:**

For the conductors pulling work in the areas with crossings and parallel lines the planning and construction of temporary structures for 2 or 4 systems (220 kV) was needed.



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Gridlines has supported this project in the field of engineering work during the approval phase.

**RANGE OF SERVICES:**

- Determination of the line route after variant examination based on the analysis of collected data through route inspections as well as coordination with the customer;
- Tower distribution and mechanical calculation of conductors with calculation software including implementation of the corresponding survey data;
- Preliminary planning of the corresponding working areas as well as access routes and their implementation with the new construction and dismantling planning.

# OUR PROJECTS

## Overhead lines design: Dismantling

**Client:** SPIE SAG GmbH / TenneT

**Project:** 380-kV overhead transmission line

**Location:** Lower Saxony, Germany

**Length:** 61 km

**Execution period:** 2018-2020

**Description:**

New construction planning of the 380 kV overhead transmission line (2 systems) partially planned with underground cable, as well as the planning of dismantling the existing 220 kV overhead line.



Gridlines provided support in the technical preparation and implementation of the project during the approval phase for the dismantling of the existing 220 kV line and the construction of the new 380 kV overhead line.

**RANGE OF SERVICES:**

- Preparation of project documents: planning documents, crossing books, technical lists.
- Data processing/evaluation with GIS (area calculation and creation of a project-related database).

## OUR PROJECTS

### Overhead lines design: 220kV Temporary construction cable

**Client:** SPIE SAG GmbH / TenneT

**Project:** 380-kV overhead transmission line

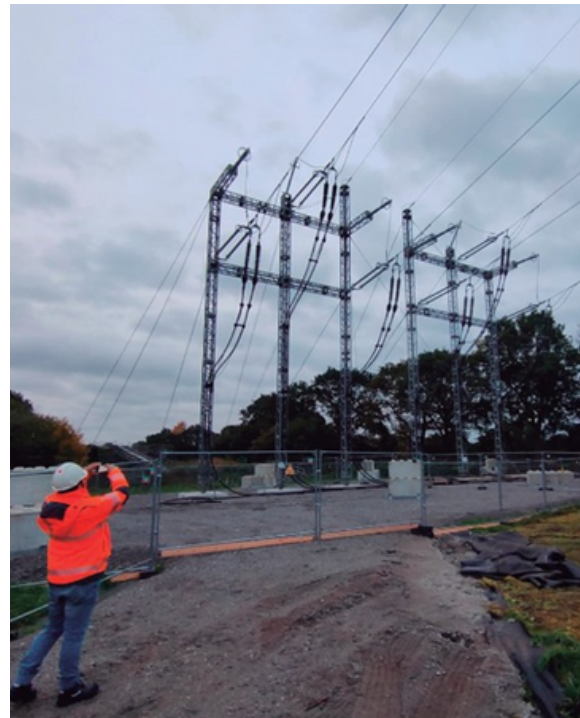
**Location:** Lower Saxony, Germany

**Length:** 5 km

**Execution period:** 2020-2020

**Description:**

For the construction of the 380 kV line, the planning of a temporary line was necessary for crossings and parallel sections between the new and the existing line. For this purpose, temporary construction cables were used to cross under the new overhead lines.



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Gridlines supported this project in the execution phase with engineering and drafting services.

**RANGE OF SERVICES:**

- Detaillierte Planung von Zugspannungen, Verankerungen der Portale, Bauteile der Kabelübergangsanlage sowie die benötigten Arbeitsflächen und Zuwegungen.
- Erstellung von Ausführungspläne

Challenges of temporary planning:

Taking into account the uninterruptible power supply, the switching of the systems could only take place during a very limited period of time. To this end, the construction sequences would be taken into account in the planning of the provisional routes.

# OUR PROJECTS

## Maintenance projects

**Client:** SPIE SAG GmbH /Avacon

**Project:** ZVN

**Project Location:** Lower Saxony,  
Germany

**Length:** 130 km

**Execution period:** 2016-2023

**Description:**

Inspection of 110 kV overhead lines.  
Reliability checks and reinforcement  
measures on different high-voltage lines  
over 130 km.



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Gridlines supported this project throughout the planning phase in terms of technical preparation, calculation and design of the reinforcements for the pylons.

**RANGE OF SERVICES:** Preparation and design of the following documents required for the planning phase in coordination with the client:

- Planning of the preliminary examination including the provision of documents for the negotiations with the property owners.
- Execution plans, drawings, etc. in DWG and PDF format as well as lists in Excel and PDF format.
- Support of the technical project management during the entire project.

OUR PROJECTS

Cable projects

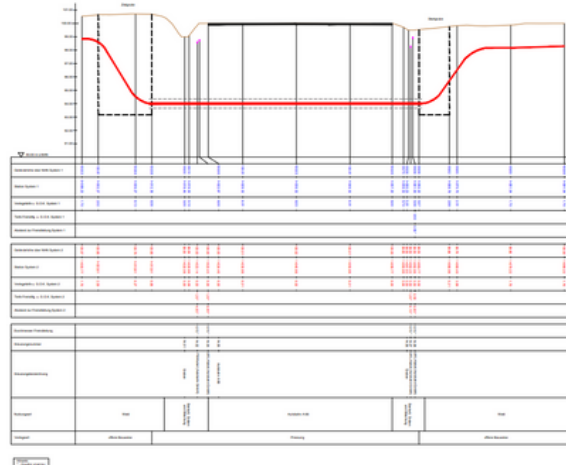
**Client:** SPIE SAG GmbH / TenneT

**Project:** 110 kV\_UW

**Location:** Hessen-Germany

**Length:** approx. 15 km

**Execution period:** 2020 – 2023



**Description:**

Types of installation: open as well as closed construction methods. In open trench with -PP-HM cable protection pipe (KSR). In the closed construction method, cable protection pipe (PP-HM) installed in the drilled channel.

Execution: planned as a two-system alternating current system, in two subsystems with three individual cables each,

Individual cables are each installed in a PVC pipe,

Overlap should be at least 1.5 m

Cable type: N(A)2XS(FL)2Y 1x2500RMS/110 76/145 kV.

Gridlines has planned this project throughout the planning phase. It is also expected to be involved in the execution phase.

**RANGE OF SERVICES:**

- Variant analysis and determination of the cable line route according to the customer's wishes and requirements as well as considering the analysis of collected data through route inspections;
- Project management. Coordination and communication between all project participants;
- Preparation of all necessary project documents: planning documents, crossing books, technical lists.
- Planning and definition of the required construction technology and its temporary working areas.
- Preparation of the access road concept.

**Challenges of cable planning:**

Private project. Considerable difficulties in obtaining both public and private approvals. This requires a comprehensive and continuous study of the optimal and feasible options. As in any cable project, it was necessary to implement and investigate temporary working and access areas prior to construction methods such as HDD procedures as well and pressings.



## OUR PROJECTS

## Visualisations

**Client:** SPIE SAG GmbH / TenneT

**Project:** 380 kV overhead transmission lines

**Location:** Schleswig-Holstein, Germany

**Locations:** 8

**Execution period:** 2020 – 2021

**Description:**

Visualisations for different sections of a new 380 kV overhead transmission line from different locations provided by the client.



UNSERE PARTNER



# GRIDLINES.EU

Comprehensive engineering services for energy industry



2017-2023

PLANNING OF  
ENERGY  
INFRASTRUCTURES