



Connecting to the Elia grid: a multi-stage process

Some actors on the Belgian electricity market (generators and wholesale industrial consumers) can request a connection to the Elia grid or ask for an existing connection to be modified. The term 'connection' covers all equipment that physically connects the requesting party's facilities to the high-voltage grid. This connection equipment constitutes the infrastructure needed to take electricity from or inject electricity into the Elia grid. The connection process, outlined in the grid codes, leads to a connection contract concluded between Elia and the connection requesting party. The process starts with the submission of a connection request. Once the requesting party has signed this contract, he becomes an Elia grid user.

I. Connecting to the Elia grid: principles

The connection equipment, also simply called the connection, forms the physical link between the Elia grid and the electrical equipment of a high-voltage grid user. Without this connection, the user cannot take electricity from the Elia grid or inject electricity into it. The connection equipment's have dedicated use to one or some grid users. A customer site connected to the Elia grid, even when considered as a closed distribution system, also has to have a connection contract with Elia ¹.

I.1. Connection equipment: several key concepts

- **Connection bay**

Connection equipment is fitted with elements that can connect or disconnect the grid connection equipment as well as the Elia grid user's industrial facilities. These elements are grouped into one or more bays. The bay closest to the Elia grid is called the 'first connection bay'.

- **Other connection equipments**

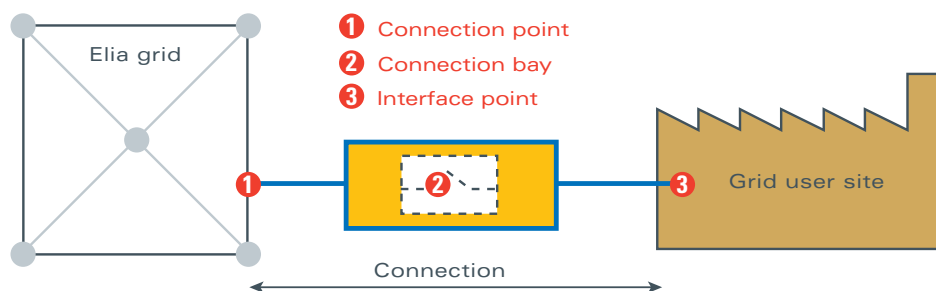
In addition to the first connection bay, the connection comprises other elements, usually at least an overhead line or underground cable connecting the Elia grid substation with the grid user's site.

- **Connection point**

The location where the connection equipment is interconnected with the Elia grid is referred to as the 'connection point'.

- **Interface point**

The interface point is the border line between the connection equipment and the grid user's electrical facilities.



- **Connection capacity**

A maximum capacity (in kVA) is given for each connection through which electricity is taken from or injected into the Elia grid. This maximum value is specified in the connection contract.

I.2. Location of connection and interface points

The location of the connection and interface points is set in the connection contract in accordance with the applicable legislation. The location is determined in consultation with the requestor in a transparent and non-discriminatory manner in accordance with the following principles:

¹ For more information about closed distribution systems, see the product sheet 'The closed distribution system connected to the Elia grid: specific operational processes associated with access'.

- The connection point is selected so that the equipment that will only be used by the grid user does not form part of the Elia grid, meaning that action taken at the connection point can connect or disconnect the user's equipment separately from the grid.
- The interface point is located on the grid user's site, downstream of the connection equipment.
- In general, Elia manages the connection equipment up to the interface point unless the grid user decides to take on partial responsibility for this.

I.3. The voltage of the connection point determines the competent authority

The voltage of the connection determines which authority is responsible for setting the technical regulations that apply to the connection:

- The federal authority is responsible for connections at voltages over 70 kV and federal legislation applies;
- Regional authorities (Brussels-Capital Region, Walloon Region, Flemish Region) are responsible for connections at voltages from 30 kV up to and including 70 kV, and regional legislation applies.

I.4. Tariffs

Connection tariffs are approved by CREG.

These tariffs include those for:

- the tariff for orientation study;
- the tariff for detailed study;
- the tariff for use of the first connection bay;
- the tariff for use of other connection equipment (overhead or underground connections and any additional equipment required in this regard, transformer equipment, equipment for offsetting reactive power and filtering the voltage wave);
- the tariff for use of additional protection equipment, additional equipment for sounding the alarm, taking measurements and metering.

Tariffs for the use of the connection cover the provision of connection equipment owned by Elia and the management of the connection.

In general, use of the first connection bay is paid via an annual fee. Any realisation or modification of other connection equipment is paid directly by the grid user according to an estimate based on the detailed study.

The connection management tariffs include the operation and maintenance costs to be paid. These are also covered by annual fees.

The connection tariffs ² are explained on Elia's website <http://www.elia.be/en/products-and-services/connection/Connection-tariffs>.

II. Other properties of the connection

II.1. One or more links possible

Depending on the grid user's needs, the connection can be made up of one or more physical links.

In the latter case, the connection will also comprise multiple connection points, interface points and connection bays.

II.2. Metering equipment essential for invoicing

The connection is fitted with metering equipment that accurately measures the capacity and energy exchanged between the Elia grid and the grid user's equipment. These meters are essential for invoicing purposes and are generally located on connection points.

For tariff reasons, the various connection and metering points are combined in one or more access points. These access points are listed in an access contract concluded with Elia. While the connection only covers the infrastructure, grid access outlines the rights and obligations specific to the exchange of capacity and energy with the Elia grid. The grouping of connection points in one or more access points is conducted in a non-discriminatory manner on the basis of objective criteria such as voltage and the Elia substation to which the connection points belong.

² For more information about grid access tariffs, see the product sheet 'Objective, transparent and regulated grid access tariffs'.

II.3. Shared connection

The same connection can be used to serve some grid users. This is known as a 'shared connection'. As with a standard connection, the separation between the Elia grid and the shared connection is clearly defined. In this case, the shared connection is only used by a limited number of defined users.

Connection tariffs for equipment used by some grid users may be shared between these grid users in proportion to their respective connection capacity or pursuant to an agreement concluded between all parties involved. By way of exception, measurement and metering facilities must be installed separately for each grid user.

III. How to apply for a connection?

Users can connect to the Elia grid by following a multi-stage process described in the applicable grid code.

III.1. Connection request

The first step is to submit a connection request. This must be done for a new connection, for modifications to an existing connection or for modifications to the user's equipment or operating methods. The connection request must be sent to the relevant system operator (depending on the connection capacity requested and the provisions laid down in the applicable grid code). Users requesting a connection to the Elia grid must provide sufficient information to allow Elia to determine which connection study/studies must be conducted (see III.2 and III.3).

Eligibility conditions to apply for a new connection to the Elia grid

A connection request can be submitted to Elia directly if the requested connection capacity is at least 25 MVA. Requests for connections with lower capacities must be submitted to the distribution system operators. However, in the perspective of harmoniously developing their systems, these operators can subsequently work with Elia about connecting to the grid equipment with a capacity lower than 25 MVA.

Requests to modify an existing connection

Requests must also be submitted to Elia for certain modifications to an existing connection, namely those that affect:

- the connection capacity;
- connection equipment;
- the grid user's facilities affecting the safety, reliability and efficiency of the Elia grid;
- the operating modes of the connection equipment and the grid user's facilities.

These requests may not necessarily result in a connection study. Elia can approve any changes it does not deem to be significant without any additional formalities. The connection contract is then amended to take the new situation into account.

An essential prerequisite for electricity generators

Connecting electricity generator units to the Elia grid requires a generation licence. This licence must be requested from CREG and is issued by the Minister of Energy. In certain situations, this generation licence is replaced by a prior agreement from CREG.

Furthermore, any electricity generation unit directly connected to the Elia grid that has a nominal capacity greater than or equal to 25 MW must be covered by a CIPU contract with Elia. The CIPU contract is described in detail in the sheet 'The CIPU contract: a set framework for taking part in the high-voltage grid management'.

III.2. Orientation study

In the initial stages, the requesting party can ask Elia to conduct an orientation study. This study may also be needed depending on the connection capacity requested and the grid situation in the area specified. This study assesses the feasibility of the connection to the grid and compares various options for this connection. The orientation study also provides, for information purposes, an estimate of the costs and an indicative assessment of the time needed to complete the connection.

The orientation study is presented in detail in the sheet "Studies to analyse properties of a connection".

III.3. Detailed study

The detailed study outlines the comprehensive technical solution for the connection option chosen (following the orientation study). It provides a more accurate estimate of the cost of this solution (calculated on the basis of connection tariffs). Once the requesting party has approved the technical solution outlined in the detailed study, they will receive an offer for establishing the connection.

The detailed study also defines, in consultation with the requesting party, the way in which tasks will be shared between Elia and the grid user regarding both the completion of the connection and its operation.

A detailed study also incorporates a reservation of the capacity needed on the grid to provide the connection capacity requested. This capacity reservation lasts for a set period, during which the connection must be ordered or a request to extend the reserved capacity submitted to Elia. Reservation of capacity for a request to connect a generation unit is subject to the awarding of a generation licence as specified above.

The detailed study is described in the sheet 'Studies to analyse properties of a connection'.

III.4. Specific conditions for connecting a generation unit

When a connection request is submitted for a generation unit, the requesting party must fulfil the specific operating conditions in addition to other provisions with regard to reactive power. Elia would ask for specific simulations to be carried out in this case.

III.5. Power quality studies

Depending on the disruption caused by the grid user's equipment, Elia may request that a power quality assessment be conducted through complementary measures or studies.

This type of study is outlined in detail in the sheet 'Power quality studies: helping to ensure adequate voltage quality'.

IV. Establishing a connection

IV.1. Connection request and connection contract

Following the provision of the detailed study by Elia for a well-defined connection option, the connection process specifies that the connection requestor provide their technical approval of the proposed solution.

Upon receiving this technical approval, Elia sends the connection requesting party an offer to establish this connection as well as a suggested connection contract.

This contract specifies the conditions under which the connection will be established. The connection contract also provides the technical descriptions of the connection equipment and the rights and obligations of both parties, as well as providing information regarding the requesting party's facilities. These facilities must comply with the statutory technical and functional requirements.

The establishment of the connection begins once the requesting party submits an order based on Elia's offer during said offer's validity period and once the connection contract has been signed.

IV.2. Power put at disposal to the grid user

The connection contract (Annex 1) also sets the apparent power (in kVA) made available to the grid user. This level of power put at disposal is agreed with every grid user and may be less than or equal to the maximum physical capacity of the connection equipment used to this effect.

Any request to boost the power put at disposal must result in a request for a detailed study, which the grid user must submit to Elia in line with the connection process. The analysis of this request comes to an end once the need for a detailed study, the feasibility of this increase, and the potential modifications and/or investments required involving the Elia grid or the grid user's equipment have been determined. An increase in the power put at disposal comes into force on the first day of the calendar month following Elia's receipt of the amendment to the connection contract signed by the grid user to document this increase in the power put at disposal and, if need be, the end of the work that may be needed on the grid to provide this additional power put at disposal.

The grid user can also request a reduction in the power put at disposal, provided that said volume had not been increased at any point over the previous 12 calendar months. This reduction comes into force through an amendment to the connection contract.

When a grid user requests and is granted a reduction in the power put at disposal available, he loses all right to reserve the previous higher quantity of power put at disposal, even when no changes have been made to the grid or connection equipment. Any subsequent request to again increase the power put at disposal must go through the connection process.

IV.3. Completion and commissioning of connection

The connection is established according to the agreements concluded between Elia and the grid user as outlined in the connection offer, the detailed study and the connection contract. More specifically, the detailed study comprises a technical addendum



that very clearly specifies each party's scope and the details to be respected. Elia and the requesting party handle the necessary formalities for obtaining the required licences and permits for their respective equipment. Each party provides the other with the support needed to achieve this objective.

The connection will be subject to compliance tests before it is commissioned.

V. Legal and contractual basis

The connection contract drawn up between Elia and the grid user serves as the contractual basis. The various grid codes define the legal framework within which the connection process takes place.

Connecting to the Elia grid: five key points

- Actors on the Belgian electricity market able to connect directly to the Elia grid or wanting to modify their existing connection must submit a connection request to Elia.
- The detailed study, in consultation with the connection requesting party, determines the properties of the connection and the distribution of tasks between Elia and the requesting party regarding the establishment and operation of the connection. This study serves as the basis for the connection offer made by Elia.
- The term 'connection' covers all equipment linking the Elia grid to the requesting party's equipment. The voltage of the connection point determines which authority is responsible for setting the legal and technical framework for the connection.
- CREG has approved Elia's connection tariffs. These tariffs comprise the estimates and fees for the provision and management of connection equipment.
- The connection contract specifies the rights and obligations of both parties. This contract sets the power put at disposal to the grid user, among other things.