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CONNECTING AN ELECTRICITY GENERATION INSTALLATION TO THE DISTRIBUTION NETWORK

These instructions are a translation of the corresponding instructions in Finnish. In any cases of ambiguity in interpretation, the Finnish-language instructions shall be complied with.

Purpose and background of the guidelines

These guidelines provide the basic information on matters relating to the network connection and operation of an electricity generation installation for small-scale producers or those considering purchasing a generation installation. The guidelines have been drawn up to facilitate the electricity producer's acquisition of a generation installation and the process of connecting it to the network.

These guidelines concern all generation to be connected to the distribution network (up to the voltage level of 24 kV), with the exception of generation installations that are only to be used as reserve power. The purpose of the guidelines and their appendices, as well as the requirements presented in them, is to enable the operation of generation installations in the distribution system operator's network so that it will not cause any disturbance in the distribution network and, consequently, to other electricity users, or pose a hazard to people working in the distribution network.

These guidelines consist of a summary of the acquisition of a generation installation and connecting it to the network, specifying chapters dealing with the connection, and the technical appendices.

The summary is presented in chapter 1 and the specifying information in chapters 2–4. There are two different types of technical appendices. The selection of the technical appendix is determined by the nominal rated capacity of the generation installation in kilovolt-amperes [kVA]:

- Appendix 1: generation installations of up to 100 kVA
- Appendix 2: generation installations of over 100 kVA

1. Summary of measures when acquiring a generation installation

This chapter includes the key matters that should be kept in mind and taken into account when acquiring a generation installation.

Ask the municipal building supervision authority whether it is necessary to apply for a building and action permit before purchasing the equipment

- The generation installation may require a building permit or an action permit
- The requirements vary from one municipality to another

Before acquiring the generation installation, confirm with the distribution system operator that the installation will meet the requirements of the electricity network and the electrical safety regulations

- It is worth contacting the distribution system operator already before making the decision to acquire a generation installation to ensure that the generation installation will be suitable for the place of connection
- Find out what kind of installation you are acquiring and provide the system operator with information about the equipment, as well as the technical documentation required by the distribution system operator

- Before the generation installation is commissioned, it is necessary to draw up an electricity-generation network service contract and (depending on the size and connection point of the generation installation) a connection contract for electricity generation with the distribution system operator
- The generation installation shall meet the technical safety requirements and it must not cause any disturbance to other users of the electricity network
    - The electricity producer is liable to pay damages if a malfunction of his equipment causes damage to other users of the electricity network or to the system operator.
- Only a skilled person with appropriate electrical installation permits is permitted to carry out the connection of the generation installation
- The generation and consumption behind the same electricity connection shall be metered separately

Please contact your electricity vendor in good time before starting generation

- Electricity generated for the market must have a buyer who operates in the electricity market

Further information about the matters listed above is recorded in the following chapters.

2. Find out and apply for any building and action permits required for the generation installation

Before making the decision to acquire your own electricity generation installation, you must find out the building ordinance of your municipality. The process is launched by contacting the municipal building inspector.

The permit process concerning construction varies between municipalities. Depending on the plan provisions, it may be necessary to apply for a building permit or an action permit. Smaller generation installations located outside the planned area usually only require an action permit.

3. Contact the distribution system operator of the area

It is not permitted to connect a generation installation to the network without the distribution system operator's permission. It is worth contacting the system operator for the first time already before making the decision to acquire a generation installation to ensure that the generation installation will be suitable for the place of connection. This way it is possible to avoid situations where a generation installation that has already been acquired does not meet the technical requirements set for it and therefore the system operator has to forbid the connection to the electricity network of a generation installation that has already been acquired.

The commissioning of a generation installation may require changes to the metering equipment or reinforcements to the electricity network. It is also worth contacting the system operator in good time in case it will be necessary to carry out alteration work.

Connecting a generation installation is always electrical work that can only be carried out by a skilled person with electrical installation permits. When acquiring a generation installation, it is worth ordering the installation service for the equipment from a competent electrical contractor.

Generation installations usually have three phases. However, the smallest generation units can also be connected to the network as single-phase generation. A single-phase generation installation can be connected behind fuse protection of up to 16 A.

3.1. Contracts between the electricity producer and system operator

A connection contract for electricity generation is usually drawn up on the connection of the generation installation. However, the need for a connection contract is assessed separately for each case. The terms of connection for electricity generation (TLE2014) recommended by Finnish Energy Industries shall be applied in the connection contract for electricity generation.

When a generation installation is connected to the electricity network so that the energy it produces can be transmitted partly or fully to the distribution network, an electricity-generation network service contract will have to be drawn up with the distribution system operator. This means that the network service contract normally valid at the metering point will be extended to also apply to generation. The general terms of network service (VPE2014) recommended by Finnish Energy Industries shall be applied to the network service contracts for the metering point. At generation sites, these terms shall be extended with an appendix to the terms of network service concerning network service for production (TVPE11) recommended by Finnish Energy Industries.

3.2. Technical safety requirements concerning the generation installation

All equipment that feeds electricity to the network shall meet the technical requirements set for it. The requirements ensure that the quality of electricity will remain at such a level that other devices connected to the electricity network will not be disturbed. Another important reason for the requirements is to ensure the safety of electricity users and those working on the electricity network.

The technical requirements set for electricity generation installations of various sizes, the technical documents to be given to the system operator and the standards concerning the installation are described in further detail in the technical appendices to these guidelines.

3.3. Metering of electricity generation

An electricity generation installation with nominal power up to 100 kVA does not require a separate metering device, as it is sufficient that the electricity acquired from the network (network input) and electricity fed into the network (network output) are metered separately from the site with a remotely read meter. Network input and output must not be netted, but the metering device shall have separate registers for these. In this connection, netting means deducting the energy transmitted to the network directly from the energy acquired from the network.

If the generation installations nominal power is more than 100 kVA, the producer must equip the generation installation with separate metering that enables calculation of consumption of own generation. Consumption of own generation means the energy generated by the generation installation that is used directly at the site. Consumption of own generation is obtained by deducting from the generated electricity the generation installation's electricity for own use and the electricity fed into the network. Electricity for own use is electricity consumed by the generation installation system itself.

Electricity tax must be paid on electricity generated at generation installations of over 100 kVA that is consumed at the generation installation site itself, if the annual energy production of the generation installation is more than 800 000 kWh. Further information about taxation is available, for example, on the Finnish Customs website (www.tulli.fi).

The system operator is responsible for the metering of network input and output. The meter is owned by the system operator who also conducts its reading. The electricity generator is responsible for metering the consumption of its own generation.

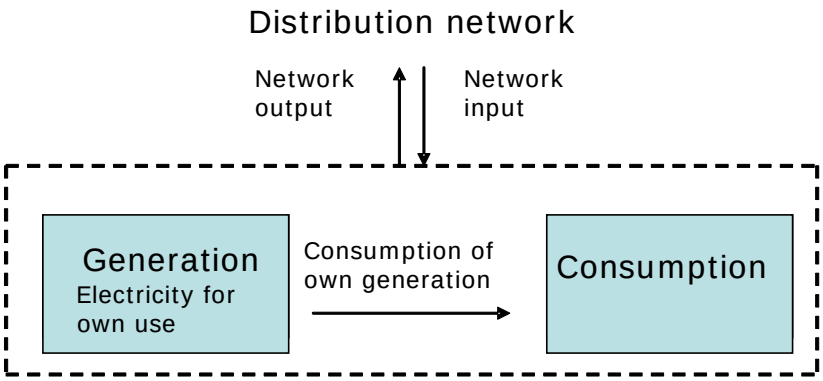

Figure 1. The area defined with a dash line in the figure describes a single electricity connection with both electricity consumption and electricity generation. The arrows depict the flow of electric energy. Consumption of own generation means electricity generated at the generation site that is also consumed at the generation site. Consumption of own generation produced at a generation installation of over 100 kVA is subject to electricity tax, if the annual energy production of the generation installation is more than 800 000 kWh.

4. Please contact the electricity vendor of your choice in good time before starting generation

The producer is entitled to connect the generation installation to the network when the generation installation meets the technical requirements set for it. The producer is also entitled to transmit electricity to the network when the connection and metering of the generation installation meet the requirements set for them and when the producer has a buyer for the electricity it feeds to the network.

If the producer wants to sell electricity through the general distribution network, the electricity must have a buyer who operates as an electricity market party. These parties are, e.g. electricity retailers.