What solutions we are working on already?

Liander is working hard to get the electricity grids ready for the energy transition. We attach great value to having a reliable, affordable and sustainable energy supply for all connected parties.

If there is a shortage of capacity in an area, Liander will increase or expand the grid so that the required capacity becomes available. It is even better, though, if these major investments and the tremendous amount of work required can be avoided by implementing innovative solutions. This also keeps the costs associated with the energy transition as low as possible.

These solutions are:

- matching energy supply and demand (flex market);
- cable pooling;
- smarter handling of redundancy;
- remote shutdown in the event of a power outage or maintenance;
- peak shaving;
- solar container;
- controllable distribution transformer;
- smart charging.

The measure or solution chosen depends on the situation.

Re 1. Matching energy supply and demand (flex market)

The flexible energy market (flex market) better matches the supply of electricity to the demand and vice versa, preventing overloading of the grid at peak times. Flexibility arises when energy consumers can voluntarily shift their supply and demand to a different time. Using smart systems, sustainably generated energy can be stored (storing locally generated energy in a battery, for example) and energy consumption can be temporarily postponed without the users having to adjust their behaviour. Aggregators, the parties that bring together supply and demand, 'collect' this flexibility from businesses in the area, use smart devices to better balance supply and demand, and offer flexibility to parties such as Liander.

Re 2. Cable pooling

Generally, when the wind is blowing hard the sun often remains hidden, and when the sun is shining fiercely the winds have died down. With this alternating supply of green energy, wind and solar farms located close to each other can easily be connected to the same cable (cable pooling). An energy consumer and energy producer can also share a cable. This new approach to connecting ensures optimum use of the assets, prevents unnecessary investments in the grid, and saves large producers of solar and wind energy a lot of money.

Re 3. Smarter handling of redundancy

When connecting a customer, like a company, residential area or large solar farm for example, Liander always ensures that there is sufficient 'redundancy' in the electricity grid. What this means in practice is having excess cables and installations available so that, in the event of a power outage, the transmission of electricity can be restored faster. Redundancy also allows maintenance on the grid to be carried out without large groups of customers being without electricity.

For electricity generators, Liander has started to use this redundancy in an even smarter way. Where a customer has a connection only to feed the electricity they generate into the grid, this customer can now voluntarily choose to be temporarily shut down in the event of a power outage or during

maintenance. As a result, energy producers like large solar farms and wind farms can be connected more quickly and Liander can deal more efficiently with planning the capacity expansion of the electricity grid.

Re 4. Remote shut down in the event of a power outage or maintenance

When there is a power outage or when maintenance is being carried out on the electricity grid, the load on the grid increases. In those situations, the chance that the voltage limits will be exceeded also increases. That is why a new energy-generating installation can only be connected if there is still enough capacity on the grid to deal with scheduled maintenance and power cuts.

Liander can shut down energy-generating installations remotely in the event of a power cut or scheduled maintenance. This way, Liander creates extra scope for connecting new energy-generating installations to the grid. This can be a good solution especially in outlying regions with long and often relatively thin cables. As soon as the power cut has been resolved or the maintenance completed, a customer can go back to feeding all their energy into the grid.

Re 5. Peak shaving

On an average day in the Netherlands, a solar farm generates only a small portion of its maximum capacity. Its peak capacity can only be reached around midday on a limited number of days per year. An unnecessarily heavy connection would be required to handle the capacity at those times when peak capacity is being generated, fed into and transmitted over the grid, costing both the customer and society a lot of money.

Peak shaving (also called peak load shaving) is a way to avoid these unnecessary costs when generating electricity using solar panels. Peak shaving can easily be done by installing PV inverters with less capacity than the total capacity of the solar panels (‘curtailment’). The capacity of the inverters determines the maximum generation capacity. A 30% curtailment of the feed-in through the use of lower capacity inverters results in only a few percentage points in annual production losses.

Re 6. Solar container

The number of requests for transmission capacity from large-scale solar farms (above 2MW) has grown explosively, partly because solar panels are becoming cheaper and because subsidies are making the investment more attractive. The total energy generated by solar farm customers could possibly double the current load on the grid over the next 5 years. One way to address this challenge is to connect large solar farms to substations through a ‘solar container unit’. With this solution, the need to make major investments in the grid can be avoided and customers can be served faster.

Re 7. Controllable distribution transformer

The significant increase in the amount of electricity being supplied from and fed into the grid is causing voltage problems. In the event of a potential grid overload (exceeding the voltage limits), the feed-in into the grid must be cut off. The classic solution has been to lay new cables or install new medium voltage units, but this is very expensive and labour-intensive.

An alternative is a controllable distribution transformer, which has a voltage regulation system to enable the smart regulation of solar panels, heat pumps and electric cars. The transformer recognises how much electricity is being fed into or drawn from the grid. When that is in danger of becoming too much, the system remotely adjusts the voltage in the low-voltage grid upwards or downwards. This way, customers can continue to feed extra capacity back into the grid.

Re 8. Smart charging

With the smart charging of electric cars, the moment or the speed of charging is adapted to the capacity offered by the electricity grid. Naturally, this takes into account when the driver needs to use the car. If more than one million electric cars will need to be charged sustainably and without problems in the future, this will only be possible if smart charging becomes the norm: the traditional way is too expensive and not sufficiently sustainable.