

Charging infrastructure for electromobility at properties

Why it's time to set up your charging
infrastructure



Ein Unternehmen
der Stadt Zürich

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E-mobility is booming. Traditional car manufacturers are now going electric and continuously expanding their lineup of EVs. Electric vehicles are achieving record shares of new registrations every year. But there's just one problem: the charging infrastructure. The situation is particularly unsatisfactory for tenants. We show how property owners can best tackle the issue and boost the appeal of their properties by installing charging stations.

The number of electric vehicles purchased in Switzerland has been increasing in recent years. The share of purely (battery) electric vehicles (BEV) in new registrations increased by 63.5 per cent in 2021 (it was 48.9 per cent in 2020), and plug-in hybrids (PHEV) by 51 per cent (up 237.2 per cent from 2020). The Swiss E-Mobility Association assumes a clear trend towards fully electric vehicles, with plug-in hybrids as a transitional technology.

Aiding this development is the constantly expanding range of electric vehicles offered by traditional car manufacturers. And many manufacturers have also announced that they will soon be switching to solely electric drives. Audi, for instance, intends to stop developing new combustion vehicles as early as 2026. Ford plans to offer only battery electric vehicles in Europe from 2030. VW is also envisaging the end of petrol and diesel cars with plans to phase out combustion engines by 2035. 'Mobility', the Swiss car-sharing provider, has a similarly ambitious goal in its sights: it wants its fleet of more than 3,000 vehicles to be fully electric by 2030. All these examples show that electric vehicles are the future of motorised private transport.

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Different charging set-ups

Electric vehicles are selling en masse, but the charging infrastructure isn't always keeping up everywhere. The infrastructure can be divided into three categories: private charging stations, semi-public charging stations and public charging stations. Private charging stations are typically located in parking spaces or garages of family homes. Semi-public charging stations may be located in underground car parks or parking spaces for residential developments or company buildings. In this case, a charging station is available for a larger but limited group of users. Access is usually granted via a specific charging card or similar ID, and is billed via a credit card or electricity bill. Any driver of an electric vehicle can use charging infrastructure located in public areas. They pay for the power they use just as they would at a conventional service station.

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their landlord or employer. Yet even responsible landlords are often hesitant when it comes to equipping their parking areas or underground garages with charging stations. The lack of charging infrastructure keeps many tenants from switching to electric cars. By failing to provide appropriate charging infrastructure early on, property owners are missing an opportunity to boost the appeal of their properties. But with proper planning, the investment is actually quite manageable.

Tenants at a disadvantage

With more than 7,200 charging points (as of 2023), Switzerland already has a fairly dense network of public charging stations. However, four out of every five charging cycles take place at home or at work, so these places need corresponding infrastructure as well. Installing a charging station isn't usually an issue for homeowners who buy an EV. Things are trickier in semi-public spaces. Anyone who rents their home or owns a freehold apartment is dependent on the goodwill and commitment of

Tackling expansion in stages

Owners, employers and managers looking to prepare underground car parks and parking areas for electromobility don't have to install charging stations everywhere all at once. A phased approach is best, as it allows you to spread out the investment costs and adapt the provision to actual needs. The Swiss Association of Engineers and Architects (SIA) has issued some outline recommendations in its 2060 information sheet. These recommendations are based on four development stages.



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Conducting a survey of tenants or employees is a tried and tested means of assessing the current demand within existing properties. This allows owners to determine how many charging stations should be completely installed (development stage D), and where initial installation suffices (development stages A to C). For new buildings and extensive redevelopment work, the SIA recommends development stage A as the minimum for all parking spaces. This allows for rapid and cost-effective expansion at a later stage. Depending on the size of the building, it is a good idea to install a certain number of charging stations right from the start. According to the SIA, these should be available in around one-fifth of parking spaces for large-scale developments.

Drawing upon expertise

What installations do you need to charge an electric vehicle? Conventional household sockets are not suitable for charging electric vehicles. Their mechanical and thermal properties mean they are not

sufficiently resilient, and they are not designed for continuous operation for hours at a stretch. The simplest technically viable solution is to install an industrial socket (CEE 16). However, owners are advised to have a charging station (wall box) installed. In addition to the socket itself, this has important extra functions such as electricity meters and load management. There is a wide range of different charging station models to choose from. When you come to select a model, it's best to get advice from an expert, as the charging station has to match the car's situation and should be as easy to scale up as possible.

Regardless of the model, each charging station must be individually fused and protected by a residual current circuit breaker. For charging in private and semi-public areas, the SIA 2060 information sheet recommends an output of 11 kW; 3.7 kW or 22 kW may also be required, depending on the type of charging station. Charging stations may only be installed by a qualified specialist and must be registered with the relevant energy supplier.

The SIA 2060 technical specification defines four development stages, from preparing the electrical supply line to installing the charging station. (Diagram: Faktor Verlag/source: SIA 2060 technical specification)

Development stages for installing charging stations according to the SIA 2060 technical specification	
 <p>A Pipe for power</p>	<p>Development stage A: configure equipment reserves</p> <p>This stage corresponds to the minimum equipment required and must be carried out for each parking space on new construction sites. Empty conduits, cable support systems and space reserved for electrical protection equipment form the basic installation for a future charging infrastructure.</p>
 <p>B Power to building</p>	<p>Development stage B: configure the building distribution system</p> <p>The connection for new construction sites must be designed so that at least 60 per cent of the parking spaces can be electrified to allow them to be used with a charging station. In refurbishment projects, it is important to check that the existing connection is sufficiently powerful to cover the additional power load for electric vehicles and provide an extension if necessary.</p>
 <p>C1 Power to garage</p>	<p>Development stage C: power supply line to the charging station</p> <p>For new construction sites, it will be much easier to install a charging station at a later date if electrical protection equipment and the necessary communication cables are already in situ, as well as the power supply line. This equipment can be installed up to at least three metres from the site of the future charging station (stage C1) or directly to the site of the future charging station (C2). Stage C2 is recommended if a charging station is likely to be installed within the next ten years.</p>
 <p>C2 Power to parking</p>	
 <p>D Ready to charge</p>	<p>Development stage D: installation of operational charging stations</p> <p>The fourth development stage corresponds to the installation of a charging station. For new construction sites, technical specification SIA 2060 recommends providing one parking space with one charging station for individual houses, two parking spaces with one charging station for multiple-occupancy dwellings, and 20 per cent of the parking spaces for large properties should be equipped with charging stations. This recommendation applies both to multiple-occupancy dwellings and to businesses wishing to allow their employees to charge their vehicles during working hours. Before selecting and installing the first charging station, a number of basic aspects will need to be clarified, e.g. load management support, the relevant billing solution and the charging power.</p>

Utilising load management

Electric vehicles require a lot more electricity to charge than other consumers in the building. So it's important that the charging infrastructure includes a load management system, especially if there are multiple charging stations. The load management system automatically coordinates the electricity demand of the charging station(s) with the other consumers, such as household appliances in a residential building or the IT infrastructure in an office building. Charging is usually a secondary priority because EVs are often connected for a long time, whether at home overnight or at work during the day. So it doesn't matter if charging is reduced or interrupted for a period of time in the event of peak loads.

The load management system not only coordinates the consumption at the charging stations with that of other consumers, but also regulates charging if multiple vehicles are connected at the same time. This prevents overloads, as the connected load of most properties is not designed for charging multiple electric vehicles. A load management system allows you to avoid expanding your connection capacity at great expense. You can also alter the prioritisation for charging as your needs change. Normally, power is distributed evenly to the connected vehicles. There are also models, such as one based on 'first come, first served', where charging is prioritised according to preferred departure time or the desired electricity billing rate (e.g. charging with off-peak electricity only).



Combining photovoltaics and electromobility

Load management is also useful if the building itself produces electricity, perhaps with a photovoltaic system on the roof and/or facade. The system can coordinate charging and solar yields so that connected EVs are charged at midday on sunny days, when photovoltaic (PV) systems supply the most solar power. Indeed, combining electromobility and PV is doubly worthwhile, as electricity doesn't have to be drawn from the grid, which makes charging cheaper. In turn, the PV system is more profitable because the EVs consume a lot of the electricity that the system produces. This is more economical than feeding it into the grid.



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Easy billing

There are various different solutions for operating a charging infrastructure. In the private sector, you generally don't need authorisation and usage is charged via the normal electricity bill. In semi-public areas – in apartment buildings and commercial premises – parking spaces with a charging station are usually assigned to a specific user. Users identify themselves by using a charging card (RFID card), so that it is clear who should be billed for the electricity consumed. The owner or building manager often delegates

Charging solutions from ewz

The 'ewz.ladelösung' option provides owners and management companies with a full-service package that covers everything relating to the charging infrastructure for electric vehicles. It includes all of the project steps, from planning through to implementation and operation. The client hardly incurs any expenses during operation, as ewz manages access for users, administers consumption-based billing and provides any necessary support for the charging station. The charging infrastructure is scalable, so it can be further expanded if necessary. Modern load management ensures that charging is coordinated with the other consumers in the building to prevent overload. Users get their own charging station and a charging card that they can use to charge their electric vehicle at public charging stations throughout Switzerland and Europe.

ewz.ch/en/ladeloesung

the billing process to the relevant energy supplier or another external provider, who bills the user for the costs of charging via a separate bill or their normal electricity bill. Some providers, including ewz, also provide support and other services (see info box), so that the owner or the administration does not have to take on any additional work. A good example of this kind of collaboration is the 'Metropolitans' project ewz.ch/en/metropolitans by ewz.

Get active now

Electric vehicles are set to replace diesel- and petrol-powered vehicles for personal private transport – and it's coming sooner rather than later. Experts are already predicting that Switzerland will have half a million plug-in vehicles by 2025, and over 3 million by 2035. This trend will also change the requirements of homes and workplaces. Before long, charging stations in car parks will be as commonplace as ovens, internet connections and lifts.

For owners of residential developments and office buildings, it's important not to miss out, and actively address the issue of charging infrastructure instead. The SIA 2060 information sheet and the expertise of our specialists provide everything you need to plan and implement this infrastructure, according to your requirements. Profitability is guaranteed: for one thing, you can charge a little more for parking space rental if it has a charging station. What's more, charging options enhance a property and are an increasingly important plus point when it comes to marketing. Investing in charging infrastructure today will ensure that you're well placed for a future of electromobility.

Subsidies for charging stations

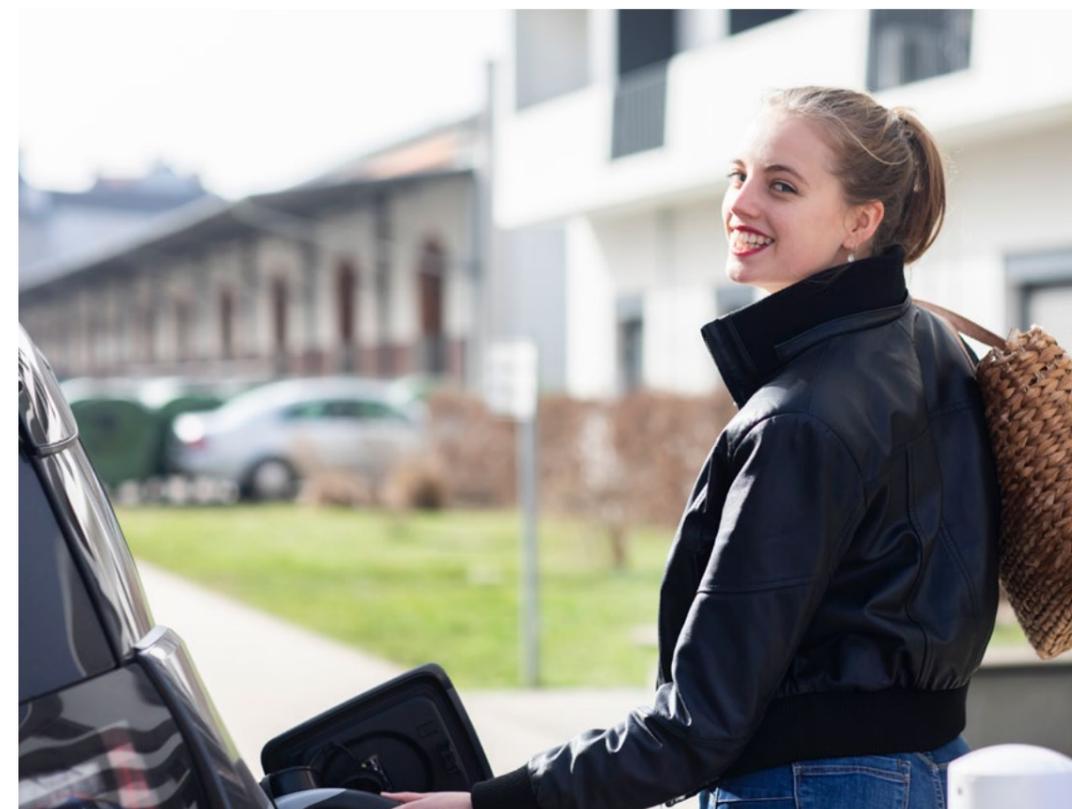
Numerous cantons promote electromobility by offering a discount on vehicle tax, while some also provide grants towards the purchase of electric vehicles. Cantons such as Schaffhausen, Thurgau, Ticino, Bern, Geneva and Vaud also offer subsidies for installing charging stations. Certain cities (e.g. Zurich), town councils and energy suppliers also subsidise charging infrastructure. You can find an overview on the website of the Swiss E-Mobility Association. Note: you must apply for funding prior to installing a charging station.

www.swiss-emobility.ch

Investing in charging infrastructure now means that you're well placed for a future of electromobility.



Metropolitans underground garage



It was far easier than I had envisaged

It all started with a specific request from one of our tenants: 'Can I have a charging station installed in the garage for my new electric vehicle?' Our small, in-house survey revealed that charging options for electric vehicles are very popular. We saw that we needed to do something in response, and we wanted to make an active contribution towards climate-friendly transport.

We needed an experienced provider of charging solutions. We had several conversations and received some appealing quotes, but only one of them came from a full-service provider.

The electromobility team from ewz was glad to receive our enquiry and recommended the ewz.ladelösung full-service charging solution. This includes the planning, implementation and operation of charging stations, along with professional load management, 24-hour support and direct monthly usage billing to consumers.

We're delighted with the solution that has been implemented. As property owners, we appreciate not having to take on additional admin and that our tenants always have a expert point of contact. And as our property is in the ewz supply area, we were even able to benefit from subsidies.

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Beat Bleuler, ewz Electricity Project Manager and co-owner of a property in Masein (GR)

Charging infrastructure development checklist

- 1 Contact e-mobility specialists
- 2 Carry out check of current technical status
- 3 Determine demand (e.g. by conducting a user survey)
- 4 Decide on stages, regulate operation
- 5 Apply for funding, report installation
- 6 Execute and put into operation

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