

# Grid connections for all-electric houses

Hints & tips for SME homebuilders

March 2026



# Introduction

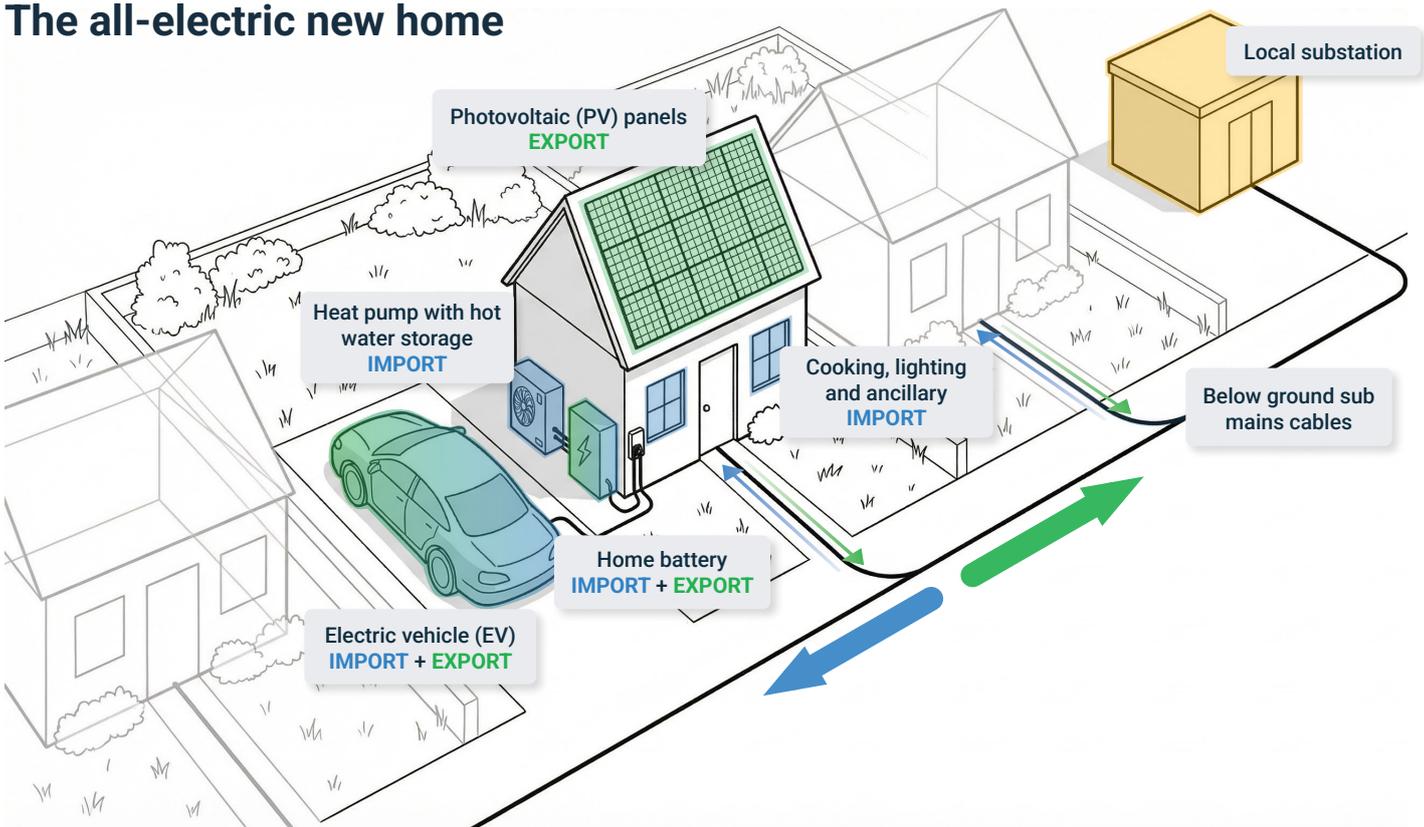
As low carbon technologies become normal features of new homes, securing right-sized electrical connections at the right time becomes much more critical.



All electric homes require greater electrical capacity for loads like electric heating and electric vehicles, but also for the export of electricity generated by photovoltaic panels and, increasingly, home batteries. At the same time, other sectors are competing for capacity, increasing the importance of engaging early and making informed connection applications.

This short guide is split into three sections which give **key considerations and differences** for new all-electric homes, **outline the activities and information** required for an application, and inform the homebuilder **where to find the technical resources** to help set a development up for success.

## The all-electric new home



All electric new homes add new **IMPORT** and **EXPORT** loads, which apply significant demands on substations and cabling infrastructure when aggregated across the development. By contrast, infrastructure for traditional gas homes was sized to accommodate smaller, diversified import loads only.

In addition, developments of new homes with PV, energy storage and smart tariffs risk imposing large local import and export peaks. The compounding effects of solar generation and dynamic electricity pricing across many homes are significant and must be considered.

# Key messages and considerations for all-electric new houses

## 1 Estimate capacity and engage with the network operator early

For all electric homes, a connection to the grid is critical and should be considered at the earliest stages, so that risks can be factored into the land purchase.

All-electric housing developments generally require more capacity and with many developers (residential and others) applying for power, timeframes for delivery can be much greater than for gas-heated developments.

It is important to make contact with the Distribution Network Operator (DNO) early to discuss the project's needs. Any DNO conversations are treated confidentially by law. DNO heatmaps and other resources are also available to help understand grid constraints in the area.

To inform early dialogue with the network operator, homebuilders should estimate the project's required capacity using appropriate guidance, noting that these will be different for all-electric homes. Site phasing should be shared so the DNO understands power-on timelines. Optioneering is expected at this stage.

## 2 Choose your delivery model up front and build the required team

The decision whether to progress an application directly with the DNO or to engage an Independent Distribution Network Operator (IDNO) or Independent Connection Provider (ICP), should be made as early as possible. A client agent should be engaged at the same time to suit the chosen model.

A client agent is a competent party who will develop or validate the electrical capacity requirement, coordinate the DNO application and liaise with the DNO through the pre-construction process. This could be an IDNO / ICP where engaged, or a consultant engineer.



### 3 Avoid over or under-assessing the electrical demand

An accurate load assessment and load profile phasing plans are key to securing a connection that serves the needs of the development as quickly and cost-efficiently as possible.

Currently, most applications ask for too much power, too early. With all-electric homes, it is important that calculations properly reflect the expected import and export loads and power-on timings, so that infrastructure can be properly sized by the DNO / IDNO.

Sharing realistic load profile phasing plans also avoids the cost of reserving unnecessary capacity and the risk of losing it if not used in time.

### 4 Develop the electrical design with network operator input

Initial electrical designs should be developed by a design engineer and shared with the network operator so that feedback or mitigations can be incorporated into the developed sitewide and plot designs. DNOs offer pre-application surgeries and other engagement to assist.

### 5 Mitigations to connection constraints exist

If early feedback from the network operator indicates a site is constrained, mitigations including adjusted phasing, energy storage and smart grids can be explored. Again, remaining engaged with the DNO / IDNO either directly or through the client agent is important as they will work with the homebuilder to determine a solution.

As good practice, PV export curtailment should only be accepted as a last resort, as it prevents householders from seeing the full benefit of their installation.



# What's different about connections for all-electric new homes?

## Higher import demand

The Future Homes Standard is expected to shift most new build homes to all-electric heating in place of fossil fuel boilers. At the same time there is increasing customer demand for other technologies such as electric vehicles and home batteries. This drives up the likely connected load across a site and can impact cable sizing. It is important to note that the popularity of these technologies will likely increase, leading to greater import demands over time.



## Significant export loads

Export loads such as PV panels, home batteries and (coming shortly) vehicle-to-grid systems mean that new homes are capable of exporting significant power to the grid often at similar times of the day. This needs to be considered within the network operator's infrastructure design, as cable and substation sizing was traditionally driven by smaller, diversified import loads.



## Time of use (ToU) tariffs

Where combined with on-plot technologies like heat pumps, EVs and batteries, dynamic electricity pricing drives changes in consumption and export patterns. Customers will collectively use power at the same time when it's cheap to generate and export when profitable. This risks causing large peaks on the local network, requiring mitigation through increased infrastructure sizing or via other means as outlined below.



## Demand calculations

**After-diversity maximum demand (ADMD)** calculations assess the likely maximum demand across a development to allow pragmatic sizing of infrastructure. ADMDs assume that across a group of homes, overall demand is softened by variance in occupant behaviour so simultaneous demand is reduced significantly.

However, due to the above factors this method may no longer be adequate. ADMDs may need to be supplemented by **maximum demand** and **maximum export** assessments so that network operators understand the worst case loads that will be placed on infrastructure when, for example, solar generation peaks across the development or ToU tariffs incentivise electricity purchase across a group of customers at once.

## Mitigation options

On-project options exist to mitigate higher potential loads. These include **project-wide energy storage**, **smart grid solutions** and **export limitations** applied at a plot level. Other measures such as **PV orientation** to reduce the magnitude of peak solar generation should also be considered.

The DNO may offer alternative connection products to assist with constraints. These could include active network management and phased connections, underlining the importance of realistic load phasing plans.

Where constraints are identified, the designer and client agent should work with the DNO (and IDNO where appointed) to explore solutions and build accepted mitigations into the design. Note that the impacts of measures must be agreed with the DNO in order to be reflected in the formal quote produced.

# Typical application process and information required

## Developer preparations

### At / before site acquisition stage:

- Identify site location and make contact with the DNO / IDNO. Decide whether to use an ICP / IDNO.
- Engage technically competent client agent e.g. IDNO, ICP or consultant.
- Establish basic site and phasing information. Assess the initial import and export loads.

## Engagement with DNO / ICP / IDNO

### At masterplan / sitewide design stage:

- Develop remaining pre-app information and submit to DNO via client agent. Note that DNOs have statutory response periods that should be factored in programme.
- Request pre-app surgery with DNO and design team if required.
- Consider feedback from DNO and review budget quote (where provided).

## Up front information required by DNO / ICP / IDNO

**Project details:** Site name, postal address, appointed agents e.g. IDNO / ICPs.

**Accommodation and outline specification:** Number of homes, property types, mix (including non-resi uses), specification including heating type and low carbon technologies (e.g. PV, batteries, EV charging etc).

**Site drawings:** Site location plan (showing site in context of surrounding area), site layout (showing redline boundary, infrastructure etc).

**Project programme and phasing:** Site phasing, initial delivery program.

**Any special considerations:** Micro grids, load management, heat networks or grid-scale generation.

## Develop electrical design

### At progressed design stage:

- Progress electrical design suitable for formal application based on feedback.
- Mitigations should be explored if DNO engagement suggests capacity constraints (e.g. smart grids, load management, export limiting).

## Submit formal application

### Prior to appointment of trades:

- Client agent submits a **formal POC application**, with supporting information.
- Application is assessed by DNO within agreed turnaround timescales.
- Review the formal quote provided by the DNO with the client agent.

## Application information required by DNO / ICP / IDNO

**Accommodation schedule and detailed specification information:** Property types (accommodation schedule), other uses (final schedule of any commercial, retail etc).

**Total electrical load for development:** Updated ADMD, maximum demand and maximum export calculations, total import load for site (kVA), total export load for site (kW).

**Import and export loads within homes:** Details of domestic loads e.g. heat pumps, EV charging points, PV arrays, battery storage. Specification is required for each technology.

**Sitewide import and export loads:** Details of non-domestic loads including street lighting, pumping stations, heat network plant, community EV charging etc.

**Temporary works details:** Site compound layout and EV charge points, temporary works electrical loads including compound, temporary builder's supply, cranes etc, temporary generator details.

**Updated project programme and phasing:** Electrical load profile phasing plan in line with the delivery programme.

Any other updates to information previously shared.

## POC offer & acceptance

- Consider offer and if acceptable enter contract with DNO.
- Progress the updated electrical design suitable for construction.
- Ensure that any requirements for temporary on-plot export limitation are built into the required installer contracts.
- **On site construction starts once all consents and legal agreements, such as wayleaves and easements, are in place.**

## Ongoing review

### If the design changes and as project phases build out:

- Update the load profile phasing plan to account for any changes in import / export loads and densification.
- Review the suitability of the connection and re-engage with the DNO where necessary.

# Who's who: the key roles and available resources

## Distribution Network Operator (DNO)

Owns and operates the regional electricity distribution network. Always involved in new grid connections, assessing applications made by the developer and delivering non-contestable works. Can deliver and adopt the on-site network, or work alongside IDNOs and ICPs. See [DNO heatmaps](#) to inform early stage designs.

## Find your local DNO

The Energy Networks Association is the industry body for DNOs. [This resource](#) allows you to find which DNO operates in your region.



## Independent Distribution Network Operator (IDNO)

An OFGEM-licensed operator that adopts and operates the on-site electricity network between the DNO connection point and homes, under a concession agreement. Can manage the connection process in dialogue with the DNO, as the developer's agent.

## Find an IDNO

The Independent Networks Association is the industry body for IDNOs. [Members of the INA](#) may operate in your region.



## Independent Connection Provider (ICP)

Can be appointed by a developer to deliver contestable electrical connection works. Builds infrastructure to DNO or IDNO standards so it can be adopted, while non-contestable works remain the responsibility of the DNO. ICPS are accredited by the Electricity Registration Scheme (NERS).

## Find an ICP

The [NERS database](#) lists accredited ICPs and is filterable by the services they offer and the regions they operate in.



## Client agent

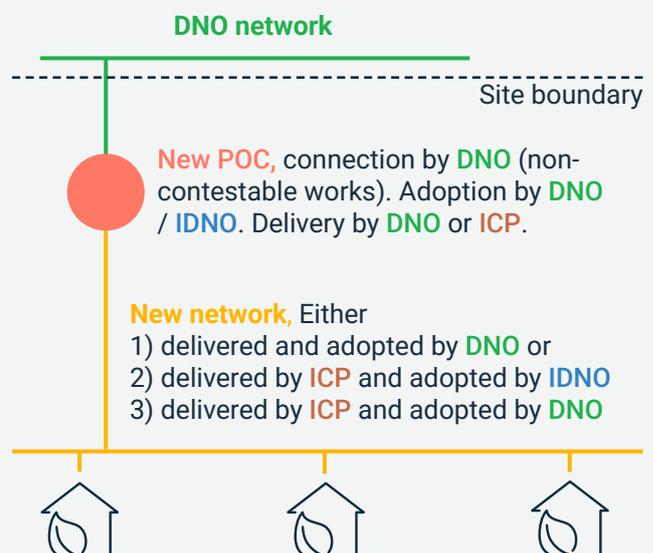
Takes responsibility for developing or validating the load assessment and managing the application process. The agent must satisfy themselves that the application is appropriate. The role may be performed by an IDNO, ICP, consultant or in house developer expertise if available.

## Other useful terms

**ADMD / E:** After-Diversity Maximum Demand/export  
**POC:** Point of Connection to the DNO network  
**kWh:** Kilowatt hours – unit of energy  
**kW / kVA:** Kilowatt / Kilovolt Amps – units of power  
**CoP:** Coefficient of Performance - heat pump efficiency  
**G99 or G98:** Generation connection requirements - see [this ENA resource for more information](#)

## Network infrastructure responsibilities

The below diagram shows which roles may be involved in the delivery and adoption of different parts of the electrical infrastructure on and off site.



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