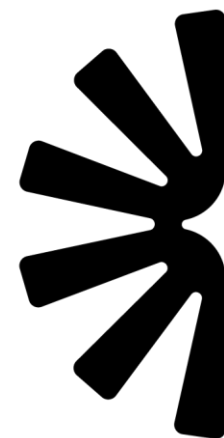


Electric vehicles



Who are we?

- Energy charity based in Bristol
- Focused on ending the suffering caused by cold homes and combating the climate crisis
- We support people in fuel poverty through our advice line and retrofit team
- We support community organisations on energy, fuel poverty, retrofit and local and central government with decarbonisation and energy plans
- We are supporting the SiB ERF application process with technical buildings advice



**Centre for
Sustainable
Energy**





Subjects covered today

- Electric vehicle types
- Costs and considerations
- Benefits
- Charging logistics
- Charging considerations
- Community case studies
- Future developments



Electric vehicles



Electric vehicles

- Battery electric vehicles (BEVs) are fully electric vehicles with no Internal Combustion Engine (ICE).
- Hybrid electric vehicles (HEVs) have both internal combustion engine and electric motors but are principally ICE vehicles as they cannot be plugged in to a charger (and are not eligible for funding).
- Plug-in hybrid electric vehicles (PHEVs) are similar to HEVs but have the option of using external electrical power (and can be funded).



[Milk float - Wikipedia](#)

The benefits

Benefits for users

- Lower running costs
- Lower maintenance costs
- Lower tax (including for businesses)
- Can drive in low emission zones
- Less noise
- Zero exhaust emissions

Benefits for community buildings

- Income generation
- Flexible payment schemes
- Maximizing solar PV generation





Cars

- Wide range of EVs on the market, with different styles, sizes, speeds and battery ranges.
- The average range for cars currently on the market is 239 miles.
- Some new zero-emission vehicles (ZEVs) are eligible for government grants of £1,500 to £3,750 towards new car costs.

www.gov.uk/zero-emission-vehicle-grants/cars





Wheelchair accessible vehicles

- Some wheelchair accessible vehicles can be sold at a 35% discount. The seller will include the discount in the purchase price.
- The maximum discount is £2,500.



www.gov.uk/zero-emission-vehicle-grants/wheelchair-accessible-vehicles

www.communitycouncils.scot/the-work-of-community-councils/showcases/ferintosh-community-bus-tackling-transport-deprivation



Vans and buses

- Grants which mean some vans can be sold at a 35% discount.
- The seller will include the discount in the purchase price.
- Maximum discount for small vans is £2,500
- £5,000 for large vans.

www.gov.uk/zero-emission-vehicle-grants/vans



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Utility vehicles (UTVs)

- In many community / estates / retrofit contexts this is where electrification makes the most sense.
- Electric utility vehicles (often called electric UTVs, site vehicles, buggies or light electric work vehicles).
- Usually small, low-speed electric vehicles used on private land or defined sites, such as:
 - Grounds maintenance vehicles
 - Caretaker / estates buggies
 - Campus or hospital site vehicles
 - Utility carts with flatbeds or small tippers
 - Site inspection and facilities vehicles
- Not designed for general road use (some can be road-legal, many are not).



[Kiplin Hall - Social Investment Business](#)



Running costs

- Running costs for E.V.s are generally lower than for ICE vehicles.
- Costs vary depending on
 - Home or workplace charging vs public rapid chargers
 - Electricity tariffs (standard vs off-peak or smart tariffs)
 - The amount of self-generation you can use (e.g. solar PV)
- Considerations
 - Length of journeys
 - Cost of charging point
 - Availability of (cheaper) overnight electricity tariffs
 - Towing weight

Maintenance costs and reliability



EV's have:

- Fewer moving parts
- No oil changes
- Less brake wear (regenerative braking)

- Typically leads to lower maintenance and servicing costs
- Battery degradation is slower than early fears suggested
- Manufacturing emissions are typically paid back after 10-13,000 miles

- Batteries deteriorate over time, but a warranty will normally cover an 8-10 year period (or 100,000 miles)



Charging times

- Charging time can vary depending on:
 - Size of the battery
 - Amount of charge already in the battery
 - Charging speed (i.e. kW rating of the charge point)
- Could be as little as 30 mins or as much as 20 hours to fully charge a car battery



Charging

Electrical supply and capacity

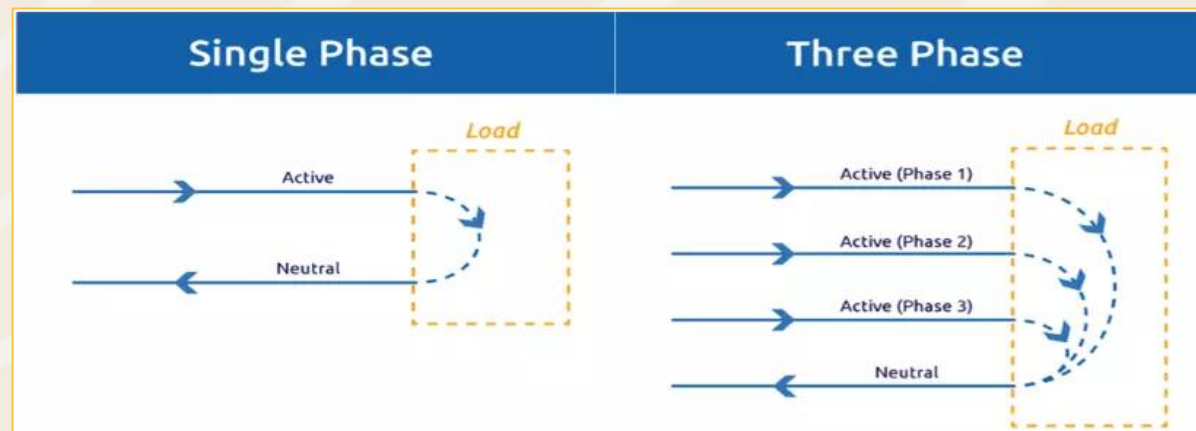
- Supply type: Single-phase or three-phase (this dictates charger number and speed)
- Available capacity: Check main supply breaker limits
- Future demand: Consider existing loads and future growth (diversity)
- Distribution board: Prefer a separate board for EV chargers to avoid nuisance tripping
- Metering: Sub-meter chargers to understand usage and costs





3-phase supply

- 3-phase simply means 3 cables supplying electricity (although usually 4 cables – 1 being neutral)
- Most non-domestic buildings will be 3-phase (may be single phase if domestic-like in nature and low energy use)
- 3-Phase supply – 400-415 volts (domestic is usually single phase 240 volts)
- Requires different (to domestic) qualifications to carry out the work – skills shortage
- Fitted as standard in German domestic new-build to handle greater future capacity (both demand and supply) from electric heating, EVs, solar, etc



Charger type and performance

- Use case: Car charging or bus/minibus charging?
- Charging speed:
 - Typical single-phase: up to 7 kW
 - Three-phase: higher charging rates possible
- AC or DC charging (DC usually higher cost and higher power)
- Charge point limits: Always constrained by supply capacity
- Standards: Most chargers are now standardised*



Location and infrastructure

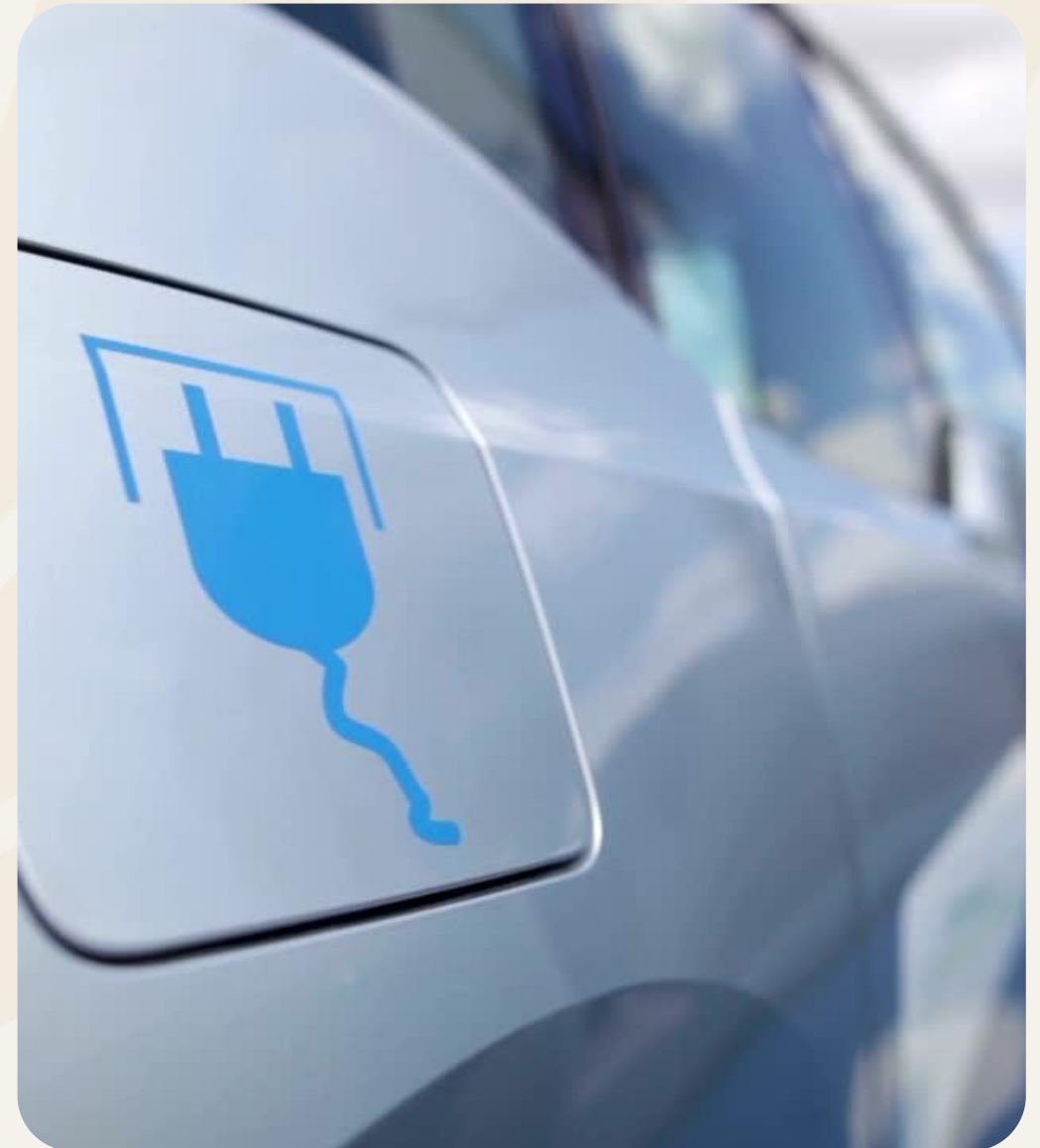
- External space: Parking layout, number of bays, accessibility
- Cable routing:
 - Underground where possible (safety)
 - Avoid trip hazards
- Visibility & security: Lighting, vandalism risk



Access, control and payment



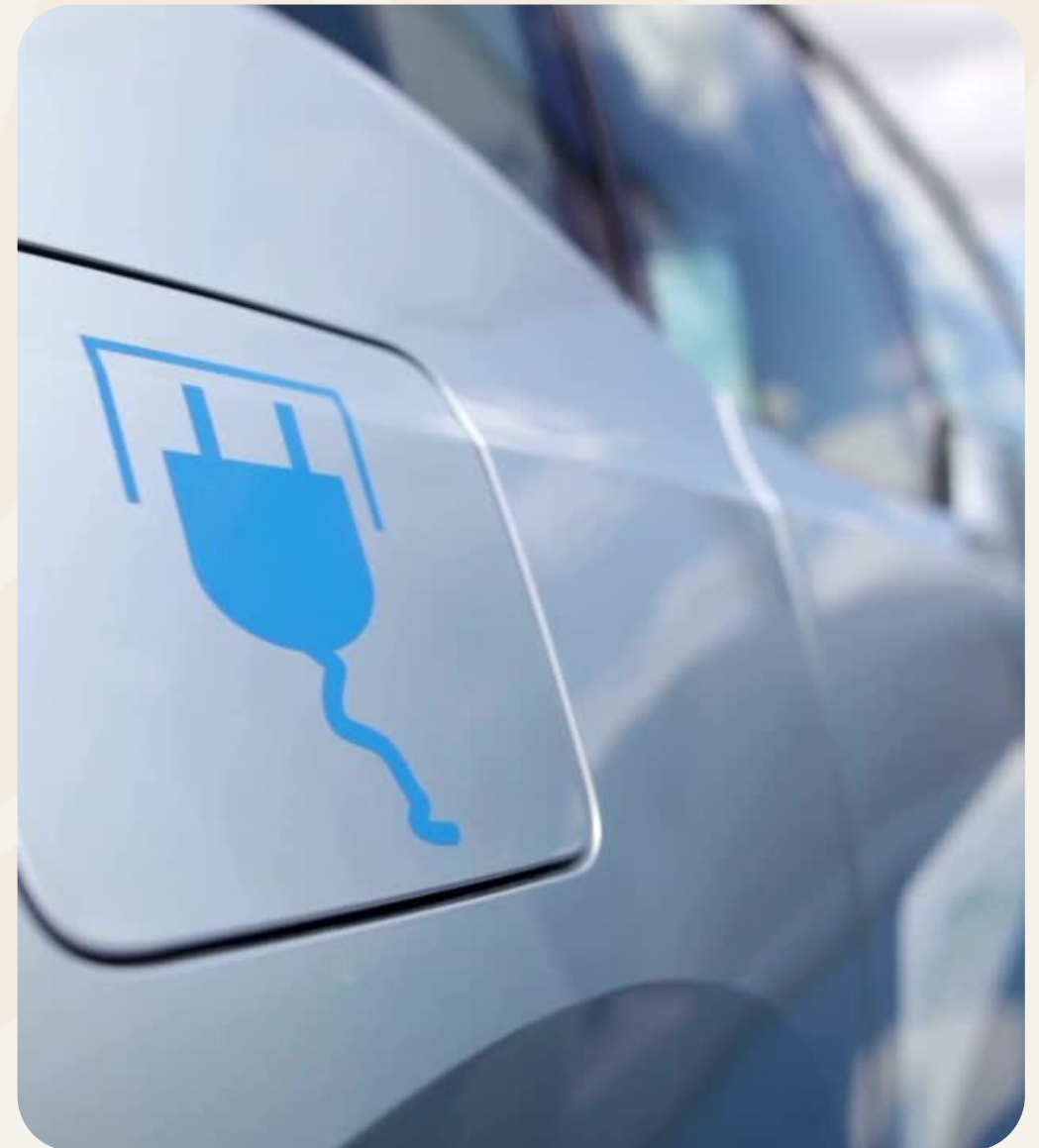
- Who can use it?
 - Public
 - Members only
 - Mixed access
- Access control:
 - App-based
 - RFID card (often better where mobile signal is poor)
- Payment model: Free, pay-as-you-go, membership





Ownership, liability and permissions

- Land ownership:
Permission required if council-owned or leased
- Insurance: Confirm liability and public risk cover
- Responsibility:
Maintenance, faults, and user safety



Installation and integration



Installation and compliance

- Installer competence:
 - NICEIC-registered
 - Experience with three-phase systems where relevant
- Supply and install: Many charger suppliers use approved installers

Energy integration and future proofing

- Solar PV integration (existing or planned)
- Battery storage (now or future)
- Load management: Smart charging to avoid peak demand issues





Workplace charging scheme

- Grants for purchase, installation and infrastructure EV charge points in workplaces.
- Scheme helps with the cost of installing up to 40 electric vehicle ChargePoint sockets.
- Up to 75% of the total costs of the purchase and installation of EV charge points (including VAT), capped at a maximum of:
 - £500 per socket
 - 40 sockets max across all sites
- Open to eligible businesses, charities, public sector organisations, small accommodation businesses

www.find-government-grants.service.gov.uk/grants/workplace-charging-scheme-2

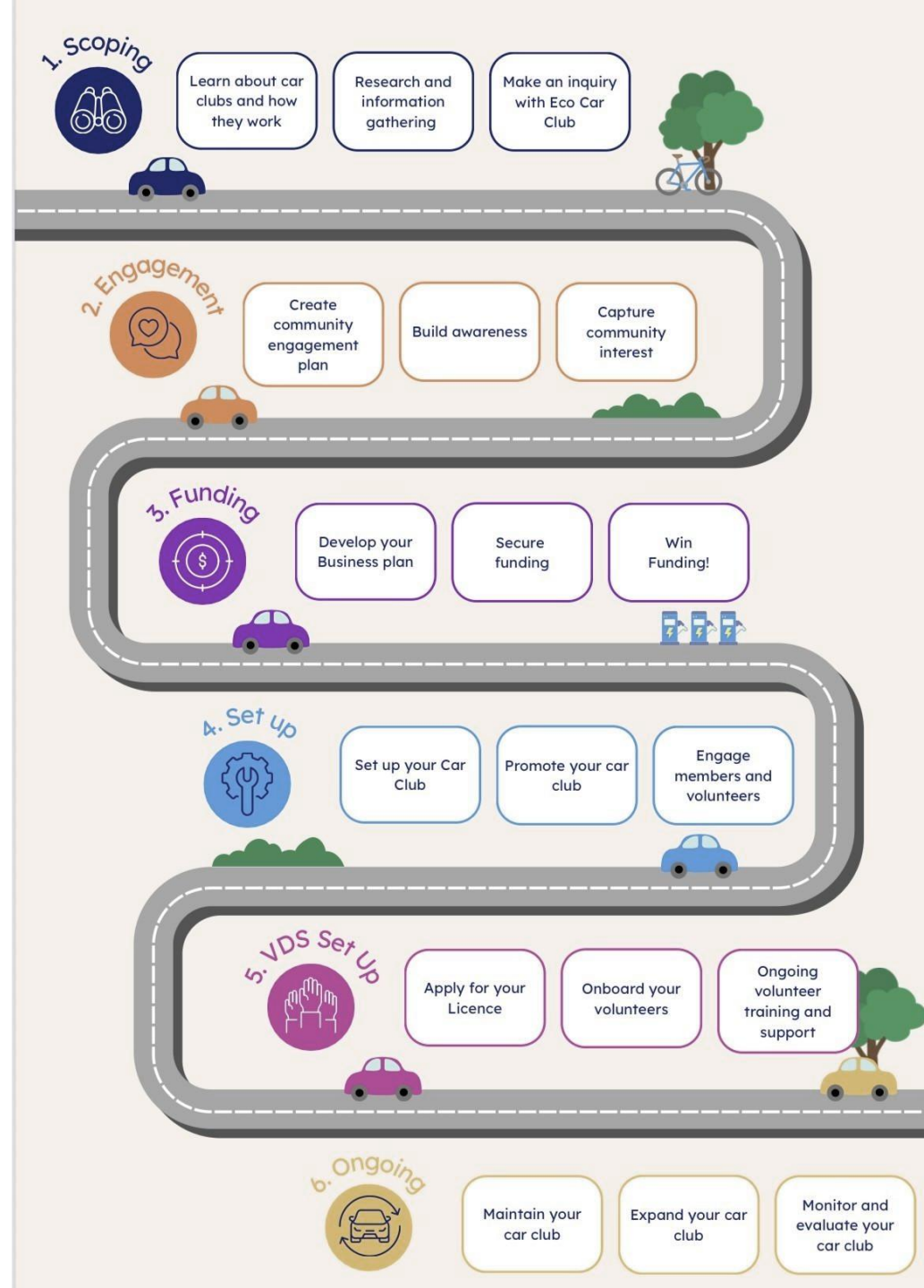


Case studies

Car club model

- Scope out local needs
- Engage customers
- Secure funding / finance
- Set up (vehicles, booking, insurance, membership)
- Volunteer scheme (optional)
- Ongoing management and member engagement

ecocarclub.org



Electric vehicle car club: Tisbury car club



- Solution to rural transport issues in village in Wiltshire.
- Project developed by Nadder Community Energy with funding from Power to Change
- Launched in 2021, 2 cars, 2 charging points and over 70 members.
- Operates as pay as you go
- To engage potential users, they shared a survey with the community to gauge interest and need.



www.tisburyelectriccarclub.com

Yealm community electric transport



- With funding from local authorities and from Power to Change, Yealm Community Energy were able to set up a separate CIC to own an electric ferry service.
- The service launched in 2023 and connects communities around the river Yealm in Devon.
- Service will reduce people driving and parking in small villages by the river.
- Conducted feasibility study to forecast demand and consulted the community.



www.ycet.co.uk

Over Community Centre charge points



- Two charging stations, four 22kW charging points.
- Priced per kWh, paid for with a contactless credit or debit card payment system. No app required.
- Payments help generate income for the community association.
- Customers encouraged to use the café while they wait, this also makes venue hire more appealing.
- South Cambridgeshire District Council grant.



www.thecentreatover.co.uk

Future developments

Two-Way (Vehicle-to-Grid / Building) Charging

- Status: Early-stage, limited vehicle compatibility
- Cost:
 - Standard charger: ~£800 (no grants)
 - Two-way charger installed: ~£4,000–£6,000
- Approvals: DNO approval required
- Reality check: Promising, but currently complex for community buildings





We're a charity supporting people and organisations across the UK to tackle the climate emergency and end the suffering caused by cold homes.

[cse.org.uk](https://www.cse.org.uk)