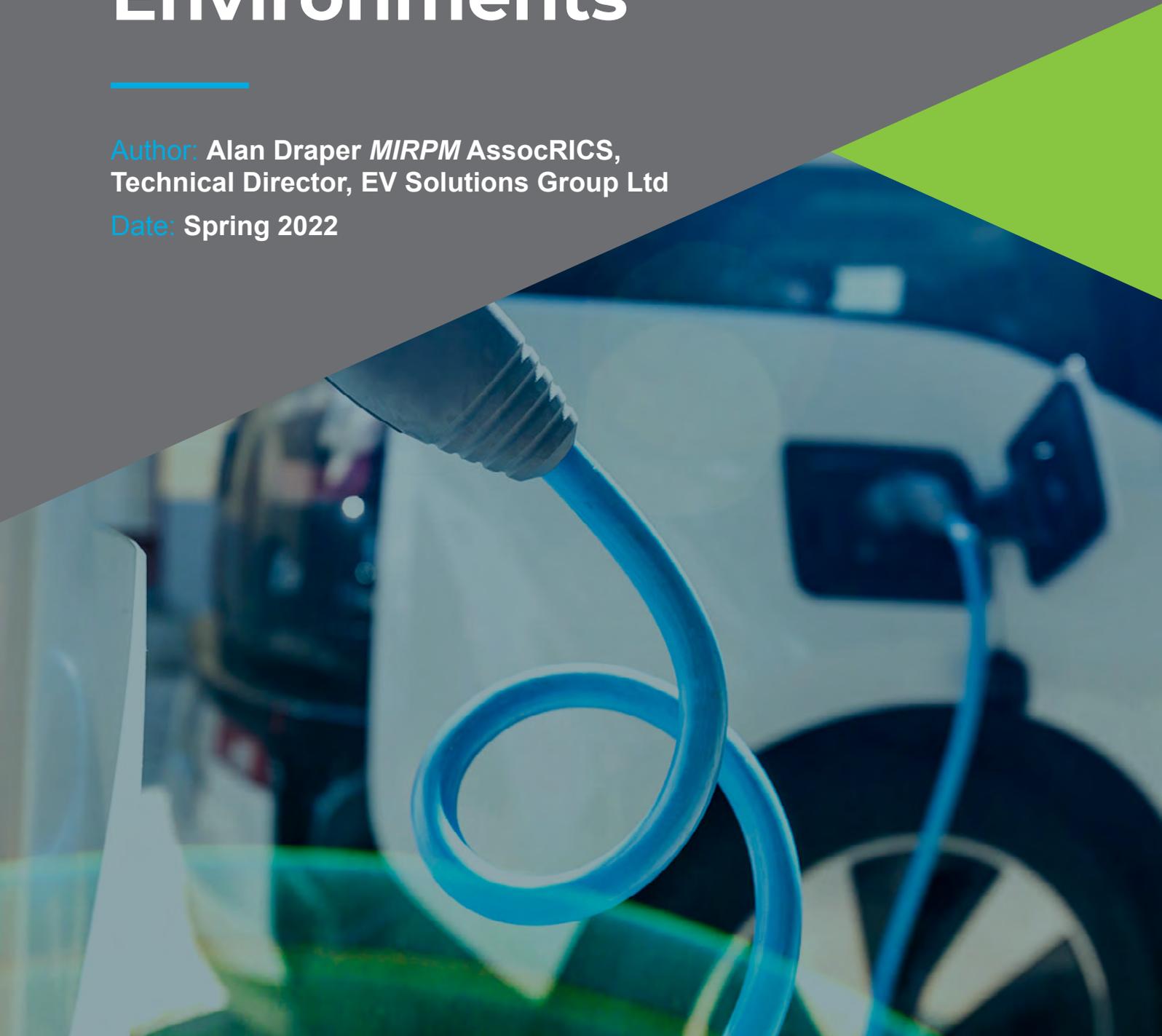


IRPM THINK PIECE:

Electric Vehicle Charging Infrastructure in Communal Living Environments

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Introduction

The backwards nature of this paper

Most white papers save their conclusions to the end. This one doesn't as we regard the conclusions as the most important aspect of this paper, and it **needs** to be inwardly digested by every residential property manager in the country.

The conclusions arising from this white paper are as follows:

- 1.** Almost every communal development will install EV chargers in two phases, these being EVC's for early adopters of EV vehicles followed by site-wide systems. We have included relevant checklists for each of these scenarios as appendices 1 and 2.
- 2.** There is no one-size fits all solution. Each site has its own unique complexities and almost certainly will require a bespoke system.
- 3.** Even on the smallest of sites, the installation of EV chargers will be a complex operation involving multiple parties.
- 4.** Property managers are already having to deal with the issue of EVC's and if you think enabling a single leaseholder to install an EVC is a complex process, just wait until it progresses to a site-wide installation.
- 5.** The costs of EV systems are extremely high and property managers need to start planning now if, for no other reason, to bolster reserve funds and provide financial provision for the consideration of such systems.

Table of Acronyms

DC	Direct current	KW	Kilowatt
AC	Alternating current	OCPP	Open Charge Point Protocol
DNO	Distribution Network Operator	OFGEM	Office for Gas and Electricity Markets
EV	Electric Vehicle	OZEV	Office for Zero emissions vehicles
EVC	Electric Vehicle Chargepoint	RMC	Residents Management Company
EVHS	Electric Vehicle Homecharge Scheme		

2030 is a long way off. Do I really need to act now?



My eureka moment

It's the 8th of January 2021 and Boris Johnson has just announced a further lockdown. The purchase of an electric vehicle (EV) is the furthest thing from my mind as I consider how to stay sane during this latest government-imposed lockdown.

The fact that owning an EV had never crossed my mind was down to my perception of the usual list of objections to EV's – range anxiety, costs, charging infrastructure. These perceptions were lazy rather than based on fact or research. I think everyone accepts that 20 years from now, almost all of us who drive will be doing so in vehicles without an internal combustion engine.

That transition is inevitable for all drivers and, I believe that for each of us, there will be a “trigger” that suddenly makes us PROPERLY research the possibility of switching to an EV. My “trigger” was a spoof top-gear style video ([LINK](#)).

The prospect of owning a vehicle through my business, tax free (no benefit in kind tax) was extremely attractive. For the first time, I looked at the viability of owning an EV and even the most basic levels of research melted away my fears around costs, charging infrastructure and, my biggest single block, range anxiety. Further research revealed generous government grants and I was away... I test drove a Tesla in February 2021 and wow... just wow !!! 6 weeks later it was in my driveway, and I'll not be going back.

Government policy

On 18th November 2020, the government announced a 2-phase approach to a nationwide move to zero emissions from vehicles, these being:

1. The sales of new petrol and diesel vehicles to end by 2030
2. All new cars built from 2035 to be zero emissions from the tailpipe

Additionally, the government has committed £1.8 billion to support the transition towards zero emission vehicles by way of grants to individuals and businesses, and £1.3 billion of that headline figure going towards building an extensive charge point infrastructure across the UK. I benefitted from a £4000 government grant towards my EV and £350 towards the cost of a home charger.

Government grants are always at their highest early on as the government incentivises people towards achieving its wider agenda. Indeed, the £350 grant I received will no longer be available from 31st March 2022 with a very notable exception – people living in or owning leasehold flats.

Additionally, the government has announced further grants for the leasehold sector, specifically:

- Non-resident building owners can apply for an Electric Vehicle Homecharge Scheme (EVHS) grant of up to £350 per socket but limited to 200 applications per year and restricted to properties with private parking
- Owners of apartment blocks will be able to claim up to £30,000 per building towards the cost of installing charge points (limited to 30 applications per applicant per year).
- £500 per bay for enabling infrastructure
- £350 (as discussed above) per bay for ‘active’ charging infrastructure

Those living in leasehold properties who wish to install an Electric Vehicle (EV) charging point will come up against a number of barriers. This think piece will explore and, hopefully, offer resolution.

The upshot though is, that these government grants explicitly targeting leaseholders will be the “trigger” for many to look at owning an EV and, as any property manager knows, if a leaseholder has a complex problem to solve, they will invariably approach their property manager.

The growth of electric vehicle sales

2020 saw the biggest annual increase in number of registrations, with more than 175,000 EV's registered showing a growth of 66% on 2019. By the end of October 2021 there were more than 675,000 plug-in vehicles in the UK of which 345,000 were battery electric vehicles (BEV's) and 325,000 plug-in hybrid vehicles (PHEV's).

During the pandemic, UK electric car sales increased 186% which is six times higher than the global increase which stood at 31% in 2020.

Government policy in the UK is certainly a huge driver for this sales growth and this, in turn, is having a positive impact on corporate attitudes towards Electric Vehicles.

Electrical infrastructure and dealing with Distribution Network Operators (DNO's)

There are a number of myths circulating with regards to the National Grid's ability to cope with the uptake of EV's, the two main ones are:

1. Can the National Grid produce the required power?
2. Can the current infrastructure carry the required power to where it is needed?



With the first of these, the most demand for electricity in UK was for 62GW in 2002. Since then, due to improved energy efficiency such as the installation of solar panels, the nation's peak demand has fallen by roughly 16%. Even if the impossible happened and we all switched to EVs overnight, it is anticipated that demand would only increase by around 10%. So we'd still be using less power as a nation than we did in 2002 and this is well within the range of manageable load fluctuation.

The answer to the second of these questions, in the context of most leasehold properties, is an emphatic "no". So why is this?

Most domestic supplies have a 60-100 amp supply fuse. Most users of electric vehicles are unlikely to go for a charger with a power rating any less than 7.4 kw as a unit of this size comfortably allows for overnight charging. A 7.4kw charger requires a 30amp fuse so realistically, you are only really able to supply a maximum of two chargers off a single domestic supply (and communal electric supplies are almost always domestic*). So unless your development has a ratio of 1 communal electricity supply for every two EV chargers required, upgraded electrical infrastructure will also be required.

Additionally, on larger developments, it is possible that further upgrades to the electrical infrastructure will be required at the level of the local transformer and low-voltage distribution cabinets.

Works on electrical infrastructure owned by the local DNO are classified as “contestable” (a private contractor could apply to do the works) or “non-contestable” (the DNO has to carry out the works). Works to upgrade transformers and low-voltage distribution cabinets will likely be classed as “non-contestable”.

So in conclusion, even on the smallest of developments, it is likely that a property manager will have to make arrangements with the local DNO to ensure that the electrical infrastructure owned and operated by the DNO is sufficient to cope with demand at each development they manage.

Government grants

From 2022, the Government’s Electric Vehicle Home Charge Scheme will be scrapped for single unit dwellings, but will remain for leasehold properties and indeed, extended. OZEV (Office for Zero Emission Vehicles formerly known as OLEV - Office for Low Emission Vehicles) has pledged that up to £850 per charge point will be available (split between £350 towards an EV charger and £500 towards infrastructure), as well as additional funds up to £30,000 per building and up to £900,000 per owner per year towards future proofing infrastructure to enable more chargers in the future.

As with all Government grants, they are time-limited (as evidenced by the government ceasing

*we deal with the reasons that most leasehold properties will likely have to tap into communal electricity supplies later in this article.

grants for EV chargers for single unit dwellings) and designed to encourage uptake of new concepts. Property managers will be under pressure to take advantage of these grants whilst available, so it is crucial that the subject of EV charging points is raised with leaseholders at the earliest opportunity.

Additionally, on 15th December 2021, the government will provide grants of:

- Up to £1,500 for electric cars priced under £32,000
- Grant rates for the Plug in Van Grant will now be £5,000 for large vans and £2,500 for small vans
- £500 off the cost of a motorcycle, and £150 for mopeds, with a price cap on vehicles of £10,000

Whilst it will be necessary to survey every leasehold development, the basic requirements for obtaining the government grants are:

- Dedicated off street parking at your property.
- An EV on the list of approved vehicles.
- Installing an OZEV approved Charger.

- Installed by an OZEV approved Installer.

Residents in Scotland can currently benefit from an additional £250-£350 of charge point funding on top of the EVHS grant, provided by the Energy Saving Trust.

Lease considerations

The leases and transfer documents (freehold properties) could be the biggest hurdle to installation of EVC's. Let's be honest; Leases and TP01's are terrible documents. They are written very much in the present and are not fit for purpose when it comes to addressing future requirements. We have seen this with such issues as satellite TV dishes and, more recently, the surge in short-letting/AirBnB use of leasehold properties.

As ever, in our industry, the lease/TP01 should be the first port of call before engaging in any project that involves change and/or addition of infrastructure. We will look at this "hurdle" from two perspectives; that of an early-adopting leaseholder requesting an EV charge point autonomously and a Freeholder seeking to create a site-wide EV charging infrastructure:

1. Individual leaseholder requests.

Let's take an example of a leaseholder who has approached the managing agent and/or freeholder with a request and has provided an outline plan.

The first consideration is whether the lease/TP01 will even allow installation of an EV charge point by an individual leaseholder. Factors that will influence the final decision include:

- the extent of the demise?
- whether they own or are leased a car parking space?
- The position of their own electric meter in relation to the car parking space?
- Will any cabling run across land owned by a third-party/freeholder?
- Will the leaseholder need to connect to a communal electricity supply?
- Can or should the landlord/RMC grant a licence?
- What would the terms of the licence look like?
- How are costs recovered and who pays?
- Who will maintain the newly installed equipment?

- What enforcement options are available if the party assigned to maintain the equipment defaults?
- Will consent be required from other parties e.g. a mortgage lender



2. Landlord or RMC elects to install an EV charger system

At the time of writing, leaseholder requests represent the majority of enquiries to managing agents, however, Landlords and RMC's will soon find themselves under pressure to act on behalf of ALL leaseholders. This pressure will quickly surface when communal electrical capacity is used up by the granting of licences to individual leaseholders. Most communal electricity supplies will be limited to a couple of EVC's per meter and many developments will be limited in the number of licences they can grant by limitations of the electrical infrastructure.

Lease considerations for freeholders/RMC's are as follows:

- Does the freeholder/RMC have the right to install an EV charging system?
- How will it be funded? (especially pertinent if service charge funds cannot be utilised)
- Who owns the land upon which infrastructure will be installed?
- Who will be responsible for maintaining the system?
- How will costs of maintenance/upgrades/repairs be recovered?
- Who can use the EVC's?
- How can rights be set out?
- Do other parties need to be consulted? i.e. local authorities, neighbours, building insurers
- Will leases need to be varied on mass?

It is the opinion of the author that the government will need to legislate in order to overcome many of the obstacles presented by leases and transfer documents. If the installation of EV chargers either by individual leaseholders or freeholders as a communal facility breaches "absolute" covenants then it is possible that any landlord granting a licence to alter could be

challenged a la **Duval vs 11-13 Randolph Crescent**.

Reliance on broad "sweeper" clauses also opens up the risk of legal challenges from dissenting parties.

Planning/building control issues

For an installation to be classed as permitted development, the electrical outlet (and its casing) must not:

- Exceed 0.2 cubic metres.
- Face onto and be within two metres of a highway.
- Be within a site designated as a scheduled monument.
- Be within the curtilage of a listed building.
- Be mounted higher than 1.6 metres from a level surface used for parking of vehicles.
- Have more than one charging point per allocated parking space.

EV chargers cannot be installed without planning permission on heritage sites or listed properties.

Financial planning

As any property manager will know, it is often hard gaining an agreement on a budget for the following 12 months, so the conversations regarding financial planning for an EV system will be a real challenge. Irrespective of any challenges with leaseholders and RMC directors, the lease may be the first hurdle, especially if it doesn't provision for the accumulation of a reserve fund.



Assuming the scenario where all parties are on-board, trying to estimate the costs of installing a system are complicated by the fact that so many parties will be involved. These will include:

1. Solicitors/surveyors to review and possibly vary leases.
2. The DNO as electrical infrastructure may require upgrading.
3. Costs of installing equipment.

4. Freeholder costs
5. Running costs including maintenance, upgrades, billing systems and safety checks.
6. Leaseholder licences (where leaseholders may own part of the system)

Leaseholder demand

Early adopters of EV's will pave the way for others and, in many cases, will provide the landlord/freeholder/RMC with a template for dealing with such requests. Problems will arise if there are limitations on the number of licences that can be issued due to infrastructure limitations. In most cases it will not be feasible to connect EV charge points to leaseholders' electric meters so most licences will likely be based around connection to a communal electricity supply. As most communal electricity supplies are rated between 60 to 100 AMPs, realistically, 2 connections to EV chargers are the likely maximum possible.

Building Managers would be advised to consider the following:

1. How to deal with early adopters of EV technology?

2. How to then integrate early adopters into a larger, site-wide scheme when this becomes necessary.

A coherent policy of moving from a scheme, licensing individual leaseholders to a site-wide scheme will likely lessen the possibility of conflict with early adopting leaseholders who may end up effectively paying twice, once for an initial licence and again towards a communal system.

Leaseholder apathy

It has been said that co-ordinating leaseholders is like herding cats! Leasehold law in England and Wales (and Commonhold law in Scotland) is ridiculously complicated and the installation of infrastructure may require deeds of variation to be signed and returned in many cases. This will put a lot of pressure on managing agents who will no doubt be barraged by phone calls/emails with questions and queries (at best) but it is the apathetic leaseholders that will pose the most difficult challenges, and could be the limiting factor in implementing site-wide

infrastructure. Leaseholders can remain totally silent on issues right up to the point that they receive an invoice.....then cue the objections/ non-payment etc.

Billing Systems

The billing of electricity used by leaseholders to power their EV's represents either a significant business opportunity or massive headache to many managing agents. As all managing agents (should) have contact details for leaseholders at sites they manage, issue service charge invoices and generally manage communal utilities then they possess the basic information to be able to bill individual leaseholders for electrical usage.

Whilst it is entirely possible that energy suppliers could install individual meters linked to each EV charge point, the author of this think piece anticipates that energy suppliers will seek to invoice infrastructure owners with these parties then being responsible for determining the electrical usage of each leaseholder.

How do we deal with EV requests today?



At the time of writing this paper, most requests to install electric vehicle chargers are made by individual leaseholders so this section is a summary of the actions that are required to achieve a satisfactory solution to all parties (at least in the short term) and the long-term limitations of this approach to EV charging in communal environments.

Connection to a supply (landlords or leaseholders)

Almost always, the first question is “where do I get my electricity?”. For most leaseholders this is probably the extent of their investigations and, in fairness to leaseholders, leases are horribly complicated

documents to both read and interpret and I’ll wager that the majority do not look at the leases before making the request. This is where the headaches begin for property managers. Individual leaseholder requests have the capability to absorb a tremendous amount of a property managers time and the first difficult challenge is communicating to the enquiring leaseholder the issue of costs. Sadly for us property managers, the perception is that we charge a lot of money to sort out the cleaners and the gardeners so when we ask for more money to manage such requests, we often face resistance. As difficult as this conversation may be, we strongly recommend that the issue of costs is the first thing that is discussed and should be on the following terms:

1. Research is charged for.
2. NO guarantees are made at the outset as to whether a licence will be granted.
3. That the costs of granting a licence will be payable by the leaseholder subject to a successful research outcome.

Assuming that the electrical supply connection is to a communal electric meter, consideration then has to be made as to how electricity will be paid for by the leaseholder. In most cases, a separate electricity meter will have to be installed between the communal supply and the charge point. As this meter will be connected to the landlords supply, a provision must be made to enable the billing of electricity to the leaseholder.

In order to deal with all of these issues, we will likely require a license to alter.



Licence to Alter

Anybody that has ever spoken to a leasehold solicitor will be familiar with the concept of advice with a load of caveats attached and I'm afraid I'm no different; I'm starting with a caveat.

The issue with regards to making no guarantees at the outset is motivated by Duval -v- 11-13 Randolph Crescent Ltd where the Supreme Court held that the landlord had breached its obligation to enforce tenant covenants by granting a license to carry out a structural alteration where an absolute covenant in the lease prevented the leaseholder from doing so.

In light of the above judgement, property managers and landlords will need to consider the following:

1. In light of Duval -v- 11-13 Randolph Crescent [2020], can a licence be granted.
2. Would granting a licence now create problems further down the line. e.g. is there a limit to the number of licenses that are capable of being granted?
3. What would the terms of the licence be?

Terms of the licence

Even where the EVC is on land demised to the property owner this is still an issue. Whilst the licence to alter will make the leaseholder responsible for its upkeep and maintenance, the government has set a precedent in the fire safety bill 2021 by making the fire safety compliance of front doors the responsibility of a third party (in most cases) even though the front doors are generally demised to individual flats. Could this be extended to EV chargers at a later date?

Where the EVC or associated infrastructure serving it is installed on land, which is not owned or leased by the leaseholder, this issue is even more pertinent.

The licence granted for the parking space must set out, or the lease or transfer for the property will need to be amended to ensure that it defines

- Who pays for the electricity costs?
- How are these costs recovered?
- The enforcement process if either party defaults in its obligations at a later stage?

- Recovery of costs if a dispute does arise?
- Consideration for integration into a future site-wide scheme?

Limitations of this approach

At some point in the future, the majority of communal developments will be expected to have access to electric charge points and consideration should be given to this possibility prior to granting any licence to alter. Salient questions to ask at this stage include:

1. What will this development look like in 10 years' time?
2. What is the capability of the current electrical infrastructure?
3. Should immediate consideration be given to a site-wide scheme?

Poor decisions made today could have disastrous legal repercussions in the future.

Solutions



There is already a vast range of technologies and solutions available. This section doesn't focus on this (or this paper would be over 100 pages long) but rather deals with the general approaches to the problem ranging from doing nothing to doing everything and various solutions in between.

The free for all

First off, you could opt to make no changes to infrastructure what so ever. The result would be leaseholders would have to use public charging networks. This approach also runs the risk of leaseholders attempting to use 3 pin chargers off either a communal electricity supply (which constitutes theft) or their own home supply. This will almost certainly create health

and safety issues (cables being trip hazards, a greater potential for fire) and will also cause damage to the electrical infrastructure of a domestic property if used over prolonged periods.

Attaching EV's to a leaseholder electrical supply

There are a number of practical considerations, and this will only work if the following criteria are met:

- Leaseholder has a car parking space
- Car parking space is close to the leaseholder's electrical supply

- The freeholder grants consent (a licence to alter)
- The local network operator's (DNO) infrastructure doesn't require upgrade to cater for increased power requirements.

Attaching EV's to a communal supply

This could work so long as there are no more than 2 flats in a development AND you have a means of both measuring electrical usage of each leaseholders EV and billing for the electricity. So why the 2 flat restriction? We explained the restrictions earlier in this article in relation to domestic supplies and there is one further restriction to this approach.

The electricity in a car battery is DC. When you use a home EV charger, AC electricity is sent to the car from your home mains supply, and the car's OBC (On-Board Charger) converts the AC to DC, which charges the electric vehicle battery.

This limits the speed at which the car battery charges because different electric vehicles have OBCs with different capabilities. For

example, a Jaguar I-PACE has an OBC rated 7.4kW. This means the maximum you can charge in AC is 7.4kW. Even if your home charge point is capable of charging at 22kW, the I-PACE can only charge at 7.4kW. A Renault Zoe can charge at 22kW.



On a DC charger (in offices and public charge points), the charge point converts the AC into DC before it reaches the car battery. This means the car doesn't need the OBC to convert the electricity from AC to DC, so it can charge a lot faster than on a home charge point. A Jaguar I-PACE on DC charge can charge up to 100kW. A Tesla Model X can charge up to 145kW. This type of charging is called rapid charging.

Fully funded, fully installed systems

A fully funded, fully installed system would mean that the upfront costs of the system will be covered by the installer. As with any business, the installer has to recoup costs, and this will likely be through an annual rental charge and charges to individual leaseholders for the electricity they use.

Pros

- No upfront costs
- Likely to be able to obtain the technology sooner
- Simple billing systems

Cons

- Increase to the service charge
- No choice of electric supplier
- Possibly restricted choice of electrical charger
- Possibly restricted choice of power rating of EV charger
- Will likely be paying a higher cost per kilowatt hour for electricity

Infrastructure only systems

This solution would involve installing the electrical infrastructure to enable leaseholders to then connect their own EV chargers to a communal infrastructure.

Pros

- Greater choice of electrical chargers
- Leaseholders will not be compelled to install an EV charger
- Leaseholders can install EV chargers at their leisure

Cons

- There may be a requirement to provide the upfront capital expenditure
- You may have to arrange a billing system as the system will run off a communal feed
- If you own the infrastructure, to what extent can you future-proof it to accommodate new technologies?

Bespoke systems

In essence, the solution pursued by each site will likely be a hybrid of the above-mentioned solutions and will be driven by the following variables:

- The degree of influence that each party named in the lease has.

Freeholders will be driven by the desire to monetise their asset; leaseholders will naturally want to save money (or at least get best value for money) and retain as much choice as possible.

- Building design.

Location of the car parking spaces, electrical infrastructure of both the site and local DNO and even the size of the car parking spaces are three such variables that come into play here.

- Money, money, money.

Those leaseholders with cash in the bank, or at least the capability to accumulate funds quickly, will likely have access to a greater range of options.

Even just the three key variables listed above ensure that pretty much every installation will be bespoke, another headache for us property managers with many firms unlikely to have the resources to manage bespoke solutions across their entire portfolio.

Electric Vehicle Chargers

3 pin plug

Most electric vehicles come with a cable that can be plugged straight into a three-pin socket at home, however, the maximum current that can be drawn from most houses is 3kW, meaning a full charge on an electric car will take the best part of a day, if not longer. Additionally, not all sockets can supply 3kW reliably: it's common for power to drop to below 2kW which will extend charging times even further. Another drawback is that sockets aren't often near a driveway, so you will likely have to use an extension cord. Some manufacturers recommend that you avoid using an extension cable if at all possible, as drawing maximum current for a long period of time can potentially be dangerous.

Wall Boxes – slow, fast and rapid

Slow Usually rated up to 3kW is mainly used to charge overnight at home or workplace and 8-12 hours to fully charge.

Fast Rated at either 7kW up to 22 kw and takes 3-4 hours to fully charge.

Rapid Typically rated from 43kW and found at motorway service stations, petrol stations, supermarkets. Takes 30-60 minutes to fully charge. It is unlikely that these will be adopted at most residential leasehold developments as they are extremely expensive and require three phase electric.



Billing systems

This section explores the various approaches to billing systems and strategies that could be implemented by freeholders/managing agents/RMC's

Low Tech

At its lowest level, metering systems could be installed that would house all of the meters relating to individual charge points. The party responsible for re-charging electricity usage could simply attend site and manually read the meters and re-charge electricity accordingly.

This approach is administratively heavy and would likely only work for smaller, regional managing agents with a portfolio close to their base. Many smaller agents may not use sophisticated billing systems and this manual approach may suit well.

High Tech

The Open Charge Point Protocol (OCPP) is an open-source communication standard for EV charging stations, charge point management systems and electric vehicles. By ensuring that any chargers installed are OCPP compliant, then the possibility exists of determining energy usage of each EV charge point and then billing accordingly.

In order to remove the manual aspect of the low tech approach as described above then it will be necessary to simultaneously install a wi-fi network to enable EV charge points to send details of electrical usage to the charge point operator who can then, in turn, issue invoices to individual charge point users.

Access to such data would allow managing agents to run a very efficient billing operation using the same systems that generate service charge invoices. This will also provide an additional revenue stream to managing agents.

Re-selling electricity

Ofgem has published guidance for organisations seeking to sell EV charging services which can be [viewed here](#).

As providing facilities for re-charging EV's amounts to the supply of electricity, it is important that any party involved in the billing of electricity in relation to electrical vehicle chargers do not fall foul of OFGEM's rules and regulations.

The supply of electricity is a licensable activity meaning that any business wanting to supply electricity has to be licensed by OFGEM to do so. The electricity supply licence sets the rules that these companies (suppliers) must abide by, however, there are circumstances where supplying electricity can be undertaken without a licence: the electricity supply exemptions and it is anticipated that the supply of electricity to EV chargers ONLY will likely fall under these exemptions so long as billing is purely for the use of the charge point.

It will be important to check with Ofgem that any model for the billing or charging of the supply of electricity through charge points falls under these exemptions.

Further Considerations

Cost vs control

Whatever way you look at this, leaseholders will foot the bill in some way, shape or form. The capital costs of installing EV chargers is huge starting at around £2000 per leaseholder. With regards cost vs control, a basic rule of thumb will apply. The more leaseholders pay in upfront capital costs the more control they will have over aspects of the system.

At one end of the spectrum, many installers are offering to cover all upfront capital costs but the caveat will be next to no control over the way the system works and higher electricity costs, administration charges, rental fees are fixed-charge costs. This is the only way installers will be able to recover capital costs and is a business model similar to those historically used by developers when installing access control systems where the developer pays no capital costs, but tie the developer into 15 year rental agreements where the rental fees are covered via the service charge.

At the other end of the spectrum, if leaseholders can bear the full capital costs, collectively, leaseholders will more likely have the ability to

choose electricity supply contracts, charger types, maintenance contractors etc.

Leasehold Choices

Electricity suppliers are already trying to win customers by providing lower rates per kilowatt per hour for charging electric vehicles (especially overnight). We have already explored the costs that leaseholders may accrue in trying to obtain an EV charger so the obvious way to try to reduce the cost per leaseholder would be the installation of a communal EV charging system thereby benefitting from economies of scale.

The various types of solutions available are dealt with in a separate article here, however, the downside to such a system is a possible loss of choice to the individual leaseholder.

At present, current choices available to purchasers of EV charging systems are:

- Choice of EV charger.
- Choice of power rating of the EV charger.
- Choice of electricity supplier.

Under a communal system, some or all of these choices may be restricted.

Management of the charging system

Once we have our shiny new charging system in place, it will require ongoing management and maintenance. Aspects to consider are:

- 1.** Electrical supply
 - a. Metering the electricity
 - b. Systems for invoicing for the electricity
 - c. Setting tariffs and/or arranging supply contracts
 - d. Is there a requirement for load balancing and how will this work in practice?
- 2.** Maintaining the system
 - a. Keeping it working.
 - b. Keeping it maintained.
 - c. Ensuring that each part of the system is being maintained, identifying who is responsible and ensuring it happens.
- 3.** Health, safety and compliance
 - a. Ensuring the system is legally compliant
 - b. Ensuring the system is safe
 - c. Are specific risk assessments required and how often?



4. Billing

- a. Who will be responsible for billing?
- b. Is the billing party OFGEN compliant?

The extent to which a managing agent/Freeholder/RMC will have to consider the above points will be a function of the leases/transfer documents and the type of system installed.

Future proofing

Electric Vehicles, to date, have been a niche technology but will become the dominant player in the market within the next 10 years or, likely, far sooner. Many businesses and products have been created based around this emerging market all hoping to be market leaders. A number of these early players will either fail or be acquired by rival companies meaning that a lot of the technologies and products we see today may be discontinued or

obsolete very quickly. I purchased my EV in March 2021 and installed a 7.4 KW charger at home. By the end of 2021, 11.4 KW chargers were becoming more commonplace, and this emphasises how quickly the market moves. Already, the slower charging speeds of 3.4 KW chargers will likely not meet the needs of most leaseholders.

This is where property managers need to dust off their crystal balls and try to ensure that any system installed isn't obsolete very quickly? Strategies for ensuring that valuable service charge funds aren't wasted will have to be developed. Personally, with any technology decisions I make within the running of my own business, the first question I ask is "What will this look like in ten years' time?". Any property manager looking to install an EV charging system should certainly familiarise themselves with market trends, new technologies and Government policy.

National Infrastructure

It seems clear to me that the Government strategy to developing a national EV charging infrastructure is to encourage private enterprise to fill in the gaps that the Governments "big-picture" policy has created. It is anticipated that the national grid will have the capacity to cope with

increased electrical demand. There will likely be localised requirements for the upgrading of transformers and electrical equipment that carries current from the local transformer to the communal electricity meter.

Additionally, in less than 10 years' time, the UK will have an additional source of power storage; Millions of batteries situated in EV's. This is an opportunity for the DNO's to change the way they manage the draw down of electricity from the National Grid. It is likely that, during peak demand, the following will occur:

- Local electricity suppliers will reward EV users for the ability to switch off or reduce the amount of electricity being fed into EV's to enable demand to be fulfilled elsewhere on the network

- Local electricity suppliers will buy back electricity from EV's to be able to cope with spikes in demand. The technology already exists to be able to transfer electricity from EV's back to the national grid.
- In short, the network of EV's in this country will provide DNO's with a nationwide, load-balancing system.....cool huh?

This last statements leads nicely onto our final topic....A glimpse into the future. Thank you for sticking with this white paper so far. The final part of this paper is the author's views on what the future will look like with the likely explosive growth of the EV market.

A glimpse into the future

This section is part fun, and part consideration when looking at installing EV systems. This final section is also an exercise in self-indulgence. As I write this, the date is 8th January 2022, and I am keen to re-visit this paper on the 8th January each year to see how many of my predictions are reality.

Prediction 1	In the UK, demand of electric cars will outstrip demand for combustion engine car sales by 2025. Whether this translates to sales will depend on the extent of the infrastructure available to support the demand.
Prediction 2	The FTT will become overwhelmed with cases relating to the installation of EV charging systems, and as such, the government will have to legislate to allow the implementation of EV infrastructure systems without lease provisions impeding this.
Prediction 3	The fire safety bill 2021 will have to be amended to cater for the fire risk associated with EV's. Whilst EV's rarely catch fire, when they do, a process called thermal runaway means that EV fires are far more dangerous and powerful than their combustion engine counterparts
Prediction 4	Within 10 years, EV's will be capable of being charged WITHOUT being plugged in much like modern mobile phones can be charged.
Prediction 5	The UK will become a world leader in EV technologies due to its ambitious targets to phase out internal combustion engines.
Prediction 6	By 2030, self-driving vehicles will be capable of driving more accurately and safely than human piloted vehicles.
Prediction 7	The price of installing EV charging infrastructure will briefly surge as the demand for electric vehicles outstrips the capacity to install the required infrastructure to charge EV's.
Prediction 8	A stock market bubble will emerge based around firms involved in the EV market. Potentially, this has already happened with Tesla.
Prediction 9	Improvements in battery technology will see vehicles capable of 1000+ miles between charges by 2030
Prediction 10	Only 20% of petrol stations open today will have more than one petrol/diesel pump by 2030

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Other contributions

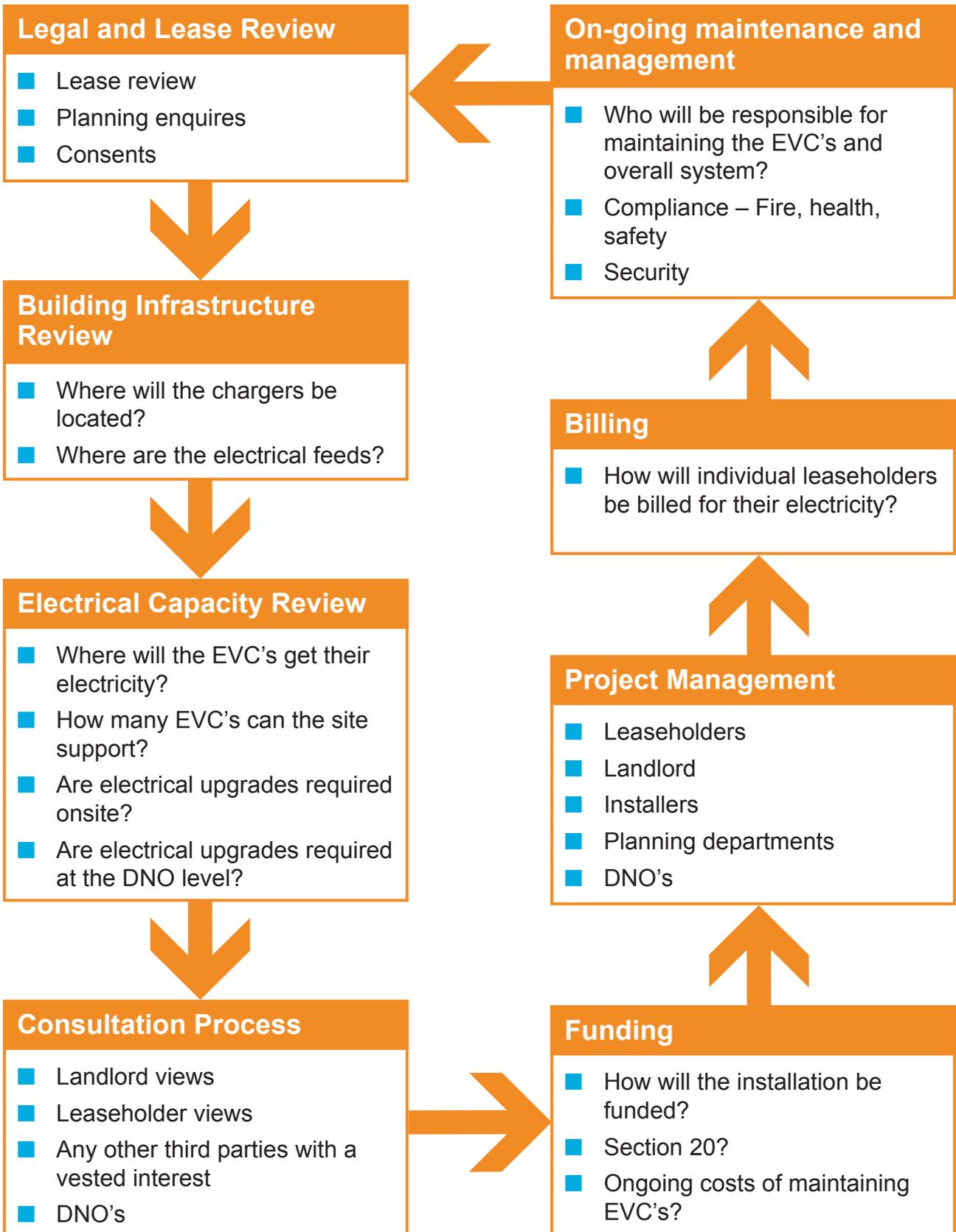
Thank you to Matthew Williams of [Cypher Accountancy](#) - who's spoof "Top Gear" video was the catalyst that culminated in this white paper.

Appendices

Appendix 1 – Property managers checklist – Individual Leaseholder Requests

Appendix 2 – Property Managers checklist – Site-wide systems

EV Charging Infrastructure – Implementation Considerations & Process





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