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# EV Charging Infrastructure

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Project Risk Matrix

# Introduction



The purpose of this Risk Matrix is to identify on a generic basis, the key risks arising in connection with an EVCI project and to suggest how these might be best allocated between the relevant project participants. This Risk Matrix is suitable for use in connection with:

- publicly procured EV concessions for the provision and operation of charging infrastructure
- large scale procurement of charging infrastructure by real estate owners involving the outsourcing of the operation of the charging infrastructure
- private sector development of EVCI without contracted revenues.

Please note that the Risk Matrix is an indicative list of the key risks, arising in connection with an EVCI project and the Risk Matrix will need to be considered in the light of project specific risks

and the contractual structure adopted for a specific project.

A number of risks will in the first instance rest with the Developer, who will then reallocate those risks via its subcontracting arrangements (see Assumptions below). Where we have suggested that a risk should be allocated to a party, if the Developer does not appoint that party then it follows that the Developer will retain that risk. For example, if the Developer is responsible for maintaining the EVCI and has not subcontracted this function to a third party, then the Developer would be responsible for maintenance.

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# Assumptions

The following assumptions apply:

- the Developer will accept demand risk on the basis of uncontracted revenues (although that would not preclude an element of Promoter support, for example, by means of an availability payment)
  - the Developer will be responsible for the customer interface and the recovery of customer charges
  - the Developer will procure the electricity supply and accept the risk of changes in supply cost
  - where applicable, the Promoter identifies and procures the site on which the EVCI is to be located
  - the Developer will enter into:
    - o a lump sum contract with the Installer for the installation of the EVCI
    - o a fixed price contract with the Supplier for the provision of the EV chargepoints
    - o an agreed price maintenance with the O&M Contractor for the maintenance of the EVCI
- in each case to deliver the Project and, where applicable, to pass down its obligations to the Promoter, and the Developer is likely to bear the risk of any liability caps/limitation periods under its subcontracts
- there is no co-location by the Developer of revenue generating assets with the EVCI (eg. solar, battery storage, retail etc.) -- whilst this is an increasing trend, for the sake of simplicity the risk matrix focusses on EVCI only
  - the chargepoints will not provide 'smart charging' (shifting the time of day when an EV charges or modulating the rate of charge) nor vehicle-to-grid services, both of which would require appropriate software to sit behind the EVCI.

# Definitions

**“Asset Host”**

means the party on whose site the EVCI is installed – this is only applicable where the Asset Host is different from the Promoter.

**“Developer”**

means the party contracting with the Promoter for the provision of the EVCI and the other parties for the delivery of the project.

**“EVC”**

means electric vehicle chargepoint infrastructure (including the chargepoint and grid connection).

**“Installer”**

means the contractor responsible for the installation of the EVCI. For these purposes we have assumed that the Installer will not be procuring the chargepoints and will therefore not be responsible for its performance, other than to the extent of its acts and omissions in connection with the installation. In some cases it may be that the party responsible for installation would also procure and wrap the EVCI performance.

**“Merchant Project”**

means the development of an EVCI project where the Developer is not responding to a procurement exercise by a third party.

**“O&M Contractor”**

means the party responsible for the maintenance of the EVCI.

**“Procured Project”**

means EVCP projects where the Developer is providing EVC in response to a procurement exercise by a Promoter.

**“Promoter”**

means in the case of Procured Projects the party which is procuring the EVCI. In most cases this will be a public sector entity or a commercial organisation with significant real estate interests.

**“Supplier”**

means the manufacturer of the EV chargepoints. For these purposes we have assumed that the Supplier will not be installing the EV chargepoints, although we are aware that this approach is adopted by some manufacturers, in which case the Supplier would be responsible for any risks allocated to the Installer in the Risk Matrix.

- KEY**
- Risk assumed by the indicated party
  - Risk shared between the indicated parties – the extent to which the risk is shared will be a matter of negotiation between the parties
  - ▲ Risk assumed by the Developer and transferred (in whole or in part) to the indicated party/parties – the extent of risk transfer will be a matter of negotiation between the parties

	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
<b>Pre-commencement risks</b>									
1.	Procurement law	●		●					<p>Generally procurement law risk is only relevant in the case of projects procured by a public sector counterparty. Historically the public sector has been unwilling to provide protection in respect of any defects in the procurement process that lead to a procurement challenge and, ultimately, the contract being rendered ineffective. However, if the contract were set aside, under the Public Contracts Regulations 2015, the Developer would have a cause of action against the public sector promoter for failing to comply with the regulations.</p> <p>Given that the Developer and its funders will be committing capital expenditure to a Project, it would seem prudent to set out the basis upon which the Developer should be compensated. However, our experience is that the public sector is often resistant to this approach.</p>
2.	Site selection	●		●					<p>Whilst we have assumed that in relation to Procured Projects the Promoter will be responsible for site selection, the Developer will wish to ensure in all cases that the site is appropriate for the proposed development.</p> <p>In addition to carrying out the usual site surveys to ensure that the site is suitable for development, the Developer will wish to ensure that:</p> <ul style="list-style-type: none"> <li>• the site can secure an electricity grid connection with sufficient capacity (or upgrade any existing grid connection) at an acceptable level of cost; and</li> <li>• where the Developer accepts demand risk, the site will be attractive in revenue terms (this may necessitate a feasibility study).</li> </ul>

	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
3.	Provision of Site	●	●	●					The Promoter should be responsible for securing the relevant rights of access over the sites. The Developer will accept this risk in relation to Merchant Projects.
4.	Title Risk	●	●	●					<p>It is most cost effective for the Promotor/Asset Host to bear title risk, so as to avoid the Developer carrying out due diligence (particularly where the Project involves multiple sites). Where the Promoter owns the Site it should be able to accept this risk and is best placed to do so. Whilst the position may be more complicated where the Promoter does not own the site, the starting position should be that it bears title risk, particularly where the Promoter has specified the site in question.</p> <p>This is a Developer risk on Merchant Projects.</p>
5.	Grid connection	(▲)	▲	▲					<p>Where a new grid connection is to be installed:</p> <p>For Procured Projects, the Promoter will be responsible for the necessary grid connection works but will subcontract these to the local electricity network operator, the Installer and/or another contractor – potentially an Independent Connections Provider (ICP).</p> <p>For Merchant Projects this will be the Developer’s responsibility.</p> <p>The Asset Host (if not the Promoter) may need to assist in the grid connection process, but should not bear any risk.</p> <p>Note: it may be possible to use an existing grid connection at the site, in which case no (or very limited) grid connection works would be necessary. However, some risk would sit with the ‘owner’ of the existing grid connection (as the counterparty to the grid connection agreement with the network operator). For a Procured Project this would be the Promoter; for a Merchant Project the Asset Host.</p>

	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
6.	Site Condition		▲	▲					As with any construction project, the Developer will need to ensure that the site is suitable for carrying out the works. Typically this risk will be passed down to the Installer with site surveys being carried out in order to mitigate this risk.
7.	Planning Consent			●					<p>The development of new build electric forecourts will required planning permission. However, the installation of chargepoints in existing carparks is permitted development under the General Permitted Development Order and does not require a planning application as follows:</p> <p><b>D. Permitted development</b></p> <p>The installation, alteration or replacement, within an area lawfully used for off-street parking, of an electrical outlet mounted on a wall for recharging electric vehicles.</p> <p>The following limitations apply to the PD right:</p> <p><b>D.1. Development not permitted</b></p> <p>Development is not permitted by Class D if the outlet and its casing would:-</p> <ul style="list-style-type: none"> <li>(a) exceed 0.2 cubic metres;</li> <li>(b) face onto and be within 2 metres of a highway;</li> <li>(c) be within a site designated as a scheduled monument; or</li> <li>(d) be within the curtilage of a listed building.</li> </ul> <p><b>D.2. Conditions</b></p> <p>Development is permitted by Class D subject to the conditions that when no longer needed as a chargepoint for electric vehicles:-</p> <ul style="list-style-type: none"> <li>(a) the development is removed as soon as reasonably practicable; and</li> <li>(b) the wall on which the development was mounted or into which the development was set is, as soon as reasonably practicable, and so far as reasonably practicable, reinstated to its condition before that development was carried out.</li> </ul>

	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
<b>Installation Phase risks</b>									
8.	Cost increases			▲	▲				<p>The Developer will bear the risk of costs increases subject to any risks which are allocated to the Promoter in the case of Procured Projects. In order to mitigate this risk, the Developer will enter into a lump sum contract and pass down the risk of cost increases, subject to any specific relief granted to the Installer under its subcontract (which in the case of Procured Projects should reflect the equivalent relief afforded to the Developer under its contractual arrangements with the Promoter). The Developer may wish to provide for some contingency in its funding arrangements.</p> <p>The Developer will need to be satisfied with the covenant strength of its subcontractor in order to ensure the efficacy of the pass down and should consider whether any performance security is required (eg. parent company guarantee or performance bond).</p>
9.	Delay in installation			▲	▲	▲			<p>The risk of delay would be passed down by the Developer to the Installer and the Supplier. Delays in the installation programme will invariably result in lost revenue for the Developer, who should consider liquidated and ascertained damages (LADs) in order to incentivise performance and to mitigate its exposure to lost revenue and financing costs. A longstop termination event should also be considered and, in the case of Procured Projects, this may be imposed by the Promoter, in which case it will need to be passed down with appropriate buffering.</p> <p>The Developer should resist any demand for LADs to be payable to the Promoter as this approach is not cost efficient and is likely to result in an increase in installation and supply costs.</p>
10.	Health & Safety			▲	▲	▲			<p>The Developer will pass down the risk of health and safety compliance to the Installer and possibly the Supplier. The Developer should consider whether any applicable liability caps should be disapplied in the case of health and safety breaches.</p>



	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
11.	Death/ personal injury/ property damage			▲	▲	▲		▲	<p>The Promoter will pass these risks down to its supply chain, with the parties using insurance to mitigate their exposure.</p> <p>The risk of third party property damage may be increased in the case of EVCI projects as the general public will be using the EVCI. Technical and insurance advice may be required in order to assess the likelihood of this risk and the extent to which insurance would respond and the applicability of any deductibles.</p>
12.	Defective materials			▲	▲	▲			<p>This risk will be passed down by the Developer to the Installer and Supplier. Consideration should be given as to whether the Installer might procure the EV chargepoints from the Supplier in order to mitigate any interface issues. An alternative would be to consider the use of an Interface Agreement, although our experience from analogous projects (eg. smart meters) is that this is typically resisted by Suppliers.</p> <p>Limitation periods under the chargepoint supply contract are likely to be shorter than the duration of the Project, which exposes the Promoter to the risk of any defects. Technical due diligence may assist to mitigate this risk.</p>
13.	Intellectual Property			▲	▲	▲			<p>This risk of infringement of intellectual property rights arises chiefly in connection with the chargepoints and the Developer should obtain appropriate warranties and undertakings from the Supplier.</p>
14.	Interface with other site activities	●	●	●	●				<p>This risk is most likely to arise in relation to Procured Projects where the EVCI is co-located with other assets or in settings where other activities are undertaken (eg. a supermarket or a depot). The Promoter or the Asset Host (as applicable) should bear the risk of other activities on the site interfering with the installation works. Equally, the Promoter will wish to ensure that the installation works are carried out in a way that does not interfere with its own activities. The parties should consider the use of site rules and/or an access protocol to manage and co-ordinate their respective activities.</p>

	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
<b>Installation Phase risks</b>									
15.	Compliance with law/quality assurance			▲	▲	▲			Given the length of the installation phase, this risk should be borne by the Installer and the Supplier on the basis that any change in law should be reasonably foreseeable.
16.	Vandalism			▲	▲			▲	<p>The Installer should be able to accept this risk by implementing appropriate site security measures, although in some instances the specific nature of the site may mean that it is more appropriate for the Promoter/Asset host to bear this risk.</p> <p>Insurance may also mitigate his risk, although advice should be taken on the level of any applicable deductible.</p>
17.	Force Majeure	●	●	●	●	●	●	●	<p>Typically this risk will be shared between all parties, with the affected party relieved from its liability to the other parties to the extent that it is unable to perform as result of an event of force majeure. After an extended period, a right of termination will arise if the affected party is unable to resume performance.</p> <p>In multi-site Projects this risk could be mitigated if the effects of the force majeure are site specific. Delay in start-up insurance or business interruption insurance may also provide some revenue protection.</p> <p>The consequences of force majeure termination will need to be addressed. In some instances, it may be possible for the parties to walk away from the relevant contract or to terminate the affected sites. The position is more complicated in respect of Procured Projects where works have been carried out or equipment installed on a site which the Asset Host or the Promoter would have the benefit of following termination. In such circumstances, it may be equitable for a compensation payment to be made in order to recognise the value of the works/equipment which would be received as a result.</p> <p>The scope of the definition of force majeure will require careful negotiation, but should be limited to unforeseeable events/circumstances genuinely outside the control of the parties.</p>

	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
18.	Supply Chain Insolvency			●					The Developer should conduct a careful assessment of its supply chain and their overall covenant strength. Where appropriate, performance security should be requested (and may be a requirement of lenders).
<b>Operating risk</b>									
19.	Increased Costs			▲			▲		Unless specific relief is available from the Promoter (where applicable), the Developer will bear the risk of increased costs of performance and look to pass this risk down to the O&M Contractor.
20.	Performance risk			▲	▲	▲	▲		<p>As the Developer is bearing demand risk, it necessarily bears the risk of poor performance of the EVCI. It should have recourse to its supply chain, however, liability caps and limitation periods will need to be carefully considered in order to ensure that the Developer is able to recover lost revenue. A key area of risk will be any mismatch between the warranty period offered under the supply contract (typically three years) and the assumed lifecycle of the chargepoint.</p> <p>If a Promoter is supporting the Project through an availability payment it may wish to consider imposing a performance specification so as to ensure that the EVCI is properly maintained and functioning to required standards. Whether or not this is required will need to be considered in the light of the extent of the demand risk borne by the Developer – the greater the demand risk, the stronger the argument that the Developer is already sufficiently incentivised to maintain the EVCI.</p>

	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
21.	Defects in Chargepoint			▲		▲	▲		<p>The Developer will have recourse to the Supplier for any defects in the chargepoint, although this will be subject to liability caps and a limitation period. Again interface issues may be relevant given the responsibility of the Installer and the O&amp;M Contractor.</p> <p>A key risk for the Developer will be a batch failure of the chargepoints outside the applicable warranty period. On smart metering procurements it has been possible to negotiate extended warranty protection in respect of batch failures and it may be possible to adopt that approach here. As the market matures and the performance and failure rates of chargepoints is better understood, technical due diligence should assist the Developer in managing this risk. Consider also whether funding contingencies may be required in order to fund replacements.</p>
22.	Defects in installation works			▲	▲		▲		As above, the Developer will have recourse to the Installer, although liability caps, limitation periods and interface risk will be relevant considerations here.
23.	Intellectual property			▲		▲	▲		Please see above.
24.	Health & Safety			▲		▲	▲		Please see above.
25.	Death/ personal injury/ property damage			▲		▲	▲	▲	Please see above.
26.	Maintenance standards			▲			▲		The O&M Contractor will be responsible for ensuring that the EVCI is maintained so as to optimise performance. The O&M Contractor will most likely seek a liability cap which is a multiple of its annual fees and the Developer will need to assess whether this is appropriate.

	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
27.	Vandalism			▲			▲	▲	It may not be possible to implement site security measures to prevent vandalism during the operational phase (i.e. on the basis that the public will have 24/7 access), although it may be possible to deter vandalism (for example, through the use of CCTV and security patrols). Depending on the nature of the site, the Asset Host may be able to assist in the implementation of such measures. Insurance is a further mitigant subject to any applicable deductible.
28.	Customer misuse			▲				▲	The use of the chargepoints will be largely unsupervised and as such there is a risk that the misuse of the chargepoints or poor driving standards could give rise to damage. Technical advice as to the likelihood of any damage and the resulting costs should be obtained. An appropriate insurance package will further mitigate this risk, although the level of deductibles will be a key consideration here.
29.	Electricity supply			●					<p>The Developer is responsible for procuring the required electricity supply and will bear the risk of any disruption, although compensation may be available if an outage is caused by the negligence of the local network operator or potentially that of a third party contractor (eg. highway maintenance cutting through a crucial cable). In the case of a Procured Project, the Developer should be relieved from the consequences of any breach arising as a result given that this risk is outside its control.</p> <p>The risk of disruption to supply is remote.</p>

	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
30.	Electricity cost			●					<p>The Developer will bear the risk of any increases in the cost of electricity. This risk can be passed to consumers, although the Asset Host/Promoter might wish to regulate price increases as this might present a reputational risk and/or an impact on footfall at their site. Whilst a certain level of price control may be acceptable to the Developer, the greater the level of pricing controlled imposed, the stronger the argument for the Promoter/Asset Host to subsidise the cost of electricity.</p> <p>The Developer could seek to mitigate price fluctuation risk via its electricity procurement strategy, eg. by entering into long-term power purchase agreements with generators, or via on-site electricity generation and/or storage (although, in the interests of simplicity, these are not considered in this Risk Matrix).</p>
31.	Data protection risk			●					<p>Depending on the charging/payment mechanism used by the Developer, there may be data risks involved in 'processing' the private data of customers. This can be managed by having appropriate data protection procedures in place.</p>
32.	Demand risk			●					<p>Generally this risk will be accepted by the Developer, although on some Procured Projects the Promoter may provide a form of availability payment in order to assist with bankability. The operation of the availability payment will be negotiated on each project, although from the Promoter's perspective it is suggested that this should operate so as to ensure that a minimum floor of revenue is achieved in order to discharge project costs and debt service, rather than to fund any equity return.</p> <p>The Developer should consider whether it needs to impose any restrictions on the Promoter/Asset Host in order to preserve any characteristics of the site which are fundamental to the viability of the project. These are likely to be resisted as the Promoter/Asset Host will wish to reserve maximum flexibility. Consider whether fundamental changes and/or site closure should give rise to a pre-determined level of compensation.</p>

	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
33.	Competing EVCI			●					<p>The Promoter will be exposed to the risk of competing EVCI reducing the usage of its chargepoints. In some instances in respect of Procured Projects, it may be possible to impose restrictions on the development of competing EVCI on the Promoter/Asset Host, although in practical terms this is likely to be most relevant in the case of a Local Authority.</p> <p>Availability payments from the Promoter might also mitigate this risk.</p>
34.	Unavailability of insurance			●					<p>The Developer will bear the risk of insurances being unavailable or only being available at excessive cost. In publicly procured projects it may be possible to pass this risk back to the public sector on the basis that they will act as insurer of last resort.</p>
35.	Insurance premia risk			●					<p>Any increase in the cost of insurance premia will be borne by the Developer.</p>
36.	Change in Law			▲			▲		<p>The Developer will look to pass the cost of any changes in law impacting on the maintenance EVCI to the O&amp;M Contractor. However, it is likely that the Developer will bear the risk of any changes in law requiring capital expenditure – in these circumstances the Developer will need to rely on reserving and/or a change in law facility to finance the necessary works.</p> <p>If the EVCI is to be transferred to the Promoter/Asset Host on expiry then it is arguable that the Promoter should bear an element of this risk on the basis that it will have the benefit of the capital expenditure from expiry.</p>
37.	Regulatory risk			●					<p>At present Ofgem, the energy regulator, does not treat the supply of electricity to EVs as a licensable activity (which would require the Developer to hold a supply licence from Ofgem). However, this situation may change as the EV market develops and different business models emerge. There is also a risk of increasing regulation of the EVCI market generally, eg. the introduction of a requirement for chargepoints to be centrally registered and with the advent of smart charging the potential requirement for DCC enrolment.</p>

	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
38.	Obsolescence			●					<p>EVCI is a fast moving and nascent market – there is a risk that EVCI installed in the coming years will quickly become superseded by new technology rendering the chargepoints unattractive to consumers, with a resulting negative impact on revenue.</p> <p>Potential mitigants include:</p> <ul style="list-style-type: none"> <li>• technical advice</li> <li>• availability payments</li> <li>• appropriate reserving for upgrades</li> <li>• specific facilities to finance any upgrades</li> <li>• passing the risk to the Promoter/Asset Host.</li> </ul>
39.	Compatibility risk			●					Over time, the EVCI may become incompatible with new models of EV. The same considerations as per Obsolescence apply here.
40.	Force Majeure	●	●	●	●	●	●	●	Please see Force Majeure above.
41.	Supply Chain Insolvency			●					Please see Supply Chain Insolvency above.



	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
42.	Project Termination - Developer Default			▲	▲	▲	▲		<p>The Promoter should ensure that it has the ability to terminate the Project for specific defaults. The Developer will wish to ensure that these are replicated in its subcontracts. The parties will need to consider what happens to the EVCI on termination. If this is to transfer to the Promoter, query whether its value should be recognised by means of a compensation payment, so as to avoid a 'windfall' for the Promoter. This should be considered on a project specific basis and an assessment of the likely value of the relevant assets made (contrast for example, (a) an electric forecourt installed on a site and (b) a standalone non-rapid chargepoint installed on a site – the former will have a much greater residual value).</p> <p>Where termination is caused by the acts and omissions of a subcontractor, the Developer will wish to recover its losses (specifically financing costs and lost equity return), although subcontractors will wish impose liability caps.</p> <p>The Promoter will also wish to recover losses from the Developer – chiefly these will relate to the costs of termination, any necessary remedial works, and any reprourement, together with any additional costs payable to the replacement contractor to the extent in excess of the payments that would otherwise have been due to the Developer. However, lenders will require any such claims to be subordinated to their own.</p>

	Risk	Promoter	Asset Host	Developer	Installer	Supplier	O&M Contractor	Insurance	Commentary
43.	Project Termination -Promoter Default	●							<p>Material breaches by the Promoter of its obligations to the Developer (eg. undue interference with project operations, non-payment of availability charges, denial of access to the project site etc) should allow the Developer to terminate its agreement with the Promoter. In such circumstances it will be necessary to consider what happens to the EVCI and what compensation might be payable to the Developer as a result.</p> <p>The Developer's losses are likely to include senior debt breakage costs, equity return and subcontractors losses which should be the starting point of any compensation calculation.</p> <p>If the Promoter is a private sector entity then performance security may be required in respect of any termination payments.</p>
44.	Project Termination - Promoter voluntary termination	●							<p>The Promoter may wish to reserve the right to voluntarily terminate, so as to preserve its flexibility, particularly where the EVCI is located on its facilities. In such circumstances compensation should be available to the Developer on the same basis as Promoter default.</p>
45.	Interest rate change			●					<p>The Developer should consider the use of interest rate hedging to mitigate this risk.</p>
46.	Refinancing			●					<p>Unless the Developer procures long term financing commensurate with the project term, the project will need to be refinanced. The key risks here are (a) availability of capital and (b) exposure to increased interest rates on refinancing as a result of market movements, in theory an operational project with a track record of performance should attract lower margins and margins for funding EV projects should also become more competitive with the increased uptake of EVs by the public.</p>

## Awards and accreditations

