

Residential charging infrastructure provision

Lead department	Department for Transport
Summary of proposal	Requirement for electric vehicle charging infrastructure to be installed in all new residential buildings and those undergoing major renovations.
Submission type	Impact assessment (IA) – 24 September 2021 (revised from 29 July 2021)
Legislation type	Secondary legislation
Implementation date	2022
Policy stage	Final
RPC reference	RPC-DfT-4408(2)
Opinion type	Formal
Date of issue	6 October 2021

RPC opinion

Rating¹	RPC opinion
Fit for purpose	The data and analysis supporting the EANDCB figure has been strengthened significantly since consultation. The IA includes a good assessment of impacts on small businesses. There are some areas for improvement, such as wider impacts.

Business impact target assessment

	Department assessment	RPC validated
Classification	Qualifying regulation provision	Qualifying regulation provision
Equivalent annual net direct cost to business (EANDCB)	£128.2 million	£128.2 million (QRP) (2019 prices, 2020 pv)
Business impact target (BIT) score	£641.0 million	£641.0 million
Business net present value	£2,393.5 million	
Overall net present value	£1,230.7 million	

¹ The RPC opinion rating is based only on the robustness of the EANDCB and quality of the SaMBA, as set out in the [Better Regulation Framework](#). The RPC rating is fit for purpose or not fit for purpose.

RPC summary

Category	Quality	RPC comments
EANDCB	Green	The IA correctly treats the cost of the requirement on housebuilders to install charge points as a direct cost to business. The overall EANDCB has increased substantially from consultation stage and the IA would benefit from explaining this further.
Small and micro business assessment (SaMBA)	Green	The SaMBA helpfully uses a variety of sources to estimate the number of small and micro businesses affected and the likely cost per business. The assessment addresses the key elements of a SaMBA by discussing potential disproportionality of impact, exemption and other possible mitigation.
Rationale and options	Good	The IA provides a clear rationale for intervention supported by well-explained market failure arguments. The IA helpfully fully costs three options at final stage, ranging from minimum compliance with international requirements to the preferred full charging infrastructure option. The IA would benefit from discussing alternatives to regulation further.
Cost-benefit analysis	Good	The IA appears to be based upon a good level of information, which seems to have been improved significantly following consultation. The IA also includes an extensive sensitivity analysis. The IA would benefit from further explanation of why estimates have changed significantly since consultation stage.
Wider impacts	Weak	The IA would benefit significantly from discussing further the issue of innovation and from discussing other potential wider impacts, such as competition, trade and impacts on the public sector.
Monitoring and evaluation plan	Good	The IA includes a detailed monitoring and evaluation plan. The plan usefully sets out key performance metrics and data that will be collected to address them.

Summary of proposal

The EU Energy Performance in Buildings Directive (EPBD) sets minimum requirements for charging infrastructure in new residential and non-residential buildings and some properties undergoing major renovation. For residential buildings, EPBD requirements are that ducting (channels for under-floor cables) be installed in every parking space in new buildings and buildings undergoing major renovation, with more than 10 parking spaces. Whilst the UK is no longer bound by the requirements of the EPBD, the Government believes it is within England's interests to proceed with these policy measures to support the transition to electric vehicles. The preferred 'full charging infrastructure' option (option 3) goes beyond the EPBD requirements by requiring installation of one charge point per dwelling (in all new residential dwellings and dwellings undergoing major renovations) and properties with more than 10 parking spaces to have cable routes in all parking spaces without charge points. The extended requirements are aimed at promoting the uptake of electric vehicles (EVs), in line with wider government policy. The Department has produced a separate IA covering requirements in respect of non-residential buildings (RPC-DfT-4407(2)).

The Department estimates a net present value of £1,318 million (2019 prices; 2022 present value base year) over 29 years. Where full charge point infrastructure installation takes place during construction, the cost of installation is passed from homeowners who would otherwise retrofit the infrastructure, to housing developers who install infrastructure at a lower cost – resulting in a net saving to society. Total benefits are estimated at £1,783 million and consists of cost savings against a baseline scenario where ducting, cabling and grid connections are retrofit into existing properties (the difference between costs of £4,343 million in the baseline and £2,560 million in the policy option). Total costs are estimated at £465 million and consist primarily of equipment installation costs.

Other than the cost of replacing components of the charging infrastructure (incurred by homeowners), costs are incurred by businesses (housebuilders). All benefits are expected to accrue to homeowners/occupants. All costs to housebuilders are considered to be direct.

Changes since the consultation stage IA

The NPV and PV of benefits have increased three-fold (from £434.6 million and £640.8 million, respectively) and the PV of costs have more than doubled (from £206.2 million). Changes to the PV of benefits (and largely to the NPV overall) are driven by increases in the costs of the baseline scenario where ducting, cabling and grid connections are retrofit into existing properties (cost more than doubled from £1,952.6 million), whereas costs in the policy option have slightly less than doubled (from £1,311.8 million). Overall, the EANDCB has increased by around 2.5-fold (from £55 million).

EANDCB

Direct and indirect impacts

The IA treats the cost of the requirement on housebuilders to install charge points as a direct cost to business. Any pass-through of these costs to house-buyers or landowners is excluded. This treatment is in line with RPC guidance and previous IAs.

Counterfactual/baseline

The baseline assumes that homeowners gradually retrofit charge points as EVs become more popular, with 100 per cent of off-street parking having charge points by 2050. The IA states that this is in line with the ending of new petrol and diesel internal combustion engine (ICE) car and van sales by 2030. Without implementation of the policy, it is assumed that all installations are retrofitted into new builds proportionate to the level of BEV ownership across the wider population. The Department's approach to the baseline appears to be reasonable and is usefully addressed in the sensitivity analysis (see below). The IA would benefit from explaining further, given the small proportion of new flats compared to the existing stock, whether EV demand is more likely to drive charging points in new flats than the other way round.

Explaining changes since the consultation stage IA

The IA states that the net benefit of the proposal has changed significantly since the consultation IA because it now assumes that costs remain flat in real terms, and now analyses the impact of technology learning in the sensitivities section (paragraph 229). However, given the magnitude of the changes since the consultation stage IA (see comparison above), the IA would benefit significantly from providing a much more detailed comparison and explanation for the changes. While important assumptions such as unit costs of installation appear unchanged from the consultation stage IA, there are some significant revisions to assumptions, such as the reduction in the economic life of the Electric Vehicle Supply Equipment (EVSE) outlet which appears to be a key factor in the increase in material replacement costs (from £204 million to £461 million). Familiarisation costs have also increased, from £1.6 million to £4.1million. While the new estimates appear to be based upon new and improved information (and the IA does seem to have been improved significantly through consultation – see the 'cost benefit analysis' section of this opinion), the IA would benefit significantly from discussing this in more detail.

SaMBA

The IA includes a good SaMBA. The Department estimates that around 2,100 small and micro businesses would be subject to the proposed regulation and estimates the annual cost to be around £6,900 per business. The IA discusses qualitatively whether this cost could be disproportionate. This notes, for example, that small housebuilding businesses will be less able to benefit from economies of scale but also, since they disproportionately focus on higher cost residences (with design and additional functionalities), they might be more able to pass on the costs to house buyers/landowners. The SaMBA notes that intelligence from trade bodies indicates that familiarisation costs would not disproportionately fall on small developers.

The SaMBA considers exemption, noting that since SMBs make up approximately 10 per cent of the market share, most monetised benefits would be retained. However, the Department explains that it sees maximising the roll out of charge points as a necessary part of a systemic transition to EVs. The IA discusses mitigation, particularly the potential availability of government programmes and funding to support small housebuilders. The IA would be improved by providing more information on what measures might make familiarisation less burdensome for smaller businesses and discussing how the estimated cost of £6,900 per business compares to that of larger businesses.

The SaMBA would benefit from discussing the capacity of the market to install charge point infrastructure and any risk of larger construction firms securing the services of the limited capacity, potentially raising costs to smaller firms.

Rationale and options

As noted by the RPC at consultation stage, the Department has provided a clear and detailed assessment which includes a rationale for intervention supported by well-explained market failure arguments.

This IA considers three options:

- option 1 (do minimum): implementation of rules equivalent to those set out in the EPBD requiring ducting be installed in all parking spaces of new or majorly renovated buildings which have over 10 parking spaces;
- option 2 (additional cabling): cabling to be installed for all parking spaces in all new buildings and those undergoing major renovation, including ducting, cabling and grid connection; and
- option 3 (full charging infrastructure; preferred option): charging infrastructure to be installed in all new buildings and those undergoing major renovations, including ducting, cabling and at least one charge point per dwelling. Properties with more than 10 parking spaces will require cable routes in all parking spaces without charge points.

The IA refers briefly to alternatives to regulation, such as continued support through existing grants and other investment-based policy. The IA would benefit from

discussing alternatives further and why they would not address the problem satisfactorily.

Although the IA refers to economies of scale, the IA would benefit from explaining further why it is proposed to restrict the measure to new properties only with more than 10 parking spaces, given that the comparison of first fit to retrofit would seem to be similar for all new properties.

The IA would benefit from discussing the significance of new residential building relative to size of the entire housing stock on the extent to which overall policy objectives might be met.

The IA notes that the preferred option does not represent the highest monetised net present value (NPV) but that it best supports wider government policy to transition to zero emission road travel, through helping to facilitate the uptake of EVs. The IA notes that an increased uptake of EVs would result in associated non-monetised emission savings. The IA also refers to avoided disruption costs that could arise as a result of construction work taking place during a retrofit installation. The IA would benefit from further discussion of the rationale for choosing option 3, referring to wider strategic government policies as appropriate.

Cost-benefit analysis

Evidence and data

The IA appears to be based upon a good level of information, which seems to have been improved significantly following consultation. The Department explains that costs were gathered in a three-stage process: literature review; initial interviews with relevant trade bodies and detailed interviews and/or data from 14 stakeholders. Estimates were captured for upfront and retrofit installation for four types of parking location associated with private houses, and buildings which have multiple occupancy parking. These costs were applied to forecasts of installations, derived from residential dwelling completion and parking provision data for residential sites.

The Department's estimates were tested during the consultation phase, with the majority of respondents stating they had no comment on the costs. Some respondents remarked that costs looked 'lower than expected' but provided no further evidence. The Department notes that since consultation it has gathered primary cost information on per-unit charge point installation costs for kerb-side residential charge points. This data has validated costs provided by consultants, confirming that the high/low-cost ranges capture the range of uncertainty. The Department elected, therefore, opted to keep costs as they were at the consultation stage but states that it will monitor and review as part of the post-implementation review.

The IA would benefit from discussing follow-up steps the Department took to elicit information from consultees, particularly where respondents remarked that costs looked 'lower than expected' and where estimates appear to be based upon particularly limited evidence (such as time and staff assumptions for familiarisation).

The IA would benefit from explaining further why the cost of option 2 is much greater than that of option 1, given that feeding the cables through ducts would appear to be relatively straightforward while retrofitting the ducts requires digging. This could include, for example, whether the difference is related to the costs of connecting to the grid.

The IA would benefit from clarifying and discussing further its assumptions for when charging points would start to be used (given that ICE cars will be in use for much longer than their new sales ban and some residents might not have a car) and implications for the estimated benefits of option 3.

Methodology

The IA provides a good explanation of the 29-year appraisal period, which corresponds to the expected economic life of the installation of cabling and other hardware.

Following consultation feedback and guidance received from MHCLG the Department has refined its method of forecasting the annual number of new build residential developments by using the Office for Budget Responsibility's (OBR) forecast net additions to the housing stock. The new data capture buildings that have undergone material change of use into residential dwellings, as well as new residential developments. The level of parking provision that would be in new build dwellings is informed by information on the level of parking provision in existing housing from the 2018/19 English Housing Survey.

Assumptions, sensitivity analysis and risks/uncertainties

The IA acknowledges there are a number of uncertainties and, following comments in the RPC's informal review of the consultation stage IA, includes an extensive sensitivity analysis. The IA notes that the most important overarching uncertainties are the level to which retrofit installations occur in the baseline and the split between types of new dwellings. The sensitivity analysis shows scenarios where the proposal could have a large negative NPV and identifies a 'cross-over' point if the installation retrofit installation rate falls below 70 per cent. The IA explains why it considers this scenario to be unlikely.

The IA notes that around 40 per cent of Ultra Low Emission Vehicle (ULEV) purchasers take up the Electric Vehicle Home Charging Scheme (EVHS) grant and that it could, therefore, be inferred that, at least in the short term, charge point infrastructure may be retrofitted by as little as 40 per cent of those who purchase a ULEV. The IA would benefit by discussing whether it would be appropriate to incorporate this information further into the analysis. The IA would also benefit from explaining further its sensitivity analysis on variations in housing types, in particular why the NPV appears to increase if the assumptions are varied in either direction.

The IA explains why it is not possible to estimate how many EV purchases will be brought forward as a result of implementing the policy, although it notes that evidence exists to suggest that availability and visibility of charge points contributes favourably to ULEV purchase decisions. The IA includes a sensitivity showing the

impact on the NPV if the introduction of 88,000 additional charge points annually led to 1000, 2000 or 3000 additional BEV. The increase in the NPV is, however, quite small and the IA would benefit from discussing the significance of this further.

The IA includes a brief discussion of the impact of Covid-19 (paragraph 161). The IA would benefit significantly from a more detailed discussion of the possible impacts on Covid, for example in terms of reinforcing trends in new build away from flats and city centres to houses and towns/suburbs (paragraph 60).

Presentation

The IA presents some costs (material replacement) as net costs over the baseline but others (installation of charging infrastructure) as a gross cost, with the avoided baseline (retrofit) cost presented as a benefit. The costs and benefits in aggregate terms avoid any issues such as double counting, but the IA would benefit from providing additional clarity and explanation of its approach and presentation.

Wider impacts

The IA discusses potential environmental impacts (emissions savings from increased take-up of electric vehicles) and provides a good discussion of groups potentially impacted by the proposal (pages 37-39). There is some mention of innovation but the IA would benefit significantly from discussing this, given the potential impact of technological developments such as wireless charging, which might be more likely to affect charge points (and therefore the preferred option) than ducting and cabling. In particular, the IA would benefit from discussing risks of 'crowding out' of innovation in option 3, both in terms of different types of charging points developing over time and variations in forms of charging (e.g. rental basis rather than an outright purchase of the unit).

The IA would also benefit from discussing other potential wider impacts, such as competition, trade and possible impacts on the public sector. On trade, we note the minor divergence from the EU Directive for EEA states. The IA could discuss the impact of the required increase in the number of electric vehicles on imports and/or foreign direct investment in UK car manufacturing. More generally, the IA could be strengthened by providing further evidence of market trends, such as sales of petrol/diesel cars and electric vehicles.

Following comments in the RPC's informal review of the consultation stage IA, the IA now helpfully includes a discussion of impacts on the electricity network (pages 44-45). The IA would benefit from addressing the comment in the RPC's informal review around the possibility that ensuring space for charging points might force housebuilders to reduce the number of new builds or decrease the amount of, for example, garden space.

The IA would benefit from discussing the potential impact of the proposal on the market for flats and whether housebuilders might expect to gain a premium for flats with charging points. This would also help to address the RPC's earlier comment on the baseline by further addressing housebuilders' existing incentives to put in charge points.

The IA would benefit from discussing further the potential alternative of hydrogen fuel, as has been promoted recently, on potential take-up of electric vehicles. This could include their likely comparative attraction to consumers (e.g. differences in filling-up/charging cost and convenience). The IA would also benefit from discussing environmental impacts of battery and electric vehicle production.

The IA could usefully include discussion on any supply chain issues in the building sector, such as availability of ducting cables and labour, and whether this could impact on the installation of charge point infrastructure.

Monitoring and evaluation plan

The IA includes a detailed monitoring and evaluation plan (pages 45-48). The Department highlights a number of risks and uncertainties throughout the IA and the monitoring and evaluation plan outlines what will be monitored, the data sources and the analysis that will go into evaluation in a post implementation review five years after regulations come into force. These areas include: costs; consumer and business impacts/preference; technology changes; international comparisons; and unintended consequences. The plan most usefully sets out key performance metrics (paragraph 224) and data that will be collected to address them (paragraph 225).

Other Comments

The IA helpfully refers to policy interactions and the associated IA on non-residential buildings. The IA could usefully expand on its reference (paragraph 87, page 21) to proposed regulations requiring charge points to be 'smart' by referring to the IA on this and providing assurance on consistency of treatment, alignment of assumptions etc.²

The net benefits of the proposal result from the avoidance of the higher cost of retrofitting EV charge point infrastructure in the counterfactual. The RPC notes that the need for retrofit is in large part driven by government policy, notably the ending of sales of new petrol and diesel cars from 2030. The RPC looks forward to seeing impact assessments relating to these policies, subject to better regulation framework requirements.

Regulatory Policy Committee

For further information, please contact regulatoryenquiries@rpc.gov.uk. Follow us on Twitter [@RPC_Gov_UK](https://twitter.com/RPC_Gov_UK), [LinkedIn](#) or consult our website www.gov.uk/rpc.

² RPC-DfT-5075(1) 'The Electric Vehicles (Smart Charge Points) Regulations 2021', 7 July 2021.