

Solar on car parks & electric vehicle charging call for evidence

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About Regen

Regen provides independent, evidence-led insight and advice in support of our mission to transform the UK's energy system for a net zero future. We focus on analysing the systemic challenges of decarbonising power, heat and transport. We know that a transformation of this scale will require engaging the whole of society in a just transition.

Regen is a membership organisation with over 200 members who share our mission, including clean energy developers, businesses, local authorities, community energy groups and research organisations across the energy sector. We manage the Electricity Storage Network (ESN) – the industry group and voice of the grid-scale electricity storage industry in GB.

Regen works closely with National Grid Electricity Distribution and Scottish & Southern Electricity Networks on the development of Distribution Future Energy Scenarios. These scenarios include projections of solar generation capacity and feed into the Distribution Network Operators' network planning processes, ensuring the distribution network infrastructure has the capacity when it is needed.

Summary and recommendations

Regen strongly supports the implementation of a policy requiring solar canopy installations on new and existing car parks.

In addition to the wider societal benefits that DESNZ identified in its call for evidence, we identify further advantages which support the government's clean power goals. Among these are ease of delivery through established grid connections and the potential for community energy involvement.

Regen believes that car parks not under construction when the policy is implemented should be expected to integrate solar canopies into their construction. For all existing and in construction car parks, the implementation period should extend to the end of 2030. This aligns with infrastructure upgrades being implemented to meet the government's Clean Power 2030 plan.

While it is likely that network constraints would be highlighted as a barrier to implementation, Regen suggests that DESNZ should assess the merit of these claims using the Network Headroom Reports, which Distribution Network Operators (DNOs) publish. Regen also recommends that, to enable more effective delivery of solar canopies, DESNZ should call on the National Energy System Operator and Transmission Owners to increase the Transmission Impact Assessment threshold in Scotland.

Regen does not believe that a wide range of exceptions should be included in the policy. Case studies of multi-storey retrofit projects in Exeter and across France support the inclusion of these types of car parks.

- **Recommendation 1:** DESNZ could include a wider set of societal benefits in its case for this policy, including faster solar deployment enabled by using existing grid connections, co-locating supply and demand, and providing opportunities for community energy.
- **Recommendation 2:** The implementation period for solar canopies should extend to the end of 2030 to align with the government's Clean Power 2030 target.
- **Recommendation 3:** DESNZ should call on the National Energy System Operator and Transmission Owners to increase the Transmission Impact Assessment threshold for Scotland from the current 200 kW limit to between 1 – 2 MW.
- **Recommendation 4:** DESNZ should implement a requirement on new and existing car parks to install solar canopies.

2.4: Benefits of solar canopies for wider society

Q: Do you agree that we have identified all the potential wider societal benefits?

No

While we agree with the benefits to wider society that have been identified, Regen believes there are further benefits to implementing a mandate to install solar canopies in car parks. These are set out below.

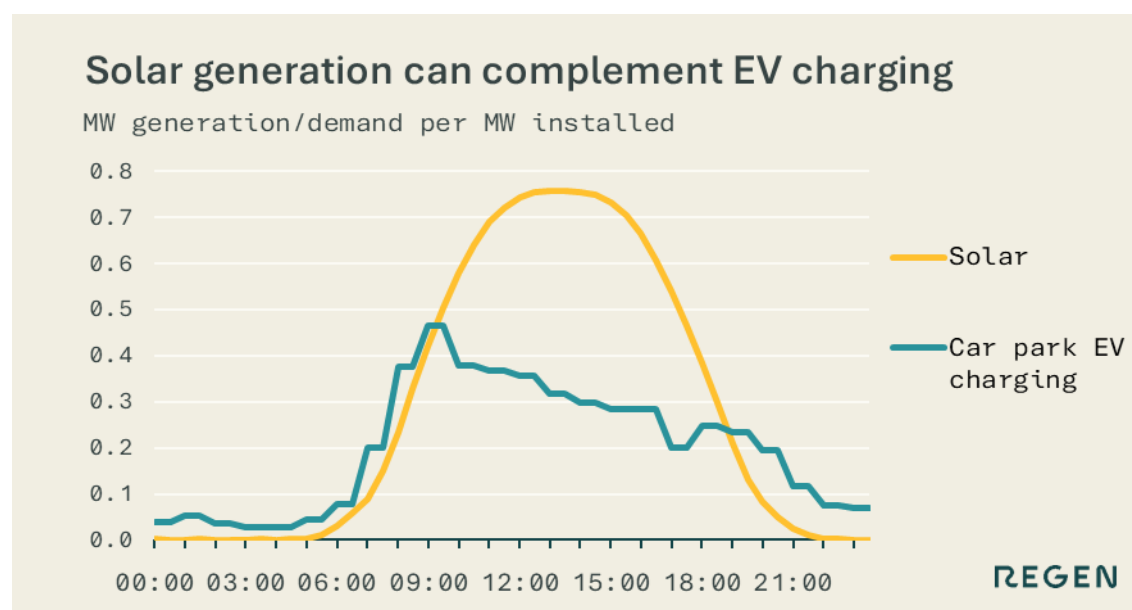
1. Faster delivery of solar projects by making use of existing grid connections

Many large car parks are located in places that already have a grid connection, such as supermarkets and retail centres, enabling faster delivery of solar capacity as requirements for additional on-site supporting infrastructure in those locations will be limited.

2. Supply and demand co-location

Figure 1

Load profiles for solar peak generation and destination-based EV charging at peak demand¹



¹ Distribution Future Energy Scenarios, National Grid Electricity Distribution, 2024

Figure 1 illustrates how loads experienced by DNOs for EV chargepoints located at destinations and car parks can be complemented by solar generation. Charging at car parks and destinations typically occurs during the day, when solar generation is at its highest output.

Regen's analysis for the National Infrastructure Commission (NIC) indicates that by 2030, under an ambitious electrification scenario, annual electricity demand from EV chargepoints located at car parks and destinations could reach 1.1 TWh with an installed capacity of 1.1 GW. By 2050, demand from these chargepoints could reach 2.5 TWh (with installed capacity reaching 1.9 GW).

3. Supporting the solar industry

DESNZ is right to highlight that a solar canopy policy would stimulate the solar PV and EV industries and support high-skilled jobs in installation and maintenance. This Call for Evidence comes at a time when the solar industry is experiencing a period of contraction, and so the policy would help keep up momentum in the sector.²

4. Lower energy demand for summer AC cooling

DESNZ is right to highlight enhanced customer experience, as noted in the benefits to car park owners:

- reduced vehicle temperatures during hot weather
- mitigating against the urban heat island effect by reducing asphalt temperature
- shelter from precipitation.

A key associated benefit would be reducing energy consumption for vehicle cooling. Whilst there is little published quantitative evidence on the shading effect of car ports in the UK, it is well established that shading can reduce solar irradiance by as much as 80%³.

5. Opportunities for community energy

Regen believes that mandating solar power on car parks could provide a significant opportunity for car park operators and solar developers to engage with community energy organisations, providing pre-approved sites which groups can invest in.

Recommendation 1: DESNZ could include a wider set of societal benefits in its case for this policy, including faster site delivery by using existing grid connections, co-locating supply and demand, and providing opportunities for community energy.

² *Solar PV manufacturing downturn will extend into 2026*, Solar Power Portal, 2024

³ *Solar shading of buildings* (BR 364), BRE, 2018

3.2: Costs of solar canopies for car park owners

Q: If solar were mandated on car parks, how long should the implementation period be, in order to reduce costs and disruption?

The implementation period for solar on car parks should apply only to existing car parks and those already under construction. Car parks which are not yet under construction should be required to install operational solar canopies by the time of their completion.

Regen believes it would be logical to allow existing car parks and those under construction to install solar by the end of 2030. This would align with the infrastructure upgrades being made to prepare the power system for the Government's Clean Power 2030 target.

France has implemented a policy requiring existing car parks to retrofit solar canopies into their design. The solar canopy mandate in France was officially enacted in 2023 and allowed operators 3-5 years to fit a solar system.⁴ However, shortly after enacting the mandate, in response to industry concerns, an 18-month extension was granted to those car parks which were initially given 3 years to install solar canopies, effectively resulting in all operators being allowed 5 years.⁵

Recommendation 2: The implementation period for solar canopies should extend to the end of 2030 to align with the government's Clean Power 2030 target.

⁴ *France rules on mandatory solar for car parks*, PV Europe, 2025

⁵ *French car parks get 18-month solar installation extension*, Solar & Storage Xtra, 2024

4.1: Barriers to implementation

Q: Do you agree that we have identified all the major barriers to the installation of solar canopies, or have we omitted anything? Do you disagree with any of the barriers we have outlined? Please provide any relevant qualitative or quantitative evidence.

Network constraints will likely be used as a barrier against the requirement to install solar canopies. The DNOs all publish Network Headroom Reports for their primary network assets, which include projections of headroom (the difference between capacity and projected power flows) for both demand and generation. DESNZ could use these reports to assess the merit of claims that DNO constraints would inhibit a requirement to install solar canopies.

The recent increase in the Transmission Impact Assessment (TIA) threshold from 1 MW to 5 MW in England and Wales removes a key barrier to solar projects of this scale.⁶ Any solar installations under 5 MW will no longer face transmission assessment, significantly reducing lead time to connect to the distribution network.

The TIA threshold is 200 kW in Scotland, and this may be a barrier to rapid development of car park solar canopies. Regen has argued this should be increased to 1 – 2 MW (noting that the transmission networks extend to lower voltages in Scotland).

Recommendation 3: DESNZ should call on the National Energy System Operator to increase the Transmission Impact Assessment threshold for Scotland from 200 kW to 1 – 2 MW.

⁶ *Streamlining the connection of projects under 5MW*, NESO, 2025

5.2: Exemptions

Q: Do you think any policy to mandate solar installation should apply to existing car parks or only new car parks? Do you think residential and/or multi-storey should be exempt?

Regen believes the mandate should apply to all new and existing car parks, with a small list of exemptions.

Policies mandating solar canopies for new car parks can be found in some German federal states as well as Slovenia. France has taken this policy a step further and has mandated retrofit on car parks with 80 or more spaces.

The first two solar car parks ever constructed in the UK were both retrofit projects, located on multi-storey car parks.⁷ The success of both projects demonstrates the business case for both retrofit and the inclusion of multi-storey car parks in a policy requiring solar canopies.

Recommendation 4: DESNZ should implement a requirement on new and existing car parks to install solar canopies.

⁷ *Mary Arches and John Lewis Car Ports, Exeter City Council*, SunGift Solar, n.d.