

Addendum 6 - Assessment of Project Cumulative Effects

1. Prefatory Note on Scope and Purpose

Notwithstanding the Applicant's legal position that a cumulative effects assessment is not required under the Fast-track Approvals Act 2024 (refer Addendum 4) in respect of other contemporaneous fast-track applications and that such effects fall within the scope of assessment for this Project, Lodestone has prepared this addendum as a matter of assistance to the Expert Panel.

This addendum is provided to support the Panel's understanding of whether the Haldon Solar Project, when considered in the context of existing and reasonably foreseeable activities – including The Point Solar Project – gives rise to any materially different or more significant effects than those already assessed on a stand-alone basis.

The assessment is intentionally high-level and does not seek to undertake a comparative evaluation of projects, nor to reopen matters of scale, siting, or design already addressed in the substantive application. Rather, it is intended to provide additional assurance that, even if cumulative considerations were to be taken into account, the Project's effects remain bounded, manageable, and appropriate within its receiving environment.

2. Introduction and Purpose

This addenda provides a high-level overview of potential cumulative effects of the Haldon Solar Project when considered alongside other existing, consented, and reasonably foreseeable activities. In particular, the cumulative effect of both Haldon and The Point solar project, also in a parallel fast-track process, has been considered.

Cumulative effects are those that arise over time or space from the combination of the Project's effects with the effects of other activities. This assessment focuses on cumulative effects relating to:

- Ecology;
- Landscape and visual effects; and
- Electricity transmission grid infrastructure.

This assessment should be read alongside the topic-specific technical assessments contained elsewhere in the fast-track application and addenda response to comments. It does not repeat detailed baseline information, but instead focuses on whether the Project contributes to an overall pattern of change that could give rise to materially different or more significant effects than those assessed on a stand-alone basis.

3. Methodology and Assessment Framework

Cumulative effects occur on both spatial and temporal scales.

The spatial extent of the cumulative effects assessment varies by topic:

- Ecology: site and local receiving environment, with reference to the wider Mackenzie Basin where relevant;
- Landscape and visual: the Project site, surrounding landscape character units, and relevant public viewpoints; and

- Transmission: the regional electricity transmission network.

The temporal scope considers existing baseline conditions, the construction period, the operational life of the Project, and foreseeable future development based on current planning and consenting information.

4. Limitations

Cumulative effects assessment necessarily involves a degree of professional judgement. In particular, information about future development is limited to projects that are either consented or publicly known at the time of assessment. Furthermore, it is noted that information of effects from other projects is limited due to lack of publicly available survey data.

5. Existing and Reasonably Foreseeable Activities

The Project is located within a landscape that already contains significant infrastructure and modification, including:

- Existing hydroelectric generation and associated infrastructure;
- High-voltage National Grid transmission lines traversing the site and wider region; and
- Rural roading and farming activities.

In addition, a number of renewable energy projects are either consented, operational, or under consideration within the wider Mackenzie Basin and Canterbury region. Not all of these projects give rise to cumulative effects, as many are geographically separated, visually discrete, or connected to different receiving environments.

Only those activities with a plausible spatial or functional relationship to the Project are considered further in the topic-specific sections below.

6. Cumulative Ecological Effects

Ecological Context

The Project site is located within a highly modified pastoral environment¹. The baseline ecological survey and subsequent surveys and site visits undertaken by DOC, Blueprint Ecology, SLR, and Environment Canterbury identified the following Threatened species:

- *Lepidium Solandri* (Threatened - Nationally Critical)
- *Convolvulus verencundus* f. *verencundus* (At risk - Declining)
- Robust grasshopper (Nationally Endangered),
- Minute grasshopper (Nationally Vulnerable),
- Otago short-horned grasshopper (At risk - Declining)
- Tekapo ground wētā (Nationally Endangered)

Many of these same species were identified at The Point Solar Farm in the Desktop Ecology Assessment so there is some commonality on ecology across the two sites, as might be expected given their proximity.

Potential Sources of Cumulative Ecological Effects

There are possible effects on invertebrates, lizards and flora during construction, from earthworks primarily. These include:

¹ P. Espie, "Haldon Solar Ecological Impact Assessment," 2025.

- Direct invertebrate mortality and injury; and
- Damage to or reduction of the extent of habitat on site.

These effects are specific to each project and management of such is covered in proposed site specific ecological management plans.

Assessment of Cumulative Ecological Effects

At this stage, cumulative ecological effects are assessed as limited and localised. This conclusion reflects the following factors:

- Ecological effects associated with the Project are largely confined to a single landholding and the specific ecological populations of each site, which may or may not be coincident;
- Other renewable energy projects in the wider region are not ecologically connected to the Project site;
- The Project does not fragment or sever ecological corridors at a regional scale; and
- The Haldon solar project and The Point combined at approximately 1000 ha, form only a tiny fraction (0.14%) of the wider Mackenzie Basin land area of 713,000 ha.

While the potential for cumulative effects cannot be entirely discounted, particularly at a regional level, there is currently no clear mechanism by which the Project would contribute to a significant adverse cumulative ecological outcome.

Conclusion on Cumulative Ecology Effects

On the basis of the information currently available, the Project is not expected to result in significant adverse cumulative ecological effects. However, we note that assessment of specific wider effects is limited by the lack of data on other developments and projects. Any cumulative effects are likely to be minor, localised, and manageable through standard ecological management and enhancement measures specific to the project.

7. Cumulative Landscape and Visual Effects

Landscape Context

The Mackenzie Basin is characterised by expansive open landscapes, but also contains substantial infrastructure associated with hydroelectric generation and electricity transmission. The Project site sits within a landscape that already accommodates large-scale infrastructure and modified land uses.

Other Relevant Developments

Relevant developments for cumulative landscape and visual consideration include:

- Existing hydroelectric infrastructure and reservoirs;
- Existing National Grid transmission lines and substations; and
- Other renewable energy developments within the broader region.

Assessment of Cumulative Landscape, Visual and Natural Character Effects

The standalone Haldon solar project was described as having low-moderate landscape, visual, and natural character effects in the Boffa Miskel Assessment that accompanied the fast-track application². In the supplemental cumulative effect memorandum prepared by Boffa Miskell, when examined in conjunction with The Point Solar, this rises to Moderate, albeit not significant effects. This is largely because:

² Boffa Miskell, "Haldon Solar Project Landscape Effects Assessment," 2025.

- When compared with the Haldon Solar Project, The Point is located closer to and more visible from accessible public viewpoints; and
- The Point will appear in the foreground and more visually prominent from these more accessible views.

In other words, the rise to Moderate visual effects is largely due to stand-alone effects of The Point project.

8. Cumulative Electricity Transmission Effects

Transmission Context

The project benefits from proximity to existing high-capacity National Grid infrastructure. The Benmore-Islington A line bisects the northern part of the site dividing it into two development areas, a northern one of approximately 100 ha and a southern one approximately 210 ha. This context is a key reason for the site selection and reduces the need for extensive new transmission infrastructure such as new lines and transmission towers. Despite this, the construction of a new 220 kV substation to connect into the existing line is a significant component of the project development cost. The Transpower component is estimated to cost between \$14-\$23M. When adding in associated costs for Lodestone equipment - transformers, medium voltage switchrooms and switchgear, reactive filtering etc the cost is expected to be approximately \$40M.

Other Generation and Connection Activity

Multiple hydro generation projects (Ōhau A, B, C, Tekapo A, B, Benmore) connect to the regional transmission network which was established to feed this electricity to the Upper South Island (Christchurch and north). The southern terminal of the inter-island HVDC link which links the electrical grids of the North and South Islands is also nearby at Benmore hydro-electric station.

The nearby hydro projects are already associated with extensive landscape modification in the region, including the electrical infrastructure, hydro dams, and perhaps more significantly, the Pukaki and Tekapo canal systems.

Transpower is responsible for operating and planning transmission at a system-wide level.

At present there are no large-scale solar farms operational within the Mackenzie district. However, there are five projects within the fast-track system:

- Haldon solar - lodged, in progress
- The Point solar - lodged, in progress,
- Grampians, referred
- Twizel solar, referred
- Balmoral solar, listed

This assessment has considered the potential cumulative transmission effects of The Point and Haldon as these are the only two projects currently in progress.

Assessment of Cumulative Transmission Effects

In response to queries from Te Rūnanga o Ngāi Tahu, Lodestone prepared a short memorandum outlining our collective understanding of the capacity and capability of the regional transmission network³. This memorandum was attached as appendix six as part of Ngāi Tahu's comments. It is informed by Lodestone's experience operating and planning solar farms

³ Lodestone Energy Limited, "Mackenzie Area Transmission Capacity and Energy Market Cumulative Effects," 2026.

in the NZ context as well as expert staff's collective experience working in the NZ electricity industry.

The Project does not give rise to significant cumulative transmission effects because:

- It utilises existing transmission corridors;
- It does not require the creation of new long-distance transmission lines;
- Grid capacity and operational effects are managed through established Transpower and electricity market processes; and
- Any upgrades are localised and do not drive broader network expansion.

Lodestone notes that the "nameplate" rating of 404 MVA of the Benmore-Islington A line, to which both projects will connect, is lower than the combined capacity of the The Point and Haldon Solar (480 MW). However, the line power flow is not unidirectional, which means that under most operating conditions, the full capacity of both projects is able to be dispatched, so physical capacity is not considered a primary constraint to the development of both farms.

If it was deemed that this constraint was more impactful than is apparent from Lodestone's high-level analysis, Transpower would still allow both projects to connect to the grid. As described in their comment submission⁴:

- A Transpower Works Agreement (TWA) guarantees the capacity of the generators specific connect assets at the generators connection location but does not guarantee access to wider transmission capacity, for example transmission line capacity. Wider transmission capacity is allocated in real time through the electricity market dispatch function on a competitive market basis. The order in which competing generation commissioned has no bearing.
- Connection rights are allocated on a "first-ready" basis, but in line with the point above, this only applies to the connection assets at the connection location and not to wider transmission capacity.
- There is nothing preventing both projects from connecting, nor does the presence or absence of a TWA give either project an inherent advantage. As the proposed connections are in different physical locations the allocation of connection assets for one project has no impact on the allocation of connection assets for the other project. Neither allocation has an impact on access to wider transmission capacity.

Physical cumulative transmission effects of the two projects are therefore not significant.

As described in Lodestone's memo to Ngāi Tahu, the more pertinent effect from both projects connecting to the grid is economic. The connection of a large amount of solar in one location on the grid will meaningfully depress electricity prices when both projects are generating electricity. This serves as a significant economic disincentive for the construction of multiple projects within the same area. It is Lodestone's view that this economic disincentive would likely mean that only one or two large solar projects could feasibly obtain project finance and get constructed within the same region.

Consequently, we conclude that cumulative transmission effects are unlikely from both a physical and economic perspective.

9. Overall Cumulative Effects Conclusion

When considered alongside other existing and reasonably foreseeable activities, the Haldon Solar Project does not result in unacceptable cumulative effects.

⁴ Transpower NZ Ltd, "Comment on Haldon Solar Project," 2026.

- Cumulative ecological effects are assessed as minor and localised, with no clear pathway for significant regional effects;
- Cumulative landscape and visual effects are potentially moderate, but not significant and consistent with the modified landscape context;
- Cumulative transmission effects are negligible and appropriately managed at a network level.

Overall, the Project does not contribute to an adverse pattern of cumulative change and is appropriate within its receiving environment.