INSIGHT ECONOMICS

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# Economic Assessment of Proposed Twizel Solar Project for Fast-track Referral

Prepared for:
**Nova Energy Limited**

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# 1. Executive Summary

**Context**

Nova seeks to develop the **Twizel Solar Project**—a large-scale solar generation facility near Twizel, in the Mackenzie District (the **proposal**). The proposal involves installing more than 495,000 ground-mounted solar panels with a grid export capacity of 300 MW, connected to Transpower's national grid via the existing Twizel substation. To expedite development, Nova has applied for referral under the Fast-track Approvals Act 2024 (**FTAA**). To assist, this report provides an independent high-level economic assessment of the estimated effects of the proposal—particularly its impacts on GDP, employment, and household incomes. It also considers a range of wider economic effects arising from the development.

**Key Findings**

The proposal will create significant one-time boosts in GDP, jobs, and incomes, particularly during construction. Over a two-year period, including flow-on effects, we estimate that the development could have the following regional impacts:

- A one-time boost in regional GDP of around $85 million;
- Employment for 570 FTE-years (or 285 people employed full-time for two years); and
- Additional household incomes of $50 million;

In addition, ongoing operation of the solar facility is expected to sustain:

- $3.7 million in annual GDP contributions;
- 18 permanent and contracted FTEs per year; and
- $1.6 million in wages annually.

Finally, the proposal will deliver a range of wider economic and social benefits, including:

- **Contribution to Renewable Generation Targets:** The project adds 300 MW of new renewable capacity in an area with strong solar resources, supporting national decarbonisation goals and easing pressure on hydro and thermal plants.
- **Improved Wholesale Market Competition:** The proposal increases supply diversity and reduces price volatility, especially during dry or high-demand periods. This aligns with Electricity Authority objectives and helps guard against market concentration.
- **Moderation of Retail Electricity Prices:** By adding low marginal cost generation to the grid, the proposal supports more stable and affordable retail electricity prices over time.
- **Utilisation Benefits:** Utilisation of existing grid infrastructure in the Mackenzie Basin reduces transmission losses, improves supply reliability, and supports local energy resilience.

- **Local Capability Building:** The project creates enduring employment opportunities and builds regional expertise in solar energy, helping integrate rural communities into the renewable energy economy.

- **Highest and Best Use of Land:** The project repurposes predominantly Class 6 dry stock farmland for a higher-value use, with minimal displacement of economic activity.

- **Investment Signal Effects**: The development will provide a strong signal of confidence in the local economy, which may help spur on, accelerate, or bring forward other economic development.

**Conclusion**

Overall, we consider the proposal will deliver regionally and nationally significant economic benefits, including both short-term gains and sustained long-term benefits. It adds critical renewable generation capacity, enhances energy security, and provides a strong signal of confidence in the regional economy. The fast-track process ensures these benefits can be realised sooner than traditional development pathways may otherwise normally allow.

# 2. Introduction

## 2.1. Context

Nova Energy Limited (**Nova**) seeks to develop the **Twizel Solar Project**—a large-scale utility solar farm located near Twizel, Canterbury (the **proposal**). The proposal involves the installation of approximately 495,000 ground-mounted solar panels with a combined AC export capacity of around 300 MW. Electricity generated by the facility will be connected to Transpower's 220 kV national grid via the existing Twizel substation.

To expedite development, Nova has submitted an application for referral under the Fast-track Approvals Act 2024 (**FTAA**). The application is currently under consideration. As part of this process, the Minister for Infrastructure has requested further information to provide evidence to support statements in the application that the project will deliver economic and employment benefits of regional or national significance.

To assist, this report provides a high-level assessment of the estimated economic effects of the proposal—particularly its impacts on the electricity market, GDP, employment, and household incomes. It also considers a range of wider economic effects arising from the development of the proposal.

## 2.2. Criteria for Assessing Referral Applications

The FTAA is a new, permanent fast-track approvals regime for projects of national and regional significance. It aims to remove barriers that have historically made it difficult to deliver the infrastructure and development New Zealand needs. Under section 22 of the Act, proposals may be referred to an expert panel for fast-track consenting where the Minister is satisfied that the project meets the purpose of the Act and has the potential to deliver significant regional or national benefits.

In considering whether to refer a project, the Minister may consider a range of factors set out in Section 22(2)(a). To assist decision makers, this report provides an assessment of the proposal against several of those criteria from an economic perspective. Specifically, it considers whether the project:

ii. will deliver new regionally or nationally significant infrastructure or enable the continued functioning of existing regionally or nationally significant infrastructure.

iv. will deliver significant economic benefits.

vii. will support climate change mitigation, including the reduction or removal of greenhouse gas emissions.

## 2.3. Structure of this Document

The rest of this document is structured as follows:

- **Section 3** identifies the subject site and describes the proposal.

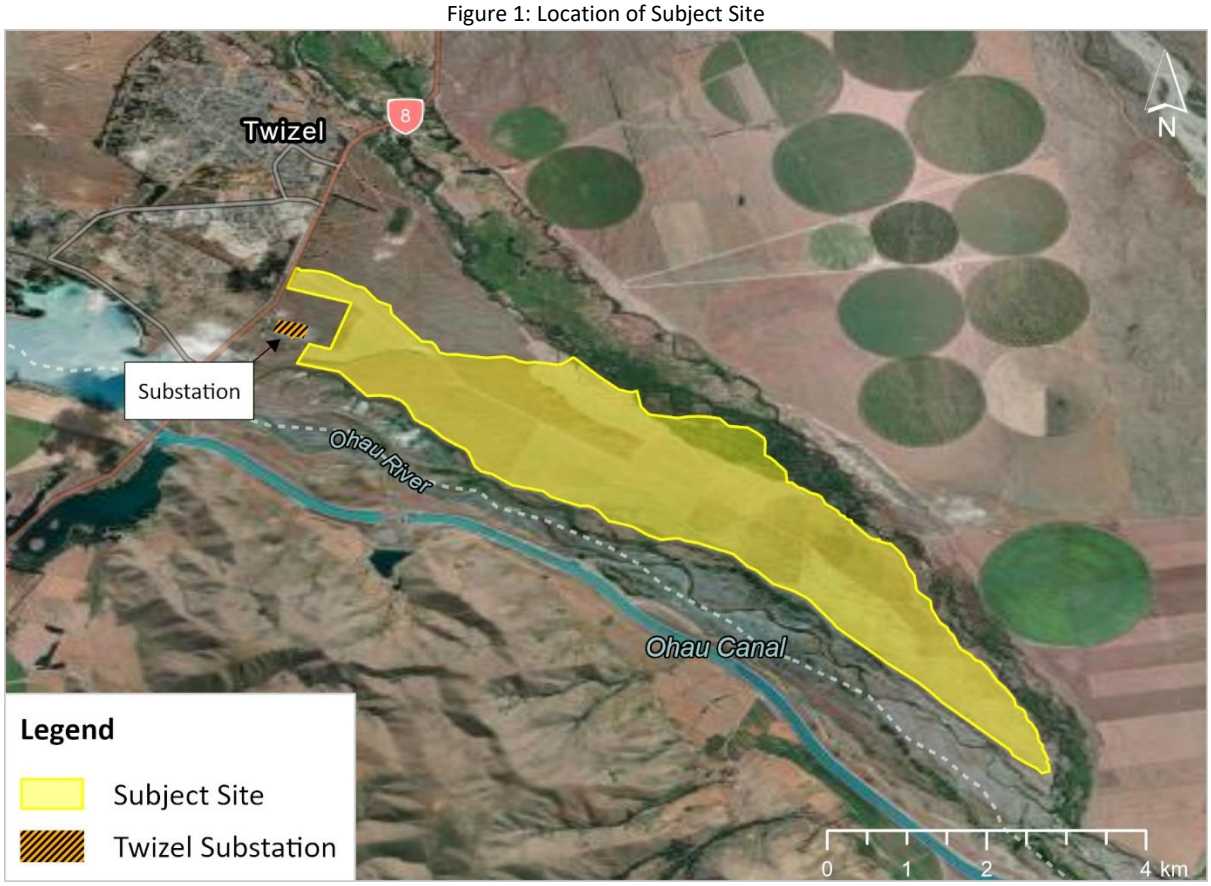
- **Section 4** discusses the economic rationale for the proposal.
- **Section 5** estimates the one-time impacts of the proposal's future development.
- **Section 6** estimates the annual impacts of future activities sustained on-site.
- **Section 7** considers a range of wider economic impacts of the proposal.
- **Section 8** provides a checklist against the FTAA referral criteria.
- **Section 9** provides a summary and conclusion.

# 3. About the Proposal

## 3.1. Site Location and Description

The subject site for the proposal is located near Twizel, in the Mackenzie District. It is bound by the Twizel and Ōhau Rivers to the north and south, with the two rivers' confluence to the east, and State Highway 8 (SH8) forming the western boundary. The site itself spans approximately 868 hectares and is largely flat with a gentle south-easterly slope. Access to the site is via an established entry road on SH8. Figure 1 below outlines the site, with the Mackenzie District's southern border delineated by the grey dashed line.

Figure 1: Location of Subject Site




## 3.2. Receiving Environment

Adjacent to the site, on the eastern side of SH8, is the Transpower Twizel substation. The site shares boundaries to the south with the Department of Conservation (**DOC**) and to the east with Meridian Energy. Currently, the property operates as a dry stock farm under a lease arrangement.

## 3.3. Zoning

The site is currently zoned General Rural Zone under the Mackenzie District Plan.

## 3.4. About the Proposal

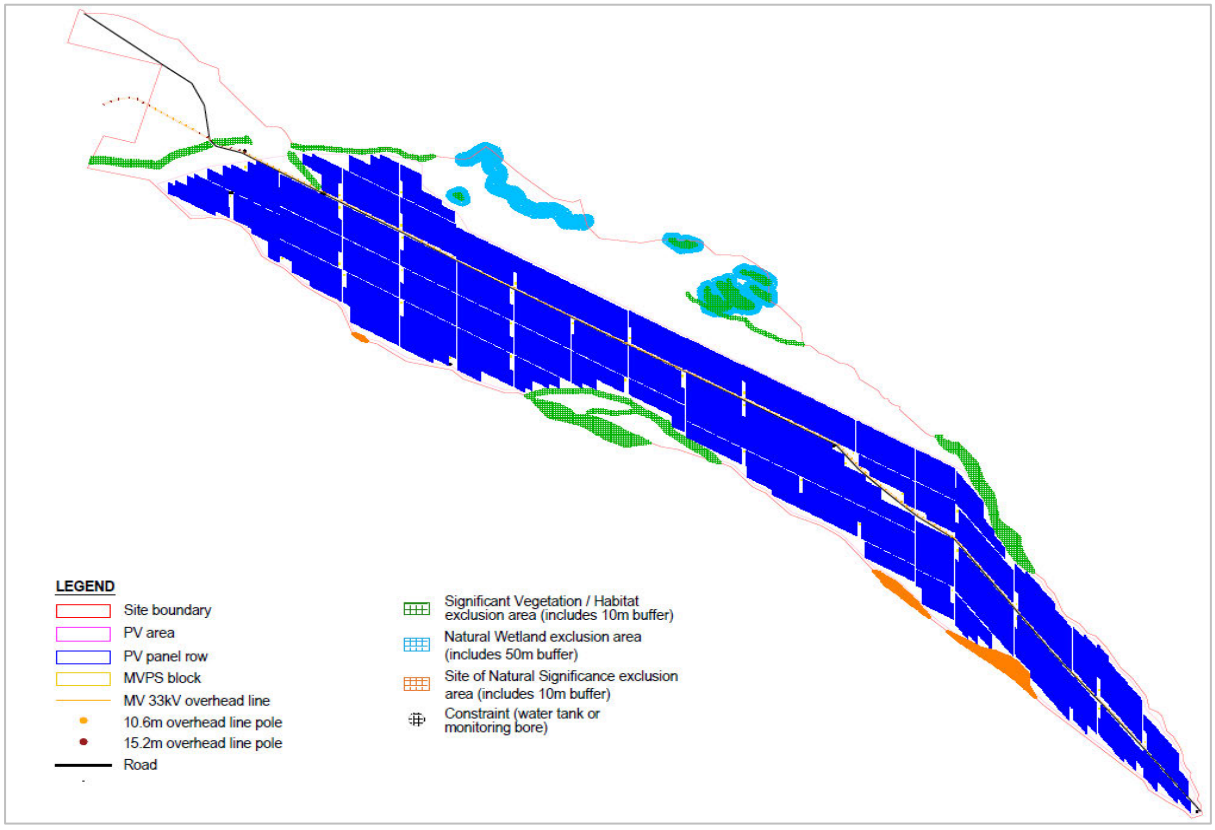
The proposal involves the installation of approximately 495,465 ground-mounted solar panels with a combined AC export capacity of around 300 megawatts (**MW**). The project utilises a single-axis east-

west tracking system for the solar panels, which automatically tilts the panels to follow the sun's angle throughout the day. Central inverters convert the direct current (DC) electricity from the solar panels into high voltage 33 kV alternating current (AC). The 33 kV circuits will then connect to Transpower's 220 kV national grid via a new connection to the Twizel substation. The project is proposed to be constructed as a single stage, but can be built in multiple stages if required, following site establishment and grid connection activities. The solar farm is anticipated to have an operational lifespan of at least 30 years.

## 3.5. Indicative Site Layout

An indicative layout of the proposed development is provided in Figure 2 below. It outlines where the solar panels (denoted as PV or *Photovoltaic*) and key infrastructure will be located, while avoiding areas set aside for ecological protection. The panels are grouped into sections, each connected to a central inverter. These inverters feed into a 33 kV distribution line that connects to the main 33/220 kV power transformers to be located within the Transpower Twizel substation.

Figure 2: Indicative Site Layout




## 3.6. Anticipated Generation

The proposal is designed to make a significant contribution to New Zealand's renewable energy supply. The 495,465 solar panels are expected to deliver a combined DC capacity of approximately 340 MWp (megawatts-peak). After conversion to AC via the central inverters, the maximum grid export capacity is expected to be approximately 300 MW.

To put this output into perspective, assuming (say) a capacity factor of 20%,[1] the solar farm could generate around 525,600 MWh (megawatt hour) of electricity per year.[2] This is enough to meet the annual electricity needs of approximately 74,000 New Zealand households, based on an average household consumption of 7,088 kWh per year.[3]

[1] The capacity factor reflects the average output relative to maximum possible output, accounting for day–night cycles, weather, and system efficiency.
[2] Calculated as 300 MW x 8,760 hours x 20% capacity factor.
[3] Ministry of Business, Innovation and Employment (MBIE), *Residential sales-based electricity cost data* (March year 2024). Available at: www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/energy-prices/electricity-cost-and-price-monitoring/

# 4. Economic Rationale for the Proposal

## 4.1. Alignment with Strategic Documents

The proposal is strongly aligned with the Government's strategic direction for decarbonisation, energy security, and renewable generation. The *Emissions Reduction Plan 2026–2030* identifies electricity generation as one of four priority areas for emissions reduction, recognising that decarbonising the electricity system is critical to achieving New Zealand's climate target of net zero by 2050.[4] The Plan commits to increasing the share of renewable generation and investing in the infrastructure needed to meet rising electricity demand while phasing down fossil fuels.

The proposal also gives effect to the *National Policy Statement for Renewable Electricity Generation 2011*,[5] which provides clear guidance for councils to recognise the national significance of renewable electricity generation, including solar. It requires that all decision-makers provide for the development, operation, maintenance, and upgrading of such generation activities, acknowledging their national and regional benefits.

Although the *New Zealand Energy Strategy* is still under development, the Ministry of Business, Innovation and Employment (**MBIE**) has made clear that the transition to a modern, secure, and affordable energy system will depend on large-scale investment in renewable generation—particularly wind and solar—to meet future demand.[6] This includes ensuring sufficient generation during periods of low hydro and variable renewables, and addressing infrastructure bottlenecks to enable rapid rollout. The Government's approach centres on removing barriers and aligning incentives to accelerate this transition.

By delivering new solar generation capacity in an area with strong irradiation, the proposal supports these national objectives and contributes to a more resilient, lower-emissions energy system. At the district level, Mackenzie District Council's *Long Term Plan* also identifies renewable energy resources in Twizel as a "natural resource of significance",[7] further reinforcing the strategic fit of the proposal within local development priorities.

## 4.2. Overview of NZ's Electricity Supply & Demand

New Zealand's electricity sector includes a high degree of renewable generation, especially compared to other developed nations, due to its strong network of hydroelectric plants. Most of these are stationed in the South Island, where they generate electricity and send it throughout the transmission system to users across the country, including to the North Island via a High-Voltage Direct Current (HVDC) link. Along with wind and solar power, which are both growing quickly from relatively small bases, New Zealand's strong hydro generation capacity meant that 88% of net electricity generation came from renewable sources in 2023.

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[4] Available here: https://environment.govt.nz/publications/new-zealands-second-emissions-reduction-plan/
[5] Available here: https://environment.govt.nz/publications/national-policy-statement-for-renewable-electricity-generation-2011/
[6] Available here: https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-strategies-for-new-zealand/new-zealand-energy-strategy
[7] Mackenzie District Council. *Long Term Plan 2024–2034: Part Four – Strategies and Policies.* p. 9.

Thermal electricity generation (i.e., from fossil-fuels) provides baseload, backup and peak electricity supply when renewable sources are insufficient, such as during spells and/or peak demand periods. Generation from these fuels comprises the balance of New Zealand's electricity supply. Most of New Zealand's thermal plants are found in the North Island, close to domestic coal, oil, and gas resources.

New Zealand households account for about one-third of total electricity demand, with a further third consumed by industrial sectors, particularly large-scale industrial processes (like wood, pulp, paper and printing plants). Tiwai Point aluminium smelter is the largest single electricity user in the country, consuming around 10% to 15% of total supply annually.

Commercial users account for a further quarter of electricity demand, with the balance (circa 7%) attributable to the transport, agriculture, forestry, and fishing sectors.

MBIE is responsible for projecting future electricity demand and ensuring there is sufficient supply to meet it. Their latest projections from July 2024[8] span five scenarios to capture a range of potential futures. In the most likely (reference) scenario, total electricity demand increases by 57% from 2023 to 2050, while three scenarios assume even higher growth, and one assumes a lower growth rate.

This demand growth is driven not just by increased population and economic activity, but also by shifts toward electrification within existing energy uses, plus increased demand from electric vehicles and large-scale datacentres. As a result, electricity's share of total energy demand is forecast to increase from just over 25% in 2023 to about 50% by 2050.

Clearly, significant extra electricity generation capacity will be required to meet projected growth in demand. In fact, MBIE project that generation capacity will need to almost double by 2050 to meet increased demand and to offset the pending retirement of some existing generators. Solar and wind account for most of this additional capacity across all five scenarios run, with the following increases expected under the most likely (reference) scenario:

- Solar generation capacity to increase more than 11-fold from 0.4 GW now to 4.7 GW by 2050
- Wind generation capacity to increase nearly five-fold from 1.0 GW now to 4.6 GW by 2050

Under other scenarios, solar generation capacity is forecast to increase to a minimum of 2.7 GW, and a maximum of 9.1 GW. Thus, regardless of which scenario is deemed most likely, large and sustained increases in solar generation capacity will be required to meet New Zealand's future energy needs.

## 4.3. Fit with Location Criteria

Finally, the proposal aligns well with locational criteria for utility-scale solar generation. Key attributes of the site that support its suitability include:

[8] MBIE. *Electricity Demand and Generation Scenarios: Results summary*. July 2024. Available here: www.mbie.govt.nz/assets/electricity-demand-and-generation-scenarios-report-2024.pdf

- **Proximity to existing grid infrastructure**: The subject site is adjacent to Transpower's Twizel substation on the eastern side of SH8. This proximity allows for a short, high-voltage connection to the national grid, minimising transmission losses and reducing capital costs associated with line construction. These efficiencies are particularly important for large-scale renewable projects seeking to maximise output and cost-effectiveness.

- **Nationally significant solar resource**: The site receives high levels of solar irradiation relative to other areas in New Zealand. Solargis' global horizontal irradiation data[9] shows the site receives around 1,470 kWh/m²/year—placing it towards the upper end of the national range, which spans from approximately 450 to 1,700 kWh/m². A map showing the subject site in relation to New Zealand's GHI levels is included in **Appendix A**.

- **High annual sunshine hours**: The Mackenzie Basin is among the sunniest regions in New Zealand. NIWA data[10] shows that Lake Tekapo recorded more than 2,500 sunshine hours per year on average between 1991 and 2020—second only to Blenheim. This high and consistent solar exposure supports the efficiency and reliability of solar energy generation. In 2023, it was the sunniest area nationally.[11]

- **Favourable topography**: The site comprises predominantly flat land with a gentle south-easterly slope, sloping away from the Twizel township. These characteristics reduce the scale and cost of earthworks, simplify construction logistics, and improve solar array alignment and efficiency.

- **Good access**: Access to the site is provided directly off SH8, which supports the efficient movement of construction and maintenance vehicles without placing pressure on local rural roads. This helps to mitigate traffic-related effects during both construction and operation.

- **Not classified as Highly Productive Land**: The site is primarily (95%) LUC Class 6, with the balance classified as Class 4. It is, therefore, not subject to the National Policy Statement for Highly Productive Land (NPS-HPL). Although land suitable for solar generation often overlaps with productive rural land, the site is mostly non-arable and has limited suitability for alternative high-value agricultural uses.

- **Low potential for land use conflict**: The site is located in a sparsely populated rural area dominated by large farming blocks and DOC land. This low population density limits the risk of reverse sensitivity issues and reduces potential amenity impacts on nearby residents.

- **Land availability**: The site was available for purchase under a competitive tender process, and has since been secured by the applicant. This ensures the site can be developed without displacement of existing high-value uses or reliance on third-party land acquisition.

[9] Available here: www.solargis.com/resources/free-maps-and-gis-data?locality=new-zealand
[10] Available here: www.niwa.co.nz/climate-and-weather/climate-data-and-activities
[11] Receiving 2,658 hours or 110 days of sunshine throughout the year.

# 5. One-Time Impacts of Development

This section estimates the one-time impacts of the proposal.

## 5.1. Introduction

In a previous section we outlined the proposal to establish a utility-scale solar farm that could deliver nearly half a million solar panels. Developing this project—across planning, civil works, and the installation of photovoltaic infrastructure—will involve significant one-off investment in materials, services, and labour. Preparing the site, constructing the array and associated infrastructure, and connecting it to the national grid will result in substantial short-term economic impacts, including contributions to GDP, employment, and wages.

## 5.2. Methodology

We quantified these one-time economic impacts using a special technique called multiplier analysis, which traces the impacts of additional economic activity in one sector—such as construction—through its supply chain to estimate the overall impacts, including flow-on effects. These comprise two parts:

- **Direct impacts** – which capture all on-site and off-site activities directly related to the proposal's development, e.g., civil contractors preparing the site, and their various subcontractors and suppliers, some of which will be on-site, and some of which will be off-site.

- **Indirect effects** – which capture additional (supply-chain) impacts arising when businesses working directly on the project source goods and services from their suppliers, who in turn may need to source goods and services from their own suppliers, and so on.

These economic impacts are measured in various ways, including:

- **Contributions to GDP (**or **value-added)** – GDP measures the difference between a business' inputs (excluding wages and salaries) and the value of its outputs. It captures the value that a business adds to its inputs to create its own outputs, hence the term "value-added."

- **Total FTEs** – which equals the total number of full-time equivalent workers employed.

- **Total Jobs** – which is the total number of people employed, i.e., including both part-time and full-time workers.

- **Total wages and salaries** – which equals the total amount paid in wages and salaries.

For example, when a construction firm wins a new project, they will subcontract various parts of the build, such as earthworks and electrical installation, to a range of specialist providers. Those subcontractors, in turn, will then usually need to source additional materials and services from their suppliers, who may then need to source materials and services from their suppliers, and so on. Multiplier analysis enables the impacts of these supply chain interactions to be captured to estimate

the overall impact of the new construction project, including its direct and flow-on (supply chain) effects.

For completeness, we also provide broad-brush estimates of potential GST payments based on the GDP (i.e., value-added) created.

## 5.3. Development Assumptions

Our analysis incorporates various assumptions about the likely scale and composition of development expenditure. The project team has advised that the total capital cost of the proposal is expected to be approximately $500 million.[12] Of this, a conservative estimate of around 25 percent—or $125 million—is expected to be spent domestically on planning, earthworks, construction, equipment, and services. The remaining 75 percent likely reflects imported components such as solar panels, inverters, and tracking systems, and is excluded from modelling.

Because reliable data was provided on project expenditure, we began with that figure and then derived estimates of planning and earthworks expenditure as percentages of the total. Specifically, we allocated 2 percent of total domestic expenditure to planning and consenting activities, and 20 percent to civil works and site preparation. These allocations are broadly consistent with our experience on other large infrastructure projects elsewhere in New Zealand.

## 5.4. Summary of Development Costs

Table 1 summarises the estimated total cost of the proposal across the three key activities based on the assumptions set out above, which equal $125 million in today's dollars.

Table 1: Summary of Estimated Development Costs ($ millions)

| **Development Activity** | **$ millions** |
|---|---|
| Planning/design/consent | $2.5 |
| Civil works & infrastructure provision | $25.0 |
| Construction & installation | $97.5 |
| **Total Development Cost** | **$125** |

Finally, these costs were mapped[13] to sectors of the regional/national economy then overlaid with the latest economic multipliers to derive the one-off impacts of the proposal's development, as set out below.

[12] The capital cost estimates provided by Nova are high-level and have been informed by its involvement in another large-scale project of a similar nature, which provides a basis for estimating both the overall and domestic components of expenditure.

[13] While the key activities involved in solar farm development align well with sectors in the economic multipliers dataset, no single sector captures the full scope of construction and installation activities. As such, expenditure was distributed across several relevant sectors to reflect the mix of manufacturing, electrical, engineering, and civil construction services involved. Planning, design, and consenting costs were allocated across scientific, architectural, and engineering services; legal and accounting services; and advertising, market research, and management services.

## 5.5. Estimated Impacts on GDP, Jobs, and Wages

Table 2 below presents the one-time impacts of the proposal's development based on the methodology, inputs, and assumptions described above. All activities are assumed to occur over a two-year period.

Table 2: One-Time Economic Impacts of the Proposal (spread over two years)

| | Planning & Design | Infrastructure & Civil Works | Construction & Installation | Development Totals |
|---|---|---|---|---|
| **Annual Jobs** | | | | |
| Direct impacts | 5 | 30 | 119 | 154 |
| Indirect impacts | 3 | 38 | 143 | 184 |
| **Total** | **8** | **68** | **262** | **338** |
| | | | | |
| **Annual FTEs** | | | | |
| Direct impacts | 4 | 29 | 113 | 146 |
| Indirect impacts | 3 | 36 | 132 | 171 |
| **Total** | **7** | **65** | **245** | **317** |
| | | | | |
| **Total Wages $m** | | | | |
| Direct impacts | $1 | $6 | $19 | $26 |
| Indirect impacts | $1 | $6 | $23 | $30 |
| **Total** | **$2** | **$12** | **$42** | **$56** |
| | | | | |
| **Total GDP $m** | | | | |
| Direct impacts | $1 | $8 | $31 | $40 |
| Indirect impacts | $1 | $11 | $42 | $54 |
| **Total** | **$2** | **$19** | **$73** | **$94** |

In summary, we estimate that:

- Future planning/design/consenting will create full-time employment for 7 people over the two-year development period, generating total wages/salaries of $2 million;
- Land development (including infrastructure provision and all other civil works) will create full-time work for 65 people, with $12 million paid in wages and salaries; and
- Construction will provide full-time work for 245 people, with $42 million paid in wages and salaries;

Overall, the proposal's development is estimated to provide full-time work for more than 315 people for two years, generating $56 million in wages/salaries, and boosting GDP by $94 million.

## 5.6. Top 10 Industries by FTEs Employed

To better understand the likely impacts of future development, Table 3 below reveals the 10 industries likely to experience the greatest employment boosts. Those top 10 industries account for nearly three-quarters of all full-time employment generated by the proposal's development, with the balance spread across numerous other sectors.

Table 3: Top 10 Industries by Annual FTEs Generated during Development

| Industries | Annual FTEs | Shares |
|---|---|---|
| Construction services | 109 | 34% |
| Heavy and civil engineering construction | 34 | 11% |
| Scientific, architectural, and engineering services | 20 | 6% |
| Fabricated metal product manufacturing | 16 | 5% |
| Non-residential building construction | 14 | 4% |
| Road transport | 12 | 4% |
| Electronic and electrical equipment manufacturing | 10 | 3% |
| Public order, safety, and regulatory services | 8 | 3% |
| Employment and other administrative services | 7 | 2% |
| Legal and accounting services | 6 | 2% |
| **Top 10 Subtotal** | **236** | **74%** |
| | | |
| All Other Industries | 81 | 26% |
| **All Industries** | **317** | **100%** |

## 5.7. Indicative GST Payments

Finally, we estimated indicative GST payments potentially associated with the proposal's future development. This is difficult to do accurately, though, because such payments depend on factors not explicitly captured in our analysis. That said, a broad-brush, indicative estimate can be derived from the national GDP generated, which was $94 million. Applying the current (15%) GST rate to this figure gives an indicative GST payment of $14 million in today's dollars.

## 5.8. Regional Share of One-Time Impacts

Based on the location and nature of the proposal, we conservatively estimate that around 90% of the national one-time economic benefits are likely to accrue to the Canterbury region. On that basis, the proposal is expected to generate a regional GDP boost of approximately $85 million, support around 285 full-time jobs over two years, and contribute around $50 million in regional wages and salaries.

# 6. Ongoing Impacts of Future Uses

This section estimates the annual impacts of the proposal's operation once built out.

## 6.1. Introduction

In addition to the one-off impacts of construction just estimated, the proposal's long-term operation is expected to support around 20 FTE jobs per year. This includes 8 permanent roles and approximately 12 FTEs provided through contracted support services. The permanent roles will likely span both on-site and off-site functions, with around half dedicated to site-based operations and maintenance—such as vegetation control, panel cleaning, equipment preventative maintenance, inspections and repair, and monitoring—and the remainder focused on management and administrative functions including stakeholder engagement, compliance, property and lease management, accounting, and market operations. Contracted roles are expected to cover a range of specialist and periodic support services.

## 6.2. Methodology

We estimated the potential annual economic impacts of ongoing operations by:

1. Inputting the likely operational workforce supported at full build-out, as follows:
    i. **Permanent Roles:** As advised by the project team, the solar farm is expected to support a total of 8 FTE positions on an ongoing basis. This includes 4 FTEs in on-site operations and maintenance, and 4 FTEs in off-site management and administration.
    ii. **Contracted Support Services:** Estimated at approximately 12 FTEs.[14]
2. Allocating those roles to their respective input-output industries.
3. Applying the same economic multipliers from the previous section to translate future ongoing employment into corresponding measures of annual GDP and wages/salaries.
4. Summarising the findings as provided in the following section.

## 6.3. Annual GDP, Jobs, and Wages

Table 4 below summarises the annual economic impacts of future activity in terms of FTEs employed, GDP contributed, and wages generated.

[14] Based on a conservative benchmark of 4 FTEs per 100,000 panels, derived from a review of more than twenty comparable solar farm projects. Applied to the Twizel project's 495,465 panels, this implies a total of approximately 20 FTEs. After accounting for the 8 permanent roles advised by the project team, the remaining 12 FTEs have been attributed to contracted support services.

Table 4: Estimated Annual Economic Impacts of the Proposal (at full build-out)

| Solar Operation & Maintenance | Jobs | FTEs | GDP $m | Wages $m |
|---|---|---|---|---|
| Permanent Roles | 8.7 | 8.0 | 1.9 | 0.8 |
| Contracted Support Services | 13.2 | 12.0 | 2.3 | 1.0 |
| **Totals** | **21.9** | **20.0** | **4.1** | **1.8** |

In summary, the proposal's future operation and maintenance could sustain the following activity at full build-out:

- Full-time employment for 20 people;
- Annual GDP of nearly $4.1 million; and
- $1.8 million paid annually in salaries / wages.

## 6.4. Indicative GST Payments

Finally, based on the estimated national GDP of $4.1 million, we calculated indicative/ballpark GST payments (in a similar manner to paragraph 5.7 above) of $615,000.

## 6.5. Regional Share of Ongoing Impacts

Assuming 90% of ongoing national impacts accrue to the region, the proposal is estimated to contribute around $3.7 million to regional GDP and $1.6 million in wages annually, while supporting 18 full-time equivalent jobs in the Canterbury Region.

## 6.6. Wider Ongoing Employment Impacts

Importantly, the jobs supported by the proposal will provide more than just ongoing employment—they also contribute to local capability building, industry diversification, and regional workforce development. For example:

- **Skill Development and Training:** On-the-job training in solar infrastructure, electrical systems, and remote monitoring can support workforce upskilling and build long-term technical capability in the region.
- **Pathways into the Energy Sector:** The operational roles—ranging from entry-level vegetation management to specialised electrical servicing—offer pathways into the growing renewable energy industry, which is expected to expand nationally as part of the energy transition.
- **Stable, Long-Term Employment:** Unlike construction jobs, these roles are ongoing and year-round, providing permanent and contracted employment in a typically rural and seasonally affected labour market.
- **Support for Local Service Providers:** Contracted services such as panel cleaning, inspection, and maintenance may be delivered by locally based firms, helping to build and sustain regional businesses and trades.

- **Broader Economic Linkages:** The solar farm may generate indirect employment through its demand for support services, consumables, and monitoring technology, as well as engagement with local suppliers and consultants.

Overall, by anchoring long-term operational activity and connecting regional workers and businesses to the renewable energy economy, the proposal is expected to deliver lasting employment and economic development benefits.

# 7. Wider Economic Impacts

## 7.1. Project Acceleration

Not only is the proposal expected to provide meaningful employment for a wide range of local workers, as illustrated above, but it will likely progress considerably faster via the FTAA process than would otherwise be the case.

The proposal is well-suited to contribute to New Zealand's near-term renewable energy targets, given the relative speed with which utility-scale solar farms can be delivered. Reflecting this, the Electricity Authority has identified solar as the most actively pursued generation type. As of 2022, solar made up 78% of all projects that could feasibly be completed by 2025.[15] However, developers have noted that regulatory barriers can still slow delivery.

Absent fast-track approval, the proposal is likely to be subjected to a protracted resource consent process that would take significantly longer. Accordingly, the proposal enables the project to commence sooner, thereby allowing the associated economic and environmental benefits to be realised sooner too.

## 7.2. Impacts on Renewable Energy Infrastructure

By adding a large-scale solar generation facility to the national grid, the proposal enhances the diversity and resilience of New Zealand's energy supply. Solar generation complements New Zealand's existing renewable sources, such as hydro and wind, by providing power during periods when these other sources may be less available (e.g., sunny days which can coincide with lower wind or dry periods which impact hydro). This diversification is crucial for improving the security and stability of the national electricity system, particularly as New Zealand transitions towards its goal of a fully renewable electricity system.

## 7.3. Reduction in Reliance on Higher Carbon Alternatives

According to the Ministry for the Environment's *Greenhouse Gas Inventory Snapshot 1990–2023*,[16] the energy sector is the second-largest contributor to New Zealand's gross greenhouse gas emissions, accounting for 38% of the total in 2023. These emissions are primarily carbon dioxide, originating from the combustion of fossil fuels across electricity generation, transport, and industrial processes. Between 2021 and 2023, however, energy emissions decreased by nearly 9%, largely due to wetter conditions boosting hydro generation and the displacement of coal and gas use in the electricity sector.

The proposed solar development supports this emissions trajectory by further reducing the need for fossil fuel-based electricity generation. Natural gas, for instance, still supplies up to 23% of New Zealand's electricity,[17] and displacing this with solar generation provides a direct emissions benefit, while also having positive implications for other industries. For instance, sectors like fertiliser

[15] www.ea.govt.nz/documents/2158/Factsheet-wholesale-market-review_october_2022.pdf
[16] Available here: www.environment.govt.nz/assets/publications/GhG-Inventory/GHG-Inventory-2025/GHG-inventory-2025-Snapshot.pdf
[17] www.ea.govt.nz/news/eye-on-electricity/natural-gas-and-the-electricity-sector-transition/

production, exemplified by companies such as Ballance Agri-Nutrients, depend on natural gas as a feedstock. By decreasing the power sector's gas consumption, more natural gas becomes available for these industrial processes, supporting their operations and contributing to economic stability.

More broadly, expanding renewable capacity improves energy security and reduces exposure to volatile fossil fuel markets, especially as domestic gas reserves continue to decline.[18] Projects like the proposal therefore contribute not only to emissions reductions, but also to long-term system resilience and industrial continuity.

## 7.4. Improved Competition in the Wholesale Electricity Market

The introduction of a large-scale solar farm into the national grid increases overall supply, which in turn enhances competition among wholesale electricity generators. By adding significant renewable capacity, the proposal increases supply diversity and puts downward pressure on wholesale prices by reducing reliance on higher-cost, fossil-fuel-based peaking plants. This additional supply can help to alleviate wholesale price pressures, especially during periods of high demand or dry years.

The Electricity Authority has emphasised that increasing generation capacity is critical for fostering competition and improving price outcomes. In a 2023 paper,[19] the Authority notes that a more dynamic generation market is essential to counteract high and volatile electricity prices and to prevent excessive market concentration. This was reinforced by the sharp spike in wholesale spot prices in August 2024, when constrained gas supply, low hydro storage, and reduced wind generation drove prices from around $300/MWh to more than $800/MWh.[20] While prices stabilised quickly, the event highlighted the market's vulnerability to supply shocks and the importance of accelerating new renewable generation. The Authority also notes that the shift toward renewables can help reduce barriers for new entrants and support a more competitive and flexible market structure.

In this context, the proposal contributes to national objectives of affordability, reliability, and sustainability. It aligns with the work of the newly established Energy Competition Taskforce,[21] which is focused on enabling greater participation from independent generators and retailers, with the ultimate aim of delivering better outcomes for electricity consumers.

## 7.5. Reduction in Rate of Retail Electricity Price Growth

While retail electricity prices in New Zealand are influenced by a range of factors—including transmission, distribution, and retail costs—increasing renewable generation can help moderate upward price pressures over time. The proposal contributes to this by adding low marginal cost generation to the grid, which reduces reliance on more expensive peaking plants and improves supply security. This can flatten wholesale price volatility, which in turn helps mitigate flow-through effects on retail pricing, especially as electricity demand grows with electrification across various sectors.

[18] www.argusmedia.com/en/news-and-insights/latest-market-news/2691119-new-zealand-to-invest-119mn-in-gas-fields
[19] Available here: www.ea.govt.nz/documents/3017/Decision_paper_promoting_competition_through_the_transition.pdf
[20] https://www.ea.govt.nz/news/eye-on-electricity/what-was-behind-high-wholesale-electricity-prices/
[21] A jointly established task force between the Electricity Authority and the Commerce Commission to investigate ways to improve the performance of the electricity market.

## 7.6. Utilisation and Diversity Benefits

The proposal also contributes to a more geographically diverse electricity generation system, with benefits for grid resilience and supply-side efficiency. Located in the Upper Waitaki catchment, the solar farm will be positioned within existing transmission capacity and hydro generation in the Mackenzie Basin and wider South Canterbury region, potentially lowering line losses and deferring the need for costly grid upgrades. It also supports local energy security and may help improve supply reliability through preservation of hydro storage or use during peak demand periods.

## 7.7. Foregone Economic Activity

The main potential economic cost of the proposal is forfeiting the subject land for alternative uses, such as rural production. However, the land is not classified as Highly Productive under the NPS-HPL, and is currently used for stock grazing, which is a very low-intensity and low value land use. Accordingly, any economic impact will be less than minor.

## 7.8. Highest and Best Use of Land

The proposal will also enable the land to be put to its highest and best use, which is a precondition for economic efficiency to hold in the underlying land market.

## 7.9. Investment Signal Effects

Finally, we note that the development will provide a strong signal of confidence in the district economy, which may help spur on, accelerate, or bring forward additional economic development.

# 8. FTAA Criteria Checklist

The following table provides a signpost to where each of the relevant criteria listed in Section 22(2)(a) of the FTAA are addressed in this report.

Table 5: Assessment Against Section 22(2)(a) Criteria of FTAA

| Ref | Criterion | Signpost |
|---|---|---|
| (i) | Identified as a priority project in government plans or strategies | n/a |
| (ii) | Delivers new or supports existing regionally/nationally significant infrastructure | Sections 4 & 7 |
| (iii) | Increases housing supply, addresses housing needs, or contributes to a well-functioning urban environment | n/a |
| (iv) | Delivers significant economic benefits | Sections 5 & 6 |
| (v) | Supports primary industries, including aquaculture | n/a[22] |
| (vi) | Supports development of natural resources, including minerals and petroleum | n/a |
| (vii) | Supports climate change mitigation (e.g., reducing greenhouse gas emissions) | Section 7 |
| (viii) | Supports climate change adaptation, reduces risk from natural hazards | n/a |
| (ix) | Addresses significant environmental issues | n/a |
| (x) | Consistent with local/regional planning documents and spatial strategies | n/a |

[22] We note, however, that there will continue to be grazing under the solar panels—a practice known as *Agrivoltaics*—so support for primary industry will be retained.

# 9. Summary and Conclusion

This report has assessed the estimated economic effects of the proposed utility-scale solar farm near Twizel. The analysis confirms that the proposal is expected to deliver a mix of short-term and enduring economic benefits—regionally and nationally.

Over the two-year construction period, the project is estimated to generate a one-time regional GDP boost of around $85 million, support the equivalent of 570 full-time job-years, and contribute $50 million in wages. Once operational, the solar farm will sustain around 18 FTEs annually, contributing $3.7 million to GDP and $1.6 million in wages each year.

Beyond these quantifiable effects, the proposal is expected to deliver a range of wider benefits:

- It strengthens the resilience and competitiveness of New Zealand's electricity market by adding 300 MW of new generation capacity in a high-irradiation location.
- It supports the decarbonisation of the energy system, reducing reliance on fossil fuels and contributing to emissions targets under the Emissions Reduction Plan.
- It helps moderate electricity price volatility and supports security of supply, especially during dry years or fuel shortages.
- It makes productive use of rural land with limited existing economic yield, and aligns with district- and national-level planning documents promoting renewable energy development.

Finally, the proposal is well-suited to fast-track consenting. Unlike other forms of generation, solar farms can be consented and delivered quickly—making them an important lever for meeting near-term energy needs. The FTAA process enables these benefits to be realised sooner than would otherwise be possible.

# Appendix A: Solar Irradiation at the Site

The figure below shows average yearly global horizontal irradiation (GHI) across New Zealand, based on long-term satellite-derived data from Solargis. The subject site is marked in blue and is centrally located within one of the highest GHI zones in the country, receiving approximately 1,470 kWh/m²/year. This level of solar resource places the site well above the national average and highlights its suitability for utility-scale solar generation.

Figure 3: Global Horizontal Irradiation (GHI) Across New Zealand