

10 March 2021

Report to

BEYOND ZERO EMISSIONS

Regional economic impact analysis of Renewable Energy Industrial Precincts

Central Queensland REIP



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Executive summary

Introduction

Beyond Zero Emissions (BZE) commissioned ACIL Allen to estimate the potential economic impact of the Central Queensland Renewable Energy Industrial Precinct (REIP) in the jurisdiction that it is located (Gladstone), the rest of Queensland and on the Australian economy as a whole.

The REIP

According to BZE, REIPs will support a cluster of manufacturers powered by 100 per cent renewable energy. These precincts will either be located within Renewable Energy Zones or connected to renewable energy generation through high voltage transmission lines.

The potential capital and operational expenses of the Central Queensland REIP is summarised in **Table ES 1**. Based on the information provided by BZE, it is estimated that the REIP itself would incur capital expenses of \$1.7 billion (excluding renewable electricity generation). It is expected that a range of new manufacturing activities will be potentially base their location in the Central Queensland region because of the presence of the REIP. Currently, these include:

- Hydrogen production
- Tyre recycling
- Green Ammonia
- Solvent extraction of Alumina

Additional capital expenses will be incurred to base the above manufacturing firms in the Central Queensland REIP. It is estimated that the additional capital expenses to establish these new manufacturing activities will be around \$8.1 billion. The combined total expected capital expenditure in the region will therefore be around \$9.9 billion.

Table ES 1 Potential capital and gross operating surplus — Central Queensland REIP

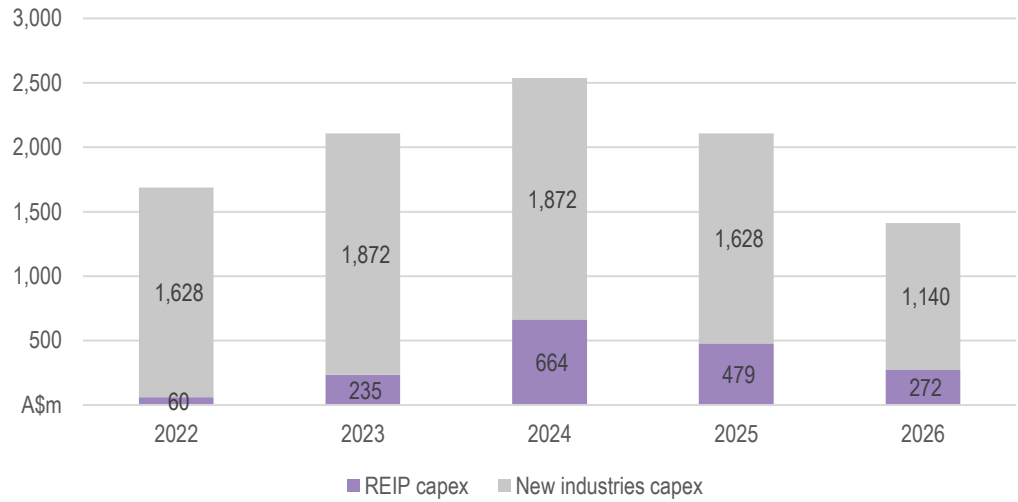
	Total capital expenditure	Annual operational profits
	A\$m	A\$m
REIP (excluding renewable electricity generation)	1,710	96
Potential new industries	8,141	458
TOTAL	9,851	554

Note: Asset life of 45 years with 5 per cent return is assumed to generate profit to meet the capital commitments.

Source: ACIL Allen estimates based on BZE data and assumptions

Given the preliminary nature of the discussions with potential participants in the REIP, the scheduling of the capital expenses and the ramp-up of operations is uncertain. Based on similar projects, an indicative time profile of capital expenses is shown in **Figure ES 1**.

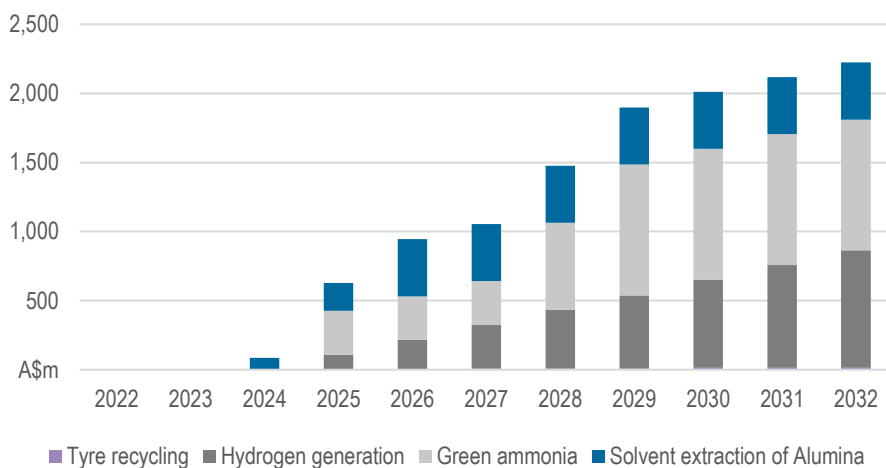
Figure ES 1 An indicative time profile of capital expenses — Central Queensland REIP



Note: Asset life of 45 years with 5 per cent return is assumed to generate profit to meet the capital commitments.
 Source: ACIL Allen estimates based on BZE data and assumptions

The estimated revenue from the above four new activities is summarised in **Figure ES 2** and is based on public announcements. Green ammonia production is the largest new manufacturing activity anticipated within the Central Queensland REIP followed by hydrogen. Annual revenue from the tyre recycling activity will be around \$14 million and the solvent extraction of Alumina will be around \$413 million. By 2032, the revenue estimated from these new manufacturing activities expected to total around \$2.2 billion.

Figure ES 2 Estimated revenue from new manufacturing activities — Central Queensland REIP (\$2020 prices)



Source: ACIL Allen estimates based on BZE data and assumptions

In addition, existing high energy intensive businesses such as aluminium smelting and chemical production would maintain their production in the region. The revenue of existing energy intensive manufacturing industries that will be supported by the REIP is conservatively estimated at around \$4.8 billion.

Economic impact analysis

To estimate the potential net economic impacts of the REIP (excluding renewable generation), new manufacturing activities — green ammonia, hydrogen, solvent extraction of alumina and tyre recycling — and maintaining existing high energy intensive manufacturing activities, ACIL Allen employed its Computable General Equilibrium (CGE) model, *Tasman Global*. It is a regional economic model with detailed supply chain relationships within the region, rest of the region and the rest of the world. ACIL Allen has employed this model for several economic impact assessments for private and government clients.

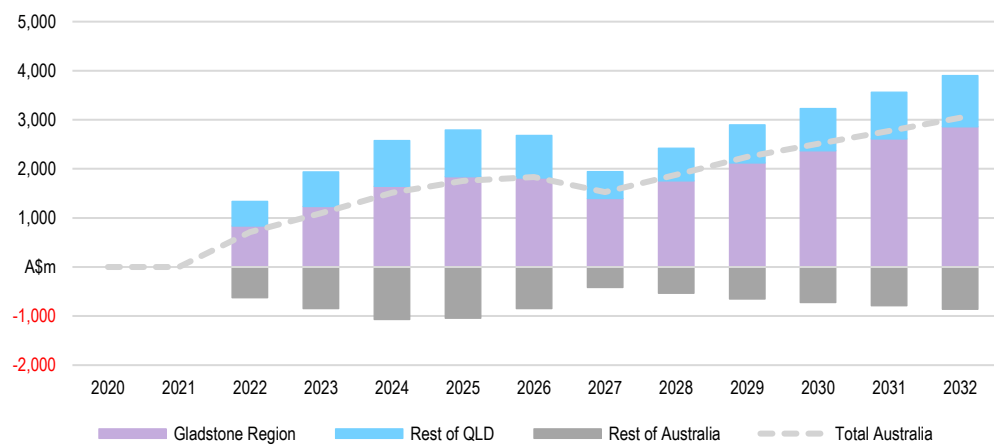
The estimated macroeconomic and employment impacts of the REIP and its supported existing and new activities are summarised below.

Real income impacts

A rise in real income indicates a rise in the capacity of residents to purchase goods and services and also to accumulate wealth in the form of financial and other assets. The change in real income arising from REIP and supporting industries is a measure of the change in the well-being of residents in the region.

Figure ES 3 shows the projected potential real income impact for the Gladstone region, the rest of Queensland and the rest of Australia between the 2022 and 2032 financial years. This includes construction phase of the REIP infrastructure to 2026 and operation of the REIP, new industries and the sustainment of existing energy intensive industries in the region.

Figure ES 3 Real income impacts relative to a reference case (\$2020 prices), 2022–2032



Source: ACIL Allen modelling based on BZE data and assumptions

Table ES 2 Real income impacts relative to a reference case, 2022-2032

Regions	Units	Annual average	Total (2022-2032)	Impact at 2032	NPV at 3%	NPV at 7%
Gladstone region	\$2020, \$m	1,862	20,482	2,861	16,287	12,272
Queensland	\$2020, \$m	2,663	29,290	3,903	23,411	17,762
Australia	\$2020, \$m	1,898	20,878	3,041	16,512	12,349

Source: ACIL Allen modelling based on BZE data and assumptions

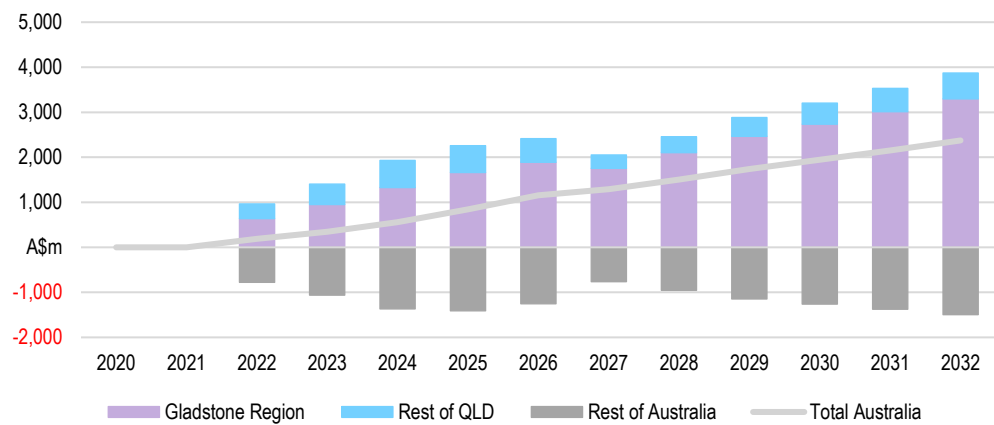
Over the period 2022 to 2032, the REIP and related activities is projected increase the real income of residents in:

- the Gladstone region by a cumulative total of \$20.5 billion (with a present value of \$12.3 billion using a 7 per cent discount rate)
- Queensland by a cumulative total of around \$29.3 billion (with a present value of \$17.8 billion with a 7 per cent discount rate)
- Australia by a cumulative total of over \$20.9 billion (with a present value of \$12.4 billion with a 7 per cent discount rate).

Impact on real economic output

Real economic output (real GDP) is one of the primary indicators used to estimate the economic impacts of a project. At the state level, this measure is defined as Gross State Product (GSP) and at the regional level, it is defined as Gross Regional Product (GRP). The projected changes in real economic output as a result of the REIP and related activities are presented in **Figure ES 4**.

Figure ES 4 Projected change in real economic output due to the Central Queensland REIP, relative to a reference case (\$2020 prices), 2022–2032



Source: ACIL Allen modelling based on BZE data and assumptions

Table ES 3 Projected change in real economic output due to the Central Queensland REIP, relative to a reference case, 2022–2032

Regions	Units	Annual average	Total (2022-2032)	Impact at 2032	NPV at 3%	NPV at 7%
Gladstone region	\$2020, \$m	1,985	21,832	3,293	17,164	12,730
Queensland	\$2020, \$m	2,453	26,980	3,869	21,357	15,990
Australia	\$2020, \$m	1,283	14,112	2,374	10,936	7,946

Source: ACIL Allen modelling based on BZE data and assumptions

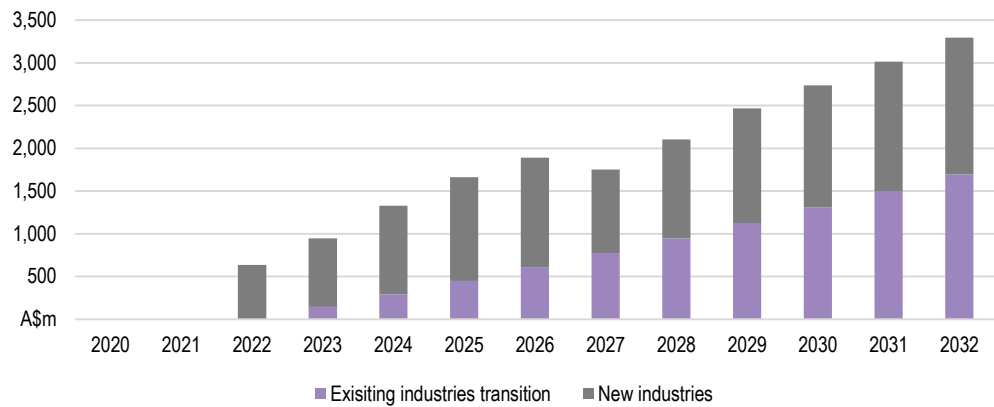
Over the period 2022 to 2032, the REIP and related activities is projected to increase real economic output of:

- the Gladstone Region by a cumulative total of \$21.8 billion relative to a reference case (with a present value of \$12.7 billion using a 7 per cent real discount rate).
- Queensland (i.e. real GSP) by a cumulative total of around \$27 billion relative to a reference case (with a present value of \$16.0 billion, using a 7 per cent real discount rate).

- Australia (i.e. real GDP) by a cumulative total of over \$14.1 billion relative to a reference case (with a present value of \$7.9 billion, using a 7 per cent real discount rate).

Real economic output impacts for existing energy intensive industries transitioning, and new industries planning to use to use renewable energy sources are summarised in **Figure ES 5**. Over the next 10 years, nearly half of of projected benefit in the Gladstone region is related to existing industries.

Figure ES 5 Real output impacts in the Gladstone region, 2022–2032



Source: ACIL Allen modelling based on BZE data and assumptions

Employment impacts

The employment impacts from the REIP and related activities are shown in **Figure ES 6** and **Table ES 4**.

Table ES 4 Employment impacts relative to a reference case, 2022-2032

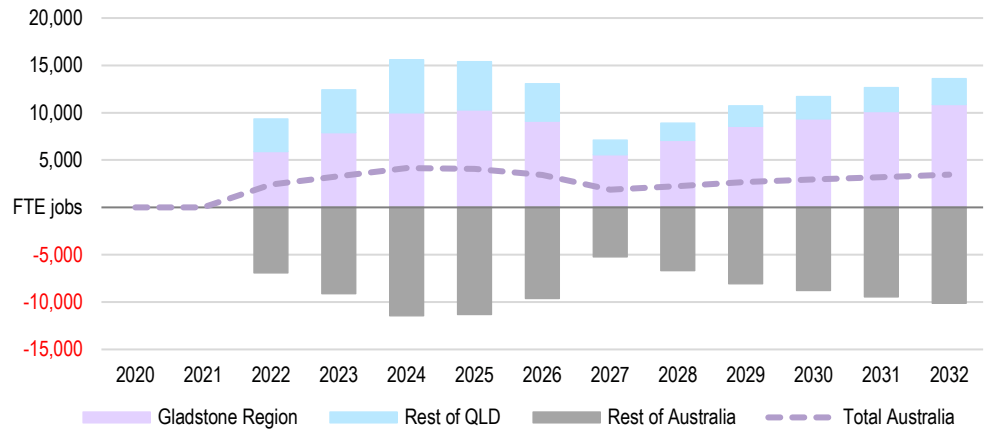
Regions	Annual average	Employment in 2032	Total (2022-2032)
	FTE	FTE	Employee years
Gladstone region	8,610	10,880	94,710
Queensland	11,868	13,613	130,545
Australia	3,069	3,471	33,761

Source: ACIL Allen modelling based on BZE data and assumptions

As a result of the REIP and related activities, it is projected that full time equivalent employment within the:

- Gladstone Region will increase by a cumulative total of 94,710 additional employee years between 2022 and 2032 (or an annual average of 8,610 FTE jobs)
- Queensland will increase by a cumulative total of 130,545 additional employee years between 2022 and 2032 (or an annual average of 11,868 FTE jobs a year)
- Australia will increase by a cumulative total of 33,761 additional employee years between 2022 and 2032 (or an annual average of 3,069 FTE jobs a year).

Figure ES 6 Employment impacts relative to a reference case, 2022–2032



Source: ACIL Allen modelling based on BZE data and assumptions

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