Meridian Energy Limited

Economic profit calculations

September 2021

Important notice

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This report summarises a report prepared by PwC for Meridian Energy Limited which analyses the economic profit generated by Meridian over the period 2011 to 2021.

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Executive Summary

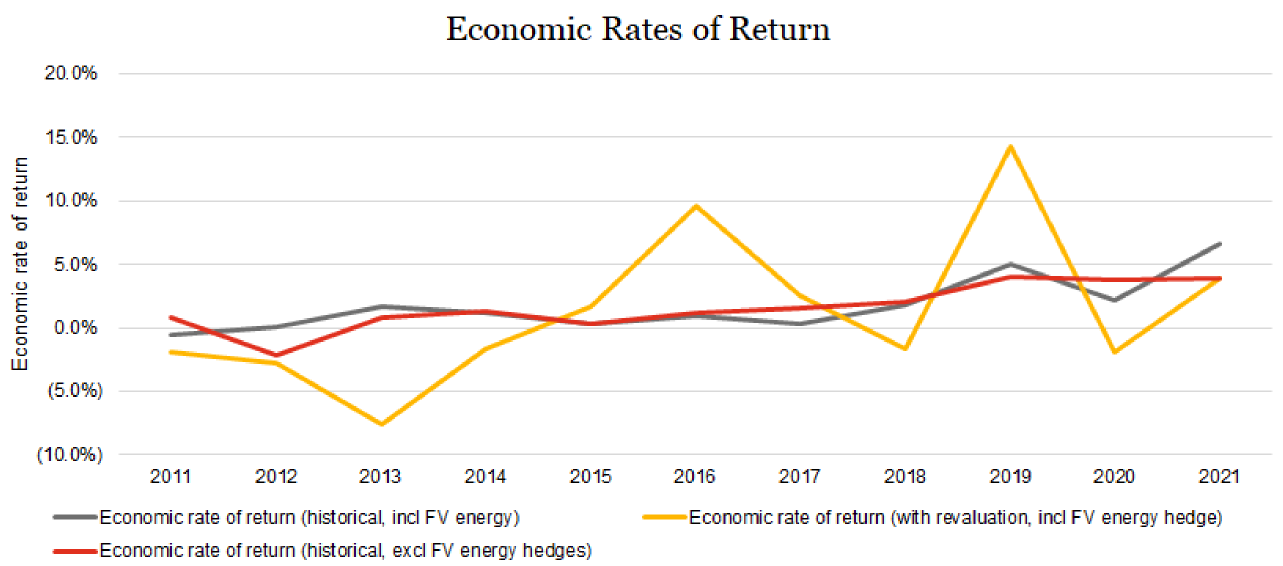
We have undertaken an economic profit analysis, using public information only, of Meridian's performance for the financial years 2011 to 2021. Although this is eleven years, it is a relatively short period in the investment life cycle for a business such as Meridian and the generation assets it owns and controls.

There are many different adjustments that can be made to derive economic profit from accounting profit. Identifying which adjustments to make and quantifying many of them involves an element of judgement. Moreover, the impact of adjustments on the analysis in a given year and over time can be material. The most significant adjustment we have made in our analysis is the inclusion or exclusion of revaluation gains and losses from economic surplus and invested capital.

Since the choice of approach can have a material impact on results, it is necessary to interpret the results with care. Furthermore, it is preferable to use more than one approach to calculate economic profit before making an assessment of the level of profit or loss generated.

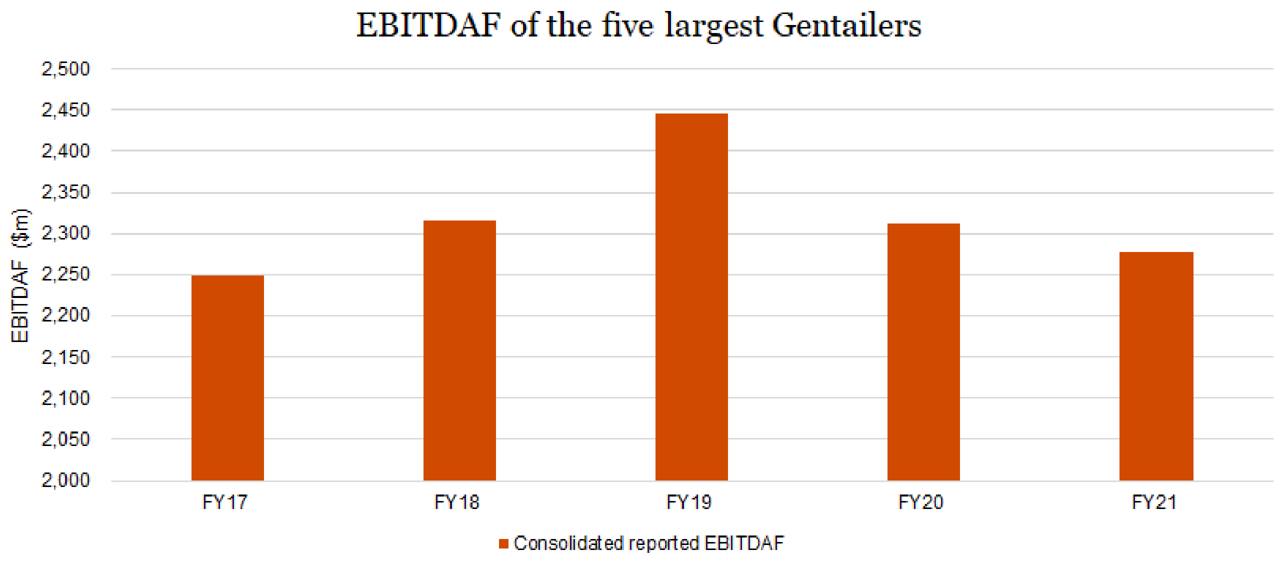
Our estimate of Meridian's economic profit (described as the economic rate of return) is summarised in the following figure. We have used three calculation methods:

- Invested capital based on historical cost (to the extent feasible) with fixed asset revaluation gains and losses excluded from economic earnings. We also exclude fair value gains or losses on energy hedges from economic profit.
- Invested capital based on historical cost, but fair value gains or losses on energy hedges are included in economic profit.
- Both earnings and invested capital include fixed asset and energy hedges revaluation gains or losses.



The figure above shows that results for any one year can differ substantially depending on the assumptions used for the calculations. Each of the three methods has pros and cons but all are valid calculation approaches.

There is no clear trend in economic profit over the eleven-year period, although you would say there is a general upward trend. The lack of a clear trend is particularly obvious if revaluation gains or losses are included in the analysis. This is in part due to economic profit being impacted by external factors. For example, in 2019 Meridian benefited from higher-than-average hydro inflows and high wholesale prices as a consequence of the temporary closure of Pohokura. The following figure demonstrates that 2019 was a positive year for the industry[1] as a whole, which suggests that caution needs to be exercised in making judgements about Meridian's performance in the absence of a full industry analysis. It is also important to consider the impact of Meridian's non-generation businesses.



All three approaches produce a positive cumulative economic profit from 2011 to 2021. However, as we have not analysed the performance of other generator-retailers or any other businesses, we cannot conclude that Meridian's performance has been exceptional or has been consistent with other similar businesses. Further analysis is required before any supportable statements can be made about the level of economic profits over the analysis period. As noted by the Commerce Commission in its report into the retail fuel sector,[2] the existence of economic profits does not necessarily signal market power and positive economic profits can arise in competitive markets. For-profit businesses aim to generate economic profits for the benefit of their shareholders.

We have not undertaken an analysis of forecast economic profit, but we are aware that equity analysts are forecasting future earnings for Meridian that are substantially lower than reported earnings in 2020. 2021 EBITDAF (earnings before interest, depreciation, amortisation, tax and fair value movements) at $729m is approximately 15% less than 2020 ($853m). For the periods 2022-24, EBITDAF forecasts are circa $750m, declining further to $650m in 2025-26.[3]

[1] EBITDAF obtained from company disclosures for Meridian, Mercury, Genesis, Trustpower and Contact. All companies, except Trustpower, have a June year end. Trustpower has a March year end.

[2] Commerce Commission "Market Study into the Retail Fuel Sector - Working paper on assessing profitability" dated 18 April 2019.

[3] UBS, "Watered Down Earnings" dated 25 August 2021

Economic profit calculations

1.1 Scope of work

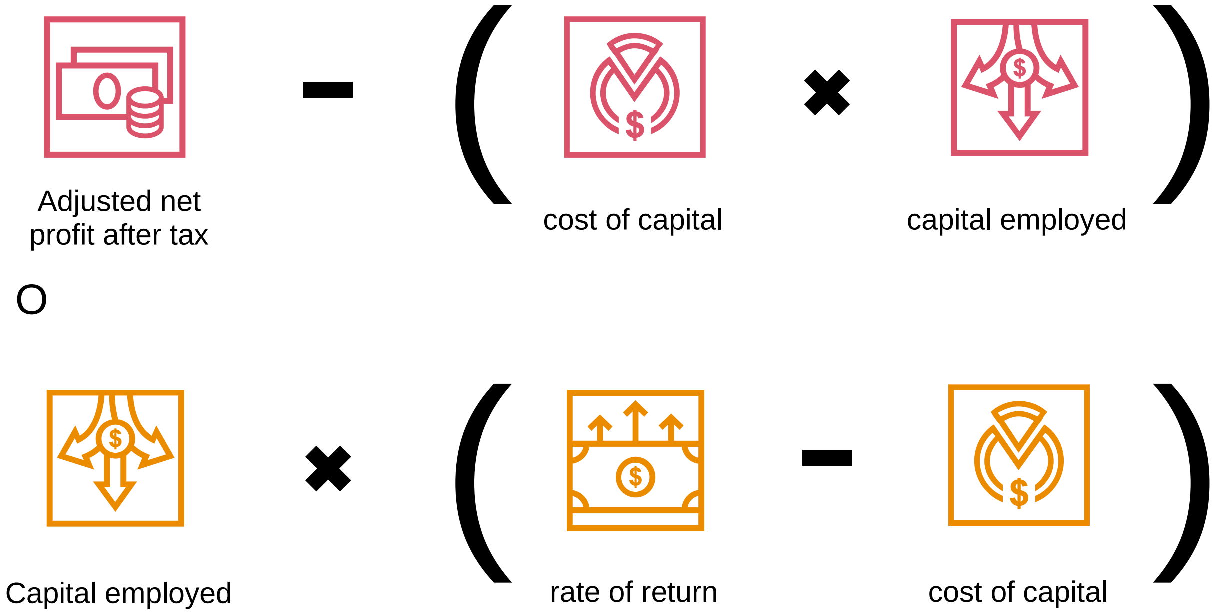
Meridian Energy Limited (**Meridian** or the **Company**) requested us to provide an analysis of its economic profit based on published financial statements. The period for our assessment is the 11 financial years from 2011 to 2021. This report contains a high-level summary of our key findings and observations.

1.2 Economic profit

Investors use a variety of performance measures to evaluate the performance of a firm. The effectiveness of any performance measure depends on the degree of correlation of the measure with market value of the firm and of the explanatory power of the measure.

Economic profit is one of several performance measures that can be used. Economic profit measures the surplus or deficit generated above or below the expected cost of capital for all providers of capital. It differs from financial reporting profit in several ways but most notably it includes a "cost" for the required return to equity (shareholders).

One of the benefits of economic profit is that it makes explicit the cost of servicing all capital used to finance operating assets and whether the firm's earnings are sufficient to cover the capital servicing costs as well as its operating costs.



A firm that generates economic profit is creating value for shareholders because it is generating profits that exceed operating costs and capital servicing costs, including the required return on shareholders' equity. Economic profits are available to shareholders and "create value" because they are in addition to the return that shareholders require from the firm given the relative risk that its earnings will vary over time (up and down)

Value creation is an important objective for firms operating in competitive, open markets to ensure they can access and retain capital to invest in operating assets.

1.3 Calculating economic profit

There isn't a single commonly accepted definition of economic profit. There are many adjustments that can be made to reported accounting numbers to derive a "true measure" of underlying economic performance. Selecting one set of adjustments as opposed to another can result in different outcomes. Debate about what adjustments to make and the complexity in estimating economic profit can detract from its explanatory power and is one of the reasons that, at least in the public domain, economic profit is less commonly used as a measurement tool.

The following are examples of adjustments that can be material to the calculations:

- Approach to determining asset values: An important choice for a firm such as Meridian is whether to include or exclude revaluations to the fixed assets. The inclusion or exclusion of revaluation adjustments affects earnings and capital employed. For a generator, revaluations are very sensitive to changes in forecast wholesale prices. With volatile prices, inclusion of revaluation adjustments can increase the volatility in reported economic profit, making interpretation of the results challenging.
- Gains or losses on the sale of fixed assets could be excluded from the calculation of economic profit on the basis that these do not reflect operating results. Alternatively, if the asset is held to the end of its life, the gain or loss on sale could be taken as the over or under recovery of depreciation and the gain/loss spread over the useful life of the asset.
- Many “investments” that are expensed, such as marketing or R&D expenditure could be capitalised and amortised over its expected useful life.
- Fair value movements for financial instruments that relate to borrowing could be excluded.

Many of the adjustments require judgement. For example, the appropriate amortisation period for marketing expenditure. The very large number of adjustments that can be made and the judgement that needs to be exercised in making the adjustments can affect the interpretation and comparison of the results.

A prominent study that tested the hypothesis that residual earnings measures are superior to accounting based measures, published in the Journal of Accounting and Economics in 1997, noted that (accounting) earnings show a higher correlation with returns and firm values than economic profit, residual income or cash flow from operations.[4] This has been disputed by proponents of the various residual income-based measures.

In keeping with the view that measures of economic profit are not indisputably superior to accounting measures, we have minimised the number of adjustments we have made to published accounting information for the purposes of our analysis.

1.4 Calculation approaches

Our approach to calculation of economic profit follows the approach outlined above. Our key assumptions to estimate Meridian’s economic profit over the period 2011 to 2021 are described below: There are three calculations: (a) using historical cost excluding revaluation of fixed assets but including fair value movements on energy hedges, (b) using historical costs excluding revaluation of fixed assets and fair value movements on energy hedges and (c) including revaluation gains and losses in capital and economic earnings.

Key assumptions that are common to all three calculation methods are:

- **Opening Invested Capital:** We have used the opening invested capital rather than the average invested capital. While both are acceptable, using opening invested capital allows a direct comparison with the conventional discounted cash flow approach. The opening invested capital for 2011 is based on the published financial statements.
- **Leases:** We have not applied the new financial reporting standard for leases in our calculations to allow consistent calculations over the ten-year period. Lease accounting standards have changed recently and the new treatment has impacted balance sheet values for most companies. For Meridian its Right-of-Use assets (as defined in the new leasing standard) made up less than 1% of the total market capitalisation in FY20, so the impact on the calculations of alternate treatment is expected to be very small.
- **Capital work in progress and other assets:** We have excluded capital work in progress, financial assets held for sale and investments that are not deemed to be integral to Meridian’s operations.
- **Gain or loss on sale of fixed assets**: We have excluded gains or losses on fixed assets from earnings and from the calculation of invested capital.
- **Tax**: Tax has been calculated at the company tax rate on adjusted EBIT after adjusting for revaluations (where relevant).

[4] Biddle GC, Bowen R and Wallace J, 1997, Does EVA beat earnings? Evidence on associations with stock returns and firm values, Journal of Accounting and Economics 24, pages 301-336.

- **Weighted average cost of capital** (WACC): To match the term of the period for which economic profit is being measured, we have used a one-year WACC calculated using the Brennan-Lally formula for the cost of equity.

The three calculation methods produce different outcomes, so in addition to the description of different assumptions, we also provide context for the different choices that can be made to calculate economic profit.

- **Asset revaluations**: Excluding or including asset revaluations is an important choice for the Meridian analysis. Each approach provides different insights into Meridian's performance.

  Where we have used the historical cost approach to calculate the asset base, we have excluded asset revaluations from the calculations, both in invested capital and income. Using historical asset values is based on the principle that this provides an estimate of the returns available to investors on the original investment. This is not strictly correct because the historical value of invested capital is affected by accounting policy choices. The most important choices in this instance are the assumed economic lives for the fixed assets as well as the policy to expense or capitalise certain cost items.

  In the case of Meridian, historical costs were derived from values set in 1999 based on assessed values of assets at this time (the demerger of ECNZ into the generators), and not based on historical costs prior to this date.

  Where we have used the current balance sheet values, or market approach to calculate the asset base for economic profit calculations, we have included asset revaluations in the calculations, both in invested capital and income. Investors care about returns on the market value of their investment as this provides a measure of the opportunity cost of the investment. If the return is less than the investor's desired rate of return, the investor can, in theory, sell their investment at the extant market value and reinvest the proceeds elsewhere. For the purposes of this assessment therefore, it is necessary to have an estimate of the market value of the investment.

  The definition of economic income is equal to the difference between the opening and closing wealth of an investor. We need market values for both estimates. Asset revaluations represent a mechanism to include market values in the analysis.

  However, in this case, the asset revaluations only cover the generation assets and do not include the market values of retail businesses in New Zealand and Australia, or other intangible assets in the business. As such the revaluation gains or losses are also not a perfect measure.

  Additionally, in the case of Meridian, fair value movements in asset values are most impacted by changes in expectations of future prices. This factor needs to be considered when interpreting the analysis.

  Due to the trade-offs and shortcomings of both approaches, we present the results of both in our analysis.

- **Fair value movements** on financial instruments not associated with operations are excluded in all scenarios on the basis that these are results of financing choices rather than reflection of performance of the assets and operations.

  On the basis that energy trading and hedges are a core component of Meridian's business, fair value movements for energy hedges should be included in the analysis. However, if the desire is to show the results using historical cost conventions, it is also appropriate to exclude fair value movements on energy hedges.

  We therefore show the impact of including and excluding fair value movements of energy hedging activities when historical costs are used to calculate economic profit. Fair value movements are included when asset revaluations are included in the analysis.

  We present three different calculations to make the point that the results can be different depending on the assumptions that are made for the calculations. The calculations show that the annual trends can vary substantially making the interpretation more difficult.

1.5 Interpreting the results

Interpreting the results of our analysis requires an awareness of the adjustments made (and the alternatives available) to accounting profit and shareholders' funds to derive economic profit. General principles that should be kept in mind include:

- It is very important to have a good understanding of the key drivers of value. Economic profit may be impacted by unexpected changes in the overall market. For example, in 2019 Meridian benefited from higher than average hydro inflows and high wholesale prices with the temporary closure at Pohukura. This resulted in an increase in profits due to factors largely outside of Meridian's control and out of line with typical wet hydro year impacts. 2020 results were affected by strong retail performance in New Zealand and Australia (higher volumes and pricing and a lower cost to serve), high generation volumes (wind farm and hydro) in New Zealand offsetting lower volumes in Australia and reduced transmission costs.[5]
- Economic profit or loss could be the result of a windfall gain/loss, unexpected financial impact or smart management.
- Meridian's assets are long lived. Making judgements about economic profit based on a snapshot for a limited time period could be misleading.
- Positive economic profit does not mean that the firm is earning "excessive profits". Whether or not profits are excessive often requires an understanding of market power and whether the firm is able to exercise such power. Also, economic profit may be temporary.
- In competitive markets all firms seek to earn economic profit. If a firm produces returns that are always equal to its weighted average cost of capital, the market value of its capital (debt plus equity) would equal to the book value of invested capital.
- It is important to analyse both the level and trends in economic profit for a firm, its competitors and the industry in general. This is a necessary pre-requisite to interpreting the results.
- In addition to historical results, it is important to understand the expected future trends in economic profit. Historical economic profit represents the outcomes that result from a combination of market forces and the competitive positioning of a firm. In this sense, historical results are a "lagging indicator". It is necessary to understand value drivers to understand whether the trend is likely to continue.

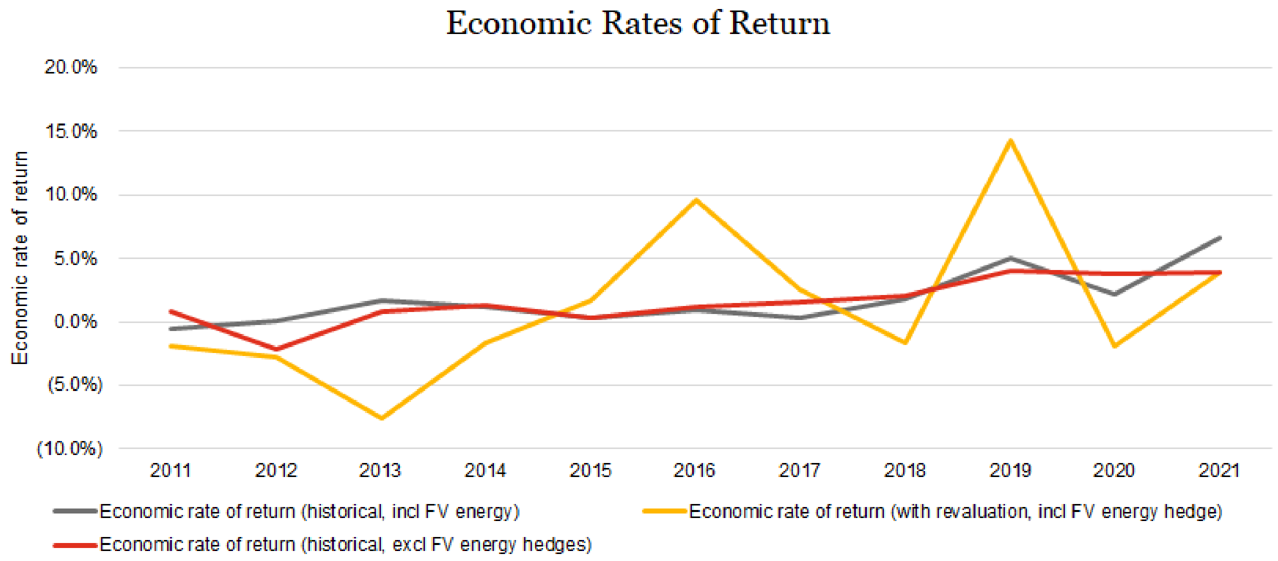
1.6 Results

We have calculated economic profit using the methods and assumptions described above for the financial years 2011 to 2021. The following sources of information have been used for these calculations:

- Meridian's historical annual reports; and
- Capital IQ and Bloomberg

Our scope required us to use only Meridian's publicly disclosed information. The chart below shows the results of our calculations.

[5] Jarden report "Rolling over the peak" dated 27 August 2020.



Note: the economic rate of return shows the difference between the ROIC and WACC.
ROIC is return on invested capital and is calculated by dividing the net operating profits after tax by the invested capital.

If revaluations are included, the results show an upward trend but are volatile, with relatively large positive and negative movements over the eleven-year period. The results are less volatile using historical costs. However, particularly in 2020 and 2021, it is clear that the historical returns are affected by the inclusion or exclusion of fair value movements on energy hedges.

1.7 Assessment of the results

Given the long life of Meridian's assets and the potential impact of market changes on profitability in any given year it is important to assess economic profit trends over time, rather than isolated periods. It is both the quantum of economic profit and the change in economic profit that are relevant to value creation. The chart above makes it clear that the results are not easily interpreted. Whilst there is a general upward trend over the eleven year period under the alternatives considered above, it is difficult to draw unambiguous conclusions, particularly when considered in light of market conditions or factors outside of Meridian's control that have driven the increase in recent years.

Looking over the whole period we can conclude that all approaches show a positive cumulative economic profit from 2010 to 2021. However, we would expect similar results from organisations in many different sectors so, without further analysis, we cannot draw inference on whether the performance of Meridian has been above or below others both within and outside the energy sector.

Finally, while we have not undertaken an analysis of forecast economic profit, we note that equity analysts are forecasting future earnings that are substantially lower than recent performance. All else equal, this would imply lower economic profit in future. Additionally, if the NZAS Aluminium Smelter were to close at the end of its current contract period (31 December 2024), wholesale electricity prices and Meridian's profitability are expected to be materially affected, and economic profit trends could decrease significantly following closure.[6]

[6] This may explain the reduced analyst forecasts referred to in the Executive Summary.