

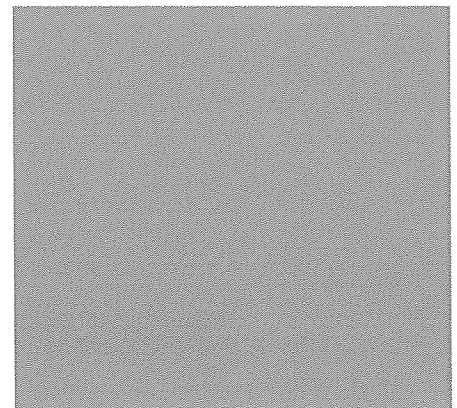
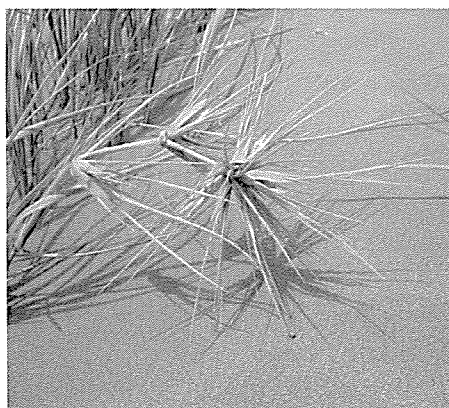
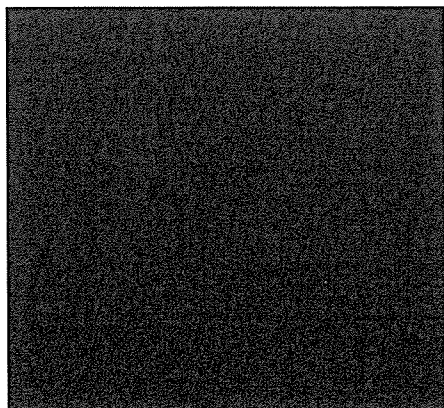
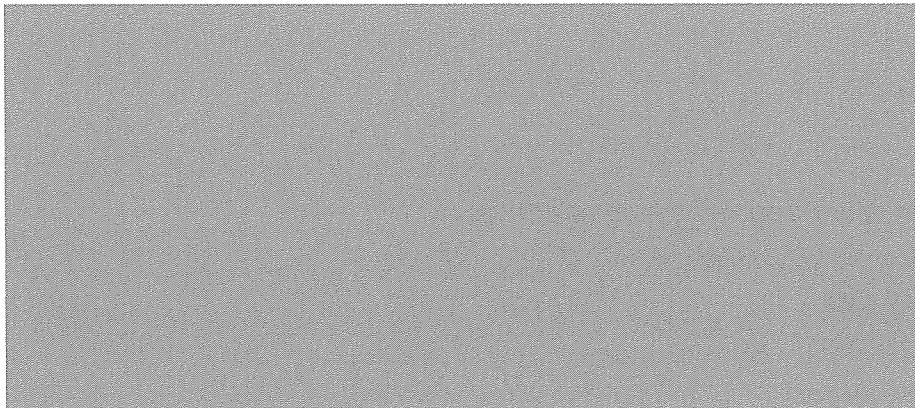
LECG

Aquaculture in New Zealand: Supplementary analysis for “New Space” settlement obligation

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DRAFT June 2010

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1 Supplementary information

1.1 Background

The Ministry of Fisheries commissioned LECG to give an indication of the possible extent of the Crown's "New Space" settlement obligation ('the obligation'). We presented a final paper on 9 June. Based on four scenarios modelled, and under the assumptions presented in the report, LECG found that the obligation value at 2020 could fall within a possible range of [REDACTED]. By 2030, the range could increase from [REDACTED].

The Ministry has asked LECG to briefly summarise two reports that are currently in circulation which were authored by other firms, and to present a discussion on how the findings in those reports could impact on our findings.

The reports we have been asked to look at are:

- Ernst & Young, *New Zealand Aquaculture: Industry Growth Scenarios*, 10 September 2009 ("the EY report");
- NZIER, *The Net Economic Benefit of Aquaculture Growth in New Zealand – Stage Two Analysis*, June 2010 ("the NZIER report").

1.2 Summaries of the reports

1.2.1 Ernst & Young report

Ernst & Young presents a summary of the current state of the industry and then sets out five growth scenarios for the industry in the future. Under these scenarios, it concludes that Aquaculture farming and processing in New Zealand could generate \$623 - \$858 million in nominal annual revenue in 2025 if the industry remains at 'business as usual'.¹ However if high value or high production strategies are followed, this annual nominal revenue could increase to as much as \$2,190 million.²

Ernst & Young assumes some conversion of existing space to different species.

¹ In real terms, using the NZ inflation rates applied by Ernst & Young, \$858 million equates to around \$574 million in real revenue.

² In real terms, using the NZ inflation rates applied by Ernst & Young, \$2,190 million in nominal revenue equates to around \$1,464 million in real revenue.

1.2.2 NZIER report

NZIER takes the business as usual scenario from the Ernst & Young report and revises it on the basis of “revised forecasts from Aquaculture NZ”. They change the assumptions about production and prices by adding margins above the baseline, and by changing the timing of growth. Using these revised forecasts, they compute the Net Economic Benefit from aquaculture. The calculation of Net Economic Benefit is done using a dynamic computable general equilibrium model (CGE).

NZIER’s assumptions about future production are significantly more optimistic than Ernst & Young’s business as usual scenario.

1.2.3 Different objectives

The reports were aimed at quite different questions:

- Our report was aimed at answering the question, “how much “new space” might be needed in New Zealand, and what might it be worth?”
- The Ernst & Young report was aimed at answering the question, “what might industry revenue look like in 2025?”
- The NZIER report was aimed at answering the question, “given industry and production forecasts for 2025, what are the Net Economic Benefits for New Zealand in terms of additional buying power?”

1.2.4 Linkages between reports

Each of these three reports contain assumptions about how the industry might evolve over the next decade and beyond, in terms of production and prices. Each of the three reports contain conclusions about how much growing space will be used in New Zealand during this time.

The scenarios we presented in the 9 June report:

- use the 2008 production figures from EY report as approximates for 2010 production;
- use the ‘business as usual’ case for assumptions about productivity growth on existing farms;
- use the real prices attained by aquaculture producers that are implied by the ‘business as usual’ case and the ‘value add and marketing’ cases to compute industry revenue.

As noted above, the NZIER report uses the EY report ‘business as usual’ case as a starting point for its revised estimates of growth in production and prices.

1.2.5 Differences between reports

Both Ernst & Young and NZIER include scenarios which depend on ‘new space’ becoming available. It is important to distinguish between the space estimates included in those reports and the space estimates set out in our June 9 report. New space in the EY and NZIER reports includes any new growing zones that were not in operation at the time of writing. The majority of those areas in the NZIER base case are already permitted, and thus qualify as existing space in our report.

Ernst & Young and NZIER use space as an endogenous input into production forecasts. This assumes that all production produced by New Zealand producers will have a market, even if this requires a growth in underlying global market share. Our approach was to keep space as the exogenous factor, and to use production forecasts to predict space. We assumed that underlying global market share would remain roughly the same as it is now. Both are valid approaches.

Our approach to the productivity of existing sites in our June 9 report differs from the EY and NZIER reports. We assume that there is a relationship between the productivity of existing space and new space. As existing space becomes more productive (say, as a result of new technologies such as basket culture for oysters or selective breeding for mussels) there is less demand for new space, all else being equal. For example, in situations where demand growth is low to moderate there is little need for new space because existing zones can be used more effectively. EY assume that new space is exogenous; it is an independent variable to site productivity.

1.2.6 Commentary on reports

In our report of June 9 we noted that a subsequent review of the Ernst & Young scenarios by Toroa Strategy noted them as ‘optimistic’. This critique extends to the ‘Business as Usual’ scenario, which shows positive revenue trends in all sectors, despite a rapidly changing and highly competitive global market for seafood protein³:

“The resulting scenarios should be regarded as generally optimistic. To the extent that the underlying positive revenue trend breeds complacency about the configuration or performance of the current industry structure, such complacency is almost certainly dangerous.”

1.3 Summary of “space” estimates

The table below attempts to reconcile the various estimates of space that are set out in the reports. The LECG estimates are of “new space”, where “new space” is space which meets the definition applied in the settlement Act.

³ Toroa Strategy, *New Zealand Aquaculture: Industry Growth Scenarios*, p. 9

<i>Summary of space estimates in reports</i>	Mussels	Oysters	Salmon	Other species	Unused/rotational	TOTAL
Existing, utilised space (same in all reports)	2750 ha. utilised (with 520 ha. for spat holding)	500 ha. utilised	130ha. permitted	8ha. Permitted	0 ha	3388 ha
Max total space added in LECG report for 2020 (includes “new space” and already permitted space)	1500 ha of ‘new space’, plus up to 810 ha newly permitted space	136 ha	24 ha (14 ha offshore)	75 ha	4951 ha (3800 ha offshore) of ‘new space’, plus 2861 ha of newly permitted space	6686 ha (3814 ha offshore) of ‘new space’, plus 3671 ha of newly permitted space
Max total space added in LECG report for 2030 (includes “new space” and already permitted space)	1500 ha of ‘new space’, plus up to 810 ha newly permitted space	136 ha	91 ha (81 ha offshore)	75 ha (but up to 480 ha of the 3800 ha new space offshore could be converted to new species)	4951 ha (3800 ha offshore) of ‘new space’, plus 2861 ha of newly permitted space	6686 ha (3881 ha offshore), plus 3671 ha of newly permitted space
Total space added in Ernst & Young “business as usual case” 2025	1370 ha	75 ha	10 ha	0 ha	0 ha	1455 ha
Total space added in Ernst & Young “permitted space case” 2025	2209 ha	500 ha	202 ha	100 ha	0 ha	3011 ha
Total space added in NZIER revised projection 2025	1644 ha	83 ha	12 ha	0 ha	0 ha	1739 ha
MFish opinion on maximum development capacities inshore	3705 ha	950 ha	10 ha	4215 ha (includes space that could be converted from mussels)	3800 ha offshore	<12690 ha (3800 ha offshore)

The table shows that once applications that do not qualify as ‘new space’ are deducted, LECG’s estimates are slightly more optimistic than the other reports in terms of new growing areas being added.

1.4 Summary of production estimates

The table below illustrates how the reports differ in terms of levels of farm production in the industry.

Summary of production estimates	Production estimates for Mussels	Production estimates for Oysters	Production estimates for Salmon	Production estimates for Other species
Existing production (same in all reports)	89,000 GWT	3,500,000 doz	9,300 GG tonnes	716 GWT
Max total production in LECG report for 2020	125,500 GWT	4,900,000 doz	13,100 GG tonnes	1,900 GWT
Production in Ernst & Young ‘business as usual case’ in 2025	143,100 GWT	4,312,500 doz	11,200 GG tonnes	0 GWT
Production in Ernst & Young ‘permitted space case’ in 2025	177,000 GWT	7,500,000 doz	26,500 GG tonnes	8,594 GWT
Production in NZIER revised projection 2025	165,000 GWT	4,960,000 doz	11,200 GG tonnes	0 GWT
Max total production in LECG report for 2030	177,000 GWT	7,000,000 doz	18,500 GG tonnes	4,800 GWT

1.5 Summary of estimates of industry revenue

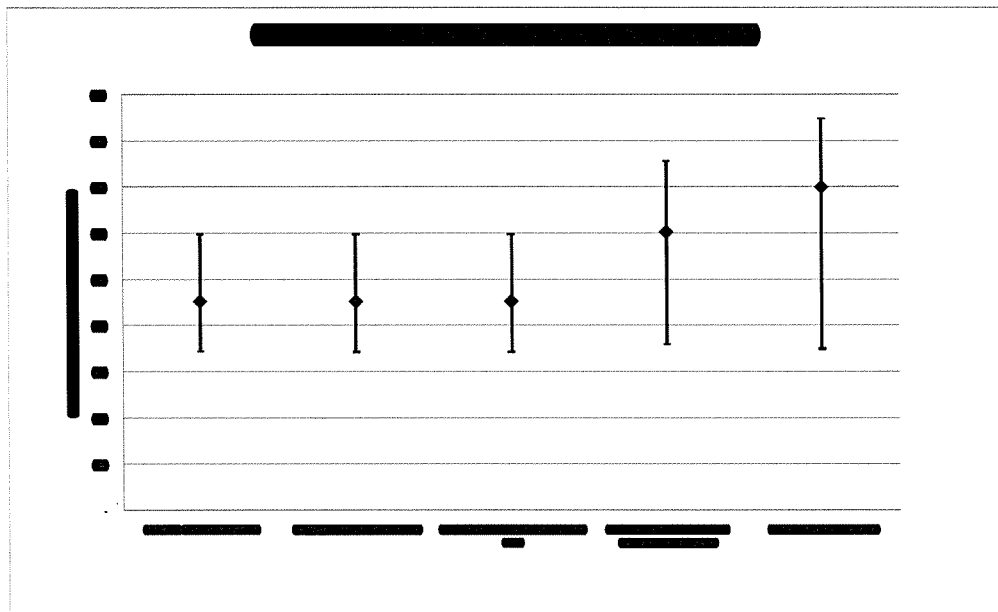
The table below illustrates how the reports differ in terms of projected industry revenue. Industry revenue has been amended so that each is reported in real terms. This makes it the most readily comparable with the \$1 billion scenario.

Summary of (real) revenue estimates	Revenue estimates for Mussels (\$NZ Real)	Revenue estimates for Oysters (\$NZ Real)	Revenue estimates for Salmon (\$NZ Real)	Revenue estimates for Other species (\$NZ Real)	Total industry revenue (\$NZ Real)
Existing revenue (same in all reports)	\$239 million	\$26 million	\$104 million	< \$1 million	\$370 million
Max total revenue in LECG report for 2020	\$288 - \$354 million	\$49 - \$50 million	\$132 - 149 million	\$5 - \$7 million	\$475 - \$560 million
Revenue in Ernst & Young 'business as usual case' in 2025*	\$344 million	\$32 million	\$114 million	< \$1 million	\$489 million
Revenue in Ernst & Young 'permitted space case' in 2025*	\$425 million	\$56 million	\$270 million	\$26 million	\$776 million
Max total revenue in LECG report for 2030	\$376 - \$552 million	\$59 - \$64 million	\$166 - \$212 million	\$13 - \$18 million	\$614 - \$846 million
Revenue in NZIER revised projection 2025 (real)	Unclear in draft. Using LECG revenue assumptions for 2020 and NZIER production figures suggests \$396 - \$581 million	Unclear in draft. Using LECG revenue assumptions for 2020 and NZIER production figures suggests \$37 - \$40 million	Unclear in draft. Using LECG revenue assumptions for 2020 and NZIER production figures suggests \$114 - \$145 million	< \$1 million	Unclear in draft. Using LECG revenue assumptions for 2020 and NZIER production figures suggests \$547 - \$766 million

** The Ernst & Young figures were reported as nominal. These figures have had the effects of inflation removed in order to make them directly comparable.*

1.6 The obligation under alternative growth scenarios

The chart below illustrates what the settlement obligation might look like if the production figures adopted in the E&Y report and the NZIER report are adopted. A comparator scenario (“Existing Applications Only”) has been left in from our previous report, which illustrates the obligation if only existing ‘new space’ is settled. These scenarios show the obligation at 2025.



The analysis shows that if the E&Y Base Case occurs, or if the NZIER production scenarios occur, the obligation will fall in the vicinity of [redacted]. In other words, the obligation will not be markedly different from LECG’s original estimates. However, if the production estimates in the ‘permitted space’ scenario occur, the obligation could rise to a maximum of [redacted]. Again, this is not markedly different from our original estimates.

An additional scenario (“LECG \$1 Billion Scenario”) has been added, which illustrates an alternative path to \$1 billion by 2025. In this scenario, there is strong growth in mussels and salmon (3.5% CAGR), a small growth in oysters (1.0% CAGR) and extremely strong growth in other species (33% CAGR). In this scenario, the \$1 billion target is only reached if there are increases in prices through value-added and marketing, to the price levels envisaged by NZIER in their ‘Value Added and Marketing’ scenario. In this scenario, the settlement obligation is at its highest. This is because the demand for space for ‘other species’, both inshore and offshore, is very high. We see this scenario as being highly optimistic but not completely unattainable.

The amount of space demanded under each scenario is shown in the chart below.

