

ECONOMIC ASSESSMENT OF LYTTTELTON COAL YARD EXPANSION PROJECT

PREPARED FOR LYTTTELTON PORT COMPANY

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Executive summary

Exports are vitally important to promoting New Zealand's economic well-being and over time export growth will facilitate growth in total domestic activity.

Canterbury's ports and international airport play a major role in facilitating international trade contributing around 13 percent and nine percent, respectively, of total national exports and imports.

Lyttelton Port located economic activity is estimated to contribute about \$134M to regional GDP. This is the equivalent of about five percent of Canterbury's transport and storage industry's contribution to GDP.

However, the importance of the port is best gauged by the GDP and employment, directly and indirectly facilitated by exports, rather than by the individual and/or collective monetary value of port-related activity. In this respect, it is estimated that Lyttelton port facilitated up to \$2.6B of New Zealand's GDP and 32,000 jobs for the year ended March 2007.

The coal trade is part of port services and contributed around 27 percent of the total weight of cargo handled at the port. It draws heavily on personnel and facilities that would otherwise be less well used. Thus, the coal trade facilitates more price-competitive operations at the port by enabling fixed costs to be spread across a much wider cargo base. In addition, the long-term contract with Solid Energy to export coal enhances LPC ability to invest in the port's infrastructure by creating a more secure cash flow.

Total direct coal trade dependent employment (i.e. West Coast and Canterbury) is estimated at between 905 and 1135. New Zealand wide, direct and indirect employment generated by the coal trade is estimated at between 2100 and 2700 jobs.

Depending on the level of additional tonnes of coal exported through Lyttelton as a result of the coal yard expansion, additional mining and transport related employment is estimated to increase by 170 at 3.3M tonnes exported and up to 421 jobs at 5M tonnes. Including direct and indirect impacts could increase total New Zealand wide employment to between 400 and 1000.

Over Solid Energy New Zealand Limited's 18-year contract period to export Pike River coal, the expansion of the coal yard is estimated to increase Canterbury's direct GDP, from construction and operation, by:

- \$94M (i.e. \$50M NPV) at 3.3M tonnes exported per annum
- \$101M (\$53M NPV) at 4M tonnes exported
- \$126M (\$65M NPV) at 4.5M tonnes exported, and
- \$166M (\$82M NPV at 5M tonnes.¹

Including the direct and indirect impacts increase that sum to about:

- \$146M (\$79M NPV) at 3.3M tonnes per annum
- \$155M (\$89M NPV) at 4M tonnes per annum
- \$188M (\$105M NPV) at 4.5M tonnes, and
- \$240M (\$121M NPV) at 5M tonnes.

The increase in direct regional GDP over the contract period for the West Coast is significantly larger than Canterbury's increase. The increases are estimated at:

- \$67M at 3.3M tonnes or \$1.2 billion (\$540M NPV) over the contract period
- \$134M at 4M tonnes or \$2.4B (\$1.1b NPV) over the contract period
- \$165M at 4.5M tonnes, or \$3B (\$1.3B NPV) over the contract period, and
- \$196M at 5M tonnes or \$3.5B (\$1.6B NPV) over the contract period.

Due to insufficient data the direct and indirect West Coast impacts were not estimated. However, nationally the direct and indirect impacts range from \$2.1B (\$945M NPV) at 3.3M tonnes per annum to \$6.2B (\$2.7B NPV) at 5M tonnes.

¹ A 10 percent discount rate has been used in this report to estimate NPVs.

1 Introduction

This report has been prepared for Lyttelton Port Company Limited (LPC) in respect of the resource consent application to reclaim 10 hectares of Te Awaparāh Bay for port activities as part of the coal stockyard expansion. The proposed reclamation arises from Solid Energy's successful securing of an 18-year contract to export mined Pike River coal on the West Coast via Lyttelton Port. The expansion is also required to enable Solid Energy New Zealand to expand its own exports as well as those of other suppliers through Lyttelton Port.

In support of LPC's resource consent application to expand the coal stockyard area, this report:

- explains the relationship between international trade and New Zealand's economic well-being
- examines the comparative value of regional trade through Lyttelton Port and evaluates recent trends
- estimates the value of Lyttelton Port trade to the Canterbury economy in respect of its direct contribution in terms of output, contribution to Gross Domestic Product (GDP) and the wider contribution it enables
- identifies the part the coal trade plays in facilitating commercially successful port operations, and considers how the expanded coal trade may contribute to this
- assesses how Lyttelton Port's contribution to the regional economy will increase as a consequence of the proposed reclamation and increased coal trade in terms of output, GDP and jobs, both from construction and the ongoing export of coal.

2 Relationship between international trade and economic well-being

The relationship between international trade and New Zealand's economic well-being is, generally, not well understood. However, put simply, New Zealand's ability to

trade with the rest of the world is vital to the health of the national economy as our small population and workforce limits the range of commodities that can be efficiently produced domestically.

New Zealand has to specialise in producing commodities and services in which it has a comparative advantage. The surpluses produced in excess of domestic needs are traded with the rest of the world to earn the foreign currency required to purchase the commodities and services that cannot be efficiently produced domestically. Those imports include essential commodities that are required to sustain the economic well-being of producers (e.g. farm machinery, manufacturing plant, motor vehicles, aircraft and ships), the economic welfare and health of people (e.g. prescription drugs, hospital and education equipment) and provide consumer choice.

The relationship between exports and economic well-being is more intricate than just being the primary source of funds to pay for imports. That is, it is not just a case of exports facilitating payment of imports, but rather over time determining the country's standard of living (i.e. well-being).

In this respect, export earnings to the nation effectively serve the same purpose as the income of a household. Thus, the relationship between exports and economic well-being becomes more intuitively obvious if the latter is explained.

Household income is used to buy the commodities and services that the household cannot or does not have a comparative advantage in producing. The level of household income determines the occupants' standard of living, i.e. the level of their economic well-being. Thus, the household's standard of living is a function of its income.

In the short to medium-term, borrowings can be used to prop up household spend and, therefore, its standard of living. However, if the borrowings are not used productively, the increased spend will be short-term and at the expense of future consumption and, eventually, the household will be forced to reduce its consumption and live within its sustainable income.

Some household occupants may be involved in unpaid economic activity, such as education, childcare or voluntary work. Consequently, the total level of economic activity generated by the household may be a multiple of the income of the household. As household income increases, more members can be sustained in

unpaid work. Thus, the total level of sustainable household activity is also a function of household income.

The example parallels the situation for the New Zealand economy. The export sector is effectively the income earner while the non-tradable sector of the economy is the equivalent of the unpaid economic activity undertaken by the household. While borrowings from the rest of the world can enhance New Zealand's standard of living by supporting a larger non-tradable sector, ultimately the economic well-being of the country and the total level of activity that can be supported are functions of exports and its rate of growth. Consequently, without export earnings and/or an adequate growth in export earnings, New Zealand would become impoverished just as a household would become impoverished without income.

Thus, New Zealand can only raise its standard of living and grow if it increases its exports. Sustainable growth cannot be supported by being inwardly focused as this creates a demand for imports that ultimately have to be funded by increased exports. Because of the very limited domestic market, exporting is the only way that the country can grow and take advantage of economies of scale.

While the relationship between exports and GDP is very complex, over time the New Zealand economy has generally functioned on one dollar of export earnings supporting about four dollars of GDP (i.e. in terms of providing the foreign exchange required to purchase imports). However, more recently, this figure has declined to around one dollar of exports to three dollars of GDP. The decline in the export/GDP ratio has resulted in an unsustainable increase in the balance of payments' deficit, now around nine percent of GDP. Exports as a percentage of GDP need to increase significantly to reduce the balance of payments' deficit to more sustainable levels.

3 Comparative value of Lyttelton's trade

The transport system is an integral part of facilitating New Zealand's international trade while the ports and airports are vital components of the transport network. Economic activity is virtually impossible without the transport system, in general, and those transport hubs, in particular. This is especially true in respect of international trade.

At the regional level, Lyttelton and Christchurch International Airport, are essential infrastructure upon which regional economic activity is based.

Exports

Table 1 shows that Lyttelton is the main regional contributor to national export and import activity. The table shows that the free-on-board (fob) value of exports for Lyttelton and Timaru ports, Christchurch International Airport and total New Zealand merchandise exports shipped through Lyttelton was \$3 billion for the year ended March 2008, i.e. 63 percent and eight percent of total Canterbury and New Zealand exports, respectively. By comparison, Timaru Port's exports were \$1B while Christchurch International Airport exported \$762 million. Together, they contributed about 13 percent of total New Zealand exports.

Table 1: Comparative value of Canterbury ports and airport's exports – 2008 March year

<i>Industry</i>	<i>Gross Weight (KG)</i>	<i>FOB (\$NZ)</i>
Lyttelton		
Agriculture & hunting	78,618,902	253,166,713
Forestry & logging	153,418,200	13,227,607
Fishing	92,591	361,705
Mining & quarrying	2,248,067,641	179,810,261
Food, beverages & tobacco	429,894,880	1,206,542,584
Textiles, apparel & leather goods	66,139,552	314,735,683
Wood processing	161,643,806	110,013,491
Paper & paper products, printing & publishing	74,570,108	16,198,905
Chemicals & petroleum, coal, rubber, plastic products	21,032,021	86,805,086
Non-metallic mineral products	14,011,443	3,483,792
Basic metal products	131,260,000	214,106,692
Fabricated metal prod & equip	9,302,743	65,322,812
Other manufacturing industries	23,597,041	283,903,544
Total Manufacturing	931,451,594	2,301,112,589
All other	2,033,873,151	269,657,014
Total	5,445,522,079	3,017,335,889
Timaru		
Agriculture & hunting	33,913,220	33,946,120
Forestry & logging	97,137,034	8,569,032
Fishing	0	0
Mining & quarrying	0	0
Food, beverages & tobacco	230,373,753	848,795,109
Textiles, apparel & leather goods	5,189,121	28,033,121
Wood processing	50,923,233	33,961,709
Paper & paper products, printing & publishing	16,269	52,554
Chemicals & petroleum, coal, rubber, plastic products	748,579	8,560,524
Non-metallic mineral products	34	426
Basic metal products	1024552	9,355,832
Fabricated metal prod & equip	580170	9,904,592
Other manufacturing industries	2390925	53,608,370
Total Manufacturing	291,246,636	992,272,237
All other	208,922	1,205,388
Total	422,505,812	1,035,992,777
Christchurch Airport		
Agriculture & hunting	2,283,315	24,801,046
Forestry & logging	0	0

<i>Industry</i>	<i>Gross Weight (KG)</i>	<i>FOB (\$NZ)</i>
Fishing	5,335,902	87,791,310
Mining & quarrying	544	178,190
Food, beverages & tobacco	3,829,131	77,659,622
Textiles, apparel & leather goods	865,823	39,424,241
Wood processing	15,430	401,803
Paper & paper products, printing & publishing	164,228	2,096,462
Chemicals & petroleum, coal, rubber, plastic products	839,646	25,949,088
Non-metallic mineral products	21,737	670,936
Basic metal products	77,823	21,640,945
Fabricated metal prod & equip	444,215	39,735,496
Other manufacturing industries	2,762,018	244,752,270
Total Manufacturing	9,020,051	647,099,403
All other	28,297	2,495,835
Total	16,668,109	762,365,784
Total Canterbury		
Agriculture & hunting	114,815,437	311,913,879
Forestry & logging	250,555,234	21,796,639
Fishing	5,428,493	88,153,015
Mining & quarrying	2,248,068,185	179,988,451
Food, beverages & tobacco	664,097,764	2,132,997,315
Textiles, apparel & leather goods	72,194,496	382,193,045
Wood processing	212,582,469	144,377,003
Paper & paper products, printing & publishing	74,750,605	18,347,921
Chemicals & petroleum, coal, rubber, plastic products	22,620,246	121,314,698
Non-metallic mineral products	14,033,214	4,155,154
Basic metal products	132,362,375	439,872,009
Fabricated metal prod & equip	10,327,128	114,962,900
Other manufacturing industries	28,749,984	582,264,184
Total Manufacturing	1,231,718,281	3,940,484,229
All other	2,034,110,370	273,358,237
Total	5,884,696,000	4,815,694,450
Total New Zealand		
Agriculture & hunting	1,222,398,421	2,179,554,209
Forestry & logging	6,191,020,055	594,629,240
Fishing	18,321,457	239,780,973
Mining & quarrying	4,950,014,273	2,051,467,738
Food, beverages & tobacco	4,667,734,608	18,626,669,556
Textiles, apparel & leather goods	277,710,928	1,676,974,664
Wood processing	2,676,757,095	1,466,014,559
Paper & paper products, printing & publishing	1,623,109,377	1,260,948,199
Chemicals & petroleum, coal, rubber, plastic products	371,475,839	1,368,104,127
Non-metallic mineral products	179,213,254	74,557,286
Basic metal products	1,236,634,395	2,602,418,556
Fabricated metal prod & equip	133,184,447	1,253,537,074
Other manufacturing industries	187,331,420	3,730,676,791
Total Manufacturing	11,353,151,363	32,059,900,812
All other	2,739,900,083	1,181,352,986
Total	26,474,805,652	38,306,685,958

With the exception of basic metal product manufacture, the table shows that in value terms, Lyttelton is the main export departure point for Canterbury's industries for the

year ended March 2008, comprising 63 percent by value and 93 percent by weight of total Canterbury exports.

Almost 60 percent of Lyttelton Port's export were agricultural and processed agricultural products. Of the balance, 26 percent were other non-agricultural processed manufactured exports, nine percent "other" and six percent related to exports by mining and quarrying activities. It is noteworthy that in terms of weight, mining and quarrying exports (mainly coal), contributed 41 percent of total exports, while "other" exports comprised 37 percent. Agricultural and processed agricultural products comprised 10 percent of the total gross weight of commodities exported.

By comparison Christchurch International Airport is very focused on exporting manufactured commodities and fish products. Those commodities comprise 86 percent of the weight and 97 percent of the value of exports through the airport. The main manufacturing industry groups that rely on the airport are "other manufacturing industries" (32 percent of value), fabricated metal products and equipment (28 percent of value) and food, beverages and tobacco (10 percent of value).

Export trade statistics indicate that Lyttelton and Christchurch International Airport are largely complementary rather than in competition with each other. It is obvious that the airport is important to export industries that require urgent delivery of perishable food commodities and high value manufactured products that are relatively lightweight. Lyttelton, on the other hand, is focused on shipping bulky unprocessed primary products and/or processed primary products.

Christchurch International Airport was the dominant export departure point for five industry groups, namely basic metal products, fishing, fabricated metal products and equipment and other manufacturing. However, the basic metal products industry is the only significant exporter, contributing four percent of the total value of Canterbury's exports. The airport's export role is complementary to the Port of Lyttelton, as it caters for industries with different needs to those that generally depend on Lyttelton.

In respect of value of exports, Lyttelton rates as a nationally significant export port for agriculture, hunting and trapping, and textiles and apparel and leather goods. In respect of weight, Lyttelton rates as nationally significant for mining and quarrying (45 percent) and textiles, apparel and leather goods (24 percent).

Over the period March 2004 to March 2008, Lyttelton Port's exports increased in value terms by a total 36 percent, about the same as the total increase for New Zealand (34 percent). Christchurch airport's growth zero.

Imports

Table 2 shows that the cost insurance freight (cif) value of imports through Lyttelton for the year ending March 2008 was \$2.1B, 78 percent of total Canterbury imports or seven percent of New Zealand's. By comparison, imports through Christchurch airport were valued at \$788M (15 percent of the region's imports). Combined Canterbury's ports and international airport were responsible for about nine percent of New Zealand's imports, both in terms of value and volume.

Excluding fishing, all industries used Lyttelton as the main point of entry for imports.

Over the period, March year 2004 to March year 2008, Lyttelton Port's growth in gross weight (18 percent) of imports was also greater than New Zealand's (32 percent), and Christchurch International Airport's (-5 percent) growth. In value terms, Lyttelton Port's increase over this period (48 percent) was also greater than the growth for all New Zealand ports (32 percent) and Christchurch International Airport (-23 percent).

In value terms, the main imports through Lyttelton related to chemicals and petroleum, coal, rubber, plastic products (\$800M or 26 percent) and fabricated metal products and equipment (\$571M, 18 percent).

Table 2 Comparative value of Canterbury ports and airport's imports – March year 2008

<i>Industry</i>	<i>Gross Weight (KG)</i>	<i>CIF (\$NZ)</i>
	Lyttelton	
Agriculture & hunting	35,298,060	46,936,719
Forestry & logging	130,291	150,837
Fishing	20,063	17,036
Mining & quarrying	419,388,368	66,171,216
Food, beverages & tobacco	149,487,296	245,384,182
Textiles, apparel & leather goods	20,432,591	207,295,306
Wood processing	10,407,914	20,910,686
Paper & paper products, printing & publishing	62,157,410	114,301,147
Chemicals & petroleum, coal, rubber, plastic products	581,229,242	802,188,755
Non-metallic mineral products	96,083,560	75,567,565
Basic metal products	59,430,090	207,263,209
Fabricated metal prod & equip	42,447,411	571,016,889
Other manufacturing industries	55,822,661	515,948,535
Total Manufacturing	1,077,498,175	2,759,876,274
All other	56,198,178	270,334,957
Total	1,588,533,135	3,143,487,039

Industry	Gross Weight (KG)	CIF (\$NZ)
Timaru		
Agriculture & hunting	342,213	830,738
Forestry & logging	0	0
Fishing	413	3484
Mining & quarrying	684,104	219,444
Food, beverages & tobacco	36,993,880	29,740,691
Textiles, apparel & leather goods	939,887	4,807,567
Wood processing	217,172	336,197
Paper & paper products, printing & publishing	2,146,130	3,034,203
Chemicals & petroleum, coal, rubber, plastic products	159,944,134	97,530,302
Non-metallic mineral products	17,041,112	6,008,895
Basic metal products	29,456,336	39,024,695
Fabricated metal prod & equip	1,605,312	7,997,196
Other manufacturing industries	7,304,438	55,188,050
Total Manufacturing	255,648,401	243,667,796
All other	56,249,507	21,319,987
Total	312,924,638	266,041,449
Airport		
Agriculture & hunting	967,300	7,746,996
Forestry & logging	94	1366
Fishing	2,169	49,472
Mining & quarrying	2,920	592,328
Food, beverages & tobacco	313,091	3,882,323
Textiles, apparel & leather goods	1,456,224	54,719,373
Wood processing	20,247	402,420
Paper & paper products, printing & publishing	980,421	20,162,824
Chemicals & petroleum, coal, rubber, plastic products	1,034,051	31,608,042
Non-metallic mineral products	472,075	6,007,247
Basic metal products	142,163	7,316,294
Fabricated metal prod & equip	832,775	224,275,379
Other manufacturing industries	2,607,640	248,121,690
Total Manufacturing	7,858,687	596,495,592
All other	15,110	3,851,300
Total	8,846,280	608,737,054
Canterbury		
Agriculture & hunting	36,607,573	55,514,453
Forestry & logging	130,385	152,203
Fishing	22,645	69,992
Mining & quarrying	420,075,392	66,982,988
Food, beverages & tobacco	186,794,267	279,007,196
Textiles, apparel & leather goods	22,828,702	266,822,246
Wood processing	10,645,333	21,649,303
Paper & paper products, printing & publishing	65,283,961	137,498,174
Chemicals & petroleum, coal, rubber, plastic products	742,207,427	931,327,099
Non-metallic mineral products	113,596,747	87,583,707
Basic metal products	89,028,589	253,604,198
Fabricated metal prod & equip	44,885,498	803,289,464
Other manufacturing industries	65,734,739	819,258,275
Total Manufacturing	1,341,005,263	3,600,039,662
All other	112,462,795	295,506,244
Total	1,910,304,053	4,018,265,542
Total New Zealand		
Agriculture & hunting	612,155,595	633,559,455
Forestry & logging	2,782,288	3,863,842
Fishing	558,615	7,135,497
Mining & quarrying	6,280,930,641	3,727,363,901
Food, beverages & tobacco	2,159,042,225	3,143,593,994

<i>Industry</i>	<i>Gross Weight (KG)</i>	<i>CIF (\$NZ)</i>
Textiles, apparel & leather goods	183,051,739	2,410,891,881
Wood processing	89,922,301	204,574,978
Paper & paper products, printing & publishing	657,177,922	1,693,737,073
Chemicals & petroleum, coal, rubber, plastic products	6,006,484,184	8,817,878,886
Non-metallic mineral products	742,877,655	654,211,534
Basic metal products	555,738,744	1,687,441,143
Fabricated metal prod & equip	431,712,827	6,687,527,459
Other manufacturing industries	610,787,582	11,486,984,812
Total Manufacturing	11,436,795,179	36,786,841,760
All other	588,674,028	1,494,630,479
Total	18,921,896,346	42,653,394,934

The comparative analysis of exports and imports highlights the fact that Lyttelton Port is very important in facilitating regional and national trade with the rest of the world. In addition, recent growth in Lyttelton Port's exports and imports suggests that its comparative importance is increasing, especially at the regional level.

4 Lyttelton's contribution to GDP and employment

Economic activity is usually measured in terms of Gross Domestic Product (GDP), which is an "added value" measure rather than sales or output.² GDP is calculated by estimating the total market value of goods and services produced in the economy after deducting the cost of goods and services used in the production process (i.e. intermediate consumption), but excluding the consumption of fixed capital (i.e. economic depreciation). Statistics New Zealand (SNZ) produces GDP statistics for the New Zealand economy but does not produce breakdowns of contributions by region.

To help quantify the importance of Lyttelton Port, Canterbury's GDP over the period 2005 to 2007 was estimated using several SNZ data sources, namely, business activity statistics, economic indicators (i.e. goods and services tax), statistics, agricultural production statistics, annual enterprise surveys, and national account data.

The results, which are in current prices, are presented in Table 3. The table shows that Canterbury's GDP for the 2007 March year was almost \$19B, a nominal increase of 5.3 percent from the previous year and a nominal increase of 14 percent

compared to 2005. Regional GDP grew at a slightly faster rate than nominal output, which increased from \$37B to \$42B over those years. Regional job counts increased from 248,890 in 2005 to 255,613 in 2007, i.e. 2.7 percent.

The largest contributors to regional GDP are property and business services (18 percent), manufacturing (16 percent) and wholesale trade (eight percent). The primary sector is also important at almost seven percent. The manufacturing and primary sectors, which together contribute 25 percent of GDP, are Lyttelton Port's predominant exporters.

² GDP is a superior measure to output as it avoids double counting of activity.

Table 3: Canterbury GDP by industry group - \$M

<i>Industry</i>	<i>Year</i>	<i>GDP</i>	<i>Output</i>	<i>Jobs</i>	<i>Industry</i>	<i>Year</i>	<i>GDP</i>	<i>Output</i>	<i>Jobs</i>
Agriculture, forestry & fishing	2005	1,152	2,600	13,767	Finance & insurance services	2005	1,049	1,716	5,172
	2006	1,189	2,658	13,843		2006	1,171	1,915	5,527
	2007	1,222	2,748	13,599		2007	1,286	2,104	5,816
Mining	2005	28	58	255	Property & business services	2005	2,634	4,351	28,469
	2006	41	85	347		2006	3,200	5,260	28,980
	2007	44	91	404		2007	3,311	5,444	29,688
Manufacturing	2005	3,073	9,260	42,458	Government administration & defence	2005	640	1,223	6,760
	2006	2,992	9,025	40,316		2006	709	1,353	7,270
	2007	3,082	9,310	39,861		2007	733	1,405	7,310
Electricity, gas and water supply	2005	334	892	565	Education	2005	807	1,161	19,180
	2006	472	1,263	610		2006	845	1,216	18,970
	2007	515	1,377	705		2007	843	1,212	18,850
Construction	2005	1,064	3,591	14,605	Health & community services	2005	1,193	1,891	26,410
	2006	1,214	4,097	15,840		2006	1,312	2,080	27,005
	2007	1,339	4,517	16,740		2007	1,456	2,307	27,455
Wholesale trade	2005	1,319	3,128	13,975	Cultural & recreational services	2005	382	759	6,039
	2006	1,400	3,320	14,318		2006	395	785	6,307
	2007	1,486	3,523	14,758		2007	414	824	6,203
Retail trade	2005	1,198	2,199	31,455	Personal & other community services	2005	290	519	8,570
	2006	1,261	2,313	32,550		2006	321	574	9,110
	2007	1,288	2,363	32,585		2007	343	613	9,445
Accommodation, restaurants & bars	2005	426	927	16,360	Total all industries including finance service charge	2005	17,045	37,359	248,890
	2006	420	915	16,620		2006	18,511	40,173	252,851
	2007	450	981	17,230		2007	19,502	42,378	255,613
Transport & storage	2005	907	2,106	11,480	Finance service charge	2005	-605	0	0
	2006	965	2,239	11,758		2006	-657	0	0

<i>Industry</i>	<i>Year</i>	<i>GDP</i>	<i>Output</i>	<i>Jobs</i>	<i>Industry</i>	<i>Year</i>	<i>GDP</i>	<i>Output</i>	<i>Jobs</i>
	2007	1,011	2,347	11,744		2007	-692	0	0
Communication services	2005	548	976	3,370	Total all industries less finance service charge	2005	16,440	37,359	248,890
	2006	603	1,074	3,480		2006	17,854	40,173	252,851
	2007	680	1,213	3,220		2007	18,809	42,378	255,613

Lyttelton Port's contribution to regional GDP was derived from Table 3 data. This was measured by the value of producers' GDP that is directly or indirectly dependent on the ability to export through Lyttelton Port. In addition, the direct and indirect jobs that are associated with exports were assessed.

Lyttelton Port is part of the region's transport and storage and communication industry. Transport and storage contributed \$1B (5 percent) to regional GDP of \$19B for the year ended March 2007. The port's contribution (i.e. LPC and its tenants) to regional GDP is in the order of \$124M, or the equivalent of 5 percent, of the transport sector's total contribution to regional GDP.³

Those statistics understate the importance of Lyttelton Port to the economic activity of the region and the nation. Lyttelton Port, provides the region with essential low cost access to international markets. The importance is best gauged by the GDP and employment, directly and indirectly facilitated by exports, rather than by the individual and/or collective monetary value of their services.

Table 4: Canterbury Region GDP and employment facilitated by Lyttelton*

<i>March year</i>	<i>GDP content Lyttelton exports</i>	<i>Percentage Canterbury GDP</i>	<i>Employment content Lyttelton exports</i>	<i>Percentage Canterbury full-time equivalent jobs</i>
2005	754	5%	11,303	5%
2006	813	5%	11,670	5%
2007	872	5%	10,764	4%

* Excludes West Coast generated GDP and employment by coal trade.

Table 4 shows the estimated value of GDP and employment directly facilitated by exports via Lyttelton and the region as a whole. The value of GDP (excluding coal) that was directly facilitated by exports shipped through Lyttelton was \$872M for the year ended March 2007. Lyttelton's figure comprised four percent of Canterbury's

³ Not all port-related activities are transport sector related, e.g. some tenants are involved in marine engineering or fishing activities.

total GDP of \$19B. There were 10,764 job counts (i.e. four percent of Canterbury's full-time equivalent labour force) involved in generating this activity.

The number of jobs directly generated by exports through the port fell by about 900 due to a decline in manufacturing related export job counts of almost 1200 compared to the previous year.

Both Lyttelton Port and Christchurch International Airport are rated as strategically important in the Canterbury Regional Council's Regional Policy Statement. It is noteworthy that the contribution to GDP facilitated by the port's merchandise exports (i.e. \$872M) is approximately three times that of the airport's GDP (i.e. \$297M) facilitated by exports while the number of associated job counts from is about 2.7 times that of the airport (i.e. 4000).

Export sector production induces economic activity elsewhere. This is because in the process of undertaking their activities, directly and indirectly, exporters make demands on other industries. For example, when exporters produce their output it impacts on the suppliers of materials and services (e.g. transport firms, electricity suppliers). In so reacting, the servicing industries (e.g. road transport) make demands on their suppliers (e.g. motor vehicle services), who in turn do the same in an almost endless but diminishing reaction. At the same time, this causes a rise in household income as a consequence of increased salaries and wages, dividends, interest and rental payments, which encourages greater expenditure. This leads to further chain reactions as producers attempt to satisfy increased consumer demand from households. The flow-on impacts are known as the output and employment multiplier impacts. They apply to all production activity, albeit for the domestic or export market. In addition, as previously explained, the foreign exchange earnings from exports facilitate other production by mitigating constraints on the over-all level of domestic economic activity, namely, the ability to fund that part of domestic consumption and or capital formation reliant on imports. Over time, a marginal increase in export activity facilitates a larger increase in domestic activity. This is referred to as the foreign exchange multiplier impact.

Having regard to current multiplier effects associated with export activity, including foreign exchange exports through Lyttelton port, it is estimated that Lyttelton port sustained up to \$2.6B of New Zealand's GDP and 32,000 jobs for the year ended March 2007.⁴ The additional output and employment generated by the foreign

⁴ For a variety of reasons, multiplier impacts need to be treated with caution. The Department of Statistics' Inter-Industry

exchange multiplier effect are diffuse and, therefore, it should not be concluded that all this contribution to GDP and employment accrued to the Canterbury region.

5 Importance of coal trade to Lyttelton

Facilitates competitive port operations

There are three categories of activities at Lyttelton Port, namely, marine activities (tugs, pilots, linesmen), container services and port services (coal, bulk cargo, cars, fuel, fishing).

The coal trade is part of port services and contributed around 27 percent of the total weight of cargo handled at the port for the year ended March 2008. While the coal trade is undertaken from a dedicated site, it is not in fact a stand-alone operation and draws heavily on personnel and facilities that would otherwise be less well used, i.e. in respect of marine activities and container services. For example, while the coal terminal has 11 full-time staff, it draws heavily on labour resources in LPC's container terminal pool. It also makes use of management, administration, engineering and maintenance staff. The coal trade also uses tugs, pilotage, berthage, lines and security (i.e. communal) services that would otherwise be less well used. That is, the coal trade facilitates the spreading of fixed personnel costs and capital costs over a much greater cargo volume to the benefit of all cargo users. Effectively, it facilitates more price-competitive operations at the port by enabling fixed costs to be spread across a much wider cargo base.

The coal trade also operates under a long-term contract with Solid Energy which enhances financial planning for the port by creating relative security with respect to future cash flow. Security of cash flow is very important to LPC's investment in the port's infrastructure.

Lyttelton coal trade generated employment

In total, the coal trade facilitates a large, but not exactly known number of jobs, most of which are based on the West Coast. In this respect, information supplied by Solid Energy New Zealand Limited indicate that excluding Pike River Coal there were between 660 and 844 mining employees and contractors engaged on the West Coast in producing coal for export and some domestic consumption. In addition,

Studies are the main source of information for assessing multiplier impacts. The studies do not fully account for the foreign exchange impact and, therefore, understate the beneficial impact of export activity on GDP. My own research suggests that over time, around \$1 of export income has supported around \$4 of GDP.

Solid Energy New Zealand indicated that there were between 140 and 186 specialists coal mining consultants and short-term contract workers employed on the West Coast. Thus, excluding Pike River Coal, there are in total between 800 and 1030 coal mining jobs on the West Coast. The bulk of West Coast coal production (over 90 percent) is for export, so most of the coal mining jobs are likely to relate to the Lyttelton coal trade.

Statistics New Zealand business activity statistics indicate there are about 40 West Coast rail employees, most of whom are likely to be engaged in facilitating the Lyttelton coal trade. There is also an unknown number of rail employees based outside of that region engaged in facilitating coal trade exports through Lyttelton. There is other employment in coal wagon and locomotive maintenance (e.g. United Group Rail (NZ) Limited).

While the coal trade is responsible for a large percentage of the total tonnage handled by the port, it contributes about three percent of total full-time employment. However, as previously stated, the coal trade draws heavily on general labour resources, especially LPC's container terminal pool. Allowing for this, the coal trade requires about 27 full-time equivalent personnel to support coal exports of about 2.5 million tones per annum.

The West Coast and Christchurch/Canterbury-based workers directly involved in the Lyttelton coal trade is estimated at between 905 and 1135 while the total direct and indirect jobs generated (nationally) by the coal trade are estimated at between 2100 and 2800 jobs.

In the past, there have been proposals to ship coal directly from the West Coast and bypass Lyttelton port. None of the alternative proposals has been found to be as competitive as exporting via Lyttelton and/or for that matter, commercially viable alternatives in their own right. It is difficult to say how much coal would not be exported if Lyttelton was unavailable, but it could be a significant proportion of current exports.

6 Impact of proposed coal yard expansion on output, GDP and jobs

Lyttelton Port construction impact

The proposed coal yard expansion will increase economic activity as a result of the reclamation and other associated activities and the increased volume of coal that will

be transported through the port as a result of Solid Energy's 18-year contract to export Pike Rive Coal through Lyttelton.

The precise capital cost of building the expanded coal yard is uncertain at this stage due to uncertainty as to how much coal will need to be handled. However, the best estimate is in the order of \$43M. This expenditure will probably be spread over a four to five-year construction period with probably around 80 percent of this cost incurred in the first two-year period when the bulk of the construction work occurs. The estimated increase in regional GDP resulting from that increase in output is about \$13M (\$12 net present value (NPV) discounted at 10 percent discount rate⁵).

This direct construction expenditure will give rise to activity elsewhere in the regional economy as the contractors make demands on their suppliers, and the suppliers' suppliers and so forth.

Consequently, the direct construction GDP of \$13M will increase to \$31M (\$28M NPV) over the construction period, allowing for the direct and indirect (i.e. flow-on or multiplier impacts).

Direct employment is estimated at 150 job years, while total direct and indirect jobs are estimated at 300 job years.

Ongoing coal trade activity

In addition to the additional construction activity, coal trade output, GDP and jobs will also increase. Most of the increased activity will accrue to the West Coast rather than to Canterbury. The largest part of the direct benefit that will accrue to the region will be captured by LPC.

The increases in GDP are sensitive to the potential volumes of additional coal exported. In this respect, four levels of coal exports are assessed, namely, 3.3M tonnes, 4M tonnes, 4.5M tonnes and 5M tonnes. They represent increases of 800,000 tonnes, 1.5M tonnes, 2M tonnes and 2.5M tonnes in coal export volumes, respectively. The higher export volumes have a lower probability of being achieved,

⁵ Net present value is the discounted value of future income streams. Discounting recognises the time value of money and, therefore, the fact that the value of money in the future is not the same as the equivalent sum of money now. For example, at 10 percent discount rate \$1000 in year 20 and year 30 is the equivalent of \$164 and \$63, respectively, in year one. The effect of discounting is to give more weight to current rather than future financial flows. Selection of the discount rate tends to be problematic, but for the purpose of the following assessments, 10 percent is adopted as this rate was commonly used in New Zealand with respect to public sector project and policy evaluations. A lower discount rate increases NPV while a higher percentage reduces it.

let alone averaged at those levels throughout the 18-year contract period, than the lower volumes.

LPC's additional contribution to regional GDP is conservatively estimated to increase by:

- \$5.4M per annum at 3.3M tonnes or \$86M (\$38M NPV) over the contract period
- \$5.8M per annum at 4M tonnes or \$93M (\$46M NPV) over the contract period
- \$7.4M per annum at 4.5M tonnes or \$119M (\$58M NPV) over the contract period, and
- \$9.9M per annum at 5M tonnes per annum or \$158M (\$70M NPV) over the contract period.

There will be an unknown amount of regional GDP generated by rail-related activities and maintenance.

Allowing for the direct and indirect ongoing impacts LPC's additional contributions to regional GDP increase over the contract period to about:

- \$115M (\$51M NPV) at 3.3M tonnes per annum
- \$124M (\$60M NPV) at 4M tonnes per annum
- \$157M (\$77M NPV) at 4.5M tonnes per annum, and
- \$209M (\$93M NPV) at 5M tonnes per annum.

Thus, total direct and indirect increase in regional GDP over the contract period, including construction, is estimated at:

- \$146M (\$79M NPV) at 3M tonnes per annum
- \$155M (\$89M NPV) at 4M tonnes per annum
- \$188M (\$105M NPV) at 4.5M tonnes per annum, and
- \$240M (\$121M NPV) at 5M tonnes per annum.

The direct increase in regional GDP for the West Coast will be many times larger than Canterbury's increase. The volume of coal exported, fluctuations in world coal prices and the value of the New Zealand dollar complicate estimating the increase for the West Coast. However, based on an exchange rate of \$NZ1 = US\$0.57 cents for coal and conservative international coal prices, West Coast GDP is estimated to increase by the following amounts:

- \$67M annually at 3.3M tonnes exported or \$1.2B (\$540M NPV) over the contract period
- \$134M annually at 4M tonnes exported or \$2.4B (\$1.1B) over the contact period
- \$165M annually at 4.5M tonnes exported, or \$3B (\$1.3B NPV) over the contract period, and
- \$196M annually at 5M tonnes exported or \$3.5B (\$1.6B) over the contract period.

Due to inadequate data, the direct and indirect impacts of those increases were not estimated. However, nationally the direct and indirect impacts are assessed as follows:

- \$118M annually at 3.3M tonnes exported or \$2.1B (\$945M NPV) over the contract period
- \$235M annually at 4M tonnes exported or \$4.2B (\$1.9B) over the contact period
- \$289M annually at 4.5M tonnes exported, or \$5.2B (\$2.3B NPV) over the contract period, and
- \$342M annually at 5M tonnes exported or \$6.1B (\$2.7B) over the contract period.

The proposed coal yard expansion will provide more room for sorting coal. This will enhance the ability to maximise the value of coal exported through Lyttelton. It will also increase the contribution to New Zealand GDP of existing coal exports.

As previously stated, the full-time equivalent LPC jobs associated with the coal export is estimated at 27 based on 2.5M tonnes exported per annum. This increases by eight full-time equivalents at 3.3M tonnes, 17 full-time equivalents at 4M tonnes, 23 full-time equivalents at 4.5M tonnes and 28 at the targeted 5M tonnes per annum.

The increase in West Coast coal mining and other rail/maintenance-related coal trade jobs is substantially larger than the increase in LPC jobs. As previously stated, West Coast employment in respect to the export coal trade through Lyttelton (i.e coal mining and rail) is estimated at 905 to 1315. This employment is estimated to increase by up to 170 at 3.3M tonnes, 254 at 4M tonnes, 337 at 4.5M tonnes and 421 at 5M tonnes.⁶ While there is inadequate information to estimate the multiplier impact for the West Coast, total direct and indirect New Zealand employment increases by up to 400 at 3.3M tonnes, 600 at 4M tonnes, 800 at 4.5M tonnes and 1000 at 5M tonnes.⁷

7 Conclusion

International trade is vital to the health of the national and regional economies. In this respect, New Zealand can only raise its standard of living and grow if it increases its exports. The ports and international airports play a vitally important part in facilitating international trade.

The proposed coal stockyard expansion is important to enabling growth in exports and the regional and national economies as a whole. The benefit to the national economy will be many times larger than the regional growth in GDP and employment resulting from construction and operation of the expanded coal stockyard.

⁶ Those estimated job increases are based on about 400 total jobs currently dependent on the Lyttelton coal trade and assuming that there is a reasonable direct relationship between the annual tonnage of coal exported and labour employed in the coal trade.

⁷ Due to unused capacity in various components of coal exports, the increases in jobs will probably be less than indicated.