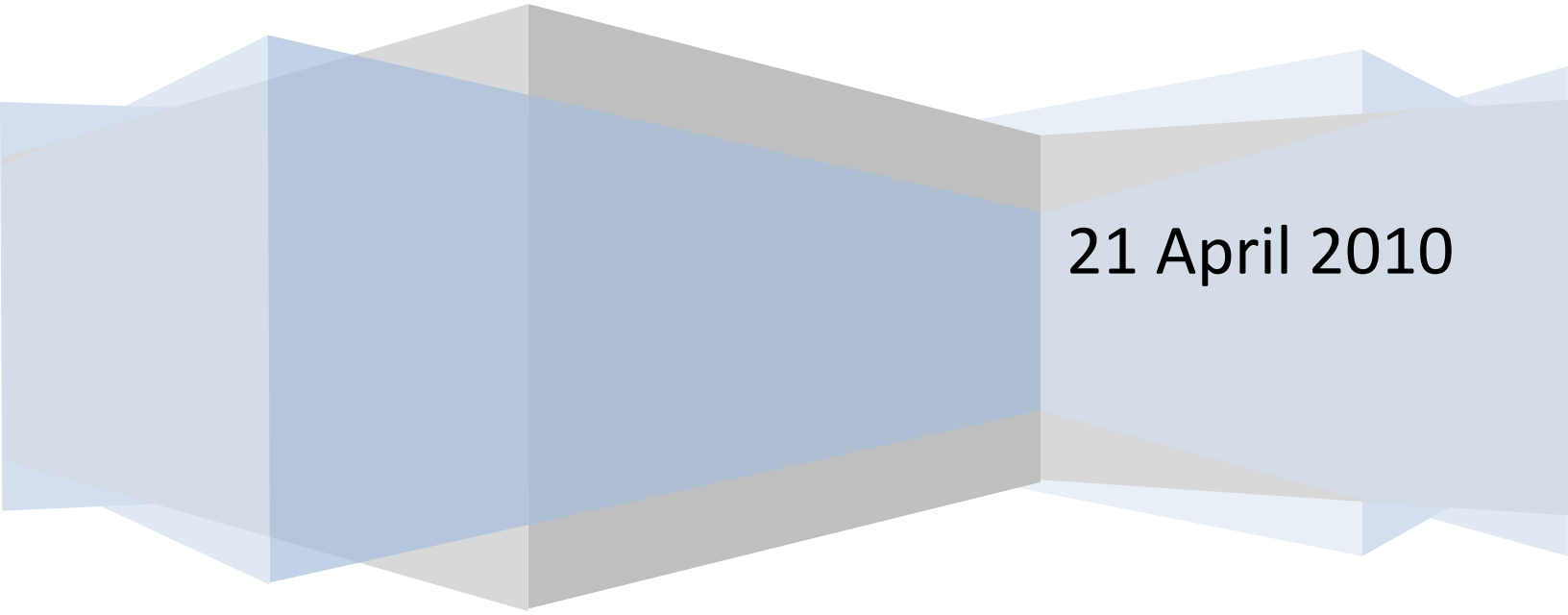
Leeds School of Business
University of Colorado at Boulder

Preliminary Business Report

Pandoraan Limestone Project

Environmental Studies Institute



21 April 2010

End Project Report

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1. Preliminary Market Research

Australian Market Abstract

Due to Australia's current relations with Pandora, the proximity of Pandora and Australia, and direct seaport channel. An extensive analysis of Australia's dimension stone market is imperative to Pandora's proposed limestone production. This section shows macro-economic indicators of Australia then segues into the importance of mineral mining in Australia and internal limestone production in Australia. After this data is presented limestone import and export data, pricing data for limestone wall cladding according to data from three sources, and an analysis of the Australian housing market are indicated and analyzed. The analysis of the aforementioned information proves Pandora should enter Australia however in order to meet financial goals their international export partners must be diversified.

Executive Summary

Due to Australia's current relations with Pandora, the proximity of Pandora and Australia, and direct seaport channel. An extensive analysis of Australia's dimension stone market is imperative to Pandora's proposed limestone production. The analysis of the Australian market is broken down into eight sections: 1. Macro-Economic indicators for Australia 2. Population analysis 3. Australian mining and limestone mining production information 4. Limestone import and export data and analysis 5. An extensive list of Australia dimension stone firm contacts 6. Pricing data for limestone wall claddings 7. Data and analysis of the Australian housing market 8. Overall recommendations for Pandoran limestone production.

1. Australia from a macro-economic perspective is a successful and economy with a strong middle class. It is characterized by a high GDP per capita as well as a low gini coefficient.
2. The majority of Australia's population resides on the Eastern side of the country, thus entrance into Australia should take place on the East coast.
3. Limestone mining is a profitable enterprise in Australia, annually producing more than $100,000,000 AU worth of limestone however dimension stone makes up less than 1% of the value of limestone production in Australia.
4. With minimal exceptions limestone, imports into Australia have decreased from 1990-2008 and limestone exports from Australia have increased from 1990-2008. Although these trends are not favourable for Pandora's limestone business, limestone is still imported into Australia in much higher numbers than it is exported.
5. Creating business contacts in the Australian dimension stone business is essential for future sales of Pandorian limestone. The contact list provides addresses, phone numbers, e-mails, the company URL, and the history of communication with each individual firm.
6. Pandora will begin its production with wall claddings, therefore pricing data and averages of limestone and sandstone wall claddings from three different Australian dimension stone firms are listed in order to provide information for break even analysis.
7. An analysis of the Australian housing market can provide an in market analogy for limestone demand. When houses are built construction material is needed, limestone wall claddings are construction materials, therefore as housing increases limestone wall cladding demand may also increase. The construction of housing was stagnant from 2001-2008 but it made a huge increase in 2009.
8. Pandora should enter the Australian market; however they need to differentiate their product to receive a higher wholesale price for their product. Pandora should make business contacts in Australia when samples are created but there are not enough limestone imports for Pandora to be successful selling exclusively to Australia. Pandora must make business contacts from other countries or worldwide distributors in order to sell sufficient amounts of limestone.

Due to Australia's current relations with Pandora, the proximity of Pandora and Australia, and direct seaport channel. An extensive analysis of Australia's dimension stone market is imperative to Pandora's proposed limestone production.

Section 1: General Demographics of Australia

Australia's GDP in 2009, $819 US is the 19th highest GDP in the world, **Table 2-1** below reveals Australia's GDP over the past three years; the Gross Domestic Product has stayed relatively constant despite the world economic recession in the latter half of 2008 and the majority of 2009. Australia's 2009 GDP per capita of 38,500 is the 22nd highest in the world, showing both a strong middle class and high purchasing power. 71.3% of Australia's GDP is generated from the services, industry makes up 24.9% of the GDP, and agriculture comprises a mere 3.8%; further indicating Australia is an advanced economy. Moreover Australia's income distribution is spread out evenly when compared against the rest of the world. In 2006 their gini coefficient was listed as 30.5, only 34 countries scored better. Which provides further testament to the strength of the Australian middle class.

Table 2-1: Australian GDP

GDP Estimates: Year	**GDP in Billions of US Dollars[1]**
2007	793.4
2008	812.5
2009	819

Geography and Population: The total population of Australia is 21,262,641 people making it the 55th most populated country in the world[2]. Over 89% of the population or 18,923,750[3] people live in urban areas. The most populated and economically important cities in Australia are listed in the **Table 2-2** below[4].

[1] Figures Found on CIA World Factbook: Economics Australia https://www.cia.gov/library/publications/the-world-factbook/geos/as.html
[2] Population data found on CIA World Factbook: People. https://www.cia.gov/library/publications/the-world-factbook/geos/as.html
[3] Urban Population data found on CIA World Factbook: People. https://www.cia.gov/library/publications/the-world-factbook/geos/as.html
[4] Population Broken Down by city found on: Australia Bureau of Statistics: 3218.0 - Regional Population Growth, Australia, 2008-09

Section 2: Population

Table 2-2: City Population

City	State	Estimated Population 2009[5]
Sydney	New South Wales	4,504,469
Melbourne	Victoria	3,995,537
Brisbane	Queensland	2,004,262
Perth	Western Australia	1,658,992
Adelaide	South Australia	1,187,466
Gold Coast-Tweed	Queensland/New South Wales	577,977
Newcastle	New South Wales	540,796
Canberra-Queanbeyan	Australian Capital Territory/New South Wales	403,118
Canberra	Australian Capital Territory[3]	*351,868*
Wollongong	New South Wales	288,984
Sunshine Coast	Queensland	245,309

7 out of 10 of the most populated cities in Australia are located on the eastern side of the country. Thus it is advisable to distribute, to market and to sell goods on Australia's eastern coast.

[5] Australia Bureau of Statistics: 3218.0 - Regional Population Growth, Australia, 2008-09

Stones, Minerals, and Mines in Australia: Information provided by the United States Geological Survey (USGS)[6]

According to data from 2007, Australia is one of the world's largest mineral producers, namely in the production of bauxite, coal, cobalt, copper, gem and near-gem diamond, gold, iron ore, lithium, manganese ore, tantalum, and uranium. Australia's total mineral exploration spending, excluding petroleum, was $1,751.9 million in 2007. The majority of mineral exploration takes place in the south western region of Australia.

Mining is a pivotal aspect to the Australian economy; the mining sector contributed more than $82 billion to the country's gross domestic product (GDP), which is roughly 7.7% of the GDP. Mining employed 104,700 people directly working in mining and an additional 200,000 who were involved in supporting mining activities. Moreover, the Australian Bureau of statistics predicts that mining will continue to be a major factor in the GDP of Australia for the next several years. Limestone production however, is not a large component of Australia's mining economy.

Table 2-3: Limestone Production

Year	Limestone Production (Thousands of Metric Tons)
2003	17,076
2004	18,360
2005	18,280
2006	18,200*
2007	18,200*

*Indicates estimated numbers.

Table 2-3 illustrates Australia's limestone production, most of which takes place in South Western Australia. The data provided in **Table 2-3** does not specify the specific type and form of limestone produced in Australia however **Table 2-4 through Table 2-10** shows the value in millions of dollars of various facets of limestone production.

[6] 2007 Minerals Yearbook: Australia (Advanced Release) Author: Pui-Kwan Tse

Section 3: Limestone Mining

The data in **Table 2-4** through **Table 2-11**, provided by the Australian Bureau of Statistics, reflects the amount of limestone commodities produced for specific use by value ($1 Million AU) in Australia. [7] The history of the data in **Table 2-4** through **Table 2-11** does not extend past 2001.

Table 2-4: Value of Limestone Production as Dimension Stone

Limestone Dimension Stone	Year	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australia
	2001-02								
	2002-03								
	2003-04								
	2004-05				1				1
	2005-06				0				0
	2006-07				1				1

Table 2-5: Value of Limestone Production for Cement

Limestone For Cement	Year	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australia
	2001-02		2	n.p.	15		10		n.p.
	2002-03		4	n.p.	14		10		n.p.
	2003-04		5	n.p.	7		10		n.p.
	2004-05		5	n.p.	18		9		n.p.
	2005-06		6	n.p.	17		11		n.p.
	2006-07		8		n.p.		10		n.p

[7] Australia Bureau of Statistics: 84150 Mining Commodities, States, Northern Territory and Australia, 2001-02 to 2005-06

Table 2-6: Limestone Production for Agricultural Use

Limestone for Agriculture	Year	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australia
	2001-02		5	n.p.	2		3		n.p.
	2002-03		8	n.p.	1		3		n.p.
	2003-04		9	n.p.	1		3		n.p.
	2004-05		9	n.p.	1		3		n.p.
	2005-06		11	n.p.	2		3		n.p.
	2006-07		12	n.p	n.p		2		n.p

Table 2-7: Limestone Production for Lime

Limestone for Lime	Year	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australia
	2001-02		0	n.p.			n.p.		n.p.
	2002-03		8	n.p.			n.p.		n.p.
	2003-04		2	n.p.			n.p.		n.p.
	2004-05		4	n.p.	2		n.p.		n.p.
	2005-06		6	n.p.	2		n.p.		n.p.
	2006-07		7	n.p	n.p		n.p		n.p

Table 2-8: Limestone Production for Metallurgical Flux

Limestone for metallurgical flux	Year	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australia
	2001-02			n.p.			1		n.p.
	2002-03			n.p.			1		n.p.
	2003-04			n.p.			1		n.p.
	2004-05			n.p.	0		1		n.p.
	2005-06			n.p.	0		1		n.p.
	2006-07			n.p.			1		n.p

Table 2-9: Limestone Production for Chemical Use

Limestone for chemical use	Year	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australia
	2001-02				13				13
	2002-03				13				13
	2003-04				17				17
	2004-05				20				20
	2005-06				17				17
	2006-07				n.p.				n.p.

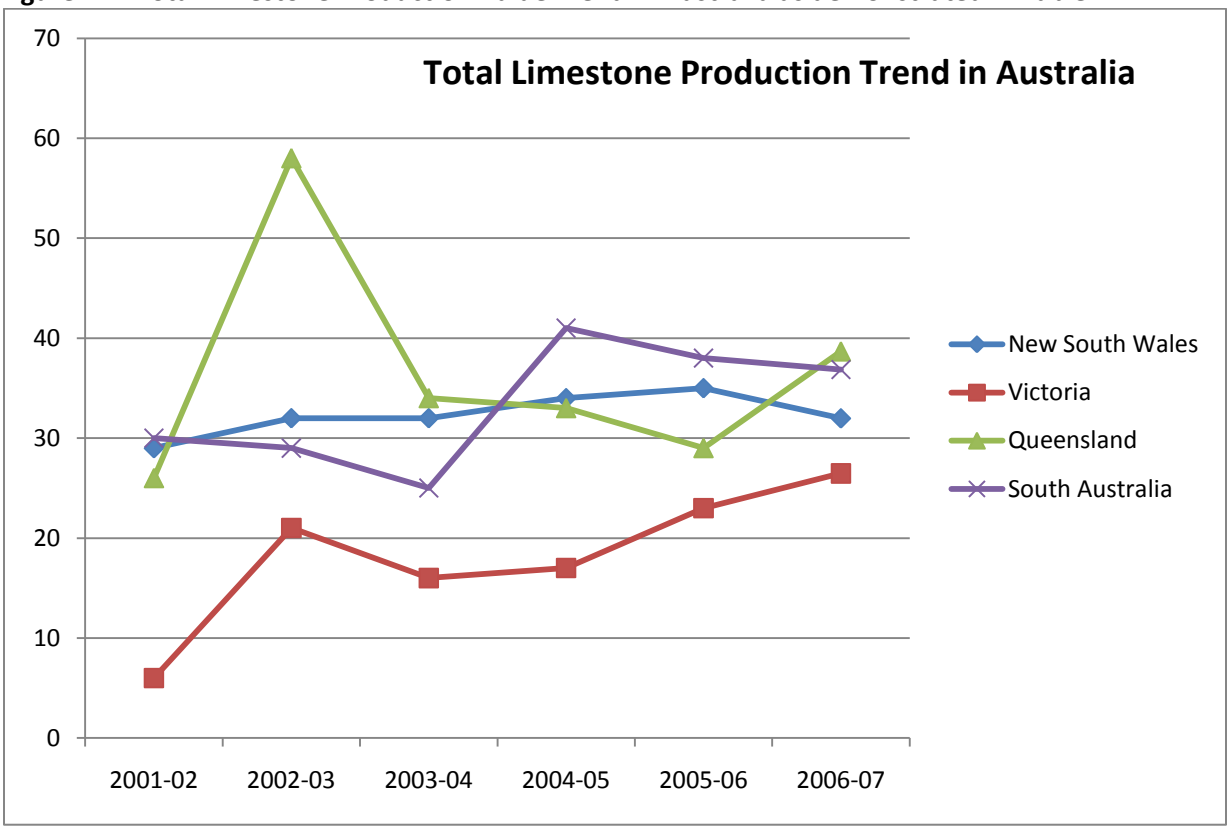
Table 2-10: Limestone Production for Other or Unspecified Use

Limestone for other use	Year	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australia
	2001-02	29		n.p.				1	n.p.
	2002-03	32		n.p.				1	n.p.
	2003-04	32		n.p.	1				n.p.
	2004-05	34		n.p.	0		0	0	n.p.
	2005-06	35		n.p.	0		0	n.p.	n.p.
	2006-07	32		n.p.	n.p.		0	n.p.	n.p.

Table 2-11: Limestone Production Total Value

Limestone Total Use	Year	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Northern Territory	Australia
	2001-02	29	6	26	30	n.p.	n.p.	1	n.p.
	2002-03	32	21	58	29	n.p.	n.p.	1	n.p.
	2003-04	32	16	34	25	n.p.	n.p.	n.p.	n.p.
	2004-05	34	17	33	41	n.p.	n.p.	n.p.	n.p.
	2005-06	35	23	29	38	n.p.	n.p.	n.p.	n.p.
	2006-07	32	26	39	37	n.p.	n.p.	n.p.	n.p.

Figure 2-1: Total Limestone Production Value Trend in Australia as demonstrated in Table 2-11



Overall, limestone production is a valuable enterprise in Australia the total proposed worth of the limestone mining industry in Australia in 2005 was approximately $124 million AU and in 2006 the total value of limestone production was $134 million AU[8]. However, according to **Table 2-4** limestone produced for dimension stone has little production value in Australia. Most likely the small value of limestone produced as dimension stone stems from the definition of a mining commodity. The information presented in **Table 2-4 – Table 2-11** displays the value of production of mining commodities, limestone produced for dimension stone general could be viewed as value added mining, because the quality, color, and type of limestone mined add a higher worth to the product; therefore the majority of limestone produced for dimension stone does not appear in **Table 2-4.**

[8] Total Value calculated for 2005 and 2006 limestone production came from information from 84150 Mining Commodities: Australia Bureau of Statistics.

Table 2-12: General Import/Export Data

	Australia[9]	Exports		Imports	
Year	Production(KT)	Volume(In Tons)	Value (000's)	Volume(KT)	Value(000's)
1970-71	10 335	na	na	713	1 018
1971-72	10 494	na	na	605	1 001
1972-73	11 224	na	na	1 130	1 890
1973-74	11 046	na	na	1 432	2 572
1974-75	10 854	na	na	1 490	3 775
1975-76	10 583	na	na	1 527	4 475
1976-77	10 552	na	na	1 100	4 433
1977-78	10 924	na	na	1 380	7 085
1979-80	11 730	na	na	1 077	4 928
1980-81	11 983	na	na	1 323	6 345
1981-82	12 698	15	1	977	4 344
1982-83	10 131	80	6	833	4 393
1983-84	9 608	35	8	940	5 381
1984-85	8 570	76	8	1 022	7 292
1985-86	10 747	21	10	996	10 794
1986-87	10 803	63	7	859	10 065
1987-88	10 614	30	6	1 004	11 480
1988-89	12 915	24	8	1 038	10 656
1990-91	12 566	65	16	971	10 194
1991-92	na	258	49	1 161	12 412
1992-93	15 895	1 729	165	819	11 859
1993-94	na	18 893	1 145	1 011	17 156
1994-95	na	463	206	1 038	14 618
1995-96	na	133 080	1 889	991	14 777
1996-97	na	178 758	2 241	1 027	12 712
1997-98	na	226 529	2 724	1 576	15 391
1998-99	na	170 795	2 500	1 066	15 881
1999-00	15 853	229 934	4 515	705	10 540
2000-01	14 743	213 469	4 101	665	10 835
2001-02	15 215	241 526	4 683	595	9 995
2002-03	18 333	242 446	5 132	582	9 170
2003-04	17 152	332 931	6 516	547	8 695
2004-05	18 366	331 515	6 568	473	7 218
2005-06	18 293	177 610	4 254	475	7 130
2006-07	19 143	171 945	4 242	567	7 575
2007-08	18 200*	745	734	693	8 182
2008-09	18 200*	15 608	2 136	438	7 841

Section 4: Limestone Imports and Exports ←

*Numbers taken from USGS

[9] *Sources:*ABS, *International Trade,*Australia, cat. no. 5465.0

The column charts below show the trend of Australia's limestone Imports, based on data provided in **Table 2-12**[10]. **Figure 2-2** demonstrates the volume of imports into Australia **Figure 2-3** shows the value of the limestone imports into Australia.

Figure 2-2: Volume of Australian Limestone Imports

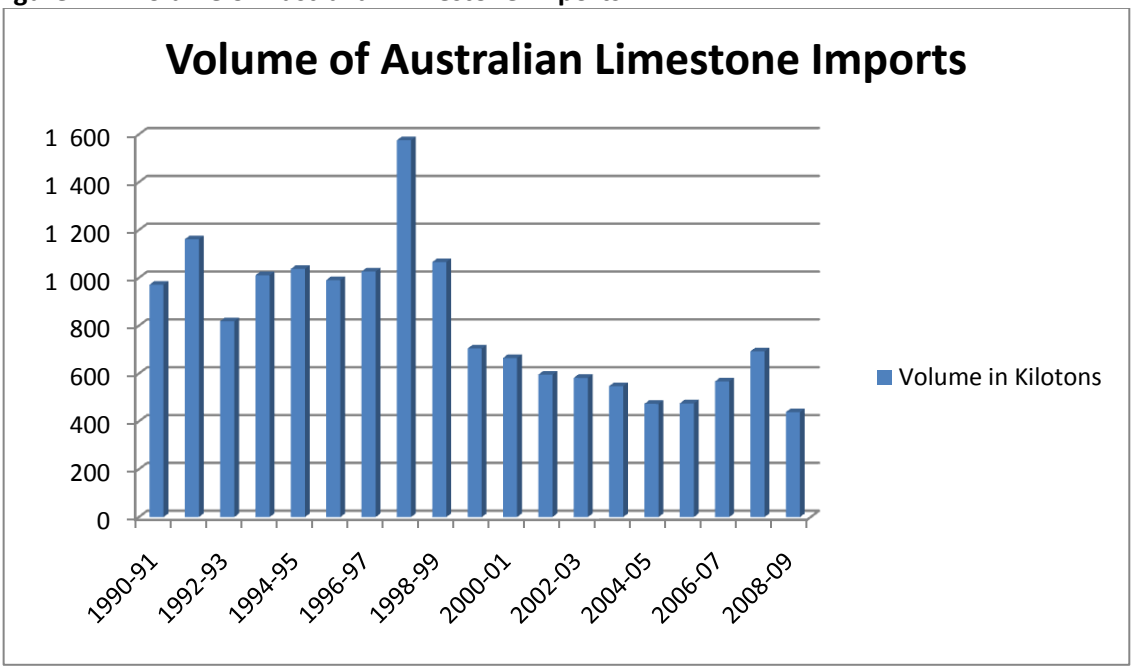
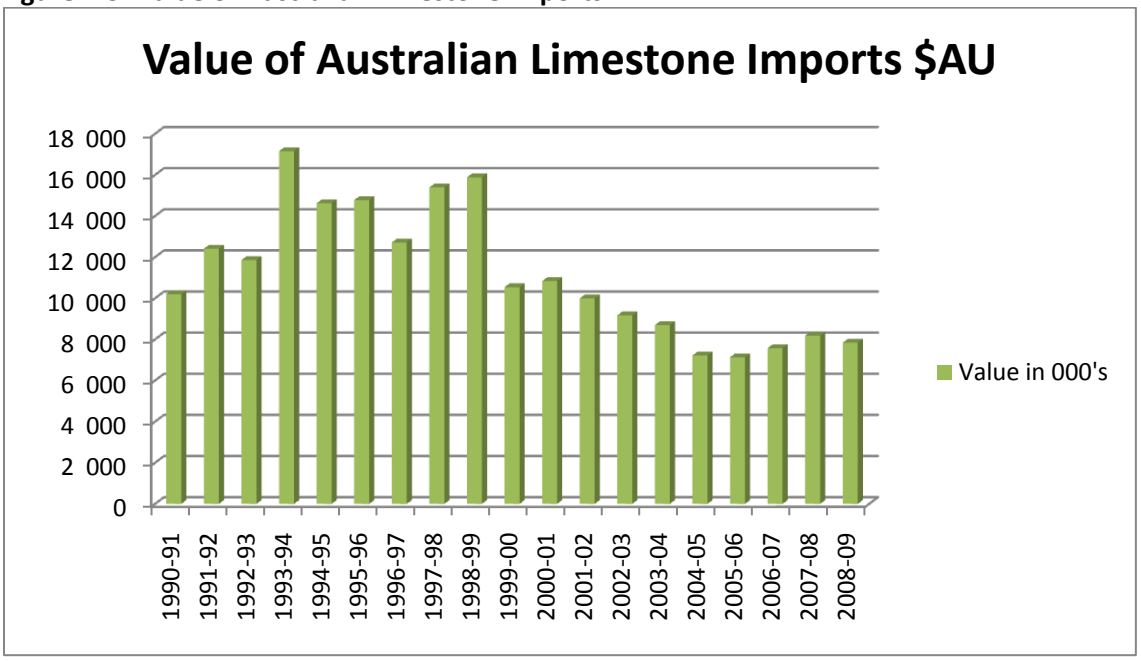


Figure 2-3: Value of Australian Limestone Imports



[10] *Sources:*ABS, *International Trade,*Australia, cat. no. 5465.0, Canberra; ABS, *Mineral Production, Australia,*cat. no. 8405.0, Canberra; ABS, *The Australian Mining Industry,*cat. no. 8414.0, Canberra; ABS, Mining Operations, cat. no. 8415.0, Canberra; Bureau of Mineral Resources, *Australian Mineral Industry Annual Review,*AGPS, Canberra; state mines departments and their equivalents; ABARE.

Import Analysis[11]

Volume Analysis: According to data provided in **Table 2-12** and **Figure 2-2** the average volume of exports from 1990-2008 was 831 kilotons. The volume of limestone imports into Australia stayed around 1,000 kilotons per year from 1990-1999, and the average volume of imports during the 90's was 1036 kilotons per year, the only big deviations came in 1997 when 1,576 kilotons were imported and 1999 when 705 kilotons were imported. The volume of limestone imports from 2000-2008 significantly decreased from the volume of imports from 1990-1999. The average volume of limestone imports during this time period was 560 kiltons imported per year which is 474 kilotons less than the average in 1990. During 2000-2008 the largest volume of imports came in 2000 with 665 kiltons imported, and the smallest volume of imports coming in 2008 when 438 kilotons were imported.

Value Analysis: According to data provided in **Table 2-12** and **Figure 2-3** the value of limestone imports fluctuated more significantly than the volume of imports, the total average value of limestone imports from 1990-2008 was $11,167,000 AU. The average value of imports from 1990-1999 was $13,554,000 AU per year. The two significant deviations from this average came in 1993 when the value of limestone imports was $17,156,000 AU and 1990 when the value was $10,194,000 AU. In 2000-2008 The value of limestone imports generally had a downward trend. The highest value of limestone imports came in 2000 with a value of $10, 835,000 AU, the smallest value of limestone imports was in 2005 with a total value of $7,135,000 AU. The average value of limestone imports from 2000-2008 was 8,516,000 AU.

Overall there is a downward sloping trend for volume and value of limestone imports into Australia. 1990-1999 had higher import averages for both volume, 1036 kilotons, and value $13,554,000 than 2000-2008 volume, 560 kilotons, and value $10,835,000. The significant decrease in import averages over the past twenty years proves Australia cannot be the only market Pandora should enter, other international markets will be essential to the success of Pandora's limestone production.

[11] All averages taken from data provided in **Table 2-12**

Figure 2-4: Trend of Volume of Australian Limestone Imports [12]

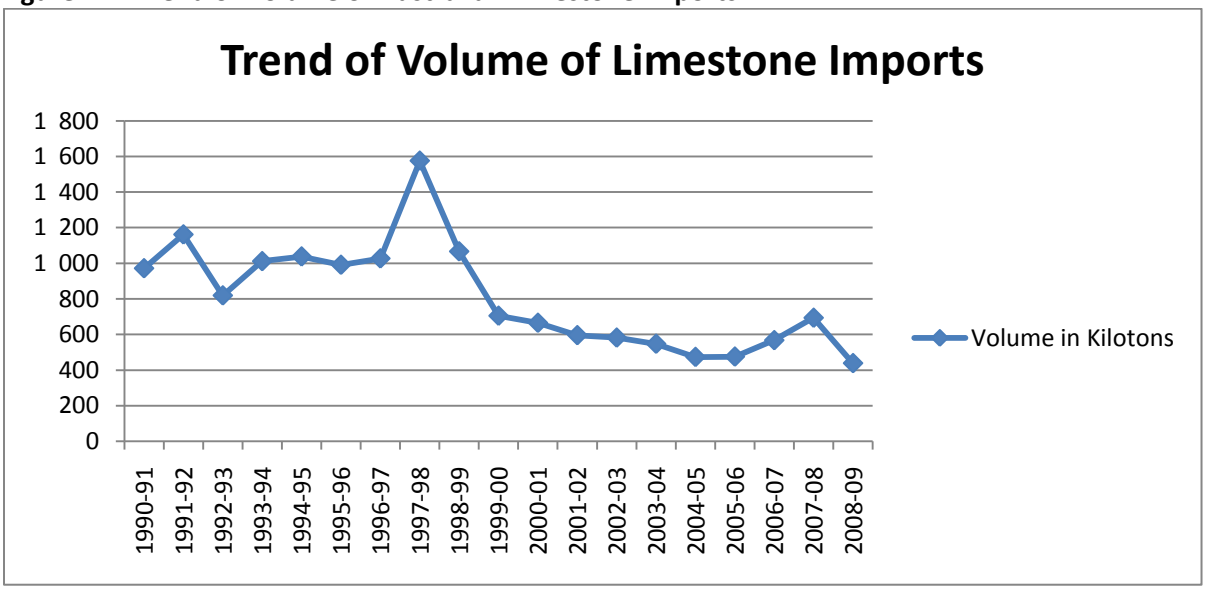
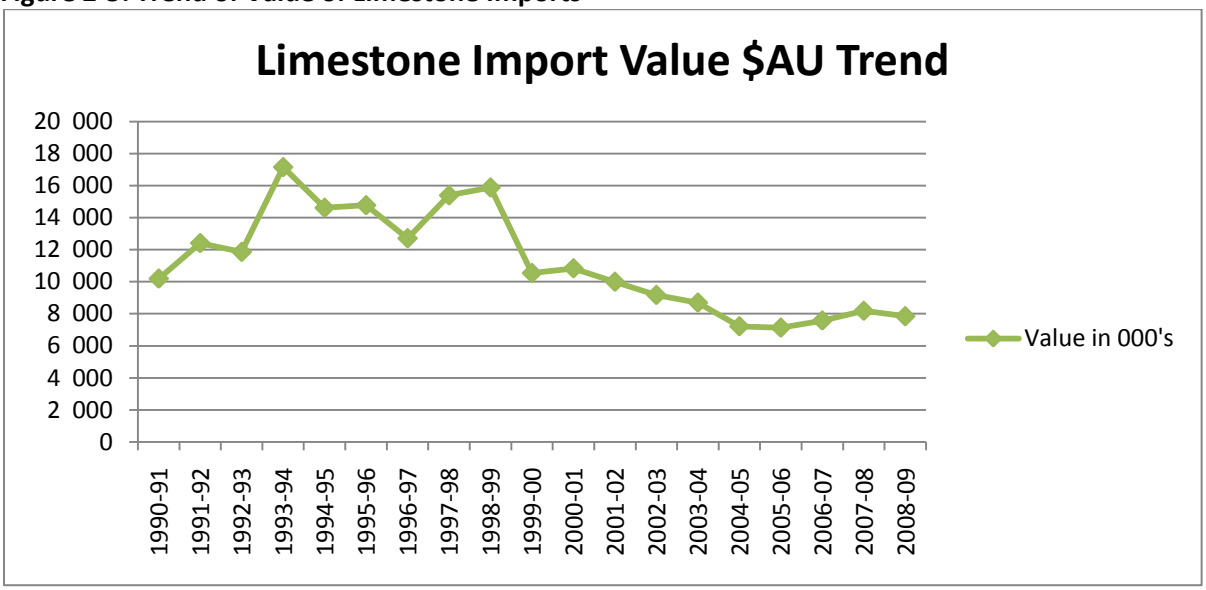


Figure 2-5: Trend of Value of Limestone Imports



The trends indicated above show both the volume and value of limestone imports has decreased from 1990-2008, with a very large decrease from 1998 to 2005 and leveling off from 2005 to 2008. The overall decrease of the import value and volume of limestone in Australia most likely can be attributed to the increase of limestone production in Australia from 1990-2006, as well as the increase in exports of limestone goods from Australia (demonstrated in **Table 2-12**).

[12] Trends for **Figure 2-4** and **Figure 2-5** are drawn from data provided in **Table 2-12**

The column charts below (**Figure 2-6** and **Figure 2-7**) show the sporadic trend of Australian limestone exports from 1990-2008, **Figure 2-6** demonstrates the volume of exports from Australia and **Figure 2-7** shows the value of the limestone exports.

Figure 2-6: Volume of Australian Limestone Exports[13]

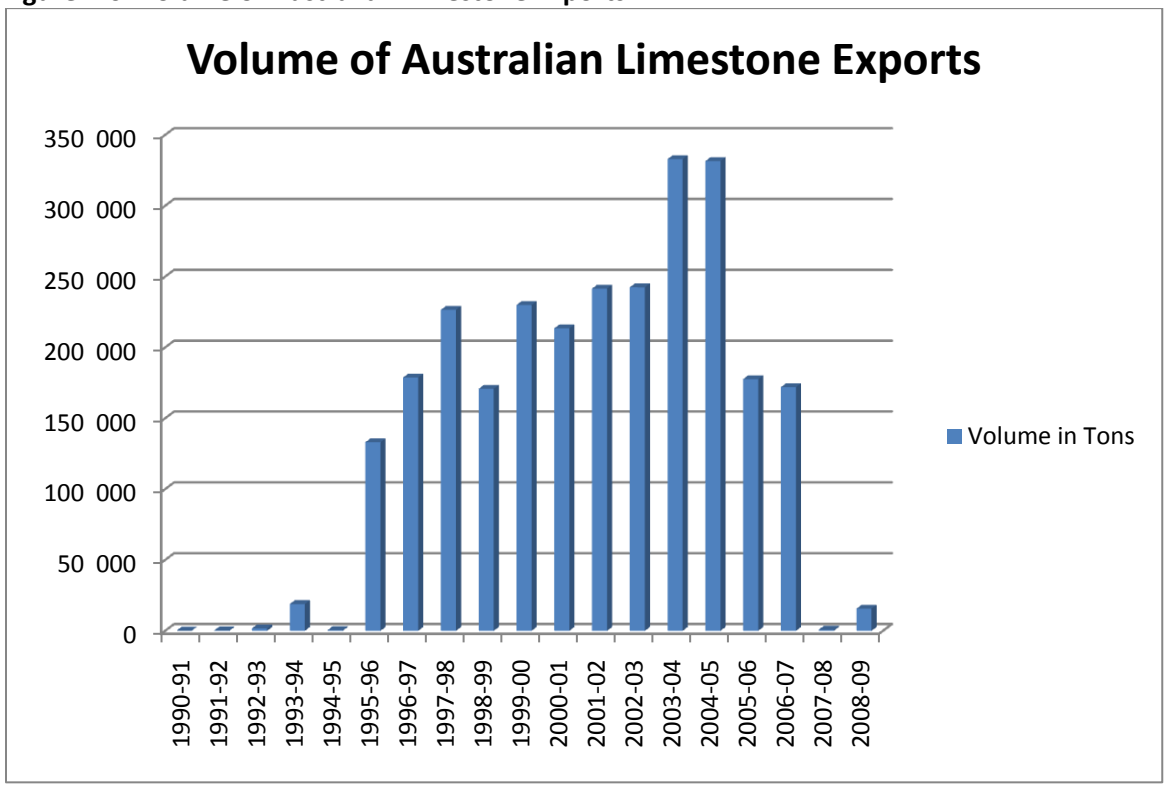


Figure 2-7: Value of Australian Limestone Exports

[13] Trends for **Figure 2-6** and **Figure 2-7** are drawn from data provided in **Table 2-12**

Export Analysis[14]

Volume Analysis: The volume of exports from 1990-2008 made a dramatic increase starting in 1995, previous to that year limestone exports from Australia were nearly nonexistent. The overall average of limestone export volume from 1990-2008 was 141, 489 tons (141.5 kilotons) exported per year. From 1990-1999, despite the large variance in volume of limestone exports, the average was 81,174 tons exported per year. However, excluding 1990-1994 the average volume of limestone exports was 187,819 tons (187.8 kilotons) per year. The volume of limestone exports from 2000 to 2008 had huge fluctuations year by year. The behavior of limestone exports from 2007 and 2008 are extremely odd and do not follow any previous trend. Including the two outliers, the average volume of exports in this time frame was 191,977 tons (192 kilotons) exported per year; excluding the outliers the average was 244,492 tons (244.5 kilotons) exported per year.

Value Analysis: Despite a large jump in value of limestone exports in 1993, from 1995 forward the value of limestone exports excluding a few outliers had an increasing trend. The average value of limestone exports was $2,833,000 AU exported per year. The average value of limestone exports from 1990-1999 was $1,545,000 AU, however the average value of imports from 1995-1999 was $2,774,000 AU per year. The high for both volume and value came in 1999 with 229,934 tons exported at a value of $4,515,000 AU. Both lows came in 1990 with 65 tons exported at a value of $16,000AU. The value of limestone exports follows a very similar trend to the volume of exports. There are large fluctuations in value year by year and behaviors that do not follow any previous trends in 2007 and 2008. The average value of limestone exports including the large drop in export volume from 2007 and 2008 was $4,263,000 AU per year; excluding the outliers from 2007 and 2008 the average value of limestone exports per year was $5,071,000 AU.

Overall, the limestone export industry has increased from 1990-2008, however the past two years 2007 and 2008 have seen huge declines in the volume and value of limestone exports. Since **Table 2-3** and **Table 2-12** show production of limestone in Australia has stayed nearly constant. Most likely limestone produced in Australia was used domestically thus decreasing the export value and volume in 2007 and 2008. The lack of exports and increase in domestic use of limestone would logically drive down demand some of the demand for limestone imports.

[14] All averages taken from data provided in **Table 2-12**

Figure 2-8: Trend of Volume of Australian Limestone Exports

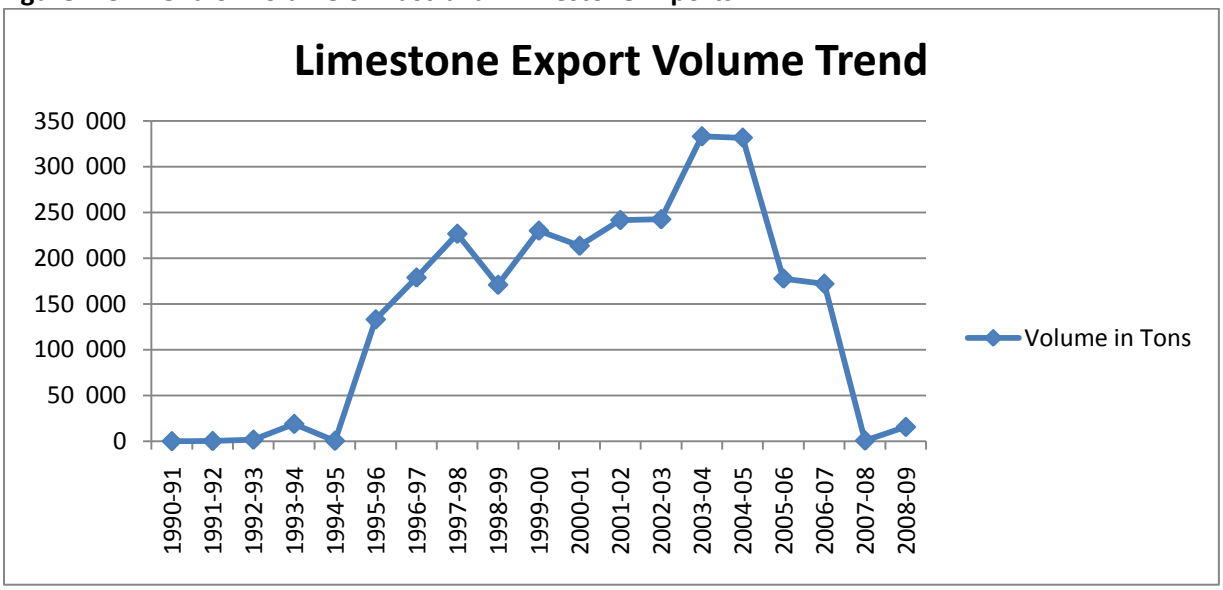
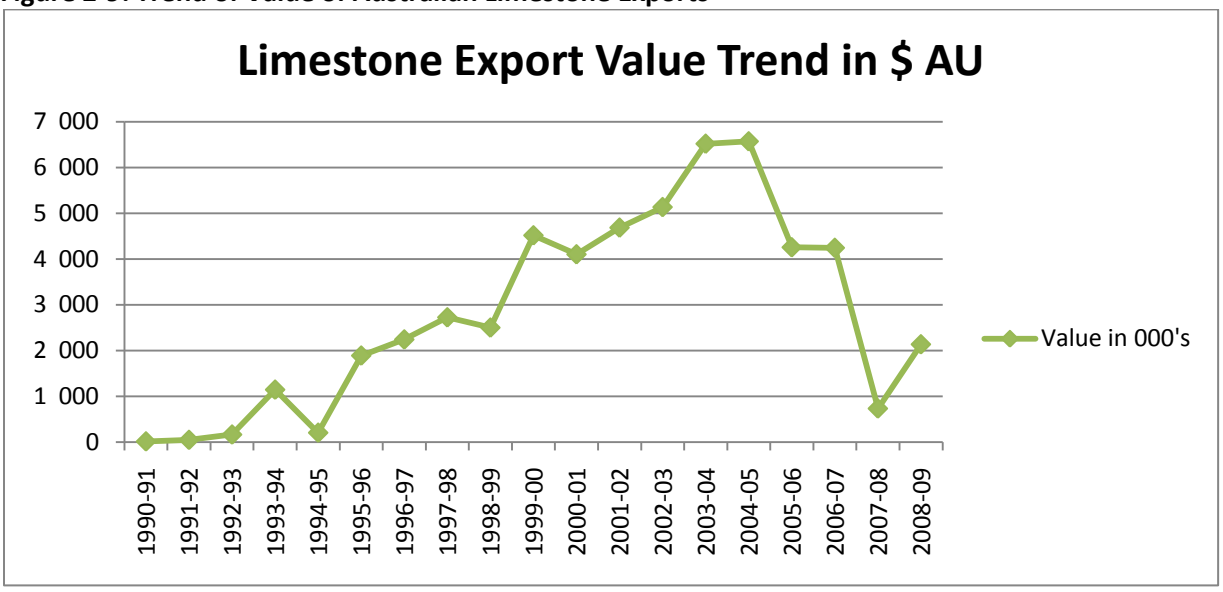


Figure 2-9: Trend of Value of Australian Limestone Exports



The trend in **Figure 2-8** and **Figure 2-9** demonstrate a large growth in volume and value of limestone exports from 1990 to 2004 and a decrease from 2004-2007. The volume of limestone exports in 1990 was 65 tons and it increased to 332 931 tons in 2003. The value of limestone exports was in $16,000 dollars AU in 1990 and increased to $6,516,000 dollars AU in 2003. The value of limestone imports in Australia increased 407 times in merely 13 years. Although there has been a recent decline in the value and volume of limestone exports from 2004-2006 (value of limestone imports was $6,568,000 AU in 2004 and decreased to $4,424,000 AU in 2006 the industry still seems stable. The extremely sharp decrease in 2007 in both volume and value is difficult to explain however, according to the USGS production of limestone in Australia was around 18,200 kilotons, so Australia must be using the majority of its limestone production for internal usage.

Overall Analysis

According to the data provided in **Table 2-12** and **Figure 2-2** through **Figure 2-9** the limestone export and import industry is a small enterprise in Australia[15]. The overall value of imports and exports in a given year can reach more than $10 million AU. Pandora would have to gain more than 50% market share of imports of limestone into Australia to reach its financial goals[16]. Also, in 2007 and 2008 limestone exports from Australia have drastically decreased, the reason for this dramatic decrease could be, Australia is using its limestone production for construction endeavors inside its country rather than exporting their limestone. This proposed trend could hinder Pandora's entrance in Australia, especially with considerations indicated for limestone exports and imports displayed in **Figure 2-2** through **Figure2-9;** the recent fall in limestone exports in 2007 and 2008, produced stagnant import values into the Australian market. Exports in 2006 dropped from 171, 945 tons to a mere 745 tons in 2007, and crept up to 15,608 tons exported in 2008 meanwhile imports in 2006 were 567 kilotons and with response to the decrease in exports from 2006 to 2007 increased to 693 kilotons, however imports dropped a little more than 150 kilotons in 2008 to 438 kilotons. The data in **Table 2-4** shows limestone production for usage as dimension stone is a very small industry in Australia. It seems limestone mining in Australia is used for more conventional uses. The trends explained above show some incentives for Pandora to enter Australia, however Pandora should look into diversifying their export partners to quickly move produced limestone goods[17].

Despite the need to diversify its export partner, Pandora should still enter the Australian market; in order to penetrate the Australian dimension stone industry Pandora must make relevant business contacts in Australia. Australian dimension stone businesses should be contact when proper samples of products, namely limestone wall cladding, are produced in order to generate interest and possible buyers from companies. Without proper samples businesses will be reluctant to build relationships and start negotiations with Pandora's limestone company. Below is a contact list of businesses in the Dimension Stone Industry. Most contacts were found on the Australian Stone Advisory Association. The 14 contacts provided in the following page all use limestone in their various dimension stone projects, thus they could serve as very beneficial business partners to Pandora.

[15] The information provided by international trade Australia does not specify the type of limestone that is exported and import in Australia e.g., wall claddings, blocks, powder, bricks, etc. It is simply an overview of the entire limestone export and import industry for Australia.
[16] Financial goals are further analyzed in separate Break Even Analysis
[17] All data provided in paragraph derives from **Table 2-12** and **Figure 2-2** through **Figure 2-9**

Table 2-13: Australian Dimension Stone Business Contacts and Further Information

Company Name	Address	Phone #	E-Mail Addresses	Company URL
Cinajus	Unit 5/73, Beauchamp Road, Matraville, NSW	61 02 9521 1971	info@cinajus.com	Web: www.cinajus.com
G Lux	130 White St Mordialloc VIC 3195	03 9512 0410	sa@g-lux.com.au	www.g-lux.com.au
Luxury Stone	24 Bancell Street CAMPBELLFIELD VIC 3061	61 03 93595922	info@luxurystone.com.au	www.luxurystone.com.au
Marble Plus	118A Long Street Smithfield NSW 2164	02 9725 4986	pteuma@marbleplus.com.au	www.marbleplus.com.au
Project Stone	27-31 Radley St, Virginia, Queensland, 4014AUSTRALIA	61 7 3865 3866	info@projectstone.com.au	www.projectstone.com.au
StoneHouse Creations	1812 Beaudesert-Boonah Road, Beaudesert QLD 4285	61 7 5541 0143	info@stonehousecreations.com.au	www.stonehousecreations.com.au
Kimberly Sandstone Products	32 Bryant Street Padstow NSW 2211	0400 458 399	lani@kimberelysandstone.com.au	www.kimberelysandstone.com.au
BEST Natural Stones	255-259, Cormack Road, Wingfield, SA, 5013	61 08 8262 6614	best@bestgroup.com.au	www.bestgroup.com.au
CDK Stone Australia	4-6 Freighter Road, MOORABBIN, Vic 3189, Australia	61 3 9553 3055	enquiries@cdkstone.com.au	www.cdkstone.com.au
Heritage Stone Pty LTD	7 Lamb Place Cambridge Tasmania 7170	61 03 6248 5572		www.heritagestone.com.au

Company Name	Address	Phone #	E-Mail Addresses	Company URL
Heritage Stone Restorations Pty Ltd	7 Delaine Av. Edwardstown SA 5039	61 08 8297 0700	kim@hsrsa.com	www.hsrsa.com
Mediterranean Stone Pty Ltd	PO Box 5019 Kahibah NSW 2290	61 2 4943 8471	mail@mediterraneanstone.com.au	www.mediterraneanstone.com.au
Paz Group	62-70 Export Drive, Brooklyn VIC 3012	03 9315 3225	mario.siketa@paz.com.au	www.paz.com.au
Tillet Natural Stone Industries	3 Coglin St, HINDMARSH, SA, Australia	61 8 8346 0971	granite@tillet.com.au	www.tillet.com.au

Company Name	Contacted Via Phone	Contacted Via E-mail	Response Via Phone	Response Via E-mail	Import Limestone	Own Quarry
Cinajus	No	Yes	N/A	No	Yes	Unknown
G Lux	No	Yes	N/A	No	Yes	Unknown
Luxury Stone	No	yes	N/A	No	Yes	Unknown
Marble Plus	No	yes	N/A	No	Yes	Unknown
Project Stone	No	yes	N/A	No	Yes	Unknown
StoneHouse Creations	No	yes	N/A	Yes	Yes	Unknown
Kimberly Sandstone Products	No	yes	N/A	No	Yes	Yes
BEST Natural Stones	No	yes	N/A	No	Unknown	Unknown
CDK Stone Australia	No	yes	N/A	No	Unknown	Unknown
Heritage Stone Pty LTD	No	yes	N/A	No	Unknown	Unknown
Heritage Stone Restorations Pty Ltd	No	Yes	N/A	Yes	No	Yes

Company Name	Contacted Via Phone	Contacted Via E-mail	Response Via Phone	Response Via E-mail	Import Limestone	Own Quarry
Mediterranean Stone Pty Ltd	No	Yes	N/A	No	Unknown	Unknown
Paz Group	No	Yes	N/A	No	Unknown	Unknown
Tillet Natural Stone Industries	No	Yes	N/A	No	Unknown	Unknown

Section 6: Price

Most Australian dimension stone prices were reluctant to give out prices for their limestone products because in the dimension stone business prices often times are negotiable so displaying one set price could damage sales and profits for a given dimension stone business. However, two companies Cinajus[18] and Kimberly Sandstone Products[19] both listed retail prices for limestone wall claddings. This information will be compared against limestone wall cladding provided by Michael Wagner.

Table 2-14: Kotah Brown Limestone Wall Claddings (Cinajus) Pricing

Kotah Brown Limestone (Cinajus)	Type & Size	Price Per Square Meter (AU) Retail	Price Per Pallet (AU) Retail
Regular	Large Rockface 575 X 285 X 20-50mm	$106.46	$2,129.20
Regular	Small Rockface 570 X 100 X 25-35mm	$78.00	$1,560.00
Regular	Small Rockface 570 X 50 X 25-35mm	$78.00	$1,560.00
Regular	Small Rockface 285 X 100 X 25-35mm	$78.00	$1,560.00
Regular	Small Rockface 285 X 50 X 25-35mm	$78.00	$1,560.00

[18] Prices for Cinajus found at this URL http://www.cinajus.com/documents/Clearance-Sale-Dec-09.pdf
[19] Prices for Kimberly Sandstone Products found at this URL http://www.kimberleysandstone.com.au/cladding_limestone.html

Table 2-15: Kotah Blue Limestone Wall Claddings (Cinajus) Pricing

Kotah Blue Limestone (Cinajus)	Type & Size	Price Per Square Meter (AU) Retail	Price Per Pallet (AU)
Regular	Large Rockface 570 X 285 X 20-50mm	$106.46	$2,129.20
Regular	Small Rockface 570 X 100 X 25-35mm	$78.00	$1,560.00
Regular	Small Rockface 570 X 50 X 25-35mm	$78.00	$1,560.00
Regular	Small Rockface 285 X 100 X 25-35mm	$78.00	$1,560.00
Regular	Small Rockface 285 X 50 X 25-35mm	$78.00	$1,560.00

Table 2-16: Tamala Limestone Wall Claddings (Kimberly Sandstone)

Tamala Limestone (Kimberly Sandstone)	Type & Size	Price Per Square Meter (AU) Retail	Price Per Pallet (AU) Retail
Irregular	Crazy Cut Cladding 30mm Thick	$55.00	$1,100.00
Irregular	Random Cut Cladding 30mm Thick (Irregular)	$75.00	$1,500.00
Regular	Limestone Cladding 300 X 300 X 30mm (Regular)	$75.00	$1,500.00

Table 2-17: Wagner Sandstone Wall Claddings (Michael Wagner)

Wagner Sandstone	Type & Size	Price Per Square Meter (AU) Retail	Price Per Pallet (AU) Retail
	Irregular Cut	$139.85	$2,797.00[20]
	Regular Cut	$279.70	$5,594.00[21]

[20] Number derived from average of high and low irregular **Sandstone** price per pallet ($1,290- $1,507) AU

Table 2-14 – Table 2-16 reflect retail prices of limestone wall claddings given by two different dimension stone firms in Australia. **Table 2-17** is a price estimate on Sandstone wall cladding from Michael Wagner. The price variation between the three different sources could be generated from the following possibilities. The quality indicators, density, compressive strength, abrasion, modulus of rupture, for the stone sold by was not provided from any of the sources therefore the quality of the limestone sold by each firm could vary significantly. Furthermore, Kimberly Sandstone Products owns a limestone quarry which could drive the retail cost down, by eliminating middlemen in their distribution channel. Moreover, the prices indicated by Cinajus were part of a sale to help move their inventory so the prices indicated in the Cinajus tables show deflated values for their limestone wall claddings. The price quote for Wagner is for sandstone wall cladding which is a more valuable stone.

Table 2-18: Average Retail Price for Wall Claddings Including Sandstone Quote from Table 2-17

Average Retail Price Wall Cladding (Including Sandstone Estimate)	Type& Size	Price Per Square Meter (AU)	Price Per Pallet (AU)
	Irregular Cut	$89.95[22]	$1,799.00 [23]
	Regular Cut	$99.30[24]	$1,986.03[25]

Table 2-19: Average Retail Pricefor Wall Claddings Excluding Sandstone Quote from Table 2-17

Average Retail Price Wall Cladding (Excluding Sandstone Estimate)	Type	Price Per Square Meter (AU)	Price Per Pallet (AU)
	Irregular Cut	$65.00	$1,300.00
	Regular Cut	$82.90	$1,658.04

The average price for Irregular and Regular cut wall claddings creates the most balanced interpretation of the retail price of limestone wall cladding. Unfortunately Pandora would not receive the prices indicated in **Table 2-18** or **Table 2-19** for their limestone wall claddings. Generally wholesale price is half of the retail price for a company. Using the averages calculated in **Table 2-18** and **Table 2-19**.**Table 2-20 and 2-21** reflect the tentative price of limestone sold directly to Australian dimension stone businesses

[21] Number derived from average of high and low regular **Sandstone** price per pallet ($2,580- 3,014) AU
[22] Price derived from average pallet price for irregular blocks divided by 20.
[23] Average pallet price for irregular stone derived from irregular prices Kimberly Sandstone **Table 2-16** and irregular price from **Table 2-17.**
[24] Price derived from average pallet price for regular blocks divided by 20.
[25] Average pallet price for regular stone derived from average of all five prices indicated in **Table 2-14** and **Table 2-15** , Kimberly Sandstone regular limestone indicated in **Table 2-16**, and average price of Regular Sandstone provided in **Table 2-17**.

Table 2-20: Average Wholesale Price for Wall Claddings Including Sandstone Quote from Table 2-17

Average Wholesale Price (Including Sandstone)	Type& Size	Price Per Square Meter (AU)	Price Per Pallet (AU)
	Irregular Cut	$44.98[26]	$899.50[27]
	Regular Cut	$49.65[28]	$993.02[29]

Table 2-21: Average Wholesale Price for Wall Claddings Excluding Sandstone Quote from Table 2-17

Average Wholesale Price (Excluding Sandstone)	Type& Size	Price Per Square Meter (AU)	Price Per Pallet (AU)
	Irregular Cut	$32.50[30]	$650.00[31]
	Regular Cut	$41.45[32]	$829.02[33]

The low wholesale price averages for limestone claddings indicated in **Table 2-20** and **Table 2-21** could be explained from the following possibilities. The prices for Cinajus, who had the largest number of limestone wall cladding prices, come from a huge sale, thus the prices are lower than their normal pricing. Kimberly Sandstone owns their own quarry thus eliminating the cost of middlemen, and the quality of the limestone was not indicated. High density, low porosity, and certain colors add value to limestone. Cinajus and Kimberly Sandstone could be selling lower quality goods creating lower prices.

[26] Price derived from average wholesale pallet price for irregular blocks divided by 20.
[27] Average wholesale pallet price for irregular stone derived from irregular pallet avg. on **Table 2-18** divided by 2.
[28] Price derived from average wholesale pallet price for regular blocks divided by 20.
[29] Average wholesale pallet price for regular stone derived from regular pallet avg. on **Table 2-18** divided by 2.
[30] Price derived from average wholesale pallet price for irregular blocks divided by 20.
[31] Average wholesale pallet price for irregular stone derived from irregular pallet avg. on **Table 2-19** divided by 2.
[32] Price derived from average wholesale pallet price for regular blocks divided by 20.
[33] Average wholesale pallet price for regular stone derived from regular pallet avg. on **Table 2-19** divided by 2.

Section 7: Australian Housing Market: **Table 2-22**[34] shows the number of houses built in Australia from 2001-2009 as well as the value of the houses built in $000's AU.

Table 2-22: Australian Housing Market 2001-2009

Date	Houses Built	$Value in 000's AU
Jan-01	2861	422708
Feb-01	3236	476572
Mar-01	4050	625141
Apr-01	3862	588911
May-01	5680	838890
Jun-01	5793	855429
Jul-01	6178	938461
Aug-01	6357	957772
Sep-01	5426	836723
Oct-01	6319	958352
Nov-01	6277	956357
Dec-01	5943	927019
Jan-02	5770	900513
Feb-02	4961	785696
Mar-02	5054	802312
Apr-02	4887	788662
May-02	5608	923730
Jun-02	5045	821690
Jul-02	6024	1002363
Aug-02	5154	875926
Sep-02	4621	778608
Oct-02	4789	834230
Nov-02	4347	787884
Dec-02	4136	744966
Jan-03	3632	652628
Feb-03	4059	754701
Mar-03	4553	838804
Apr-03	4589	855243
May-03	5282	1007886
Jun-03	4974	959600
Jul-03	5865	1137445
Aug-03	5082	974061
Sep-03	5336	1037349

[34] Australia Bureau of Statistics: Housing In Numbers

Date	Houses Built	$ Value in 000's AU
Oct-03	5591	1082061
Nov-03	4880	973278
Dec-03	5020	1000190
Jan-04	3794	759282
Feb-04	4166	826171
Mar-04	4805	995445
Apr-04	4314	887258
May-04	4675	999282
Jun-04	4694	1018583
Jul-04	4758	1037017
Aug-04	4708	1003387
Sep-04	4610	993715
Oct-04	4280	909805
Nov-04	4476	965385
Dec-04	4341	961976
Jan-05	3328	722768
Feb-05	3963	869707
Mar-05	4472	994719
Apr-05	4344	955417
May-05	4934	1066332
Jun-05	4813	1060387
Jul-05	4469	992322
Aug-05	4876	1077074
Sep-05	4527	1017561
Oct-05	4241	932956
Nov-05	4527	997536
Dec-05	4246	955254
Jan-06	3561	800943
Feb-06	4068	913267
Mar-06	4697	1082588
Apr-06	3882	855630
May-06	5179	1163225
Jun-06	4927	1159747
Jul-06	4862	1142866
Aug-06	5213	1256128
Sep-06	4500	1060799
Oct-06	4685	1093404

Date	Houses Built	$ Value in 000's AU
Nov-06	4736	1128760
Dec-06	4175	986833
Jan-07	3827	900918
Feb-07	4004	949053
Mar-07	4608	1106552
Apr-07	4115	962913
May-07	5198	1284453
Jun-07	4807	1205713
Jul-07	4879	1202599
Aug-07	5261	1308511
Sep-07	4562	1144176
Oct-07	5214	1300856
Nov-07	4939	1198336
Dec-07	4297	1051985
Jan-08	4043	969949
Feb-08	4505	1093392
Mar-08	4185	1012712
Apr-08	4623	1152455
May-08	4709	1175433
Jun-08	4326	1069904
Jul-08	4607	1152846
Aug-08	3959	993114
Sep-08	4096	1014799
Oct-08	4185	1068808
Nov-08	3688	917345
Dec-08	4305	1079871
Jan-09	3638	917591
Feb-09	4454	1101274
Mar-09	5830	1444525
Apr-09	5688	1403123
May-09	6592	1629643
Jun-09	7055	1746389
Jul-09	7164	1792580
Aug-09	6681	1625460
Sep-09	7654	1844297
Oct-09	8134	1970160
Nov-09	7182	1776237
Dec-09	6819	1733573

Figure 2-10: Australian Houses Built Trend

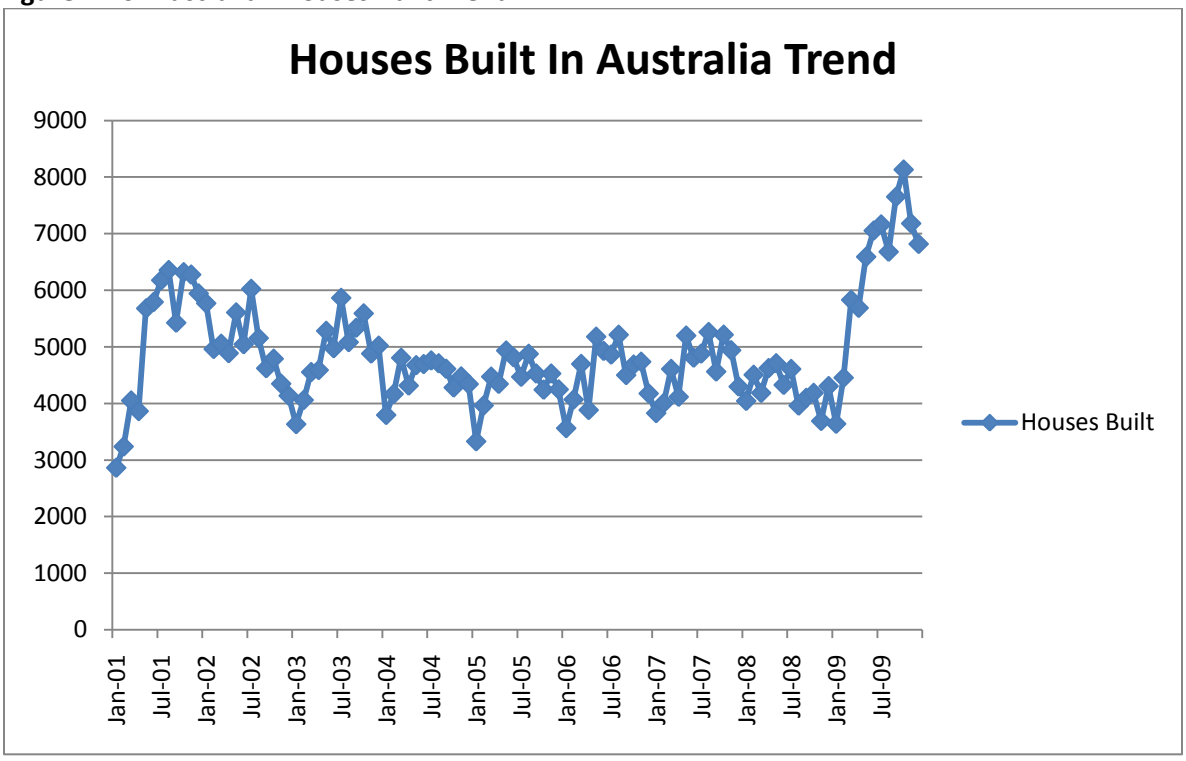
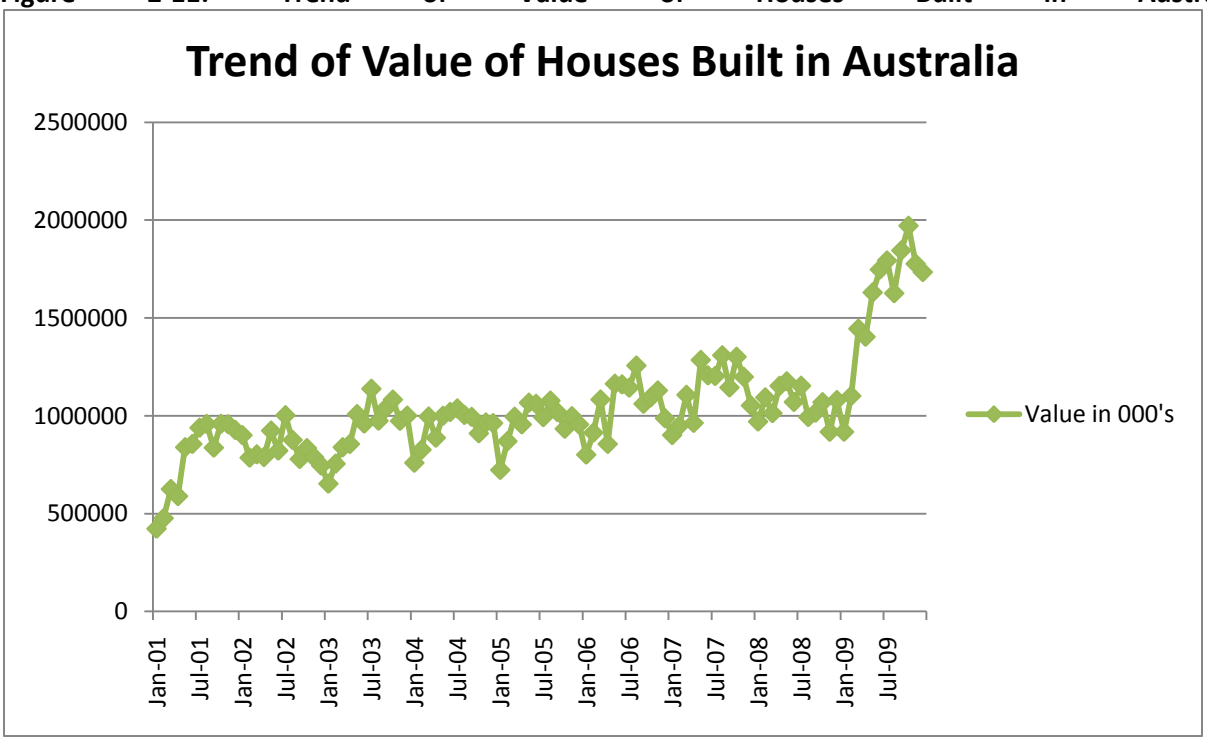


Figure 2-11: Trend of Value of Houses Built in Australia



Australian Housing Market Information

Since 2001 the volume and value of houses built in Australia have moved in a sporadic manner. The largest increase for both volume and value of housing construction came in 2009; in January 2009 the volume of production was 3638 houses valued at $917,591,000 AU in October 2009 the housing market peaked, 8134 houses were built and valued at $1,970,160,000 AU. The increase in housing in 2009 is a solid example for derived demand of limestone in Australia. As houses continue to be built, construction materials such as limestone will be in higher demand in order to create modern, stylishly decorated homes. The average value of houses built in Australia in 2009 was $246,906 AU[35].Limestone wall claddings provide gorgeous mantels for fireplaces, great wall coverings for pool like settings, as well as aesthetically pleasing alternatives to bricks for exterior decorating.

According to the Australian Resources PTY[36], an online limestone resource center, limestone has many uses for construction materials for instance, “There are many variations of limestone that can be used in house construction, however there are basically two types of stone which give different textures and colours and two different finishes, quarry cut and diamond cut. (“Quarry cut limestone blocks are cut directly from the quarry floor using electric saws with tungsten tipped blades. Diamond cut blocks are produced by reprocessing quarry cut blocks through multi- bladed saws to produce an accurately cut product such as housing blocks, cladding, paving etc. The saw blades used in this process are diamond tipped to give a smoother finish.”) From this point there are several options in the way these blocks are laid (stretcher bond, random bond etc.) and varying mortar joints can be used.” However, Limestone is one of the most expensive dimension stones used for bricks or wall claddings so most likely consumers would have to demand limestone usage before the house is built.

[35] Number calculated by adding the total value of houses produced in the year of 2009 then dividing the calculated number (18984852000) and dividing the total number of houses built in 2009 (76891) which equaled $246,906 per house.

[36] http://www.limestone-resources.com.au/

Section 8: Recommendation for Australia's Market

1. Pandora should enter the Eastern Australian. The eastern side of Australia is the most densely populated area of Australia and there is direct port access from Pandora to Brisbane, a port on the north eastern side of Australia. Furthermore Australia has a strong middle class the GDP per capita is $38,500 US and the gini coefficient is 30.5. Although imports of limestone products into Australia have decreased there is on average of $11,167,000 AU of limestone imported into Australia each year.
2. Before Pandora enters the Australian market, business contacts must be created. The best form to create contacts is to send samples of Pandoran limestone wall cladding to the dimension stone firms listed in **Table 2-13**.
3. Pandora must differentiate its product from competitors to increase the wholesale price. The averages displayed in **Table 2-20** and **Table 2-21** will not bring sufficient profits to Pandora. Sending samples to dimension stone firms could help differentiate Pandora's wall cladding from Australian limestone, by showing the difference in quality, colors, and
4. Pandora must find an international distributor or other international export partners in order to move their production inventory.

2. Explanation of the Breakeven Analysis and the Incorporated Excel Workbook

Introduction

Due to the complexities and multitude of options acquiring machinery, designing and building a production facility, and changing energy costs, it is hard to constantly understand the bottom line implications of changes. For that reason, a powerful Excel Workbook was developed which automatically calculates breakeven points and profit level based on: pricing data, transportation, positions and salaries, facilities, machinery, forklifts, and energy requirements.

The most important thing to understand about using the Excel workbook is that any cell in white is data that is capable of being changed. Any field in grey is an automatically generated or calculated field based on the initial entries. Many of the worksheets tie directly together. For example, the square footage of the roofs is calculated and that figure is used to calculate the power capacity of the solar array. No other calculations are needed. In the following sections (which correspond to the tabs of the Excel Worksheet), explanations of formulas will assist the reader in understanding the use and methodology used in the breakeven analysis.

Breakeven Analysis

The breakeven analysis is the culmination of all the other worksheets calculations. Aside from figures from other worksheets, this sheet accepts entries for working days per year, production factor, number of units produced per production factor, as well as adding costs associated with palletizing. The main function of this sheet is to calculate the breakeven point in units of the proposed production. Additionally, the sheet forecasts profitability of different sales volumes in 10% increments until a production factor of one.

Pricing Data

The 'Pricing Data' worksheet provides space to enter different pricing values from various sources. The sheet automatically generates an average of these prices and incorporates this value on the main 'Breakeven Analysis' sheet. Again, any of the white fields can be altered. Just as a note—a value of $0 in the price column will average this price into the final value—altering the true market average price.

Transportation

The 'Transportation' worksheet provides the ability to alter the route of transportation. Other travel segments can be added to the sheet so multiple options can be explored and their affect on the bottom line understood. By indicating whether a segment should be included in the analysis in the column 'Segment Included (Y/N)', the table will automatically calculate the cost of transportation per pallet with the included segments. Note the calculations only work properly when a value of 'Y' or 'N' is in that column. Again, only white cells can be altered on this sheet.

Positions and Salaries

The 'Positions and Salaries' worksheet provides the ability to change the labor requirements of the project. Not only can positions be added, but previous positions can be altered for title, wage, the need for that position at various years, and whether the positions is affected by changes in production factor. By changing the 'Y' or 'N' value in the column 'Dependent on Production Factor', the corresponding total jobs field will update at the bottom of the page as well as on the main 'Breakeven Analysis' tab. Please note that if you change the production factor on the 'Breakeven Analysis' tab, the breakeven analysis will update to reflect the updated labor demands. Again, only the white cells are alterable—the grey fields are automatically calculated and change other values throughout the workbook.

Positions and Salaries

The 'Positions and Salaries' worksheet provides the ability to change the labor requirements of the project. Not only can positions be added, but also previous positions can be altered for title, wage, the need for that position at various years, and whether the positions are affected by changes in production factor. By changing the 'Y' or 'N' value in the column 'Dependent on Production Factor', the corresponding total jobs field will update at the bottom of the page as well as on the main 'Breakeven Analysis' tab. Please note that if you change the production factor on the 'Breakeven Analysis' tab, the breakeven analysis will update to reflect the updated labour demands. Again, only the white cells are alterable—the grey fields are automatically calculated and change other values throughout the workbook.

Buildings and Facilities

The 'Buildings and Facilities' worksheet provides the ability to understand the costs associated with different and ever-changing production designs. The worksheet lists the buildings required, what type of structure it is, the estimated square footage, and the cost per square foot. Additionally, you will find a 'Y' or 'N' column, which indicates whether the

structure is suitable for mounting a solar array. The total square footage of roofs available for solar arrays is then calculated. This figure can be seen on this worksheet and is also the figure used for calculations on the energy worksheet.

This worksheet also considers depreciation expense and its affect on the overall break-even point. On this sheet you will be able to indicate the number of years of a useful life and the depreciation expense per year is automatically calculated as the sum of the calculated building expenses divided by the years of useful life.

Again, only the white cells are alterable—the grey fields are automatically calculated and change other values throughout the workbook.

Machinery

The 'Machinery' worksheet provides the ability to understand the costs associated with different purchasing different saws and heavy machinery. Not only does the sheet calculate costs based on quantity and price per unit, it also records manufacturer, model, and type.

One of the biggest functionalities of the sheet is the ability to record the power requirements of each machine. Using the voltage and wattage requirements for each machine the kilowatts required from the power source. This is calculated as (voltage x wattage)/ 1000 x 1.732 for each machine. The worksheet has the functionality to calculate the total kW required based on the number and type of each machine in the list.

This worksheet also considers depreciation expense and its affect on the overall break-even point. On this sheet you will be able to indicate the number of years of a useful life and the depreciation expense per year is automatically calculated as the sum of the calculated building expenses divided by the years of useful life.

Again, only the white cells are alterable—the grey fields are automatically calculated and change other values throughout the workbook.

Forklifts

The 'Forklift' worksheet provides the ability to understand the costs associated with different types and models of forklifts. It lists manufacturer, type, model, price, and quantity. The overall cost associated with acquiring different quantities of different forklifts. This price is reflected at the bottom as the total capital investment.

This worksheet also considers depreciation expense and its affect on the overall break-even point. On this sheet you will be able to indicate the number of years of a useful life and the depreciation expense per year is automatically calculated as the sum of the calculated building expenses divided by the years of useful life.

Again, only the white cells are alterable—the grey fields are automatically calculated and change other values throughout the workbook.

Energy

The 'Energy' worksheet provides the ability to understand the costs associated with both solar energy as well as the option for diesel energy. The worksheet incorporates data from the 'machinery' tab, which are the automatically calculated energy requirements.

The worksheet also contains information from the most recent solar quote and automatically calculates the cost per kW, roof square footage required for the installation, the cost per square foot, and whether square footage of the roof is large enough for the required kW. If it so happens the roof is not large enough to provide all the necessary power, the sheet will automatically calculate adding a diesel generator for the remaining power required.

At the bottom of the worksheet, information pertaining to the quote obtained for the diesel generator is contained. The fields below this information automatically calculate similar to the solar equations. If the field 'kWH Not Satisfied By Solar' is 0, the sheet will automatically calculate an energy solution without the generator included. If production requires greater power requiremetns that cannot be satisfied by the roof-mounted solar system, the generator will automatically be calculated into the overall energy scheme and it will calculate the cost per kWH required over what solar would produce. Additionally, there is the ability to understand the implications of rising diesel prices by changing the 'Diesel Price per Litre' field.

One of the biggest benefits the 'Energy' worksheet is the ability to do a quick breakeven analysis of the solar options versus the diesel options and the payback period associated with adopting solar. This breakeven analysis is automatically calculated from information entered for the solar system as well as the diesel generator system.

This worksheet also considers depreciation expense and its affect on the overall break-even point. On this sheet you will be able to indicate the number of years of a useful life and the depreciation expense per year is automatically calculated as the sum of the calculated building expenses divided by the years of useful life.

Again, only the white cells are alterable—the grey fields are automatically calculated and change other values throughout the workbook.

3. Analysis and Recommendations of Production Costs

Introduction

The following is the analysis and recommendation pertaining to the production costs of the Pandoran Limestone Project. The project currently has no assets available for production and will have to acquire a considerable amount of machinery, build an extensive production facility, hire a many employees, and work around the power requirements of a quarry in a very remote location. The costs associated with this production facility are very unique and required extensive research and background information to properly analyze the costs.

The next sections outline the following costs and how they were incorporated into the final breakeven analysis. Each section will include all relevant costs, the source of the information, and any analysis to how these costs may change or better options which may exist.

Machinery Costs

Based on recommendations from those in the international dimension stone industry, heavy industry machinery manufacturer, Park Industries, was contact to provide guidance and quotes for the heavy machinery needed for the project. Speaking with Bob Then at Park Industries, the following machines with rough cost estimates were provided based on an explanation of the project needs:

Table 3-1

MACHINERY COSTS			
Type	Quantity	Manufacturer	Price
Python Block Saws	3	Park Industries	$180,000
300-Tonne Splitter	3	Park Industries	$180,000
150-Tonne Splitters	3	Park Industries	$180,000

TXS-5500	1	Park Industries	$180,000
TXS-4500	1	Park Industries	$180,000
Water Pump	1	TBD	$10,000

Total Capital Investment	**$1,450,000**

Park Industries comes highly recommended for quality and productivity. The different size guillotine splitters will be able to handle the large fieldstone, and the smaller splitter can easily handle the processed stone blocks. The TXS-Series veneer saws are a great product discovered during research, which will allow the production facility to automate much of the small block processing. The smaller TXS-4500 veneer saw has two perpendicular blades that will allow for the production of regular veneer corner pieces—something not expected to be able to be produced. Bob Then also invited a representative to the TXS Saw Expo in May in Minnesota.

A water pump will also be needed to recirculate water for the various saws. Preliminary research indicates industrial grade water pumps can be acquired for several thousand dollars and will have the capacity to feed 'clean' water at a rate of up to 100 gallons per minute, easily handling the needs of the various saws. Please see **Appendix 3-1** for a specification sheet of the proposed water pump.

Power Production Facility Options

Creating a power system for a remote limestone quarry is certainly complicated. Fortunately, one feature of Pandora's unique location—right along the equator—provides it with the opportunity to harness the sun's power. In fact, sunshine is so abundant that the entire limestone production facility can be run off solar photovoltaic cells. This is not only a benefit to the bottom-line of the overall project, but also to recognize the importance of making this project as environmentally sustainable as possible. From this analysis and this report's incorporated Excel Workbook, it will become apparent—the addition of solar power would add to the green narrative of the product and help Pandora sustainably create profit.

First and foremost, it is important to understand the power requirements of the machinery in the production facility. After speaking with the supplier of the majority of our machinery, Bob Then at Park Industries, it can be assumed the project will be operating at least the following machines:

Table 3-2

MACHINERY POWER REQUIREMENTS Type	Quantity	Volts	Amps	kW Required
Python Block Saws	3	480	60	149.64
300-Tonne Splitter	3	480	60	149.64
150-Tonne Splitters	3	480	60	149.64
TXS-5500	1	480	60	49.88
TXS-4500	1	480	60	49.88
Water Pump	1	480	60	49.88

Total kW Required	**598.58**

See 'Machinery' tab in Excel Workbook

Bob Then has advised each of these machines run best using a 3-phase electrical system with each machine drawing 480 volts at 60 amps. Preliminary estimates for power consumption can be derived from the formula: (Volts x Amps x 1.732)/1000, which is measured in kilowatts (kW).

Research into photovoltaic capacity has indicated systems currently can produce .013 kW per square foot for roof-installed solutions. For the proposed power requirements, this means 46,154 sq. ft of roof space must be available to satisfy the needs of production using a production factor of one. Preliminary cost estimates for a 700 kW roof system including the solar panels, mounting structure, design plans, and grid inverter is $2,086,500, not including transportation and installation. The most current figure of price per kW stands at $3,477 AU per kW of solar power or $45.21 AU per square foot for materials.

Table 3-3

SOLAR SYSTEM COSTS	
Photovoltaic Array Costs	
System kW	600
Photovoltaic Sq. Footage	46154
Photovoltaic Capital Expenditure	$2,086,500
Cost Per kW	$3,477.50
Cost Per Sq. Foot	$45.21
kW Per Sq. Foot	0.013
Roof Sq. Footage Available	63264
Solar Sq. Footage Requirement	46045
kW Not Satisfied By Solar	0.00
Total System Capital Expenditure	$2,081,559

See 'Energy' Tab in Excel Workbook

Pricing for diesel generators varies widely; however one that came with good recommendations was the Detroit Diesel S-Series. When comparing the costs associated with production using diesel power, calculations were generated as if the generator were a 'stand-alone' installation for fairness in comparing overall costs. At $202,700 AU Detroit Diesel offers a 900kW (really 675 kW when run at normal—75%-- operating conditions) S-Series generator. The cost diesel fuel is reported to cost $0.76 per litre and this generator at a 75% rate will consume 174 litres of diesel per hour or at a rate of $0.1959 AU per kWh –[(fuel cost x fuel consumption) / kW Produced]. Please see **Appendix 3-2** for a specification sheet of this quoted generator.

Table 3-4

DIESEL GENERATOR COSTS	
Diesel Cost per Litre	$0.76
Manufacturer	Detroit Diesel
Model	S Series
Price	$202,700.00
kW Capacity (Max)	900
kW Capacity (75%)	675
Diesel Fuel Consumption Per Hour (75%) (L)	174.00
Diesel Fuel Cost Per kWH	$0.1959
kWH Not Satisfied by Solar	598.58
Total System Capital Expenditure	$202,700.00
Total Diesel Cost Per Year	$268,309.91
Total Depreciation Cost Per Year (10 yrs)	$288,579.91

See 'Energy' Tab in Excel Workbook

When comparing solar versus diesel, it is important to consider the aforementioned eco-friendly narratives the project hopes to use in marketing. While diesel generators have very low initial costs, the fluctuations in diesel prices may produce too much unexpected exposure for the project. Based on projections, it would take approximately 4.87 years for the investment in solar technology to payoff for the project based on:

Table 3-5

SOLAR / DIESEL PAYBACK ANALYSIS			
Diesel Cost Per kWH	$0.1959	Solar Cost Per kWH	$0.00
Diesel Operating Cost	$202,700.0000	Solar Cost Per kWH	$2,081,559.17
		Difference in Initial Investment	$1,878,859.17
		Payback Period Hours	14207.95

	Payback Period Working Days	1775.99
	Payback Period Years	4.87

See 'Energy' Tab in Excel Workbook

While this does seem attractive, and we do suggest solar be adopted wherever possible due to the cost savings after year 5, the fact-of-the-matter is diesel options still must be available for the project. These projections were made on a production factor of 1, greater production factors will require even greater power demands, meaning diesel may have to remain a component of the overall power scheme. As designed, the solar system should be able to handle a production factor of two (two shifts in one day), but anything beyond that will either require a battery system or diesel generator power. Initial research into batteries indicates they are relatively inexpensive and should not lengthen payback periods extensively. A smaller diesel generator could also be an option for adding an additional production factor, but the expansion of solar to meet the additional power needs with a battery system incorporated would be a more profitable choice over the long run.

Contact Information:

Solar Electric Supply, Inc.

2880 Research Park Dr. #100

Soquel, CA 95073

(877) 297-0014

Generator Joe

4016 Quartz Dr.

Santa Rosa, CA 95405

(707) 539-9003

joe@generatorjoe.com

Block Forklift Options and Recommendations

Forklifts will be used extensively throughout the Pandora limestone project in both the extraction site and the production facility. Larger 12-tonne forklifts will be used for large blocks at the extraction site, and smaller 7-tonne forklifts will be used for small blocks at the production facility. Based on research of forklifts and lift trucks it is apparent Toyota produces the most productive and fuel-efficient lift trucks in the industry. Toyotas beat their competition by nearly 20% in fuel efficiency and almost 11% in productivity. Not only do Toyota's perform particularly well, they are also the world's most sold lift trucks with service facilities and trained mechanics around the world.[3738] The productivity of these lift trucks, as well as access to spare parts is why we recommend Toyota's diesel lift trucks as a viable option due to the remoteness of Pandora. Additionally, the fuel economy of these lift trucks will add to the overall green narrative of the project.[39]

Mike Woods of Welch Equipment in Denver, made recommendations for the need for both several 7-tonne lift trucks and 12-tonne lift trucks, the Toyota 7FGU70 and the Toyota 4FD115, respectively. Woods suggested the use of air-filled pneumatic tires for these machines as they provide the best traction for dirt, however they do run an increased risk of flat tires. The 7FGU70, priced at approximately $85,600 AU, has the capacity to handle production facility tasks like stacking well. The 4FD115, the 12-tonne truck, is priced at approximately $133,750 AU each and will have the ability to lift a 1.5 cu meter block from its location on the ground. Woods also suggested the use of 'shifting forks', which allow for loading and unloading in tighter spaces by 'shifting' the location of the forks by eight inches. None of the quotes given by Welch Equipment include transportation.

Based on these initial costs and estimating the need seven production facility forklifts (7-tonne) and five extraction site forklifts (12-tonne), initial capital investment would be approximately $1,364,250 AU, not including transportation. The 12-tonne forklifts are shipped directly from the Toyota factory in Japan and Woods indicated there might be an option for direct shipping of these trucks to Pandora or more likely Australia. Obviously these figures are dependent on what options are installed and how transportation is arranged. Woods indicated there was a several month fulfillment period for both types of forklift and he suggested ordering approximately six months before needing the trucks on location.

[37] http://www.toyotaforklift.com/about_us/company_profile/corporate_brochure.pdf
[38] http://toyotaequipment.blogspot.com/2010/02/toyota-forklift-fuel-efficiency.html
[39] http://www.toyotaforklift.com/about_us/news/press_releases/0154.aspx

Table 3-6

Forklift Costs				
Size	Quantity	Manufacturer	Model	Price
12-Tonne	7	Toyota	4FD115	$133,750
7-Tonne	5	Toyota	7FGU70	$85,600
Total Capital Investment	**$1,364,250**			

See 'Forklift' Tab in Excel Workbook

Also, Toyota has recently released a line of hybrid lift trucks, which cut fuel consumption by 50%.[40] If the price of diesel proves to be too erratic, these hybrid options, although new to the market, could considerably reduce the project's exposure to rising fuel costs.

Contact Information:

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Global Sales

(800) 226-0009

www.toyotaforklift.com

[40] http://www.toyotaforklift.com/about_us/news/press_releases/0149.aspx

Position and Salary Information

A Pandoran government official provided initial and ongoing positions and salaries for production to the team. The project will for the first several years use foreign expatriates in all leadership and management positions. These expats, although paid relatively high, will act as initial consultants to the overall operation of the production facility as it pertains to their expertise. After an initial period, local workers who will have been trained and mentored regarding their jobs and responsibilities will replace these expats.

Additionally, the production facility has the option to increase their production factor (increase the number of shifts per day). If this occurs, all non-leadership positions will multiply by the production factor with the costs of salaries and benefits corresponding accordingly. See **the 'Positions and Salaries' Excel Worksheet** for a list of positions and salaries provided to the team. On the left you will find a column distinguishing the position as one that is affected by the production factor.

Building Costs

The costs with constructing the actual production facility have not been finalized but preliminary estimates were provided to the team. These can be seen in **the 'Buildings and Facilities' Excel Worksheet,** which includes a column indicating if any particular structure is available for solar array mounting. Indicating whether each structure can handle a solar array influenced the solar energy costs and whether the facility could provide enough solar energy for the facility.

As these building costs are still preliminary, it will be important to update the Excel Workbook fields with new information to determine respective profitability and breakeven point.

4. Analysis and Recommendations of Transportation Costs

Summary:

This part of the research is focused on transportation. The purpose the transportation analysis is to examine the transportation system in Pacific Ocean and determine main costs. The research was conducted through contacting transportation companies from Australia, China and USA. The contact list is provided at the end of the transportation analysis section. Main cast are summarized at the end of the section. This section included overall analysis divided into parts:

1. Introduction
2. Opportunities to export limestone
3. Possible threats and delays for the transportation
4. Connecting Pandora to the outside world
5. Methods of Transportation
6. Pandora-Brisbane:
7. Australian Transportation
8. Recommendation:

Introduction:

The current economic downturn has significantly impacted the ocean freight system around the world. In spite of this challenge the businesses and transportation companies continued to be committed to investing resources in the smartest way to ensure that the transportation system enhanced the economic competitiveness and provided high returns on invested capital through investing in potential areas of future development. Throughout the past decade we saw huge sums of investments injected into Pacific Ocean trade routes, which was mostly due to South-East Asia development and increase in exporting power of those countries.

The success of Pandora Island as a potential player in limestone industry will be due to continued and strong emphasis upon improving the transportation infrastructure, in particular ports and other sea freight related improvements, because these type of improvement in infrastructure will mostly impact the performance of the export. The Pandora Island has to increase its commitment to construct deep water port, since the nation will enjoy the benefits of the more efficient transportation system and other services that will be available upon getting the new port running.

The success of Pandora Island as a potential player in limestone industry will be due to continued and strong emphasis upon improving the transportation infrastructure…

Pandora has the lowest "Ocean Economy"[41] in the world, ranking the bottom 15%, which is not impressing position, because the economy of most countries directly depend on the international trade.[42] The Pandora Island actually lacks any international trade, besides the exporting of phosphate. Therefore, it is vital for the Island to establish new source of revenue through exporting, where come into the game the project of exporting the limestone products to Australia and possibly China and the United States.

[41] "Ocean Economy" is the economic role of ocean resources that has been available to date.
[42] Review of Maritime Transport, 2007. United Nations Conference on Trade and Development.

Opportunities to export limestone:

The new project of exporting limestone from Pandora also directly depends on the level of ocean transportation infrastructure on the island. Therefore, the study of possible transportation channels will help to create the most beneficial distribution channel for exporting limestone. Today, there are two ships per month on a regular basis, cargo, and one fuel, which connect Pandora with Australia through Brisbane port.[43]

Brisbane port is one of the biggest and busiest ports on Australian continent. The connection with Brisbane port provides an opportunity to be involved in international trade and be connected to the outside world. Therefore, Pandora-Brisbane connection is the best and the only possible start of the distribution channel.

Close observation of all opportunities for transporting limestone from the Island leaves only two potential methods of transportation of limestone from the Island: ocean freight and air transportation. However, after studying air transportation, the result is that air shipping is very expensive[44], thus, not feasible. The second method of transportation is ocean transportation, which is the best for this project and deserves a closer attention and careful studying.

In order to understand the overall situation on Pandora and its connection with Australian market and further with the world, we decided to contact people who are familiar with the transportation area, deeply understand the situation and pertain all the necessary information about the ocean link between Pandora and Australia. Therefore, we communicated with professionals from Australia, China and the United States.

After communicating with representative of one of the Australian transportation company, the picture of the transportation system in Pandora became clearer and provided us with more insides about the feasibility of the project in terms of finding the “gate” to the outside world. In particular, the transportation from Pandora is limited by few industrial drawbacks like: lack of contemporary port on the Island with all necessary equipment to accommodate world’s standards and requirements. The only possible type of containers that the Island can accommodate is 20 foot containers, which in fact became great news because of the weight limits per container. Even though, if we would be able to use bigger 40 foot containers, it would violate the weight limits on the port of Brisbane (20,000 kg per container). The 20’ GP[45] container specifications are in table 4-1:

[43] According to Professor Davis.
[44] According to Air Chartering. http://www.chapman-freeborn.com/default.aspx
[45] GP stands for general purpose.

The decision for using 20' GP containers is 1) Pandora Island does not have appropriate infrastructure to accommodate other types of container 2) the containers will carry quite weighty limestone products, therefore, each container's weight should be within limits of approximately 20, 000 tonnes.

Table 4-1

General Purpose	**20' GP Container**
Specifications	8x8'6'' Standard
Inside Cubic	32.8 m^3
Capacity	1,158 cu. Ft
Cargo Capacity	21,640 kg
Tare Weight[46]	2,360 kg
Internal Measurements	
Length	5.90 m
Width	2.35 m
Height	2.38 m
Door Size	
Height	2.38 m
Width	2.33 m

As a guide to ship 1x20' GP container from Pandora to Brisbane including loading at the Cargo Transport the cost would be 7750.00 AUD[47] per container. The costs do not vary in regards to weights or volume, the price reflects the costs for the 1x20' GP no matter how much or how little to put in the container. It also should be noted that we can ship LCL (Less then Container) which means that in case we do not feel up some of the containers the transportation company can load the consolidated containers for groups of people and each customer pays for the amount of volumes they take up. Therefore, the LCL method costs 300 AUD per m^3 or 1000 kg, whichever is greater, plus the additional 70 AUD for the documents per shipment. However, we understand that there are some physical restrictions in terms of volume, which is constrained by the actual size of the container. In addition, there is a 20,000 kg weight limits to each container. Therefore, by understanding the "ceiling" limits we can plan the overall production cycle and derive the appropriate transportation costs.

As I mentioned above Pandora Island cannot handle 40'GP containers, therefore, the only option is to use 20'GP container. We could possible buy the containers itself and use them for an extended period of time. However, as the professionals of transportation company from Australia noted[48], when shipping with shipping line they will hire an empty container to us as part of the freight and so using a shipping line container is a lot cheaper and does not cost us any extra. The only rule is to empty and return container to wharf within seven days. This option is the most attractive to our project and saves a lot of money, because the containers will be emptied within seven days and easily returned to the required destination. However, this situation will also depend on the method of distribution chosen, which could vary from shipping and selling to different distributions, to one distributor and transport the goods to China and US.

[46] Tare Weight is the weight of an empty container.
[47] According to Drew Bowler. Cargo Transport System. However, the cost is in processes of negotiation and could be 50% less or 3500 AUD.
[48] Drew Bowler, Cargo Transport System.

Possible threats and delays for the transportation

As we found out the only common cause of delays to the transporting goods is bad weather in Pandora. Therefore, the vessel will need to wait until the sea will calm down. Overall, the weather in Pandora is pretty stable and highly studied by transportation companies in order to avoid possible delays. As a result, the risk of possible delay outsourced[49] to transportation companies.

In terms of the threat to the transporting goods, the transportation companies provide insurance, which costs approximately 2% of the value of the goods inside of the container depending on the transporting and insuring company.[50] Therefore, it is possible to insure all the goods against possible loss. The transportation company can provide transit insurance from Door to Door or Port to Port, however if shipping personal effects coverage will be applied if a special removalist[51] will pack the cargo.

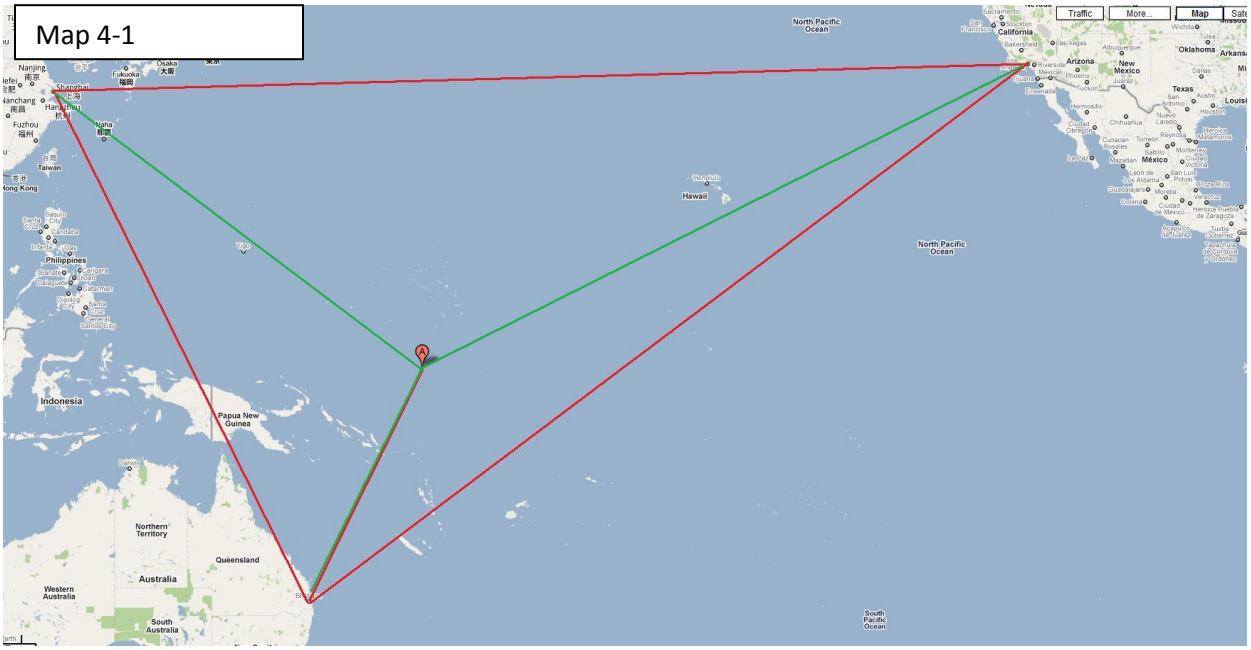
Possible threat: … If there is rough weather in Pandora vessel cannot be unloaded or loaded. …

In terms of container demurrages, they never occur in Pandora, as they do not really have a port or any authority to charge for demurrages. In Brisbane the demurrages are also rare, however if documents or cargo is not in proper order, the port can implement the demurrage and it can become are regular occurrence. Therefore, it is very important to understand the laws of Australia and other potential countries for exporting the goods in order to avoid delays and any kind of demurrages.

[49] The transportation company will analyze the weather and make sure that the weather will not cause any delays.
[50] Cargo insurance quotes. http://www.shipping-insurance.com/cargo-insurance-quotes.html
[51] Australian English. Removalist is a domestic removals company that transports contents when moving house. It is also applicable to transporting other goods through ocean cargo transport.

Connecting Pandora to the outside world

In order to estimate the overall and average costs of transportation, gathering the freight rates for three main destinations, from Pandora to Brisbane, Brisbane to Shanghai, from Shanghai to Los Angeles, will help a lot. By adding the total freight cost we can see that total cost will be 5,900 AUD[52]. All information was obtained from the actual companies[53] by contacting them using cell phone, skype and emails.



The map 4-1 above indicates current and future possible routes of transportation. The red lines illustrate existing channels of transportation in the Pacific Ocean, which connect Pandora Island with three potential markets including Brisbane (Australia), Shanghai (China) and Los Angeles (The United States of America). The green lines show the future potential routes of direct distribution. This possibility will only be realized after enough cash will be generated from investment in the project. The green lines directly connect Pandora to Brisbane, Pandora to Shanghai and Pandora to Los Angeles.

[52] Island-Brisbane=3,500; Brisbane-Shanghai=1200; Shanghai-LA=1200
[53] For China and USA, contacted WORLDCARGO LOGISTICS CO. For Australia, Drew Bowler, Cargo Transport.

Table 4-2

Starting Point	**Destination**	**Distance in kilometers**[54]
Pandora Island	Brisbane	3,340.78
Pandora Island	Shanghai	5,952.24
Shanghai	Los Angeles	10,455
Brisbane	Los Angeles	11,567.68

From the above data (table 4-2) we see that Pandora-Brisbane connection has the lowest distance among four possibilities. This is one of the major reasons why the project of extracting limestone from Pandora Island, decided to penetrate Australian market. The transportation cost is the one of the major variable costs in this project. We can observe the costs per 20' GP container on the table 4-3 below:

Table 4-3

Cost of Transportation (AUD)	**Starting Point**	**Destination**
3,500[55]	Pandora	Brisbane
1,200	Shanghai	Los Angeles
1,200	Brisbane	Shanghai
3,000	Brisbane	Los Angeles

The chart shows all the possible routes of transportation in three different markets: Australia, China, and the United States of America. Each cost of transportation is per container and obtained from the professional people in transportation industry.[56] If we connect this starting points and destinations, then we will be able to obtain follow the map above by assigning a cost to each red line.

[54] The distance is approximate and was obtained by using google map (distance measuring).
[55] The cost is still in stage of negotiating with Cargo Transport. The initial cost was 7,750 AUD per container, however, when the Cargo Transport Company found out the project will export 50 containers per month-the cost will substantially go down. 3,500 AUD is approximated to the cost of ships going back from the Island (obtained from Professor Davis)
[56] Contacted WORLDCARGO LOGISTICS CO and Cargo Transport (Drew Bowler).

Methods of Transportation

Sea transport has been the largest carrier of freight throughout recorded history. Transport by water is cheaper than transport by air, and the factor of difference is huge (7 times)[57]. For the purpose of this project, the commerce of method of shipping is the most applicable. Virtually any material that can be moved, can be moved by water.

Some of few categories of merchant shipping is:

Bulk carriers: cargo ships used to transport bulk cargo items such as ore, limestone products and other similar cargo. The bulk carrier could be either dry or wet. In our case the shipment will be dry, because limestone blocks will be shipped.

Container ships: also a cargo ships that carry their load in containers of different sizes. In our case, the container size is 20' GP. These types of ships are informally known as "box boats". In addition, container ships carry the most of the world's dry cargo.

Tankers: this type of the ship carries fluids, such as oil, petroleum products; therefore, it is not applicable method of transportation of us.

Reefer ships: mostly used to transport perishable commodities, which also becomes inapplicable for this project.

Barge: is a flat-bottomed boat, build to transport heavy goods. Most barges will need to be moved by tugboats as a towing method, because barges most of the time lack their own propeller. This method of shipping is quite interesting for our project, because of the cheapness of barge transportation. However, it the project will use barge method of transportation, then the cost of insurance will go substantially up depending on the value of the transporting goods.[58] In addition, there is not any functioning barge transportation between Pandora and Brisbane or they go very rarely.

[57] Maritime trade and transportation. U.S. Dept. of Transportation. 1999
[58] $3,850 USD per vessel, according to BIMCO. URL: https://www.bimco.org/

Pandora-Brisbane

Currently the only shipping option the project has is from Pandora: Brisbane – Port Vila – Noro – Honiara – Pandora – Brisbane. This vessel sails to Pandora every month. In addition, there is a possibility to use vessel calling Pandora from Fiji, however the ship sailed infrequently (total two sailings total)[59] and it is very expensive.

Therefore, the only option for Exports from Pandora is via Brisbane, then from Brisbane to the rest of the world (as I previously mentioned). However, if the project would generate enough volume of cargo, the shipping lines could consider making Pandora as a direct call into both Shanghai and Long Beach, but the volumes would have to be large, meaning at least 500 x 20' GP per months or even double that amount.

However, since it is not possible at this time, the only suggestion how to penetrate the Chinese and US market would have to be Pandora-Brisbane-Shanghai-Long Beach. [60] In addition, it will all depend on where the shipping lines are short of cargo and what service they would like to increase. Considering current situation, Pandora will not be able to take up to 500 containers.[61]

[59] According to Drew Bowler, Business Development. Australian Transportation Company.
[60] According to Drew Bowler, Business Development. Australian Transportation Company.
[61] According to Drew Bowler, Business Development. Australian Transportation Company.

Australian Transportation

In 2008-2009, 910 million tonnes of cargo moved across Australian ports. This represented a 6.8 percent increase on 2007-2008 and another record high. Exports, imports, loaded domestic cargo, and unloaded domestic cargo accounted for 77.7 percent, 9.2 percent, 6.5 percent, 6.6 percent respectively of total cargo movement.[62]

In the same years, 786.6 million (table 4-4) tonnes of international cargo moved across Australian ports (look at Table below). In comparison with previous year, there was a 7.6 percent increase in exports and an 8.1 percent increase in imports by weight. However, by value, there was a 7.1 percent increase in exports and 13.4 percent increase in imports between 2007-2008 and 2009-2010.

Table 4-4[63]

Financial year	***Value***				***Weight***		
	Exports	*Imports*	*Total*		*Exports*	*Imports*	*Total*
	($ billions)				*(million tonnes)*		
1999	68.2	68.5	136.7		431.8	56.3	488.1
2000	78.2	76.5	154.7		462	56.7	518.7
2001	99.4	83	182.4		495	55	550
2002	99.5	85.2	184.7		501	57.8	558.8
2003	93.4	94.9	188.3		529.4	62.2	591.6
2004	89.3	93.5	182.8		558.3	64.2	622.5
2005	106.3	108.9	215.2		610.6	69.9	680.5
2006	128.5	120.5	249		624.5	71.5	696
2007	142.4	133	275.4		656.2	77.5	733.7
2008	152.5	150.8	303.3		705.8	83.8	789.6
Summary of Australian Coastal Freight, 10 years to 2008							
Financial year	*Loaded*				*Unloaded*		
	Interstate	*Intrastate*	*Total*		*Interstate*	*Intrastate*	*Total*
	(million tonnes)						
1999	31.9	16.5	48.4		31	17.1	48.1
2000	21.7	18.6	40.3		32.4	18.4	50.8
2001	33.2	18.8	52		32.8	18.7	51.5
2002	32.5	19.9	52.4		33.2	19.7	52.9
2003	34.3	18.6	52.9		35	18.5	53.5
2004	34.8	18.4	53.2		35.5	19.6	55.1

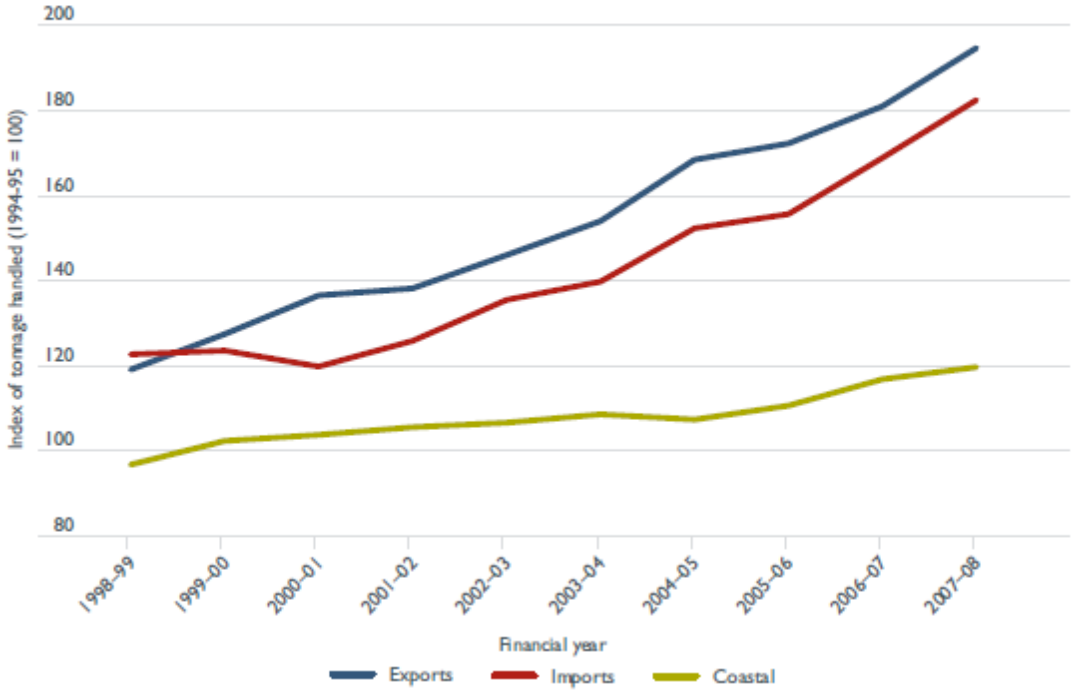
[62] Australian Governement. Department of Infrastructure, Transport, Regional Development and Local Government. Bureau of Infrastructure, Transport and Regional Economics.

[63] Australian Governement. Department of Infrastructure, Transport, Regional Development and Local Government. Bureau of Infrastructure, Transport and Regional Economics.

Interstate	*Intrastate*	*Total*		*Interstate*	*Intrastate*	*Total*	
2005	34.1	19.6	53.7		34	19.4	53.4
2006	34.8	20.4	55.2		34.1	21	55.1
2007	35.7	20.7	56.4		34.6	25.5	60.1
2008	37.2	22.3	59.5		37.3	22.5	59.8

In addition, the overall activities on Australian ports increase faster than in the previous years. The biggest increase we can observe in three consequent year (2007, 2008, 2009). Loaded export tones increased by 7.6 percent in 2009 compared with an increase of 5.1 percent in the previous year. In contrast, unloaded import tones increased by 8.1 percent, compared with 8.6 percent increase in previous year. We can observe the overall movement in the following graph with different indexes:

Figure 1.1 Australia's maritime trading: index of exports, imports and coastal tonnage, 10 years to 2007–08



It is also worth noting the Australian port activity. The number of vessels involved in international shipping entering Australia rose and increase 2.3 percent. Over the same period the number of voyages by all ships involved in international shipping increased by 6.9 percent, while the number of port visits made by all ships increased by 4.3 percent. We can also observe the trend in the Table 4-5:

Table 4-5 Summary of Australian port visits, 10 years

Financial year	All ships involved in international shipping	Voyages by all ships involved international shipping	Port calls by all ships involved in coastal and international shipping
1998–99	3 187	9 744	20 899
1999–00	3 165	9 893	21 683
2000–01	3 162	9 738	21 542
2001–02	3 103	8 779	21 358
2002–03	3 140	8 935	23 454
2003–04	3 363	9 261	23 436
2004–05	3 540	10 03	4 25 348
2005–06	3 528	10 17	2 25 615
2006–07	3 723	10 40	5 26 307
2007–08	3 807	11 11	9 27 442

The expansion of Australia's international maritime trade continued despite the recession. Total international sea freight to and from Australia increased by 10 percent by value and 7.6 percent by weight compared with previous year.[64] We can also take a look at the territorial divisions of Australia and understand where Queensland is located on that scale. Brisbane is the future "gate" to export limestone from Pandora and it is also the capital of the Australian state of Queensland and is the largest city in that state. The Port of Brisbane is part of the Australia TradeCoast, the county's fastest growing economic development area. Commercially, the area has attracted a mix of companies from throughout the Asia Pacific region. [65] Brisbane has an extensive transportation network within the city, as well as connections to regional centers, interstate and to overseas destinations. This fact makes Brisbane even more attractive for the project, as it will provide more opportunity and infrastructure to distribute the limestone product. In addition, Queensland is Australia's second largest by area, following Western Australia, and the country's third most populous after New South Wales and Victoria. This makes Queensland an attractive market, because if the demand of the limestone in that area will consume the project's exported limestone it will make Pandora to work more efficiently without penetrating further markets in first several years.

Western Australia continued to have the largest volume and value of exports, while Queensland received the largest volume of imports by weight and New South Wales received the most imports in terms of value. This was not changed from the previous year. The chart below illustrates the division of imports and exports by value and weight in different states:

[64] Australian Governement. Department of Infrastructure, Transport, Regional Development and Local Government. Bureau of Infrastructure, Transport and Regional Economics.
[65] "About Us". Australian TradeCost.

Recommendation:

1. Improve port infrastructure, because the Nation of the Island and the economy overall will benefit anonymously.
2. Use ocean container transportation for export, because it is the cheapest way to transport limestone to Brisbane. [66]
3. Penetrate market through: Island → Brisbane→ Shanghai → LA, because it is the most cost efficient distribution channel.[67]

Main Costs for transportation:

- Island-Brisbane
  3,500 AUD (initially 7,750)
- Brisbane-Shanghai
  1,200 AUD
- Shanghai-LA
  1,200 AUD

Distance≈ 31,400 km
Containers=50
Total Cost=5,900 AUD

[66] Refer to the research above
[67] Refer to the research above

Contact Information:

• China

• WORLDCARGO LOGISTICS CO., LTD ***(Contacted through Phone, Xing Yung and obtained information about Brisbane-Shanghai, Shanghai-LA transportation costs)***
GUOQUANNORTH RD
SHANGHAI 200439
CHINA
Phone: +86-21-51098105
Fax: +86-21-51095925
Email: jim@worldcargo-log.com
Website: http://www.worldcargo-log.com
One leader in international transportation logistics in china. We offer a complete range of import and export logistics service via all modes of transport. We not only offer service to commercial cargo but also valid for personal cargo. Within many years span we have taken confidence and good repute from our clients. You are welcome to reach us to solve your logistics problem.
Services offered:
Oceanfreight (LCL, FCL),airfreight , Bulkcarrier, Ro/Ro, Warehousing. Discount courier (DHL,TNT,UPS.FEDEX.EMS) , Door to door. Import export business letter of credit, customs clearance.

• Shenship Shenzhen Ltd. **(Contacted through phone and email: unsuccessful)**
Room 503A, Haibin Commercial Center
No. 9 Xinghua Road, Shekou
Shenzhen 518067
China
Phone: +86 755 2688 2203
Fax: +852 755 2185 1100
Email: ky_ng@shenship.com
Website: http://www.shenship.com
Shenship was established in Southern China since 1985 and started initially as a transport company, which operated a fleet of cross-border trucks running between Hong Kong and China. The development was so rapid during the past twenty years that the company , at present, is a 3PL that offers total logistics solutions to its clients not only locally, but also globally.....
Services offered:
Bulk Logistics, Contract Logistics Dangerous Goods and Chemicals, Heavy Lift and Project Management Oil & Energy, Intermodal Services to Mainland China, CIS, Indian Gulf and ASEAN

• Shanghai Brightway Shipping Co., Ltd. **(Contacted through phone and email: verified transportation costs from Brisbane to Shanghai)**
Room1815, No.1688, South Building, North Sichuan Road
Shanghai, China 200080
China
Phone: 0086-21-63932295,63932726
Fax: 0086-21-63243362,63241187,63561003
Email: mylcon@brightway88.com

Website: http://www.brightway88.com
We are first class NVOCC in Shanghai, China and we will arrange with the carriers and give you the best service in China. We handle your shipments very smoothly. Contact Ms. Mary Lee E-mail: mary@brightway88.com
Services offered:
Air Transportation, Sea transportation, Custom Broker

- Interfreight Logistics Co., Ltd **(Contacted through phone: obtained information about Shanghai-LA transportation cost)**

22A-1, Sunshine Island Building, Dongmennan Rd., Louhu District, Shenzhen, China 518000
China
Phone: 0086-755-82147303
Fax: 0086-755-82147340
Email: overseas@interfreightlog.com
Website: http://www.interfreightlog.com
Interfreight Logistics Co., Ltd. is an international freight forwarders and logistics provider located in China. We're specializing a one-stop logistics service. And we've been devoted ourselves to provide the best logistics supply-chain solution to our customers at the cheapest cost and in most convenient & reliable way.
Services offered:
We are specializing sea & air freight, import & export, FCL/LCL, trucking & warehousing, packing, custom clearance & declaration from all Chinese main ports throughout the whole world.

- SHANGHAI S & J FORWARDING CO.,LTD. **(Contacted through phone and email: unsuccessful)**

RM 22A, JIAN-AI BLDG. NO. 8 CHANGYANG ROAD, SHANGHAI, CHINA SHANGHAI & SHENZHEN, 200082
CHINA
Phone: 0086-21-35110862 / 35110859 (Shanghai) 0086-755-82294340 /82280751 (Shenzhen)
Fax: 0086-21-65471002 (Shanghai) 0086-755-82280751 (Shenzhen)
Email: sjforwarding@online.sh.cn sunny_jammy@online.sh.cn Website: http://www.sj-forwarding.com
Our company was establish in Shanghai on Jan. 1998 and set up a branch office in Shenzhen also we are a Chinese NVOCC,and we are also SJ Dolphin Forwarding Co., Ltd. in Hong Kong. according to the global agent network and abundant experience as int'l freight transportation agency, we can provide a 'safe, quick, economical' service to all of our customers, our staff will do their best to fulfill to your needs
Services offered:
air & sea import service: clearance, inspection, trucking, devanning, insurance etc.
air &sea export service: booking, clearance, inspection, trucking, stuffing, insurance etc
logistic service: warehouse &haulage for bulk, refrigeration, exhibit, dangerous...

- China Logistics Ltd. **(Contacted through phone and email: unsuccessful)**

12/F VIP Commercial Centre; 120 Canton Road Tsimshatsui, Hong Kong,
China
Phone: +852 2376 2680 Fax: +852 2376 3360

Email: jgwynn@prclogistics.com Website: http://www.prclogistics.com
With American and British Customer Service representatives as well as offices and service into and out of Hong Kong and Mainland China, China Logistics is geared to serving you with all of your Import and Exporting needs. Our group has been doing business in the China region since 1987, and our clients come from a wide range of industries.
Services offered:
Mainland China and Hong Kong Air/ Ocean Import/Export * Inland freight transport Cross border transport * Customs brokerage * Hand carry service * 24 hour availability * American & British Customer Service Reps.

FreightCare **(Contacted through phone and email: unsuccessful)**
PO BOX 38
NORTH SYDNEY, NEW SOUTH WALES
AUSTRALIA
Phone: 1300 85 79 80 Fax: 1300 85 79 81
Email: info@freightcare.com.au Website: http://www.freightcare.com.au
FreightCare offers low cost International Air Freight and Sea Freight Services
Extensive Heavy Machinery and Equipment Transportation experience
Established technologically advanced Worldwide Network
Warehouse, Container Packing.
Services offered:
International Air Freight and Sea Freight
Air Freight Charter, Break Bulk and Special Project Cargo
LCL and FCL,RORO,Customs

World-Link International **(Contacted through phone and email: unsuccessful)**
14 Adele Avenue
Kidman Park, SA 5025
Australia
Phone: +61 8 8353 2033 Fax: +61 8 8235 0105
Email: sales@worldlinkau.com Website: http://www.worldlinkau.com
World-Link International Logistics is one of Australia's largest independently Australian owned and operated freight forwarding companies. Operating since 1986 World-Link is developing a solid reputation within the Australian import and export community as a capable can-do outfit, no matter what the task.
Services offered:
FCL/LCL Imports/Exports, Air Freight, Perishable goods, Customs clearances, Project cargo.

SEAWINGS SHIPPING PTY LTD **(Contacted through phone and email: unsuccessful)**
1753 BOTANY RD
BANKSMEADOW , SYDNEY, NSW 2019
AUSTRALIA
Phone: 02-9316 9933 Fax: 02-9316 9393
Email: sm@seawings.com.au Website: http://www.seawings.com.au

AUSTRALIAN International Sea & Air Forwarder. Licensed Customs Broker. NATIONAL NETWORK INTERACTIVE FREIGHT MANAGEMENT & TRACKING SYSTEM Need Australian Representation ? Pls email us. Services offered: Import / Export Sea / Air Forwarding , including consolidation to VIETNAM. Warehousing . Packing & Transportation. Project Cargo.

G & J Leyshon & Sons Pty Ltd **(Contacted through phone and email: unsuccessful)**
231a St Vincent Street
Port Adelaide, South Australia 5015
Australia
Phone: 61 8 8240 0111 Fax: 61 8 8240 0366
Email: david@leyshon.com.au Website: http://www.leyshon.com.au
G & J Leyshon & Sons Pty Ltd is a Customs Broker and International Freight Forwarder that can handle all facets of both Imports and Export by either sea or air. Leyshon & Sons are Australian owned and South Australian based with reciprocal agents throughtout Australia and the World. We specialise in personal service hence our company motto "SERVICE IS OUR STRENGTH" Services offered: FCL,LCL,Breakbulk and Ro/Ro seafreight,both hazardous and non hazardous. Airfreight, direct or by consol.Customs Brokerage,Quarantine and Insurance all arranged to make life as easy as possible for our clients,door to door available

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- ALLTRANS International **(Contacted through phone and email: unsuccessful)**

Suite 2, Level 1, 848 King Georges Road, South Hurstville
Sydney, N.S.W. 2221
Australia
Phone: ++ 61.2.9546 5911 Fax: ++ 61.2.9546 5966
Email: alltrans@bigpond.com Website: http://www.
ALLTRANS, is a provider of cargo services on both the Domestic and International levels. Catering to the needs of like minded International Forwarders and industry requiring a hands on approach to provide solutions to all logistic requirements through operational support and or design/implementation of a predetermined strategy, in particular within the Project Cargo sector Services offered: 24Hr/7Day Operations - Tel: ++ 61.418.413 755 Traditional Freight Forwarding, Air & Sea Charters,Sales, Marketing & Research Aviation and Vessel representation and management

- Australia

Cargo Transport **(Contacted through email (Drew Bowler): obtained information on transportation cost)**
2/101-103 Buchannen Road. PO Box 336. Banyo
Phone: 61732673012
Email: drew@cgosystem.com.au

5. Analysis of Using Direct Distributors

Our search for distributors has yielded a substantial amount of potential partners than would be able to sell our product to a significantly larger market than if we were to focus entirely on Australia. The first and our only substantial contact we made was with MS International, an world-wide distributor, positioned mainly in the US market which consists of 15 locations spread across the nation, as well as four international locations in Brazil, China, India and Turkey. Currently, MSI is uninterested in working with ESI and the Limestone production this early on in the startup stage.

After a conversation with our main contact Ronak, the head of the International distribution and sales for MS International, he informed us that our product would be extremely hard to sell to any distributor without any infrastructure in place, and this far out from out from an actual production facility. However it was not all bad news, he instructed us to re-contact him in the future once the island has constructed a production facility and established inventory.

Contracting with a distributor in order to slingshot production facilities in Pandora through more accessible funding is ultimately not feasible at this point in the preliminary business-plan research phase. It will be too difficult to convince a distribution company to contract with Pandora given their lack of production facility, 2012 expected start date.

See **Table 1-1** for a list of potential distribution organizations for future contact that can be used after the Pandoraan facility is up and running. This following list includes both international and US distributors, which should provide the Pandoraan government several options to pursue when they think a distributor would be an appropriate strategic move. Its important to note that this list of companies, links and phone numbers may not being useful or accurate several years in the future, as this list will be several years old when facilities on Pandora will be in place.

Table 5-1: Distribution Company Contact List

#	Company	Email Address	Phone Number	Website	Contact	Contacted
1	Daltile	denver.ssc109@daltile.com	303-744-1743	Link	Diana DuBois	-
2	Marazzi	contact@marazzitile.com	972-232-3801	Link	-	-
3	Arizona Tile	-	303-574-2990	Link	-	-
4	Stone Connection	chasalesteam@stoneconnection.com	704-588-9371	Link	-	-
5	MS International	ronak@msistone.com	714-685-2781	Link	Ronak	Yes
6	Durango Stone	info@durangostone.com	602-438-1001	Link	-	-
7	ABC Stone	info@abcworldwidestone.com	718-389-8360	Link	-	-
8	VM Kaldorf GmbH	info@vm-kaldorf.de	0 84 23 / 99 11-0	Link	-	-
9	TAB India	info@amsumash.com	763-571-8400	Link	-	-
10	Consentino	service@silestoneusa.com	281.494.7277	Link	-	-
11	Antolini Luigi	al.spa@antolini.it	+39-045-6836611	Link	-	-
12	Cactus Stone	-	602-914-2122	Link	-	-

Table 5-1 Note: This list represents a list of future contacts for the island to use if they are seeking a distributor. The only organization contacted from the this list was MS International, who informed us that the best method for moving forward would be to not seek contracting with a distributor until 1-3 years after a supply chain and a consistent inventory and production history is established.

6. Emails

Hello Dear Mr. Drew,

My name is Arin Meirembayev and I'm a student at University of Colorado at Boulder. I deeply appreciate your helpfulness and understand that your help will make a huge contribution in our project on Pandora.
I composed a list of questions (in form of bullet points). Any assistance or suggestion will be valuable to our project.

1. Container
    a. What is the price per container? Does the price depend on weight or volume?
    b. Can you provide us with cost of renting a container vs. cost of buying? (Standard container 40')
    c. What is the maximum container weight that can be transported by law?
2. Transportation and Insurance
    a. What are the most causes of delay and how often do they occur?
    b. How long does it take to transport from Pandora to Brisbane?
    c. What type of insurance do transportation companies provide?
    d. How will container demurrages be covered? How often do they occur?
    e. What is the average cost of loading goods (bricks) in Pandora? What is the average cost of unloading goods (e.g. bricks) in Australia?
    f. What is the cost per tonne per km of truck transport?
    g. What special regulations and/or fees pertain to truck transport of maximum-weight container?
    h. What is the best way to load and unload containers of palettes containing cut stone (2.5 tonnes per palette>? And what are the costs?
3. Australia and Regulations
    a. What kind of tariffs (percentage of ad valorem) will be applied for the cargo to be imported to Australia?
    b. How much time is available for custom declaration of goods (e.g. bricks)?
    c. Are there any additional (besides tariffs and custom declaration) regulations applied for imported goods (e.g. bricks) from Pandora?
4. If you would have any suggestions of reference of other professionals in this industry, that would be really helpful.

Answers to the above questions will be used for further analysis of transportation costs between Pandora and Australia.

Hi Arin,

Thank you for the email and no problems at all answering all of your questions below. After reading the email im also not sure exactly what you are looking to import from Pandora?? If it is bricks will they be new?? If not Australian Quarantine will takes weeks to inspect these bricks and they will charge a fortune to do it. This is mainly due to the fact if Quarantine find one speck of dirt every single brick will need to go to a special cleaning facility to clean each individual brick. Also due to the weight limits being only 20,000kgs per container it will not make the exercise worthwhile as you will not be able to max out a container. Let me know exactly what you are looking to import so I can give you better guidance however to help out int eh meantime I have put all answers in red for your benefit….

1. Container
    a. What is the price per container? Does the price depend on weight or volume? With price im a touch confused as Im not sure if you're talking about shipping from Brisbane to Pandora or from the USA to Pandora or Pandora to Brisbane?? Can you please confirm exactly from where to where?? Im guessing Brisbane to Pandora but if you could confirm it would be appreciated? As a guide to ship 1 x 20'GP from Brisbane to Pandora including loading at Cargo Transport the cost would be AUD7750.00 per container. Costs do not vary in regards to weights or volume, you pay for 1 x 20'GP no matter how much or how little you put in container. Please note you can ship LCL (Less then Container) which means we load consolidated containers for groups of people and each customer pays for the amount of volumes they take up. To ship LCL the costs are AUD365.00 per m3 or 1000kgs whichever is greater (Minimum AUD365.00) + AUD75.00 documents per shipment. There is no LCL service from Pandora to Brisbane and costs to ship a 20'GP from Pandora to Brisbane will be approximately AUD6000.00
    b. Can you provide us with cost of renting a container vs. cost of buying? (Standard container 40') Firstly you cannot ship 40'GP's to Pandora as the port cannot handle them. Cost to buy a 20'GP container is approximately AUD2200.00 + GST (10%). When shipping with shipping line they will hire empty container to you as part of the freight and so using a shipping line container is a lot cheaper and doesn't cost you any extra. Only rule is you must empty and return container to wharf within 7 days.
    c. What is the maximum container weight that can be transported by law? The maximum container weight from Brisbane to Pandora or Pandora to Brisbane is 20,000kgs
2. Transportation and Insurance
    a. What are the most causes of delay and how often do they occur? The most causes of delay are bad weather in Pandora, if there is rough weather in Pandora vessel cannot unload or load so vessel must wait until seas will calm down.
    b. How long does it take to transport from Pandora to Brisbane? 15 Days Transit from Brisbane to Pandora and 14 Days Pandora to Brisbane

c. What type of insurance do transportation companies provide? We can provide transit insurance from Door to Door or Port to port, however if shipping personal effects you will only be covered if a removalist packs your cargo

d. How will container demurrages be covered? How often do they occur? Container demurrages never occur in Pandora as they do not really have a port or any authority to charge them. In Brisbane they are also rare, however if documents or cargo is not in order they become very common and can be a regular occurrence

e. What is the average cost of loading goods (bricks) in Pandora? What is the average cost of unloading goods (e.g. bricks) in Australia? Loading in Pandora has never really taken place however I would work on approximately AUD650.00 per container in Pandora and AUD800.00 per container in Australia. These costs will include transport to metro area in Brisbane.

f. What is the cost per tonne per km of truck transport? In Australia this varies. Brisbane metro (25km to port) is about AUD450.00 per container, +50km AUD550.00 per container, +100km AUD650.00 per container, +200km AUD900.00 per container.

g. What special regulations and/or fees pertain to truck transport of maximum-weight container? Max weight you can pack on Pandora vessels is 20,000kgs due to lifting equipment in Pandora and max road limits in Australia are 22,000kgs so there is no fees payable for overweight containers

h. What is the best way to load and unload containers of palettes containing cut stone (2.5 tonnes per palette>? And what are the costs? I will need to ask about this question as im not sure if they could even do this in Pandora based on the equipment they have.

3. Australia and Regulations

a. What kind of tariffs (percentage of ad valorem) will be applied for the cargo to be imported to Australia? The Duty rate varies depending on commodity, if you have exact commodities I can check this for you. GST is applicable is all goods and is based on 10% of the CIF + Duty.

b. How much time is available for custom declaration of goods (e.g. bricks)? If paperwork is in order and they pass Quarantine, they can clear within 1 day, if not they can take anywhere from 3 days upto 6 weeks depending on the problem. Cargo such as bricks from Pandora will probably take 2-3 weeks as they would not pass Australian Quarantine as they would almost certainatly be covered in dirt and will require special cleaning. Costs for Quarantine will be enormous at about another AUD2500.00+ on top of all freight costs.

c. Are there any additional (besides tariffs and custom declaration) regulations applied for imported goods (e.g. bricks) from Pandora? You will need to advise exactly what the commodity is?? I don't know of any Bricks in Pandora and they have no furnace in place to make them so I will need to know exactly what this is before I can advise duty rates?

Hopefully this has helped you out and give you some idea as to costs and problems that could be occurred. I personally would be very wary importing used bricks from Pandora mainly due to Quarantine issues once bricks arrive into Australia. If you have any further questions please let me know.

Thanks and Kind Regards,

Drew Bowler
Business Development

Cargo Transport System
2/101-103 Buchanan Road | PO Box 336 | BANYO QLD 4014 | Tel + 617 3267 3012 | Fax + 617 3267 3740
ABN 93 425 606 853 drew@cgosystem.com.au | www.cgosystem.com.au

Hello Mr. Drew,

If it's possible, I would like to know the approximate sea freight rates from Brisbane to Shanghai. The reason: as I understand, there is not direct connection between Pandora and China. And there's not any connections from Pandora to USA.
I was thinking to connect to China and USA through Brisbane. (First shipping to Brisbane and then from there to China and USA)
Therefore, could you please let me know the approximate rate of shipping 20 GP containers from Brisbane to Shanghai (China), and from Brisbane to Los Angeles (USA)?

Thank you,

Hi Arin,

It is defiantly possible. However from what I am aware no one is currently exporting from Pandora. Are you able to advise commodity? In the meantime I will put costs together to give you an idea, but please note costs will be very high especially as you have to unpack and repack containers in Brisbane due to the fact that you can only use special containers to and from Pandora and to and from Australia to USA/China. The approximate costs are as follows…….

Pandora to Brisbane

Freight- AUD6000.00 per 20'GP

Transshipment costs in Brisbane

Unpack/Repack, Port Fees, Transshipment Entry- AUD2750.00 per 20'GP

Brisbane to Shanghai

Freight- AUD1200.00 per 20'GP

Brisbane to Long Beach (LAX)

Freight- AUD3000.00 per 20'GP

So the total costs to ship a container from Pandora to Shanghai is approximately AUD9950.00 and Pandora to Long Beach is approximately AUD11,750.00. These costs are very high. Commodity would have to be very high value to make this worthwhile. Let me know your thoughts and if you need anything further at all please let me know.

Thanks and Kind Regards,

Drew Bowler
Business Development

Hello Mr. Drew,

This information is great and will be very helpful for our project.

Before being included in the team of this project as a student at University of Colorado at Boulder, I signed the non-disclosure agreement.
Pandora Island has been very sensitive to outside world and afraid that people will take advantage of their weakness.
Therefore, it is impossible for me to disclose the type of commodity being considered in this project. However, I would be happy to send a non-disclosure agreement for you to sign, because I believe you are very knowledge in export/import area and your advises are very helpful.
Let me know you thoughts.

Meanwhile, I've been trying to come up with potential routes of transportation from Pandora Island. I will attach the jpg file for you to take a look at.

The map indicates today's and future possible routes of transportation.
The red lines illustrate existing channels of transportation in pacific ocean, which connect Pandora Island with three potential markets including Brisbane (Australia), Shanghai (China) and Los Angeles (The United States of America). The green lines show the future potential routes of direct distribution. This possibility will only be realized after enough cash will be generated from investment in the project. The green lines directly connect Pandora to Bribane, Pandora to Shanghai and Pandora to Los Angeles.
My question to you, Mr. Drew. Is it more feasible to create route:
1) Pandora--Brisbane; Brisbane--Shanghai; Shanghai--Los Angeles
or
2) Pandora--Brisbane; Brisbane--Shanghai; Brisbane--Los Angeles
Which of these two potential channels are more feasible in terms of cost and overall logical way of transporting commodity from Pandora?

Thank you,

Hi Arin,

No problems at all with the information. If you need anything please let me know.
Please send over your non-disclosure agreement and I will sign. By knowing the commodity this should help with freight requirements and also help out trying to work out exact costs within Brisbane if containers need to be unpacked re-packed.

Currently the only shipping option you have from Pandora are on the following schedule……

Brisbane – Port Vila – Noro – Honiara – Pandora – Brisbane – This vessel sails Pandora every month. There is talk of another vessel calling Pandora from Fiji, however from what I know there has been one maybe two sailings however they are not regular and are very expensive.

The only options you have for Exports from Pandora is via Brisbane. Then Brisbane to the world. However if you had enough volume of cargo shipping lines could consider calling Pandora as a direct call into both Shanghai & Long Beach, however volumes would have to be large. When I say volume I mean you would need at least 500 x 20'GP's probably double that amount too!
If Pandora was a direct call I would suggest shipping lines would want to call Pandora – Brisbane – Shanghai – Long Beach. However this would all depend upon where shipping lines are short of cargo and what service they would like to increase. However it's all abit up in the air until you work out how much volume you will have. If you can work out how many 20'GP's of product you could have ready every month then it would be a real start in trying to work out who/how you could move this freight and what markets you could approach. Depending on what commodity is and what you are looking to do with it, Australia via Brisbane is by far your best option.

You will also need to take into consideration the port in Pandora. With the current setup they won't really have space to store 500 full containers. Plus loading vessel's is going to cause issues as you will only be able to facilitate self loading vessels. As such a lot of shipping lines will be unable to call Pandora, even if they can self load they will be put off by the port facilities and the loading conditions from the workboats as they will consider this too dangerous.

Please try to put together number of 20' containers you believe that they will be able to have ready every month. From here we can then start to work out what will work best for your cargo considering costs and transit times.
Thanks and Kind Regards,

Drew Bowler
Business Development
Hello Mr. Drew,

Thanks again for the information.
I attached a non-disclosure agreement for you.
I also found out that it is expected to ship 50 containers per months.
In addition, Professor Davis told me that the transportation cost from Pandora to Brisbane using "back haul" method is 3,000 USD per container and from Brisbane to Pandora is 8,000 USD per container.
Could you please confirm this information?

Best regards,

Hi Arin,

No problems at all. Please note that the USD3000.00 for Pandora to Brisbane is a lot lower then my rates of AUD6000.00, however this rate is based on small volumes. Obviously with 50 containers a month I could get rates that you will require to make this process viable. If you need anything further at all please let me know.

Thanks and Kind Regards,

Drew Bowler
Business Development

Hello Kim,

I am student at the University of Colorado in Boulder and an associate of the Environmental Studies Institute, a non-profit corporation in the U.S. The Environmental Studies Institute represents a small island state that has a virtually unlimited supply of pure, high-density, fossiliferized dolomitic limestone of diverse colors and textures.

We are exploring the possibility of offering sawn wall cladding (regular and irregular) in the East and South Australia market, and are writing to explore your interest in utilizing this product.

Whether or not you have such interest, we would very much appreciate your responses to the following questions as part of our market research. If it is convenient, please simply insert your answers after each question and reply to all senders/recipients.

1. Do you use limestone wall claddings for any of your restoration projects?

2. What is the average price your company pays to purchase limestone imports or to extract limestone from your quarry, and if applicable sawn veneer?

3. What are the technical specifications (PSI, Density, Compressive Strength, Absorption, and Abrasion) of the limestone your company uses for restoration? We would be happy to share with you the technical specifications of the limestone we wish to bring to market, which have been measured exhaustively.

4. What colors of limestone are currently the most popular among your customers and restoration projects? Our colors range from white, to tan, beige, silver, grey, and brown.

If you would like further information on The Environmental Studies Institute or our limestone supply, please contact our president Dr. W. Jackson Davis Ph.D. jacksondavis@earthlink.net

Thank you for your time and assistance. I look forward to hearing from you.

Mickey Citarella

To Whom it May Concern,

I am a fourth year student at the University of Colorado and am currently engaged in a project in which I must find data on the sales of various dimension stones in Australia, including Limestone, Travertine, Granite, Marble etc. I have explored your site and have been unable to find any data that meets these specifications. If possible could you direct me towards a source that may contain some of the required data? Or do you all have any information that may be beneficial to my research.

If you all need to contact me further feel free to e-mail me at citarell@colorado.edu

Thank you very much!

Mickey

University of Colorado at Boulder
Leeds School of Business
citarell@colorado.edu
303-579-1012

Hello Ronak,

It was good to speak with you today.

As background, I represent a group of senior business students in the Leeds School of

Business at the University of Colorado that is assisting a company called the Environmental

Studies Institute (ESI) and its President, Dr. W. Jackson Davis.

ESI represents a small island state with a virtually unlimited supply of pure, high-density, fossiliferous dolomitic limestone. We are doing market research to explore the possibility of an export industry focused initially on sawn veneer wall cladding. Feasibility studies have shown that the stone also cuts and polishes beautifully, which could be a future direction after the veneer business is firmly established.

As per our conversation today I will send information regarding the characteristics of our various products, as well as whatever additional specifics are possible, by the end of the week.

Thank you again for your time.

Sincerely,

Jonathan Nooning

(720) 289-5807

Jonathan.Nooning@Colorado.edu

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Hello Ronak,

Here is information you requested. We emphasize that we are in the mid-planning stage and these are projections based on our experience and the specifications of machinery we are looking at. As noted, the supply is for practical purposes unlimited.

Our projected minimal output unit of regular 12" x 12" x 2 ½" sawn wall cladding, based on a single guillotine line operating at full capacity at one shift per day, is 27 palettes/day, or 4.5 US containers a day, equivalent to an annual output of 7,722 palettes or 1,287 containers. (we are assuming an 85% capacity factor for new equipment)

We can double output by adding a second shift, and double it again by adding either a third shift or a second split line. Our facility is designed to accommodate 5 split lines for a maximum projected output of 405 palettes (67.5 U.S. containers) daily (3 shifts x 5 lines x 27 palettes per line).

In terms of price points, to project revenue streams we have forecasted recovery of roughly 50% of the retail value per palette. Acceptable price points vary considerably with our assumptions regarding demand, FOB arrangements, marine transport insurance, demurrage, customs, tariffs, etc. If you will kindly specify these we can be more specific with price-points based on net revenues.

The limestone can be produced in quantity in the following colors:

White ("cream"), tan ("sand"), light grey ("silver"), dark gray ("storm"), light brown ("earth"), and dark brown ("deep earth")

Textures range as follows:

porous, almost coralline (compressive strength 4000-5000 PSI, corresponding to medium-density limestone; this is the shallowest stone, 1 m deep).

medium-porosity – slightly deeper stone, high-density limestone (PSI > 8000)

low porosity – deepest and densest stone

fossiliferous (shallow-and medium-depth stone)

non-fossiliferous (deep stone)

Each of these textures can be produced in quantity. The color tends to be correlated with texture, ranging from cream (shallowest, most porous stone) through sand (deeper, less porous stone) to silver through deep earth (very dense and smooth, almost like marble).

Physical properties of the limestone were determined by Applied Petrographics, Inc. (Dr. Dimayan Jana, Greensburg, PA) and the Tile Council of North America (Anderson, South Carolina laboratory). The attached table shows average TCNA results against ASTM standards for all dimension stone. We performed the tests on numerous widely-dispersed samples, and are confident in the homogeneity of properties across the deposit.

Photographs showing some of the samples used to build a wall after guillotine splitting are shown in the attached photographs. We also have numerous samples of filled and polished tile, as well as flamed, sandblasted, and unfinished, which give a good picture of the variability.

Again, we are in the early stages of feasibility analysis. It will take at least two years to reach production at the above levels, although this would definitely be accelerated with an appropriate expression of interest by a distributor (which will accelerate start-up funding).

Our president, Dr. Davis, would be pleased to meet with you if helpful. Would you kindly reply to “all senders” so that Dr. Davis receives a copy as well.

Thank you,

Jonathan Nooning

Jonathan.Nooning@Colorado.edu

(720) 289-5807

7. Meeting Notes

Opim Blog

Professor Marlatt had requested we complete the following tasks by 01-27-10

1. Schedule a meeting before our 3rd class on 01-27-10

2. Team Members should get to know each other better.
-Why we chose project?
-What are our schedules? When can we hold group meetings?
-Establish a team leader and expectations.
- Establish an electronic site to store project materials and communications with project team.

3. Schedule first meeting with client, establish a time/ day that will typically work on a weekly basis.

Our group scheduled a meeting without our client Monday January 25th 2010 and we accomplished all the tasks given to us.

1. A meeting was scheduled on 01-25-2010 and we are planning on meeting again on 01-27-2010.

2. Each member chose the project with the Environmental Studies Institute because we all had an interest in international business as well as sustainability. Also, the challenge and importance of this project to the Environmental Studies Institute was another large factor in our project choice.

   Our group has very complimentary schedules. We will generally be meeting at 2 0'clock on Wednesdays and will meet on Mondays or Fridays if extra group meetings are necessary.

   We currently have not assigned a team leader because we feel each person will be able to equally contribute to the project as well as the communication amongst our Client, Hitachi Mentor, and team members. If need arises in the future, we will elect a team leader to assign tasks to group members and communicate with our client and mentor.

   Our group will be using webfiles.colorado.edu to store important information about our project, and we will be using a blog to write and store summaries of group meetings.

3. We asked our client, W. Jackson Davis, if he will be able to meet weekly at 2 o'clock on Wednesdays.

4. Overall, we are all very excited to start this project. We all view the project as a great way to experience international business and we are committed to doing the best possible job to help the community we are working with.

Our group meet with our client Dr. W. Jackson Davis from 1:30pm-3:25pm on Wednesday February 17th 2010.

The goals of the meeting were:

1. To review and discuss the Catalina Marketing Research Report on dimension stone.
2. To assign work expected to be accomplished by next meeting.
3. Clearly define team member roles.

1. We started the meeting by looking over the Catalina Report. Dr. W. Jackson Davis reviewed different notes he made while reading the report and we chimed in with our various opinions and inputs.
    a. He split his comments into two categories. 1. Universal and 2. Specific.
    b. His first universal comment was: the group needed to find sources, then determine market structure, the supply demand price, and find principle contacts in Australia.
    c. Next he wanted us to disaggregate the market into three sectors: 1. Type of stone. 2. Sub-products of limestone. 3.Disaggregation into foreign and domestic supply.
    d. The specific comments were: Finding the world market compared to the Australian Market. The Growth potential. Where Australia buys stone. Who is competition. Leading partners. Top 25 importers in Australia. Demand by region, demand by state.

2. Each team member was assigned work they must complete before the next meeting taking place on Wednesday.
    a. Mickey: Find a marketing research report template, he must discuss proper marketing research with various marketing professors in the Leeds School of Business. Mickey also must contact the USGS, in order to establish local contacts who may be able to help the team with area knowledge and other contacts who may be beneficial.
    b. Arin: Will assist Mickey with finding a marketing research report as well as finding initial information on shipping and transportation costs from Pandora to Australia.
    c. Jon Nooning: Will begin preliminary research and set up a lunch meeting with Dr. Bob Armstrong.
    d. Uller will discuss preliminary costs with Dr. W. Jackson Davis.

3. Future roles for team members were also communicated and solidified. They are indicated in the section below.

• Approve sections, construct and finalize project charter

• Maintain contact with Dr. Davis on a twice weekly basis and as needed
• Schedule meetings with mineral consultant and venture capitalist Bob Armstrong
• Communicate group objectives and issues to Dr. Marlatt as needed
• Record meetings and provides audio within 24 hours of meeting
• Postitioning Research as follows:
• Define target markets for each product line, including providing data and information on demographics and culture
• Determine trends in the Australian commercial and residential real estate and improvement markets to best develop a positioning Approach
• Identify strengths and weaknesses of products for best positioning
• Branding Research as follows:
• Explore options to best utilize green / social narrative in product branding
• Determine the possibility of joint partnerships within Eastern Australia, establishing contact and obtaining information from these potential partners
• Provide a list of approximately 10 outlets for various products
• Create work breakdown structure and research 10 similar companies for first deliverable
• Analyze positioning and branding research data and information and make recommendations on findings in final deliverable
• Maintain contact with Jason Davenport, our Hitachi consultant, on a weekly basis
• Establish meeting goals based on project schedule and client requests
• Compose meeting notes and ready them for blog writeup
• Marketing Research as follows:
• For blocks, stones, and tiles, determine current market volume and saturation
• Establish demand estimates for Pandoraian limestone by contacting prospective distribution outlets
• Compile information on various price points and establish preliminary target price points
• Determine exact marketing locations providing Jon an explanation of proposed market locations of particular products for partner
contact
• Create final pricing structure using cost data from all aspects of research as well as marketing research
• Establish a marketing plan for each product with local variation
• Explain risk management, meeting agendas, and identify tangible costs and benefits for the first deliverable
• Finalize the overall marketing plan and provide recommendations for final deliverable

• Create and maintain group blog
• Ensure meetings remain on track to achieve specified goals
• Extraction Research:
• Obtain and finalize cost estimates with Dr. Davis regarding initial capital investments
• Estimate labor rates and predict the eventual rise in the employment rates and its effect on wages
• Determine the costs of energy resources within the specified environmental objectives and forecast any changes in technology/cost which may impact later phases of production
• Determine cost of production expansion and additional phases based on demand research
• Rehabilitation Research:

• Verify cost estimates of overall rehabilitation and culture preservation with independent consultant
• Conduct research into the cost of similar rehabilitation and cultural preservation projects
• Finalize rehabilitation cost estimates for price structure
• Competition Research:
• Analyze supply chain and pricing of competitors, providing Mickey with information on price points, Arin with transportation information, and Jon information to determine positioning
• Determine current market shares of 5 largest competitors
• Compile advantages / disadvantages of competitors products
• Write assumptions, roles and responsibilities, and set project schedule for first deliverable
• Provide extraction, rehabilitation, and competition cost structure data and analysis for final deliverable
• Schedule and arrange group meetings
• Transportation Research:
• Determine costs associated with sea transportation including: barges and tugboats
• Determine the feasibility of 'return' shipping and the discounted costs associated
• Identify costs of land transportation including a truck fleet in Pandora and land transportation estimates in Australia
• Establish the need for shipping containers and determine the costs associated with them
• Understand the implications of demurrage and provide estimates of frequency and economic effects of delays
• Select shipping ports and estimate docking and usage fees
• Identify 5 potential strategic partners for land, sea, and docking logistics
• Use production estimates and transportation research to obtain insurance quotes
• Research current customers regulations and tariffs and obtain data on the cost of Pandoraan imports to Australia
• Analyze and interpret transportation and logistics data an information and make recommendations for final deliverable

Group Meeting: Wednesday February 24th 2010 12:30pm-2:50pm Dr. W. Jackson Davis, Dr. Bob Armstrong

Our team met with our client Dr. W. Jackson Davis, and an advisor Dr. Bob Armstrong in Littleton Colorado.
The goals for the meeting were:

1. Introduce Dr. W. Jackson Davis with Dr. Bob Armstrong.
2. Have Dr. Bob Armstrong give our team and client more insight on the dimension stone industry and project.
3. Give status updates on work accomplished over the past week.
4. Outline goals for our upcoming meeting which will be held at 2:00pm Wednesday March 3rd.
    1. Our team united with Dr. Bob Armstrong and Dr. W. Jackson Davis for a lunch meeting in Littleton Colorado. The first hour of the meeting was an in depth dialog between the two doctors. Dr. W. Jackson Davis gave a brief explanation of the project and addressed many of the questions Dr. Bob Armstrong presented him. Some of these issues included past corruption and embezzlement issues with

Pandora's government, the quality and aesthetics of Pandorian limestone, and possible quarrying and production techniques for limestone extraction.

2. Dr. Bob Armstrong provided us with new and exciting information on the dimension stone industry. He informed us of a group called CSIRO, which is an Australian based commonwealth of scientific and research information. This group could potentially provide industry contacts in Eastern Australia such as, geologists, scientists, and experts or businesses in various areas of construction or infrastructure. Secondly, he informed us about a group the Baltic Dry Shipping Index which provides current up to date shipping prices for non-liquid goods. This site can provide a great outline for pricing on overseas shipping as well as potential contacts in the transportation industry. Lastly, Dr. Armstrong helped us clarify what to look for in a marketing research report. We need to go through the producer to find demand, and then try to calculate our supply based upon that demand. Also, knowing how much supply we can produce in a week, month, and year. Knowing the capacity of our supply will also help us find potential customers.
3. Our group understands that it is now crunch time. Arin made great strides in his search for transportation cost information; he found a contact from Australia who provided excellent base line numbers. Mickey found a marketing research professional that will assist with finding sources and drawing up a working template for the marketing research. Jon Nooning, started predicting demand for the first five years of production and Uller meet privately with Dr. W. Jackson Davis to discuss preliminary costs of products. This week we need to think of questions to ask a dimension stone expert in Australia, as well as trying to contact different dimension stone professionals listed on the Australian Stone Advisory Association Website.
4. The team will be meeting with Dr. W. Jackson Davis Wednesday March 3rd at 2:00pm.

Group Meeting: Wednesday March 3rd 2010 2:00pm-3:15pm Dr. W. Jackson Davis.

We met with our client in the business school.

1. The central goal was to discuss the feasibility of phase 1 production.

1. After consulting transportation costs Dr. Drew, a transportation specialist from Brisbane Australia, the team did basic calculations and realized phase 1 of the project, creating limestone bricks, would not turn a profit. So the team discussed the possibility of skipping phase 1 and moving towards phase two, creating limestone wall claddings, of production.
2. Jon Nooning, and Uller Doetsch also realized finding an international distributor might be easier than trying to penetrate the Australian market.

3. The goals for next meeting are
    a. Mickey: Research Australian Market to appease Pandora Gov.
    b. Jon: Find Distributors and Contact them.
    c. Uller: Find information on saws
    d. Arin: Further consult Dr. Drew on Transportation costs.

Group Meeting: Wednesday March 10th 2010 2:00pm-3:15pm Dr. W. Jackson Davis.

We met with our client in the business school.

1. The Goal of this meeting was to update the team and client on our findings for the project.

   Uller: Uller contacted Park Industries regarding saws for dimension stone. A summary of their conversation is listed below. Here are the details of my phone conversation with Bob Ghen of Park Industries:

   Based on my description of the block saw we were looking for, Bob recommended the Park Jaguar series of saws. He indicated these saws have the ability to saw 15" thick segments of stone. They run on a 30HP or 40HP motor (he recommended the 40HP for reliability due to our remote location), and either on a 240V or a 480V system. He indicated there is substantial additional cost with the 240V system (they have to alter the internal components to reduce wearout) and that would have to be quoted with the system. The water requirements for the saw range from 3-14 GPM, however he recommended a 8-10 GPM rate which aligns well with Jackson's estimates. Finally, he quoted one saw (he was willing to work with a quantity discount) for $100,000 for normal delivery and setup. He said our sea transportation would be extra but Park Industries is willing and able to handle all aspects of the transportation (below). Additionally, Park Industries requires their staff install and setup the equipment and that would incur an additional cost (he said there is a possibility of waiving this but it may affect the warranty).

   The table for the saw is approx 10 ft, and a series of tables can be incorporated with one another. Each table is $13,000.

   Bob indicated transportation was not an issue. He recently worked on delivering three saws to a client in Antigua in the Caribbean. Two of the saws were the Jaguar series and were able to fit into two 20 ft containers, a larger saw had to have a custom wooden container and special chemicals applied to the saw for deck shipping built by a company in Minneapolis that Park works with frequently. Park is willing to handle the logistics and shipping of the saws and seems comfortable doing so.

   He welcomed a representative to his showroom in Minnesota to test the saws. He said we could bring our materials and do real world testing on any of the machines they offer. He also said training could be done at their facility, so we could potentially have one person well-trained by Park do the training for the rest of the operators on site (again, this would involve a waiver indicating our acceptance of a lesser warranty).

So this is just a start. I'll be getting in contact with him to discuss the Hydrosplit series as well as the TMX veneer production machines. I'll be looking for costs, dimensions, production capacity, and warranty.

Let me know if there is something I missed.

Arin: Continued his conversation with Dr. Drew and learned the biggest ports in the Pacific are located in Brisbane, Australia, Shanghai, China, and Los Angeles California. He is still consulting with Dr. Drew regarding prices for shipping to these different ports.

Mickey: Sent out e-mails to 10 different dimension stone firms in Australia, only one responded, and gave useless information.

Jon: Was sick and could not make it to the meeting. However, he has contacted MS International and is now speaking with a representative named Ronak.

Group Meeting: Wednesday March 31st 2010 2:00pm-3:15pm Dr. W. Jackson Davis

1. The Goal of this meeting was to update the team and client on our findings for the project.

Mickey: E-mailed 7 more dimension stone firms in Australia, and received one response from Heritage Stone. The response asked for a sample of our limestone product. He also e-mailed various governmental groups in Australia and the United States to find information on limestone imports and exports from Australia.

Uller: Researched capacity of solar power. He is currently receiving tentative quotes from a few American firms. Below is one price quote

Solar System Quote						
System Capacity kW	30.00	50.00	75.00	100.00	150.00	250.00
System Area sq. ft.	2,308.00	3,846.00	5,769.00	7,692.00	11,538.00	19,231.00
Base Price (USD)	$97,500.00	$162,500.00	$243,750.00	$325,000.00	$487,500.00	$812,500.00
Base Price (AUD)	$104,325.00	$173,875.00	$260,812.50	$347,750.00	$521,625.00	$869,375.00
Cost Per kW (AUD)	$3,477.50	$3,477.50	$3,477.50	$3,477.50	$3,477.50	$3,477.50
Cost Per Sq. Ft (AUD)	$45.20	$45.21	$45.21	$45.21	$45.21	$45.21
System Capacities						
kW per Sq. Foot	0.01300					

Jon: Has continued conversations with Ronak, however our chances of working with MS international is looking slim.

Arin: Found pricing data from DR. Drew it is listed below.

Cost of Transportation (AUD)	Starting Point	Destination
3,500	Pandora	Brisbane
1,200	Shanghai	Los Angeles
1,200	Brisbane	Shanghai
3,000	Brisbane	Los Angeles

From this point forward we are limiting our meetings with Dr. W. Jackson Davis in order to focus on our write up.

Meeting April 21st 2010: 2:00-3:00pm W. Jackson Davis

The goal of this meeting was to provide our client with the first draft of our final deliverable. Each member discussed his part of the deliverable and Jackson Davis agreed to comment and revise the deliverable by Sunday April 25th.