

Tungsten Mining

RAPID MOVE TOWARDS TUNGSTEN PRODUCTION

Capital Structure

Code	TGN
Shares	79.1 m.
Options	15 m @ 16 cts 6/16
Price	\$ 0.16
Market Cap	\$ 12.6 m.
Cash (est)	\$ 3.5 m.
EV	\$ 9.1 m.

Source: Strachan Corporate

Valuation Metric

Asset	\$m	\$/Shr
Kilba	35	\$ 0.22
Funding	10	\$ 0.06
Cash	4	\$ 0.03
option cash	2	\$ 0.02
Exploration	3	\$ 0.02
Corporate	(5)	-\$ 0.03
	<u>50</u>	<u>\$ 0.32</u>

Source: Strachan Corporate

Board

Patrick McManus	Chairman
Paul Berndt	Managing Director
Francis Koh	Non Executive
Robert Van der Laan	CFO

Opinion*

Tungsten Mining is well equipped to rapidly develop a mine at the Kilba tungsten deposit in the Pilbara region of Western Australia. It has the skills and funding to take it through to a development decision During Q3 '13. Provided that final estimates for engineering, construction costing and metallurgical processing are favourable, the company should be able to attract suitable funding.

Tungsten has become a key strategic metal for the strength, hardness and high melting point of its steel alloys and cutting compounds. Consumers outside of China are actively searching for alternative sources of supply, which will favour the company's business plan.

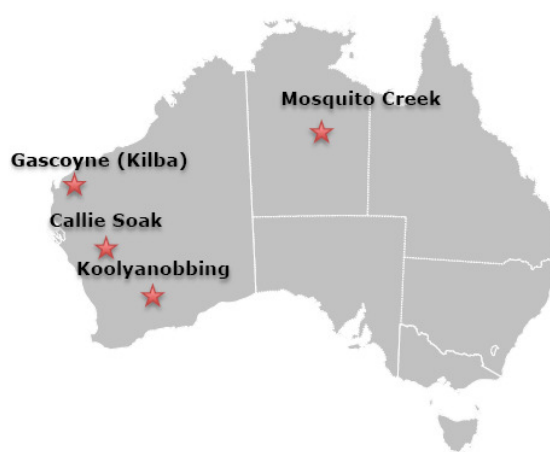
Peter Strachan.

*No recommendation is offered for this commissioned research.

Investment Drivers

- ◆ Tungsten Mining owns the high grade Kilba tungsten project in the Pilbara region of Western Australia. Recent drilling aims to support estimation of a JORC Resource by mid 2013. A target of 0.7 to 1.4 mt of mineralisation grading 0.5% to 0.8% WO₃ is in prospect with exploration appeal pointing to an initial five year project life mining 200Kt pa.
- ◆ The company aims to establish a project to produce at least 1,500 tpa of tungsten concentrate by late 2014. Coarse grained, high grade mineralisation will support scheelite recovery of ~84% into a saleable concentrate, generating revenue of about \$38 million pa and free cash flow of over \$17 million pa for an initial 5 years from 2015.
- ◆ Kilba's granted mining tenement status and the potential for off-take and funding partnership should enhance approval and funding process.
- ◆ Several scheelite occurrences surrounding Kilba remain undrilled, offering regional exploration appeal and opportunities for Resource expansion.
- ◆ The company is led by experienced industrial minerals executives with a solid background in project management and specific tungsten processing expertise.
- ◆ Tungsten is a strategic metal that is in short supply. Like rare earths, China dominates the market for tungsten. Recent actions by strategic investors including Berkshire Hathaway, Todd Corporation and JOGMEC demonstrate a keen interest in securing supplies of this metal which is used in high temperature and hard wearing applications as well as in military applications.
- ◆ An initial valuation of 32 cents per share is estimated, ahead of full feasibility determinations.

Location of Kilba Tungsten Deposit



Source: Tungsten Mining

Tungsten project development with broad exploration appeal

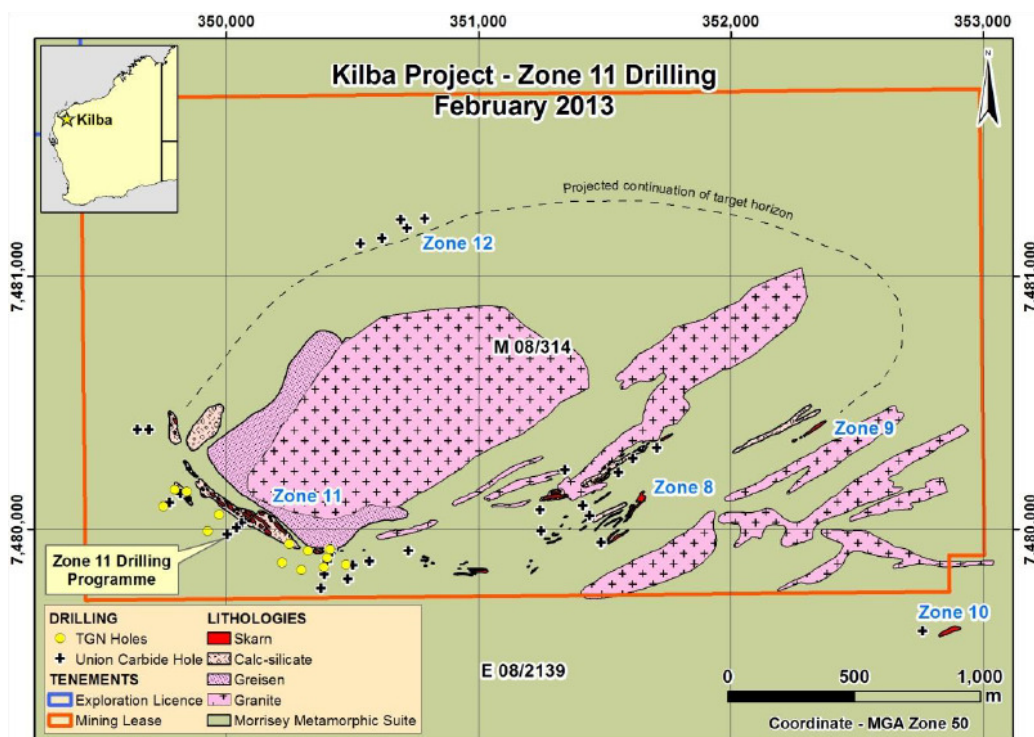
Background

Tungsten Mining listed on the ASX in December 2012 raising \$5.1 million. The company has a broad portfolio of exploration projects and maintains a key focus on early cash flow from mining at the high grade Kilba tungsten deposit. Insitu grades of over 0.7% WO₃ are typically twice those seen in many peer miners and represent an insitu value of around \$215 per tonne with a recovered value of around \$170 per tonne of mineralisation.

Projects

Kilba Tungsten Project 100%

Scheelite mineralisation occurs at the Kilba deposit along more than 700 metres of skarn deposit strike that outcrops and dips to the southwest at Zone 11.



Source: Tungsten Mining

More drill results by end of March

Resource upgrade expected in April

Simple metallurgical recovery process

The company is now working to upgrade Resources at Kilba, focusing on outlining open pit mineralisation to feed a simple, standard gravity recovery process from coarse mineralisation that should only require grinding to 80% passing 2 millimeters.

This work will feed in to a Bankable Feasibility Study by Q3, '13 with commitments to proceed expected at Board level following negotiation of funding arrangements by the end of 2013, with the aim of commencing production by the end of 2014 or early 2015.

Rock chip sampling and scout drilling along additional outcrops over more than 6 kilometres of potential mineralised skarn has outlined several targets for more intense exploration effort. For example at Zone 8, one intercept of **3 metres grading 1.81% WO₃** shows strong potential with an intercept that indicates recoverable value of \$465 per tonne of mineralisation.

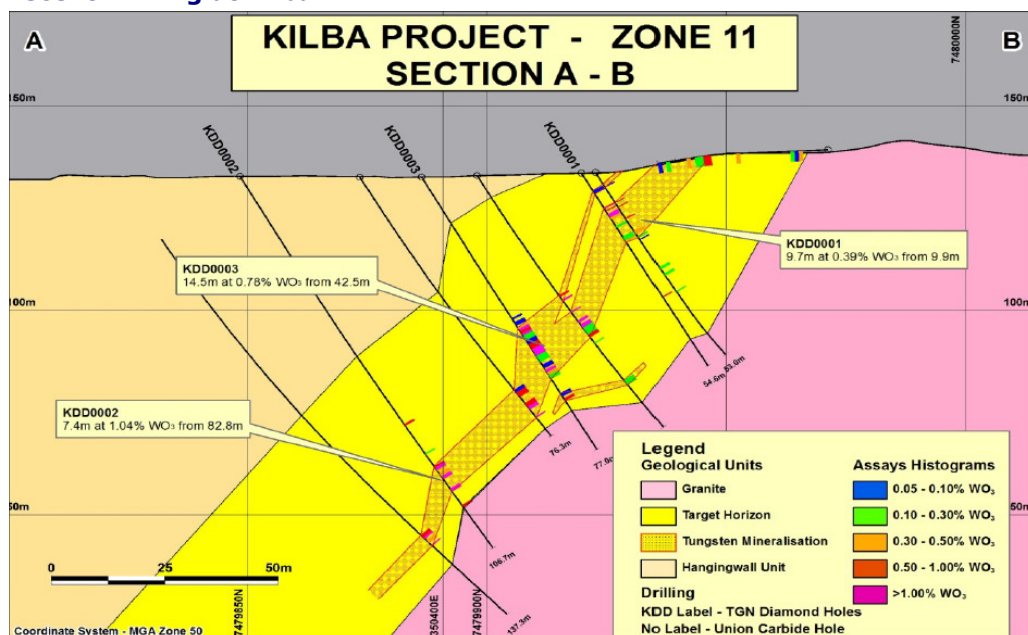
Recent drilling, including intercepts of:

- **9.7 metres grading 0.38% WO₃ from 9.9 metres,**
- **7.4 metres grading 1.06% WO₃ from 82.8 metres,**
- **14.5 metres grading 0.8% WO₃ from 42.5 metres**
- **4.55 metres grading 0.38% WO₃ from 120.45 metres and**
- **2.3 metres grading 0.76% WO₃ from 106.9 metres,**

illustrate the continuity and grade of mineralisation from near surface to depths of at least 100 metres.

Recent Drilling at Kilba

Exploration appeal



Source: Tungsten Mining

Low CAPEX high margin operation

The company’s preliminary financial estimates point to a total production cost of \$67 per tonne of ore processed after an initial capital cost of \$25 million. These costs will be refined by the ongoing feasibility process. Given Australian trends for capital works and cost of business, these early estimates may require some revision to higher numbers than the preliminary bench-top estimates. Operating cost estimates include the cost of mining and processing to a concentrate containing over 70% scheelite and the cost of trucking the concentrate to Fremantle for sale to ammonium paratungstate (APT) producers around the world.

Value target of over \$35 million

Strachan Corporate applies a 5.75% royalty to revenue amounts generated on the basis of an APT price of US\$380/MTU with an appropriate 20% discount for concentrate sales and applies a 10% discount to cash flow over 5 years of production and two years of preliminary development capital spending to estimate an NPV for the project of \$33.5 million, which is more than three times the company’s current enterprise valuation.

Peer Companies

Industry trends have seen significant investor interest for companies developing tungsten minerals.

Significant investor/industry interest in tungsten

New Zealand’s largest private resources company Todd Corporation has recently taken a 19.9% interest in Wolf Minerals (ASX: WLF), which is developing the large and low grade Hemerdon tungsten and tin project in SW England, aiming for production of 325,000 MTU pa.

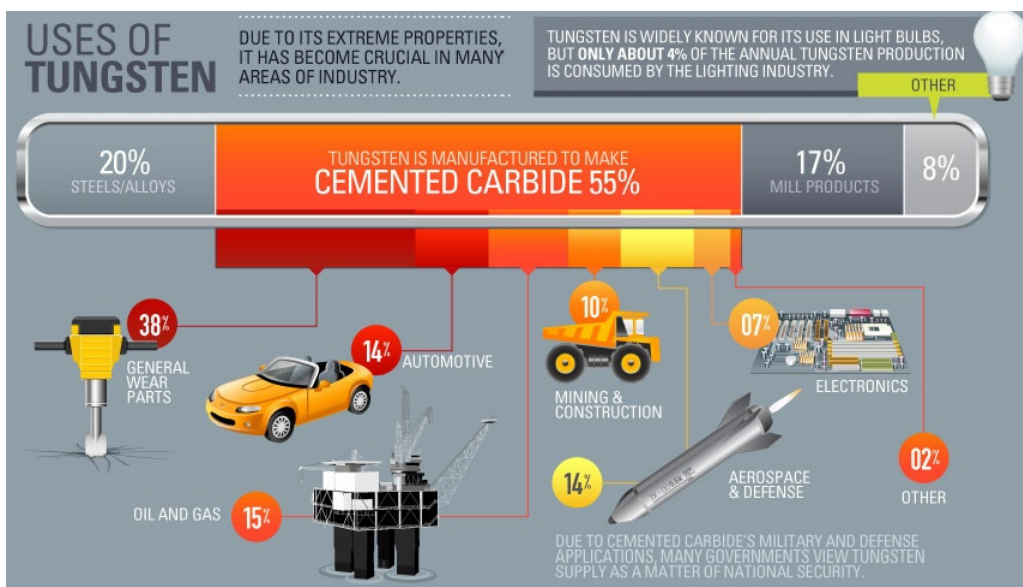
Warren Buffett’s Berkshire Hathaway has recently taken a substantial joint venture interest in South Korea’s Sangdong project along side Toronto listed company Woulfe Mining (TSXV: WOF). Woulfe plans to produce 400,000 MTU pa from an underground re-development. This move follows Berkshire Hathaway’s early entrance into the lithium carbonate based battery business, demonstrating its ability to pick trends in scarce or strategically limited resources.

Locally, Japan Oil Gas and Metals National Corporation (JOGMEC) has agreed to fund \$5.4 million of feasibility study costs to earn a 30% interest in the Watershed tungsten mine with Vital Metals. Watershed contains about 22 mt of mineralisation grading 0.22% WO₃ and feasibility work is due for completion this month.

Tungsten Uses and Market

Tungsten is a very hard, dense metal that is resistant to corrosion and has a high melting point, making it ideal for use in cutting tools, armament, ballistics and high temperature applications such as automotive brake pads and cutting tools. The metal has the highest melting point of all metals and at temperatures over 1650 C it also has the highest tensile strength. High speed steel, used to cut material at higher speeds than carbon steel, contains up to 18% tungsten.

Strategic metal with few substitutes & low price elasticity



Source: Largo Resources

Tungsten carbide (WC or W₂C) is extremely hard and is used to make drill bits and cutting implements. It is sometimes used for jewellery because of its hardness and wear resistance. Tungsten's unique properties covering at least 75% of its application as carbides and super steel alloys, shield it from substitution. Tungsten presents little incentive to search for substitution on the basis of cost since only small amounts of the metal are used in most applications. Price increases thus make only a small impact on final product costs and can be easily passed on to end users.

Very hard alloys used for cutting tools & military applications

Tungsten is commonly found in as wolframite (iron-manganese tungstate, FeWO₄/MnWO₄) and as scheelite (calcium tungstate, CaWO₄). The average grade of Western W miners, including underground operations is 0.58%WO₃ while some mines with co-product credits have grades of less than 0.2% WO₃. Most wolframite and scheelite mines tend to be underground but more of the new projects on the boards will be open pit mines.

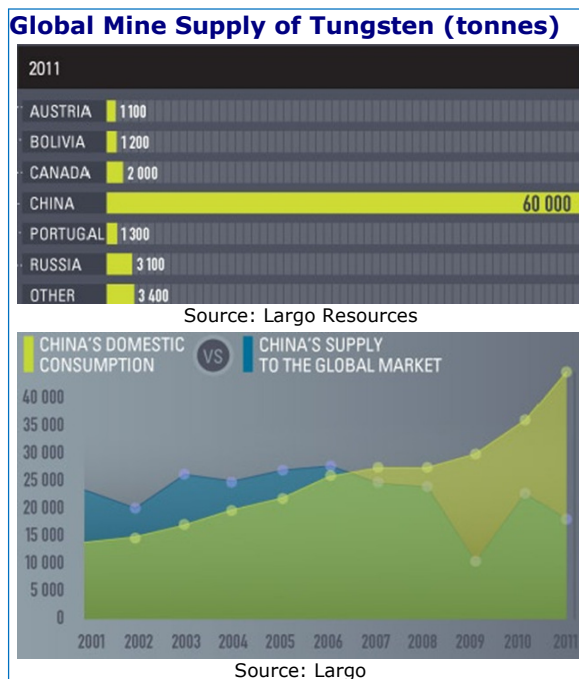
Metallurgical processing relies on scheelite's high density and some flotation techniques are also employed to polish up concentrates by removing sulphide co-products.

China supplies about 86% of the 72,000 tpa global tungsten mine production. Its dominance in this strategic metal is similar to that of China's position in rare earth metals.

Globally, demand is topped up by about 30% from metal recycling. Cobalt is usually a co-product of tungsten when recycled. The current low price for cobalt at below US\$12/lb could hold back supply of recycled tungsten.

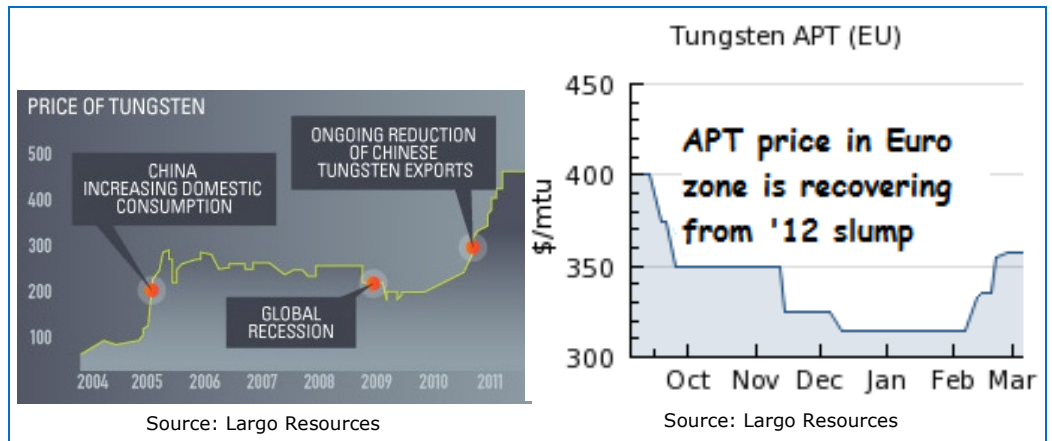
Over the past 12 years, China's consumption of tungsten has tripled, severely restricting its ability to export.

In all likelihood, new sources of tungsten will need to be found to meet expanding demand. Recent global demand increases have only been met by drawing down strategic stockpiles of product. Price action since 2005 is encouraging new mines to open, so that additional production has begun to arrive. While many planned projects will not proceed, the market may achieve some balance post 2017 on the back of projects that are well advanced towards feasibility and funding.



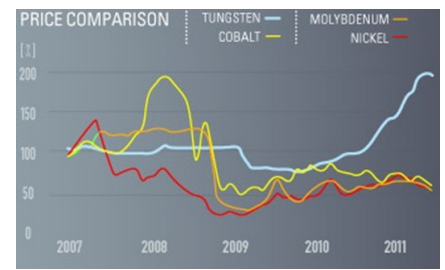
Tungsten concentrate is sold on the basis of a metric tonne unit (MTU), equal to 1% of a metric tonne (22.046 pounds) of contained WO₃. Concentrate price is based on a discount to quotations for ammonium paratungstate (APT).

Chinese export quotas boost tungsten price



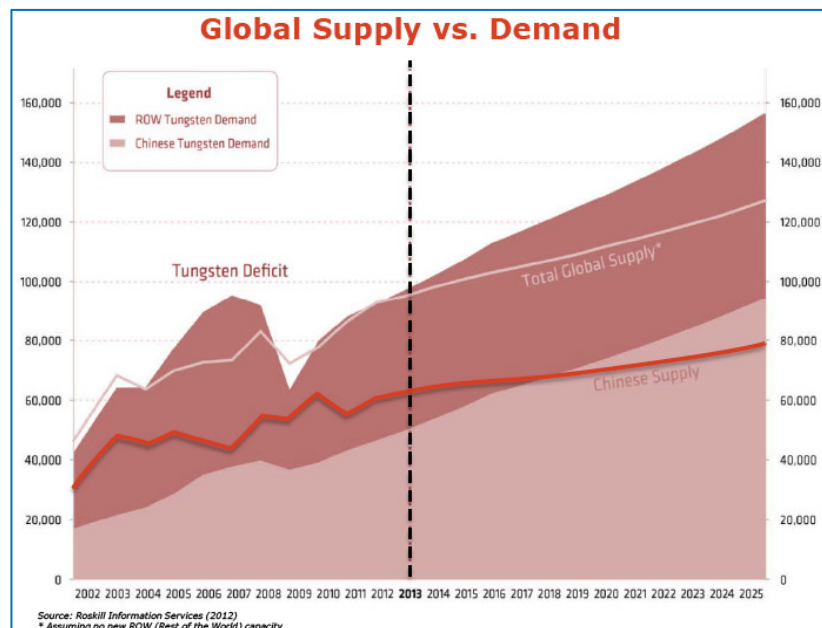
The price of tungsten rose dramatically following the economic recession in 2009, from a low of less than US\$200 per metric tonne unit (MTU = 10 kilograms) of ammonium paratungstate in mid 2009 to reach new highs of US\$480/MTU in mid 2011. This price increase reflected growth in demand and tightening of supply from China, which imposed a ban on the sale of tungsten concentrate and export quotas on tungsten products. APT prices eased to a low of US\$295/MTU by late 2012 on the back of worries about weakening Chinese industrial production but have since recovered to around US\$360/MTU, well above the average price over the last ten years.

Tungsten price movements have outperformed other steel alloying metals as a result of its scarcity and the actions of Chinese authorities to restrict export sales.



Globally, non-Chinese tungsten consumers rely on Chinese supply of processed metal for about 23,000 tonnes of their requirements. China has become a net importer of concentrate, only exporting downstream tungsten products.

The tungsten market is only gradually adjusting to a new supply/demand reality. During the 1990's, cheap Chinese supply flooded the market pushing most of the non-Chinese mines out of business and concentrating supply with Chinese producers. Since China has become a net importer of concentrate, the APT price has recovered but the supply side has been slow to react. Difficulties in attracting debt and equity in the post GFC, risk adverse environment have restricted further development.



Source: Largo Resources

During 2012 about 2,400 tpa of new, non-Chinese WO₃ capacity was commissioned and 6,000 tpa is due to be added by the end of 2013 from projects in South Korea and Vietnam. Further planned mine additions during 2014 and 2015 could put pressure on existing high cost producers. Industry sources recognise 16 advanced projects with combined capacity to deliver 55 Kt of WO₃ pa but some will not proceed or be delayed, while production from existing miners may decline under falling mined grades or exhaustion of Reserves.

In general, new tungsten mines need to aim to achieve cash costs below the top quartile of producer costs. This requires a cost of less than US\$200 per MTU. The Kilba project aims for a cost of less than \$100/MTU.

S.W.O.T Analysis

Strengths

Ore body: Kilba mineralisation has a high insitu value.

Skills: Management is well skilled in project development, operations and processing of Tungsten minerals.

Weaknesses

Small Company: Tungsten Mining is a small company in a market where funding favours larger companies.

Tungsten Market Size: The global Tungsten market is only about 100Kt pa of APT, limiting opportunities for growth.

Opportunities

Exploration: The company has ability to expand Resources from known tungsten occurrences.

Joint Venture: Recent corporate actions indicate strong support by market participants and investors for new project development.

Threats

Funding: Funding will be a major hurdle.

Takeover: The level of interest in the tungsten market could attract a bidder, but more likely financial support.

Board & Management

Patrick McManus

Patrick is a Metallurgist and Industrial minerals specialist with over 35 years experience. He is CEO and MD of Potash West NL and was a Founding Director and former MD of Corvette Resources.

Non-Exec Chairman

Paul Berndt

Paul is Metallurgist with a strong background in project development, mining operations and process engineering. He brings career spanning 38 years in Australia, China, Indonesia, Peru, Spain and Venezuela, working with tungsten, base metals, coal, diamonds, gold, industrial minerals, platinum-group metals and diamonds. He was previously MD of a tungsten mining operation in Spain that processed a very similar skarn orebody to Kilba.

Managing Director

Robert Van der Laan

Robert is a qualified accountant with more than 25 years experience in public and private companies. He is sole director of Richmond Resources Pty Ltd, vendor of the 20% interest in the Callie Soak Project, which Tungsten Mining has acquired

CFO

Francis Loh

Francis is an Accountant with experience in SE Asian capital markets and significant commercial experience with Singaporean companies. He was formerly the Finance Manager for Oriental Group Ltd, a Singaporean listed entity from 2005 to 2012. He is a director with a corporate advisory firm, providing personal investment planning and company restructuring services to a variety of clients

Director

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