



22 June 2009

The Manager  
Australian Stock Exchange Limited (ASX)  
Company Announcements Office

Dear Sir/Madam

The directors of Wasabi are pleased to provide the following update on Global Geothermal Limited.

### **Global Geothermal**

Wasabi Energy's subsidiary Global Geothermal Limited (GGL) is the owner of the Kalina Cycle technology. GGL licences the technology internationally to a range of companies with an interest in green power production.

Wasabi has been involved with the Kalina Cycle for many years and is delighted that an increasing number of power plants utilising the technology are now operational. The Siemens plant in Germany is in addition to a Kalina Cycle geothermal plant in Iceland and two industrial waste heat plants in Japan.

### **Siemens Complete Construction and Commissioning of Geothermal Power Plant**

Siemens has completed the construction and commissioning of its first geothermal power plant, which uses a binary cycle with ammonia-water technology (Kalina Cycle) to produce electricity, built under a turn-key contract for the town of Unterhaching, Germany. The plant's power output is 3.4 MW. After successful acceptance tests, the plant was transferred into the ownership of, and operation by, the town of Unterhaching at the beginning of April 2009.

The high-efficiency, no emissions power plant uses geothermal fluid from deep wells that have been drilled to extract and re-inject brine from underneath the town of Unterhaching.

The heat made available from the geothermal fluid is also used in the town's district heating system. Depending on consumption patterns at any given time, the plant can produce heat for district heating, and electricity for distribution to the grid. Siemens's modern automation and control system allows automatic and smooth transition into various operational modes.

The geothermal plant in Unterhaching is Germany's largest and most modern geothermal plant. While operating as a base-load heat and power source, it will contribute to reducing the town's emissions caused by energy consumption from 60,000 to 20,000 tonnes of CO<sub>2</sub> annually.

In addition to Unterhaching, Siemens is also building a geothermal power plant utilizing Kalina Cycle technology in Bruchsal, Germany.

### **Updated Presentation**

Attached is an updated presentation which gives an outline of the Company's activities.

Yours sincerely

John Byrne  
Chairman



wasabi  
energy

*June 2009*

*[www.wasabienergy.com](http://www.wasabienergy.com)*

Disclaimer: This presentation contains certain forward-looking statements that have been based on current expectations about future acts, events and circumstances. These forward looking statements are, however, subject to risks, uncertainties and assumptions that could cause those acts, events and circumstances to differ materially from the expectations described in such forward-looking statements.

Wasabi Energy Limited accepts no responsibility to update any person regarding any error or omission or change in the information in this presentation or any other information available to a person or any obligation to furnish the person with further information.

# Mission Statement

- Wasabi aims to become a major, profitable, energy and clean technology company, building on an established platform of strategic investments in the power, technology and water conservation areas.

# Major Assets

- 70%+ of unlisted Global Geothermal Limited with affiliates (GGL)
- 33% of unlisted Aqua Guardian Group (AGG)
- 14% of Australian Renewable Fuels – (ARW)
- 38% of Rum Jungle Uranium Ltd – (RUM - \$8 million cash)
- 12.5% of Green Earth Energy Ltd - (GER - \$6 million cash)
- 8.5% of Aviva Corporation Ltd – (AVA - \$11 million cash)
- Other smaller listed and unlisted positions

# Capital Structure - Current

- 919,140,445 Ordinary Shares
- 40m options exercisable at 3 and 3.5c
- Noteholders agreed to accept 35m Xtract Energy shares at 1.6p for total of A\$1.15m redemption of notes reducing debt to A\$2.36m
- Placement of 75 million WAS shares at 1 cent with 37.5 million 1 cent options raised \$0.75 million

# Rights Issue

- 1 for 2 non-renounceable rights issue of \$4.5 million 7% three year convertible 1 cent preference shares
- Dividend paid in shares, with two year unlisted 1 cent option upon conversion if not redeemed
- Forced conversion if WAS trades at more than 1.5c for 14 days yr 1, 2c yr 2, 2.5c yr 3
- Sub underwritten \$2.36m noteholders, \$2.14m others
- Placement/Rights Management Fee of 1%, 2% to sub-underwriters
- Rights Issue closes 29 June 2009

# Corporate Objective for 2009

- Rationalise investments and concentrate on 3 core assets:
  - Global Geothermal Limited
  - Aqua Guardian Group
  - Australian Renewable Fuels Limited
- Other investments to be sold or refocussed.

# Management, Directors and Advisors

**John Byrne (Chairman)**

**Tim Wise (Managing Director)**

**Stephen Morris (Executive Director)**

**Bob Reynolds (Non-Executive)**

**Bob Vallender (Non-Executive)**

**Auditors : KPMG**

**Lawyers : Gadens**



# The Kalina Cycle® The New Advantage in Thermal Conversion



## Power Generation from Waste Heat and Geothermal

May 2009

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# Kalina Cycle® Technology Summary

- Invented 1988, tested and now commercially available
- Patented Proprietary Process Technology owned by Global Geothermal (and its wholly owned subsidiary Recurrent Engineering)
- Underlying principles are Simple, Effective, Efficient and Safe (Principles utilised in Refrigeration for over 100 yrs)
- Utilises a binary fluid of Ammonia and Water to drive a turbine which has a higher efficiency due to its lower boiling point compared to water alone.
- Uses standard industry components, such as boilers, vapour turbines etc
- First major breakthrough in power generation technology since Organic Rankine Cycle (ORC)

# Kalina Cycle® Technology Summary

- 20% – 40% more power than ORC from most heat sources at less cost
- Lower specific capital cost (\$/kW).
- Each plant is different but typical operating costs are 2c/kWhr geothermal & 0.5c/kWhr waste heat
- Modular plants currently being developed in Japan and China and expected in late 2009 at less than US\$1.5 million per MW
- High degree of plant safety
- Technology can produce extra 20%+ global power with zero extra emissions
- Kalina Cycle® is BACT (Best Available Control Technology)

# Kalina Cycle® Areas of Application

What are the areas of applications?



500°C+ **Power Station Bottoming Cycles**

## Waste Heat Recovery in Industries

- Gas compressor stations
- Iron + Steel Industry
- Cement Industry
- Chemical Industry
- Incineration Plants
- Diesel Plants



Waste Incineration (Japan)



Steel Plant (Japan)

100°C **Hot Brine Heat Recuperation**

- Geothermal Plants



Geothermal Plant (Iceland)

40°C **Ocean Thermal**

Primary Source

# Kalina Cycle® Plants Built To Date

## Completed Projects:

- Canoga Park, Gas Turbine Demo, Boeing, USA, 6.5MW, 1991-1997
- Fukuoka, Municipal waste to Heat Demo, Japan, 4.5MW, 1999
- Sumitomo Steel, Japan, 3.5MW, 2000
- Húsavík Geothermal, Iceland, 2MW, 2000
- Fuji Oil, Refinery, Japan, 3MW, 2002
- Siemens, Unterhaching Geothermal, Germany, 3.4MW commissioned April, 2009
- Siemens, Bruschal Geothermal, Germany, 0.6MW in final stages of commissioning, 2009



# Kalina Cycle® Current Projects

- 50kW Ecogen Boxes, Build in US for NEDO/GERD Japan, 1000+ possible Japan sites
- Kakkonda 3MW Geothermal Bottoming Cycle, Japan
- Tibet Geothermal, 100kW test plant, 5-20MW main plant
- Alaskan Geothermal, 2 X 100kW Ecogen Box
- Shanghai 2010 World Expo 100kW solar thermal plant
- China Pilkington Glass 2MW waste heat plant
- Shanghai Petrochemical 1.2MW waste heat plant
- Three China Cement 5-10MW waste heat plants
- China combined cycle coal fired power station, 25-50MW
- China Solar Silicon Manufacturer, 25MW waste heat plant
- China Steel Mill, waste heat
- 5MW Modular Box for German Geothermal Market
- Exorka – 8 German sites for 5MW geothermal plants
- Others



**Global Geothermal**  
Advanced Geothermal Power Engineering



RECURRENT

# Global Geothermal Revenue Streams

- Current Model has three revenue streams:
- Licensing
  - Up-front licensing fee
  - Training fees
  - Engineering services
  - Royalties \$ per installed kW
- Sales
  - Build + Sell Modular Plants
  - EPC Contracts
- Ownership
  - Operate – Húsavík Purchase
- Green Bonus Income, including Carbon Credits, Govt Grants, CDM mechanisms, higher guaranteed feed-in tariffs, etc

Cement Waste Heat Recovery Market  
10,000MW+ in China alone = potential  
**\$500,000,000 royalty income**

# History of the Kalina Cycle®

- 1988 Invention of technology, formation of Exergy Inc
- 1990-97 Canoga Park Testing, \$50 million+ spent
- 1999 First commercial Kalina Cycle® Plant operational, Sumitomo Metals
- 2000 First geothermal power station, Húsavík
- 2002 Formation of Recurrent Engineering by AMP Capital Partners of the US which takes a global licence and hires Exergy staff, focuses on the acquisition of Geothermal properties, investing \$100 million
- 2006 Wasabi acquires major interest in Exergy and disputes AMP licence
- 2007 March - AMP sell geothermal properties to Italian company ENEL \$140 million+ and settle licence dispute with Wasabi
- 2007 July - Global Geothermal Ltd formed in the UK, to consolidate the Kalina Cycle® technology and engineering expertise into one vehicle , acquires 100% of Recurrent Engineering and Exergy IP.
- 2008 December - SSNE sign as new licensee and manufacturer
- 2009 Major IP advance with RIP Cycle and multiple heat source patents granted





# Global Geothermal Limited

- Owns Exergy's intellectual property including over 200+ international patents to the Kalina Cycle®
- Owns Recurrent Engineering, with Kalina core engineering and development team, including RIP Cycle and Multiple Heat Source patents
- Wasabi Energy Ltd (ASX – WAS) owns 70% (rising to 93%) directly and 2.5% indirectly
- Further consolidation of ownership under Wasabi is continuing
- Competes with ORMAT and United Technologies ORC
- Previously, Kalina high price and long lead time meant uncompetitive
- China manufacturing and modular approach means GGL can beat competition on performance, price and delivery
- 75% of global power comes from processes suitable for Kalina Cycle ®

