

# ASX Announcement

23 May 2012

## Update on Option to Acquire 50% of an Advanced Geothermal Power Generation Project in Turkey.



- The project subject to the Option includes an operating 7.5 MWe geothermal power plant in Canakkale Turkey
- Significant build-out opportunity with historical studies indicating geothermal power generation potential of up to 80 MWe
- Commenced pre-feasibility study for the development of a first stage 14 - 17.5 MWe build-out

### Option Update

Wasabi Energy (ASX: WAS, AIM: WAS, OTCQX: WSBLY) announced on 4 April 2012 that its wholly owned subsidiary Imparator Enerji<sup>1</sup> had signed an Option Agreement to acquire a 50% interest in an advanced geothermal project (the "Project") in the Republic of Turkey (the "Option"). It was announced that the Option is subject to partner and regulatory approvals, to be received by Wasabi before exercise of the Option and that the total consideration of US\$11.75 million (including a US\$5 million loan note to be issued by Wasabi, and subject to certain adjustments) would, subject to Wasabi deciding to exercise the Option, be payable in staged payments on or before 31 December 2013.

Wasabi now confirms that it has received the required partner approval from Egenda Enerji<sup>2</sup>, which is a majority-owned subsidiary of Enda Enerji Holdings A.S.<sup>2</sup> ("Enda Enerji"), a leading independent power producer (IPP) experienced in the successful development and operation of power generation plants in Turkey. Subject to the exercise of the Option, Wasabi would develop the Project by way of a joint venture with Enda Enerji. The exercise of the Option remains subject to the Project Lender's consent as well as regulatory approvals, including approval by the Energy Market Regulatory Authority (EMRA).

### Tuzla Geothermal Power Plant (7.5 MWe ORC)<sup>3</sup>



Fig.1

Additional details regarding the Tuzla Geothermal Power Project (TGPP) have been provided in the following sections:

- >> Project Introduction ..... page 2.
- >> Project Details & Evaluation ..... page 3.
- >> Project Company & JV Partner ..... page 4.
- >> Chairman's Comments ..... page 5.

<sup>1</sup> - Imparator Enerji Limited Sirketi, is a company registered under the Laws of Turkey with offices located at: Levels 5 & 6, Louis Vuitton Orjin Building, 15 Bostan Street Tesvikiye, Nisantasi Istanbul 34367 Turkey.

<sup>2</sup> - Enda Enerji Holding A.S. owns 65% of Egenda Ege Enerji Uretim A.S. which owns 100% of Tuzla Jeotermal Enerji A.S.

<sup>3</sup> - Image and additional information provided courtesy of Tuzla Jeotermal Enerji A.S., 2012.

## Project Introduction

The Tuzla Geothermal Power Project (TGPP) is the project that is subject to the Option. The TGPP covers an area of approximately 11km<sup>2</sup> of a very shallow and relatively high temperature geothermal zone in North Western Turkey (figure 3) and hosts a recently installed and currently operating 7.5 MWe power plant (figures 1 & 2). The Tuzla geothermal field has been extensively studied since the 1960's through a range of geological, geochemical and geophysical techniques including the drilling of several deep wells into the target reservoir (figure 4) which have collectively confirmed the TGPP as a major regional geothermal resource.

As part of its evaluation of the TGPP, Wasabi is collaborating with the TGPP's technical team to develop a work program of potential modifications to the existing power plant which subject to joint venture approval, may be implemented to achieve maximum electricity generation. Concurrently with the power plant optimisation activities, Wasabi has commenced the development of a pre-feasibility study for a proposed 14 - 17.5 MWe first-stage build-out at the TGPP (figure 2), which also, subject to joint venture approval, may utilise Wasabi's proprietary Kalina Cycle<sup>®4</sup> technology.

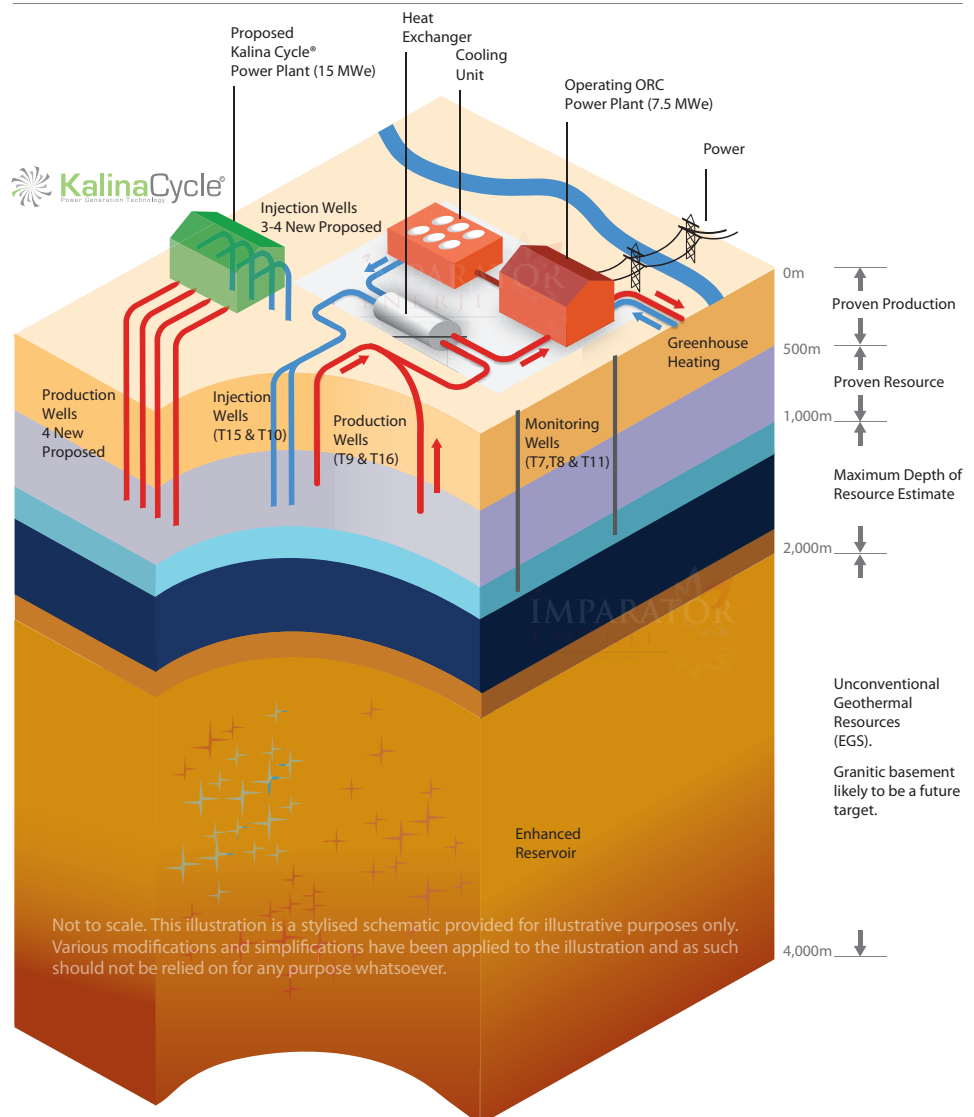
The development of geothermal power generation capacity in Turkey is supported by a basic geothermal feed-in tariff of US\$0.105/kWh introduced in December 2010, with a maximum tariff of US\$0.132 achievable provided certain key pieces of equipment were procured in Turkey<sup>6</sup>. An advisory panel on geothermal development to the Government of Turkey recently recommended increasing the basic geothermal feed-in tariff to US\$0.150/kWh.

## Wasabi currently expects that

- TGPP provides an attractive build-out opportunity given the scale and relatively shallow depth of the proven geothermal resource, as well as the significant synergies any build-out may be able to take advantage of including; operations & maintenance, transmission, site office, and other site infrastructure.
- Any future build-out at the TGPP utilising the Kalina Cycle<sup>®</sup> has the potential to increase power generation at the project by 20% more than the incumbent technology and is likely be able to generate additional electricity from the use of the geothermal brine exiting the existing power plant; thereby increasing the geothermal brine utilisation efficiency of the project (utilisation of the Kalina Cycle<sup>®</sup> at the TGPP is subject to joint venture approval).

It is currently intended that funds required for the acquisition of the Option, work program commitments and future build-out will be funded through the realization of non-core investments held by Wasabi Energy as well as a range of other potential capital raising initiatives currently being evaluated.

**Tuzla Geothermal Power Plant (7.5 MWe ORC)<sup>7</sup>**



**Fig.2**

## Project Details & Evaluation

As part of Wasabi's due-diligence activities in investigating the merits of acquiring the Option, in November 2011 Imparator Enerji hosted a site-visit to the TGPP (*figure 4*) with experts engaged to conduct detailed technical assessments of the project. The technical due-diligence predominantly

consisted of investigations into the productivity and potential scale of the in-ground geothermal resource (upstream) as well as the status and potential options for improving the availability and capacity of the existing TGPP power plant (downstream).

### TGPP Upstream - Geothermal Resource Information

- The presence, distribution and productivity of the geothermal resource are based on the analysis of an extensive collection of technical data including, geological, hydrogeological, geophysical, geochemical and direct well-bore data.
- The productivity of the reservoir is demonstrated by the four deep wells (*figure 4*) currently utilised by the existing power plant, with two production wells and two injection wells, respectively.
- Resource estimates as recently as 2008 by the MTA, the Mineral Research & Exploration General Directorate which discovered the resource indicate power generation potential of up to 80 MWe.
- MTA drilled the 814m T-1 discovery well in 1982 (proved a 174°C resource at 330m) and subsequently in March 2003 granted a 49 year production license for the TGPP.

### Independent Geological Report – *Geologica, Inc (California, U.S.)*

- Geologica, Inc conducted a technical review and evaluation of existing geological, geochemical, and geophysical exploration data, constructed a conceptual and thermal model of the reservoir, and analysis of drilling and test results and estimated the resource capacity and the feasibility of expanding development of the geothermal resources.
- A report (*Preliminary Geothermal Resource Assessment*) commissioned by Wasabi Energy to determine the commercial potential of the Tuzla geothermal resource, in December 2011 concluded that:
  - *the area represents a highly productive geothermal resource*
  - *the reservoir has commercial grade capacity*
  - *the reservoir could sustain both (several potential) exploitation scenarios*

### TGPP Downstream - Power Plant Information

- Operating 7.5 MWe (gross nameplate capacity), air-cooled, organic rankine cycle (ORC) binary power plant utilising a pentane working fluid. Due to a combination of design, operational and current brine/steam production constraints the power plant is operating at approximately three-quarters of the nameplate capacity.
- The Tuzla geothermal power plant is designed to extract thermal energy and generate electricity from the geothermal brine produced from two production wells with the cooled brine then reinjected into the reservoir in a closed loop system (*figure 4*).
- Successfully passed acceptance tests and commenced commercial power generation in January 2010. Electricity sales under Turkey's feed-in tariff (US\$0.105/kWh) system on 1 January 2012.
- EMRA granted 40 year power generation license from 11 May 2004.
- Internal studies by Wasabi Energy indicate that modifications at the TGPP power plant can be expected to increase annual power generation from current levels to at least nameplate capacity.

### Independent Engineer Report – *POWER Engineers, Inc (Idaho, U.S.)*

- POWER Engineers, Inc conducted an assessment of the existing power plant following a site visit as well as discussions with Tuzla Jeotermal operation staff. POWER Engineers Inc reviewed some of the leading rehabilitation options for the existing power plant by developing an AspenTech Hysys model for the power plant. The model was used as a basis for determining the expected impact on power plant availability, capacity, operations and maintenance and ultimately the expected costs for each of the potential options.
- A report (*Tuzla Geothermal Power Plant Evaluation and Potential Rehabilitation Report – Independent Engineer Report*) commissioned by Wasabi Energy to assess the various rehabilitation options for the existing power plant, in December 2011 concluded that:
  - *there are several options available for increasing (power) plant net output, increasing availability, and reducing O&M costs.*
  - *subject to certain reconfiguration options and the supply of additional brine, power output from the existing plant could be significantly increased, potentially to levels exceeding the original nameplate capacity of the plant.*

### European Geothermal Energy Prospectivity Map<sup>8</sup>

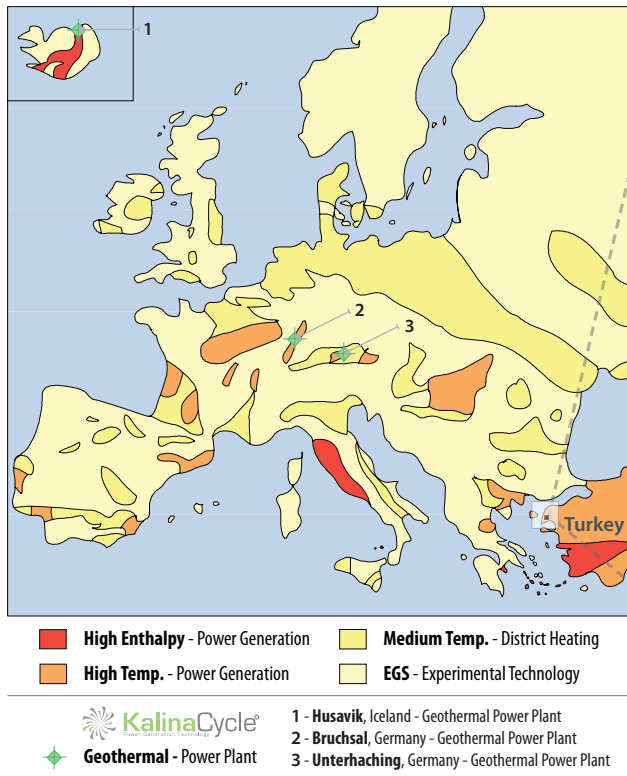


Fig.3

### TGPP Geothermal Production License (Well Locations)<sup>9</sup>

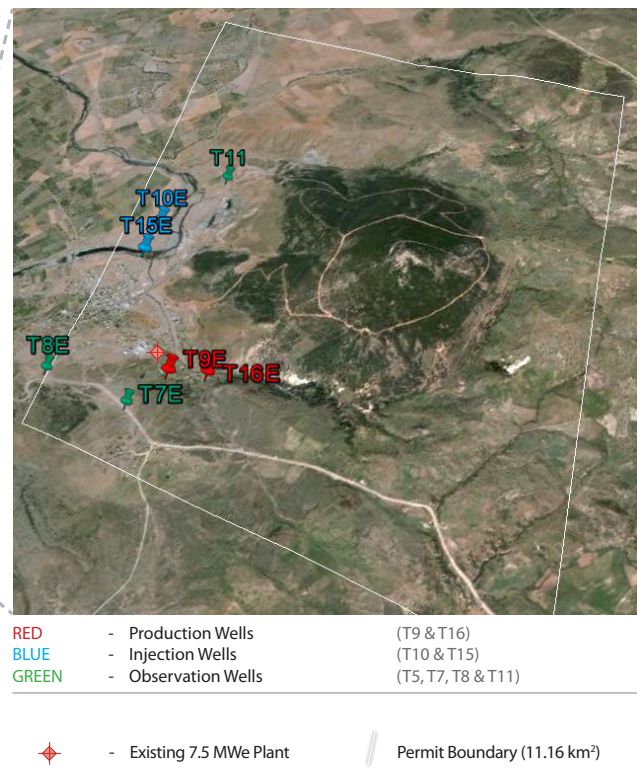


Fig.4

### Project Company and JV Partner<sup>2</sup>



Tuzla Jeotermal Enerji A.S. is a Turkish joint stock company and the registered owner of the Tuzla Geothermal Power Project (TGPP) and all direct and associated assets including the geothermal production and power generation licenses.

The option being acquired by Imparator Enerji is over the Tuzla Jeotermal Enerji A.S., entitling Imparator Enerji to acquire a direct 50% interest in the project company.



Enda Enerji Holding A.S., a leading independent power producer (IPP) in Turkey (through a majority owned subsidiary<sup>2</sup>) is the owner of Tuzla Jeotermal Enerji A.S. and the operator of the TGPP.

**Key Statistics**

- Founded in 1993, in İzmir, by more than 100 businessmen mainly from the Aegean Region
- 227.97 MWe of operating generation capacity
- Portfolio of power generating projects consisting of hydro, natural gas, wind and geothermal
- 566,613 MWh of power generation in 2011
- 387.96 MWe of operating capacity in 2013

<sup>4</sup> - Kalina Cycle® is a registered trademark of Global Geothermal Limited<sup>5</sup>. The Kalina Cycle® is a patented power cycle technology owned by Global Geothermal Limited.  
<sup>5</sup> - Global Geothermal Limited (U.K.) and Recurrent Engineering LLC (U.S.) are wholly owned subsidiaries of Australian Securities Exchange (ASX: WAS) and AIM (AIM: WAS) listed, Wasabi Energy Limited.  
<sup>6</sup> - For more information on the Turkish Energy Sector, refer to Wasabi Energy announcement dated 4 April, 2012.  
<sup>7</sup> - Imparator Enerji Internal Pre-feasibility Report, 2012. Adapted from Mock et al, US DOE Publications, after IPCC Report.  
<sup>8</sup> - The European Geothermal Energy Prospectivity Map has been developed from public information published by the European Geothermal Energy Council (EGEC) and information about the locations of existing Kalina Cycle® plants.  
<sup>9</sup> - Well Field Development Study. Imparator Enerji, 2012.

## Comment from the Chairman

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Executive Chairman of Wasabi Energy, Mr. John Byrne commented:

*"The opportunity we have in Turkey, through our Option over the Tuzla project (TGPP) looks compelling. As well as the potential geothermal resource we would be looking to utilize our proprietary technology, the Kalina Cycle®, to increase electricity output by over 20% at the TGPP. The Kalina Cycle® is currently used on a number of geothermal power plants in Germany, Iceland and Japan as well as in various industrial applications. The thermal efficiency of the Kalina Cycle® continues to provide a competitive advantage for Wasabi Energy."*

*"The Turkish power generation sector is receiving unprecedented interest from domestic and international investors and continues to be driven by the strong underlying demand for power in Turkey as a result of sustained economic growth. As a foreign investor entering the Turkish market, the US dollar denominated feed-in tariff for geothermal power generation would provide a further level of security for any foreign investor."*

*"Should we decide to exercise the Option, we would look to redeploy capital within the group and/or raise additional funds as appropriate to ensure the acquisition is value-accretive."*

Yours Sincerely,



Mr. John Byrne

Executive Chairman  
Wasabi Energy

## Comment from Imparator Enerji

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Managing Director & CEO of Imparator Enerji and Imparator Green Energy plc, Mr. Bahay Ozcakmak commented:

*"Should we decide to exercise the Option, the interest in the geothermal resource could become a cornerstone asset for our business moving forward. The Project would provide Imparator with a substantial near term build-out opportunity to both build a significant generation business, as well as demonstrating our technology within Turkey. We look forward to continuing to work closely with our potential JV partner Tuzla Jeotermal and their ultimate parent company Enda Enerji to fully evaluate the full potential of the TGPP."*

Yours Sincerely,



Mr. Bahay Ozcakmak

Managing Director & CEO  
Imparator Enerji

## For further information contact

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## Imparator Enerji Corporate Information

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## Corporate Information

General corporate information regarding Wasabi Energy and the companies Wasabi Energy holds a strategic investment in can be found in this section. Announcements regarding Wasabi Energy corporate developments are made to the Australian Securities Exchange (ASX) and the London Stock Exchange's, Alternative Investment Market (AIM), are also available on the Wasabi Energy website. Additional information regarding the investee companies can be found at their respective web sites, details below.

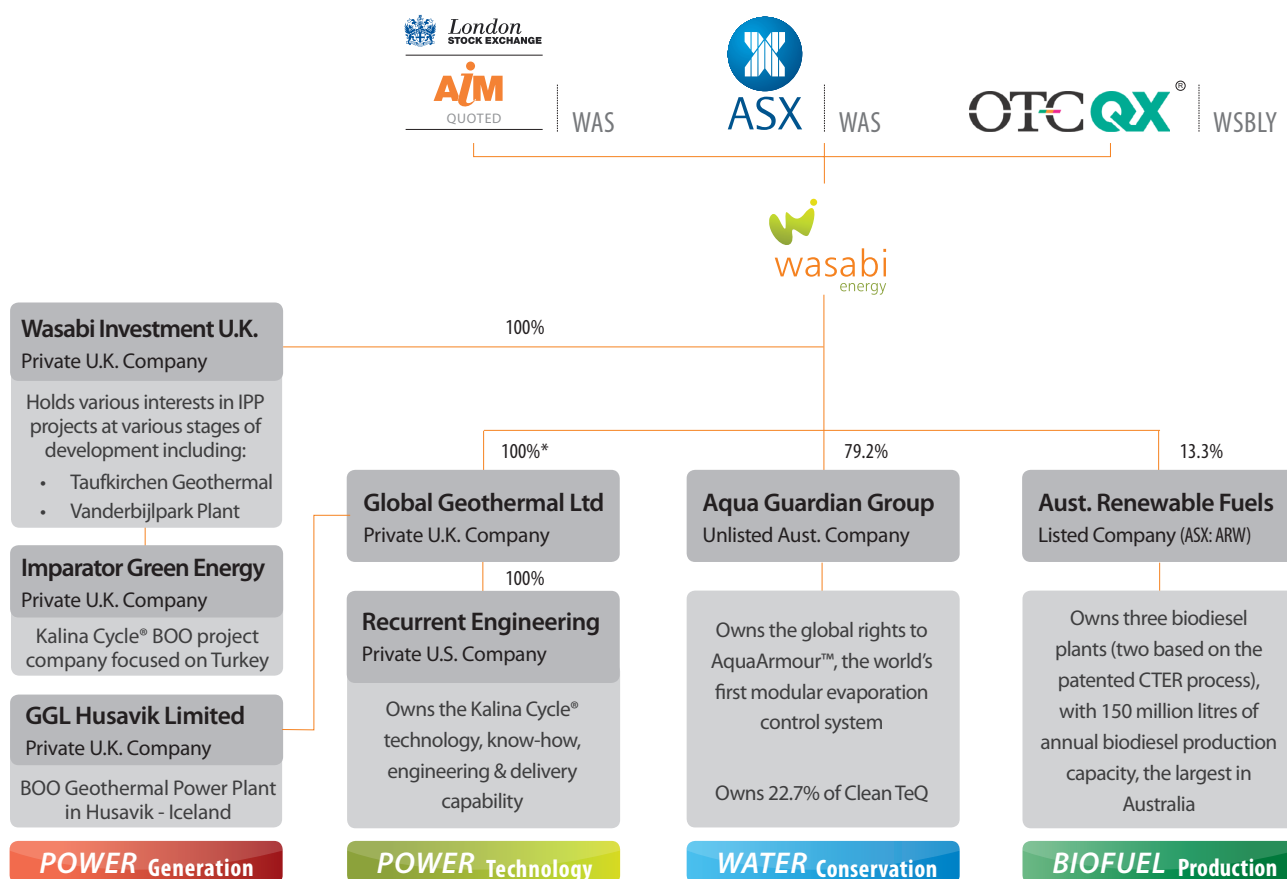


## About Wasabi Energy

Wasabi Energy Limited is listed on both the Australian Securities Exchange (ASX: WAS) and the AIM market in London (AIM: WAS) as well as American Depository Receipts trading on OTCQX Market (OTCQX: WSBLY). Wasabi Energy is an emerging power producer that also invests in sustainable technologies. Its power business is based on the proprietary Kalina Cycle® power generation technology which utilises low grade, waste heat from industrial facilities or geothermal sources to produce electricity. In a typical industrial application of the Kalina Cycle® technology can increase energy efficiency in an industrial plant by up to 20%. Through its strategic investments Wasabi Energy owns a 79.2% interest in Aqua Guardian Group, the developer of the AquaArmour™ a water management, conservation and algal control product. Aqua Guardian Group also has a 22.7% interest in the air, water and minerals ASX listed company Clean Teq (ASX: CLQ). Wasabi Energy also owns a 13.3% interest in Australian Renewable Fuels, a separately ASX listed company (ASX: ARW) which produces liquid biofuels from a variety of non-food grade feedstocks.

Additional information:  
[www.wasabienergy.com](http://www.wasabienergy.com)

## Group Structure



BOO - Build-Own-Operate

\* - Subject to finalisation of 2.7% share purchase.