



VESKI Innovation Fellow

Professor Edwin van Leeuwen FTSE

Research Project

Geothermal base-load power options for Victoria

Project Summary

This project will investigate 'hot dry rocks' or geothermal energy as a future energy source for Victoria. The question of how Australia meets future growth in power demand while reducing CO₂ emissions is one of the key challenges of our time.



The scale of moving towards clean coal power is formidable. In Australia, resistance to nuclear power makes it politically unpalatable at present. Solar and wind are intermittent and high cost. Hydro and tidal have only limited application. In this context, energy from enhanced (or engineered) geothermal systems (EGS) provides an alluring option. With minimal environmental footprint, widespread applicability and no significant waste stream, EGS has a theoretical capacity to meet future energy growth expectations.

Exploitation of geothermal energy is realised by tapping into the Earth's upper crust at depths of four to six kilometres to harness the natural heat that is in the Earth's surface. An engineered geothermal system works by pumping a fluid down into the Earth's surface into the hot rock formations, through a hot reservoir, and extracting the steam through a turbine to generate electricity.

Realising geothermal energy production in Australia requires overcoming difficult challenges: from targeting heat reservoirs at great depths and engineering them for optimum long-term heat exchange, to managing the risks of commercialisation.

"We are trying to 'de-risk' geothermal energy to the point where companies that are in the energy business would consider investing capital to drill into prospective geological areas. At the end of the VESKI project what I'm really looking for is substantial funding to move to the first stage of demonstrating geothermal energy in Victoria. I think we need to do this sooner rather than later and we just have to bite the bullet in drilling several wells either in the Latrobe Valley, in the Otways or in North West Victoria, where we think there is suitable geology and heat sources."

The VESKI Innovation Fellowship will address all aspects critical to realising Victoria's EGS potential. It will do so by assembling and adapting pertinent technologies from related industry experience and by consolidating the skill base within the science, engineering and financial community in order to deliver a demonstrator EGS project in Victoria.

Personal History

Professor Edwin van Leeuwen has been a global research and technology manager with one of the largest mining companies in the world, BHP Billiton for the past 24 years, leading a number of national and international research and technology groups to develop innovative technologies for the mining and petroleum industries. He led the team that developed the world's first airborne gravity gradiometer system and received many awards such as the Clunies Ross National Science Technology award and Prime minister's Centenary of Federation Medal for services to Australian Society in Sciences and Engineering. He is also a member of the Australian Academy of Technological Sciences and Engineering.

Professor van Leeuwen is Director Geothermal Energy Systems Victoria and Professor, School of Earth Sciences and commenced his VESKI Innovation Fellowship in March 2010 with support from the Melbourne Energy Institute, The University of Melbourne.

Professor van Leeuwen is relocating back to Melbourne after spending the last three years based mainly in Singapore where he was managing BHP Billiton's global Technology operations in Russia, China and India.

Edwin migrated to Australia at the age of one with his family from Holland. His parents moved to Khancoban on the western side of the Snowy Mountain scheme. Edwin was interested in sciences from an early age and before his tertiary education spent a year at the Aeronautical Research Laboratory at Fisherman's Bend in Melbourne.

He did his undergraduate studies at the Australian National University in Canberra and his Post Graduate PhD studies in mathematical sciences at Monash University.

His wife Silvana is a doctor of medicine from Monash University. They have two daughters who are both studying sciences at University. Natasha has followed in her father's footsteps and is studying Earth Sciences and Lara is studying Chemical Engineering.

Other VESKI Innovation Fellowship recipients:

Professor Andrew Holmes AM FRS FAA FTSE

Professor Marcus Pandy PhD

Dr Gareth Forde PhD

Dr Alyssa Barry PhD

Professor Michael Cowley PhD

Professor Sarah Hosking PhD

Associate Professor Ygal Haupt PhD

Dr Ross Dickins PhD

Dr Mark Shackleton PhD

VESKI Fellows in an ambassadorial role include:

Professor Adrienne Clarke AC

Professor Peter Doherty AC

Professor Alan Trounson

Mr Brian Jamieson

Dr Janine Kirk AM

For further information visit www.veski.org.au

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BACKGROUND INFORMATION

VESKI [Victorian Endowment for Science, Knowledge and Innovation] assists outstanding Australian scientists and leading innovators to undertake their research in Victoria and contribute to building an inspired community where innovation, ideas, and business provide benefits for Australia. VESKI is supported by the State Government of Victoria.

