

14 November 2011

ASX Code: PTR

ABN 17 106 806 884

Level 1, 129 Greenhill Road
Unley SA 5061

T: +61 8 8274 5000

F: +61 8 8272 8141

W: www.petratherm.com.au/

E: admin@petratherm.com.au



PETRATHERM LIMITED
ABN 17 106 806 884

Carbon pricing presentation by MD

The attached presentation, by Petratherm's MD, Terry Kallis, summarizes the broad impacts of the recently legislated carbon pricing initiatives for the National Electricity Market (NEM), the Geothermal Sector and the Paralana Geothermal project. The presentation will be discussed on Boardroom Radio later today.

The presentation incorporates economic modelling analysis undertaken by specialist economic and energy consultants SKM/MMA presented to their clients in Adelaide last week.

The SKM/MMA analysis is based on the recently adopted package of reforms and assesses the likely impact of that package on the following parameters;

- Reduction in carbon emissions out to 2050 under various scenarios - business as usual, adopting the recent carbon laws and under high carbon price scenario
- Impact on wholesale electricity prices out to 2050 in the Australian energy market under the above scenarios
- Resultant power generation mix out to 2050 from adopting the recent carbon laws – covering both fossil and fuel and renewable sources of power generation.

The presentation covers the short term and long term economic assumptions underlying the Paralana Project, and highlights the aim of achieving a price of around \$100/MWh to enable large scale deployment of power generation to the NEM.

The presentation draws the following conclusions;

- Geothermal energy has the potential to provide large scale base load power at competitive cost;
- The key challenge relates to “demonstrating economic flows”;
- Paralana project is well positioned with a clear path to market at various stages of development;
- Carbon pricing will provide a long term framework to underpin investment; and
- The Australian power generation mix is expected to feature a large percentage (22% of total energy) supply coming from geothermal energy – particularly in South Australia.

About the recent carbon package of legislative reforms

The recently passed legislation includes a comprehensive package of carbon pricing initiatives that will now commence from July 2012, and can be briefly summarized as follows;

- *The introduction of a price on carbon creates the investment framework and certainty needed to enable significant renewable energy development;*
- *The \$13 billion investment through the new Clean Energy Finance Corporation and the Australian Renewable Energy Agency will provide funding to the development of renewable energy projects, and*
- *The carbon pricing initiatives will commence from July next year at a price of \$23 per tonne of CO₂ and will be replaced with a market based Emissions Trading Scheme by July 2015.*

Yours faithfully



Terry Kallis
Managing Director

MEDIA CONTACTS:

Terry Kallis
Kieran Hall / Tim Hughes

Petratherm Ltd
Hughes Public Relations

08 8274 5000
08 8412 4100

Petratherm Limited

Carbon pricing presentation

Managing Director Terry Kallis

November 2011

CLEAN ENERGY FOR FUTURE GENERATIONS

Disclaimer and competent persons statement

Disclaimer

This presentation has been prepared by Petratherm Limited (Petratherm). The information contained in this presentation is a professional opinion only and is given in good faith.

Certain information in this document has been derived from third parties and though Petratherm has no reason to believe that it is not accurate, reliable or complete, it may not have been independently audited or verified by Petratherm.

Any forward-looking statements included in this document involve subjective judgment and analysis and are subject to uncertainties, risks and contingencies, many of which are outside the control of, and maybe unknown to, Petratherm.

In particular, they speak only as of the date of this document, they assume the success of Petratherm's strategies and they are subject to significant regulatory, business, competitive and economic uncertainties and risks. Actual future events may vary materially from the forward looking statements and the assumptions on which the forward looking statements are based. Recipients of this document ("Recipients") are cautioned not to place undue reliance on such forward-looking statements.

Petratherm makes no representation or warranty as to the accuracy, reliability or completeness of information in this document and does not take responsibility for updating any information or correcting any error or omission which may become apparent after this document has been issued.

To the extent permitted by law, Petratherm and its officers, employees, related bodies corporate and agents ("Agents") disclaim all liability, direct, indirect or consequential (and whether or not arising out of the negligence, default or lack of care of Petratherm and/or any of its Agents) for any loss or damage suffered by a Recipient or other persons arising out of, or in connection with, any use or reliance on this presentation or information.

All amounts in Australian dollars (AUD) unless stated otherwise.

The information in this report that relates to Exploration Results, Geothermal Resources or Geothermal Reserves is based on information compiled by Peter Reid, who appears on the Register of Practicing Geothermal Professionals maintained by the Australian Geothermal Energy Group Incorporated at the time of the publication of this report. Peter Reid is a full time employee of the Company. Peter Reid has sufficient experience which is relevant to the style and type of geothermal play under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the Second Edition (2010) of the Australian Code for Reporting Exploration Results, Geothermal Resources and Geothermal Reserves. Peter Reid has consented in writing to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Presentation Outline

- > Australian geothermal energy potential and cost comparisons with other energy technologies – conventional and renewable
- > Geothermal cost drivers and comparisons of different geothermal energy technologies
- > Paralana project key assumptions and commercial/market overview
- > SKM/MMA* Carbon price impact – based on legislative changes - emissions, price, generation mix
- > Summary and Conclusions

* Independent assessment presented on 9 November 2011 – assuming new carbon pricing legislation

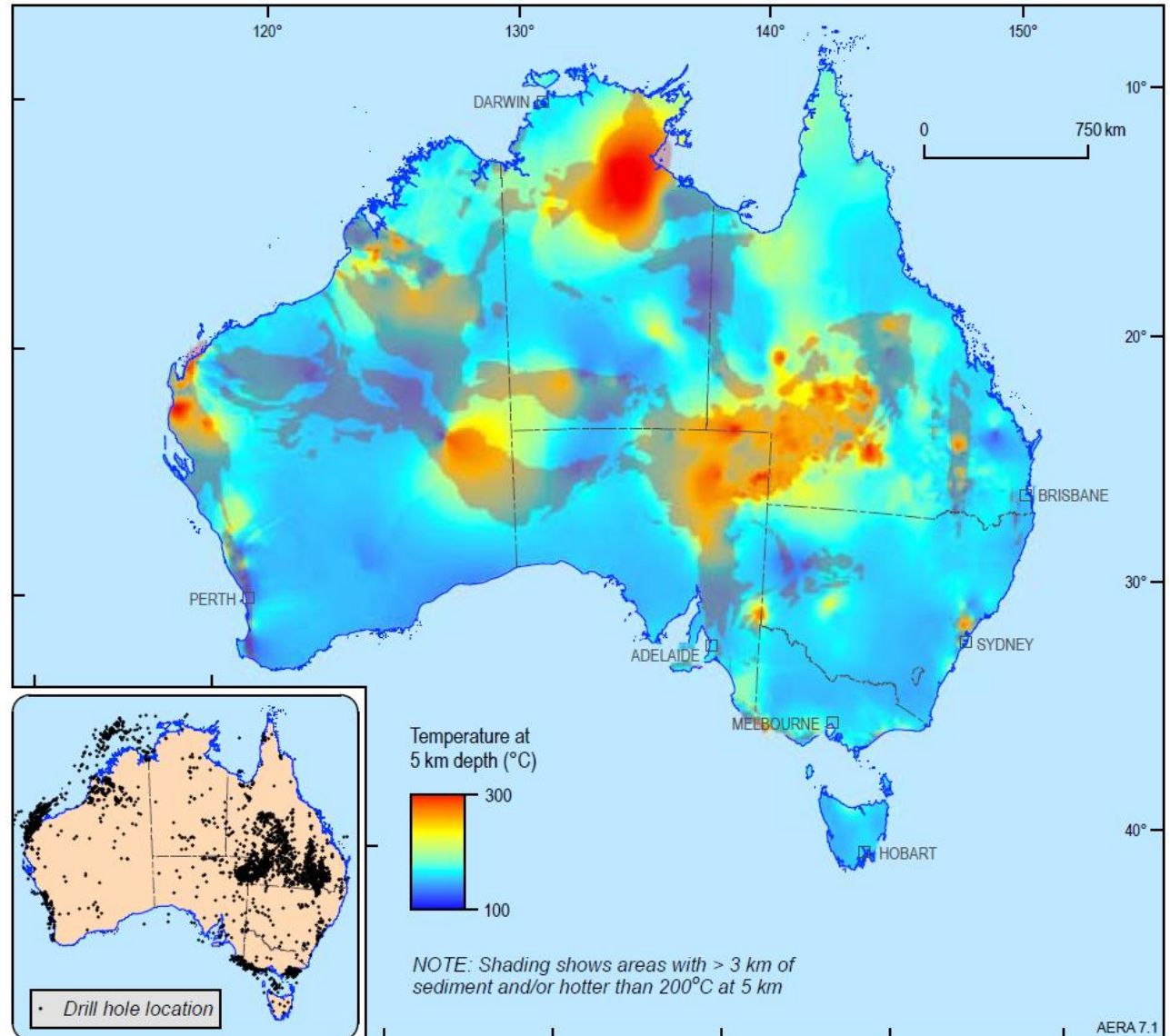
Geothermal energy overview

Geo-science Australia (GA) has estimated that the potential geothermal resource is equivalent to 26,000 times Australia's annual electricity energy consumption

The potential is enormous

The challenge is to deliver geothermal power economically at a competitive price to the National Electricity Market

Carbon pricing legislation will provide the long term framework to underpin economics and investment



Energy technologies - Australian Resource Assessment - GA

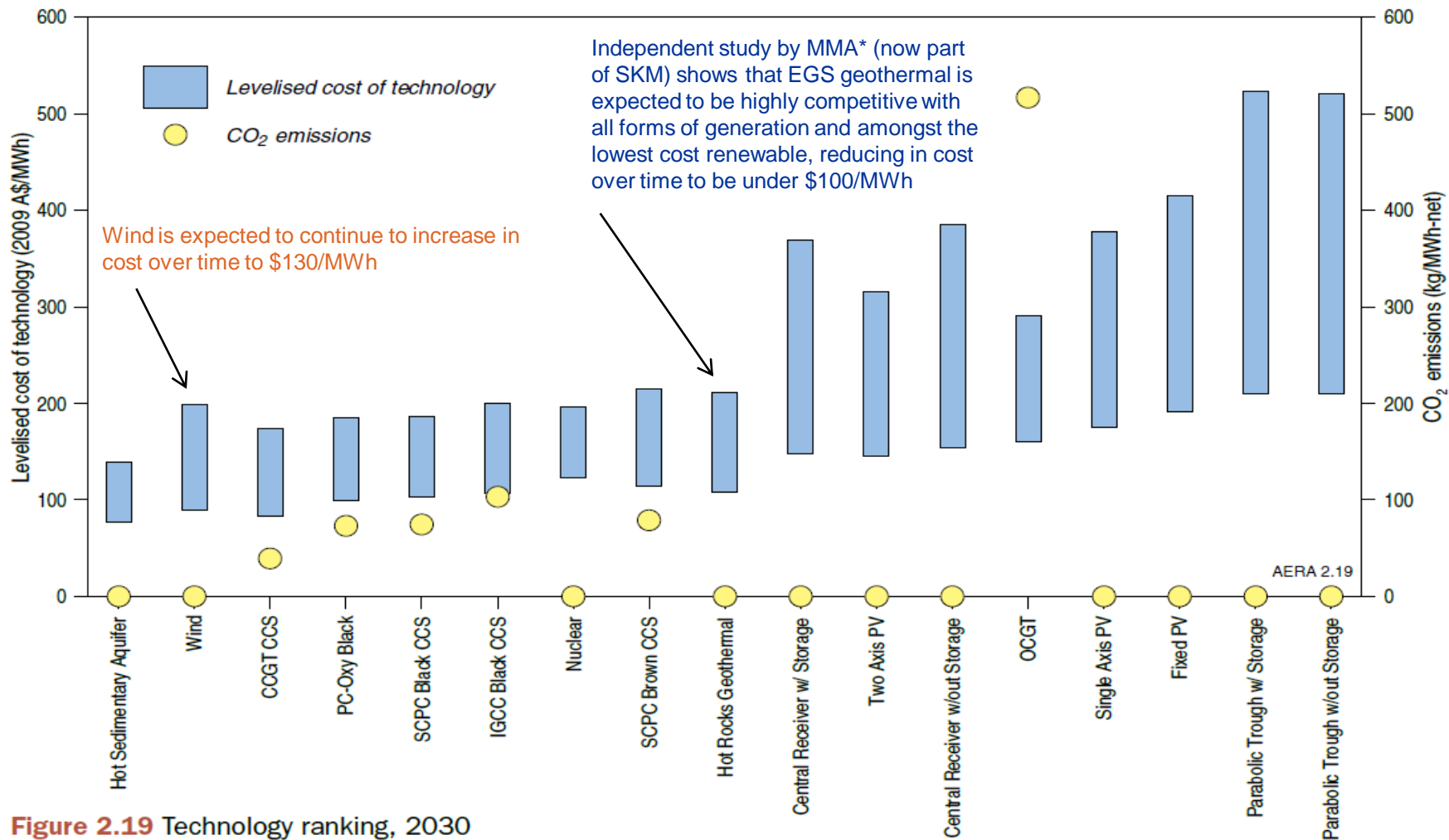


Figure 2.19 Technology ranking, 2030

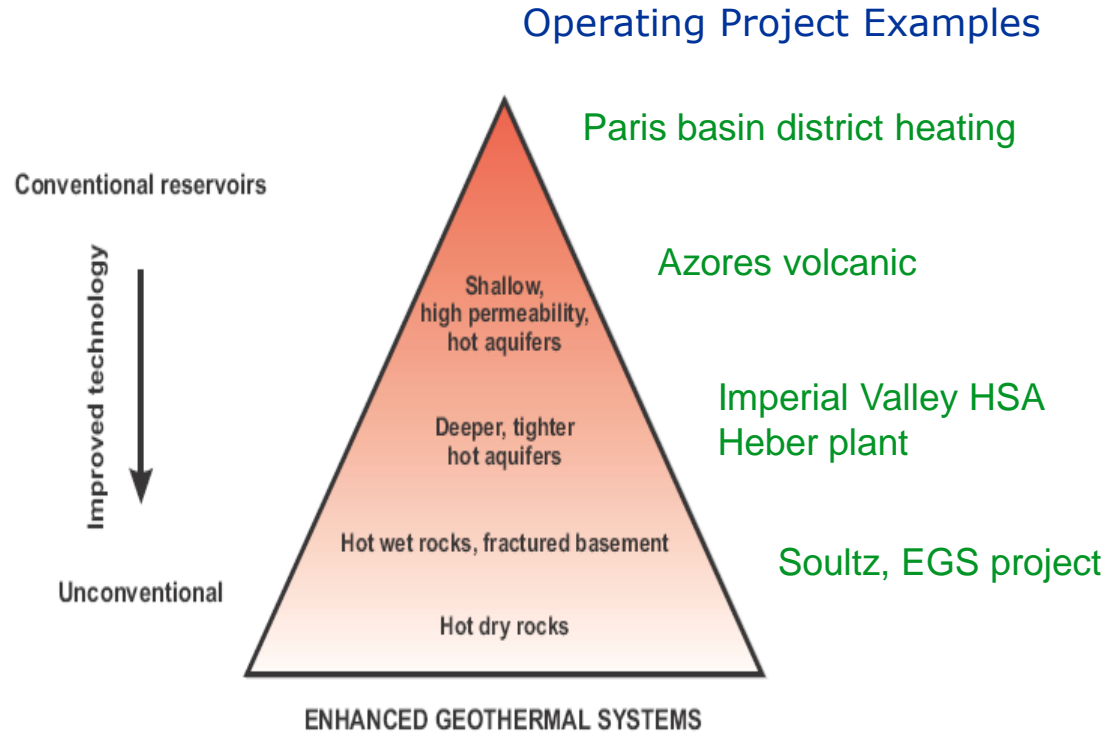
Source: EPRI technology status data, 2010

Note for 2.18 and 2.19: EPRI levelised cost of technology estimates based on simplified pro-forma costs, individual projects may lie outside this. Levelised cost of technologies: includes weighted cost of capital (8.4% real before tax); excludes financial support mechanisms; excludes grid connection, transmission, and firming (standing reserve requirements); and includes a notional allowance of 7.5% for site-specific costs.

Geothermal energy overview – key parameters

Key Project Parameters

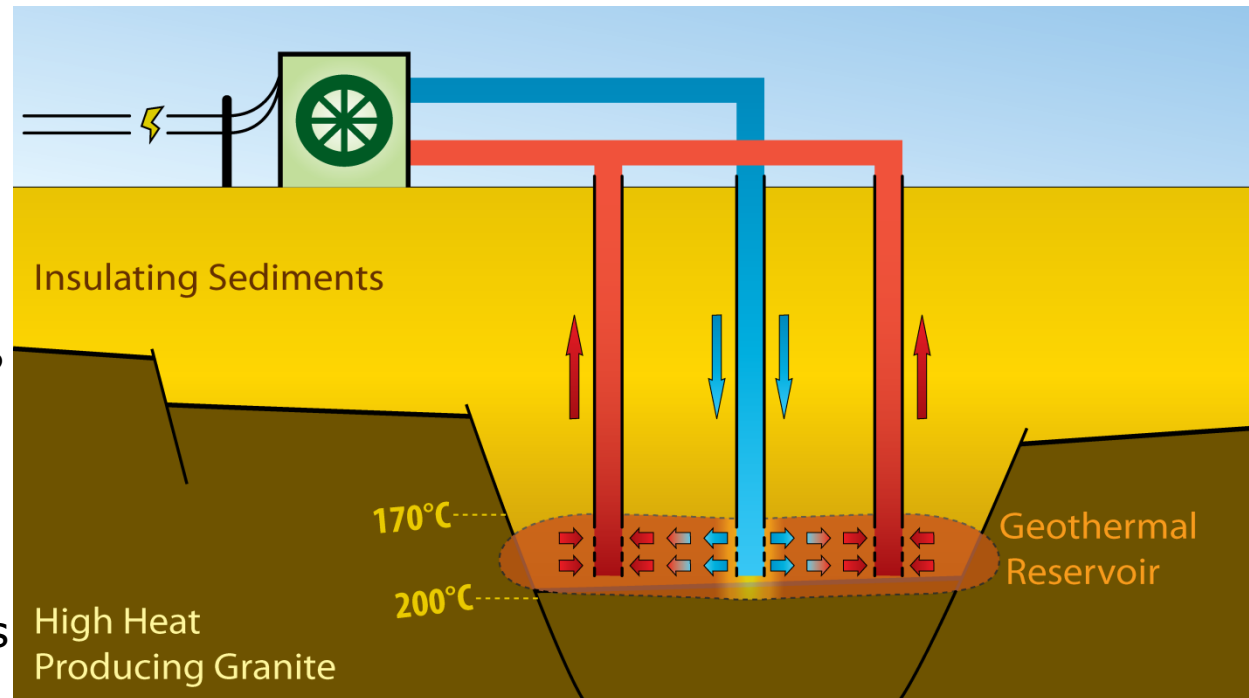
- > Temperature
- > Drilling depth
- > Flow rate
- > Network connection
- > Generation plant type
- > Market/Customer
- > **Optimization of parameters** to achieve commercial return against competitive alternatives in target market (heat or power)



Each project has specific project parameters that when optimized enable viable operation

Development Model – Heat Exchanger Within Insulator

- > Higher Permeability
- > Chemically Stable
- > Lower Fracc Challenge?
- > Mesoproterozoic metasediments – bedding / joint surfaces



= Cheaper Power!

HEWI Model at Paralana

The required heat exchanger is created in the insulating layers above the granite heat source. This may reduce risk, cost and time.

Paralana project track record of achievement

- > Paralana 1B – recorded a high heat flow of 113 mW/m² and high temperature gradient to 1800m depth
- > Paralana 2 well - 4,003m deep injector well successfully drilled
- > Temperatures of 176°C at 3,672m measured and 190°C modeled at 4,000m
- > Strong government support for Paralana JV project - awarded \$69.8 million in grants
- > Successful fracture stimulation – reservoir creation – and flow testing of well



Paralana project – modeled economic assumptions

Key Economic Assumptions:

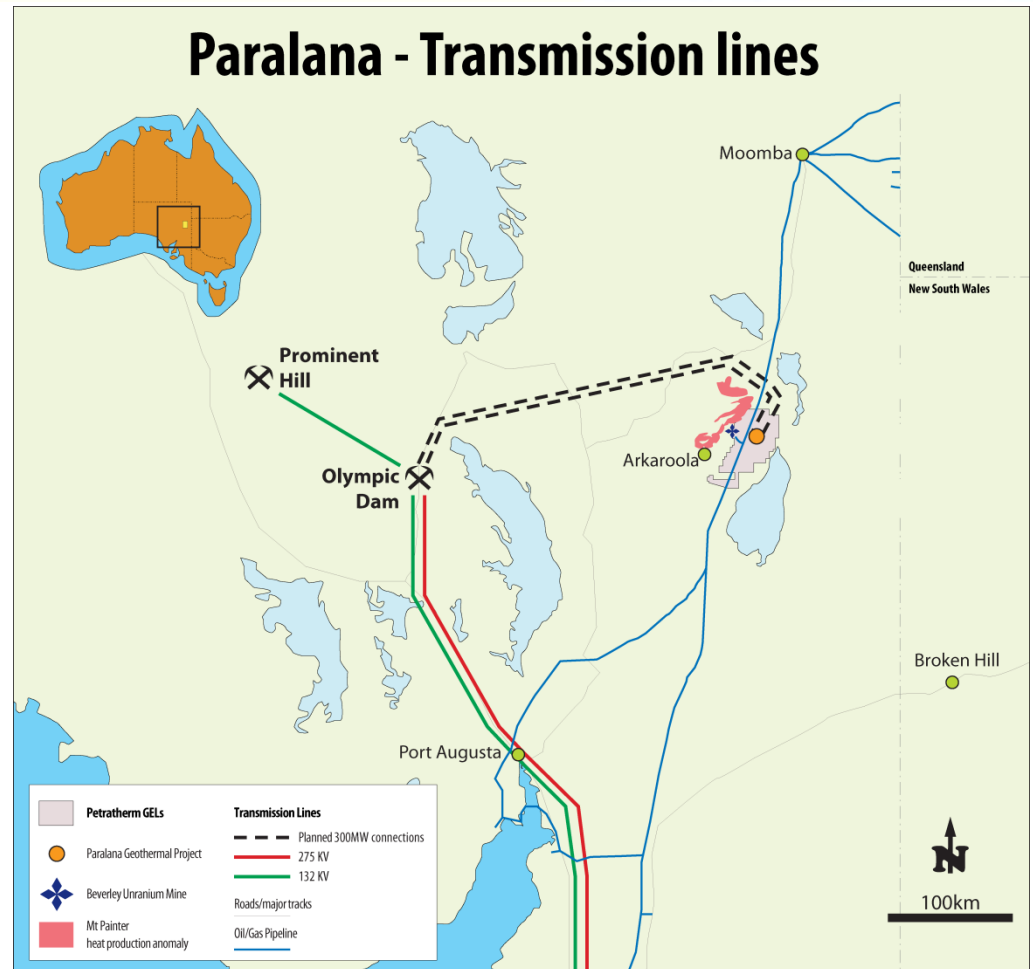
- Temperature of 190°C modeled at depth of 4,000m
- Flow rate of 75 litres per sec – considered most conservative in sector
- Net output per production well of 3.75 MW based on flow, inclusive of parasitic loads
- 20 year project life, includes all costs with 12 wells for a 30 MW development and connection to customer and results in a LRMC* of \$107/MWh (delivered), comparable with independently assessed industry LRMC ranges
- Bundled price for sale of output black and RECs expected to be > \$140/MWh due to current high off grid price at Beverley mine
- JV retains the full value of black and RECs - no predetermined price - retain full upside
- Potential for commercial viability at small scale 3.75 MW, 7.5 MW and 30 MW
- Aim for long term price of \$100/MWh delivered to National Electricity Market (NEM)

“The key challenge is to demonstrate economic flows”

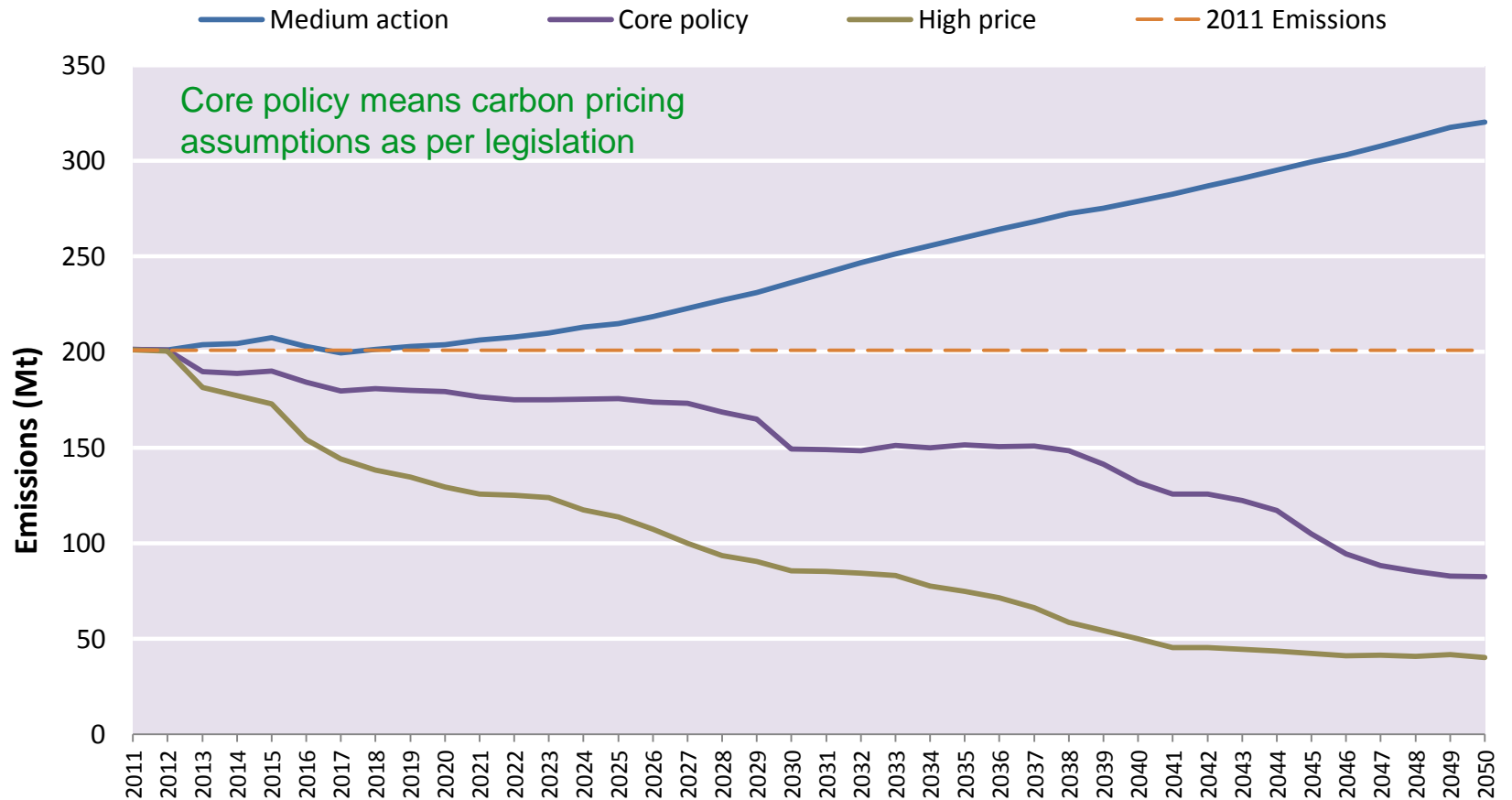
*(*Long Run Marginal Cost calculation over 20 years, includes all costs, consistent with energy industry comparisons made by the Electricity Supply Association of Australia, McLennan, Magasanik and Associates and the AGEA Economics Committee)*

Paralana Project – commercial / market overview

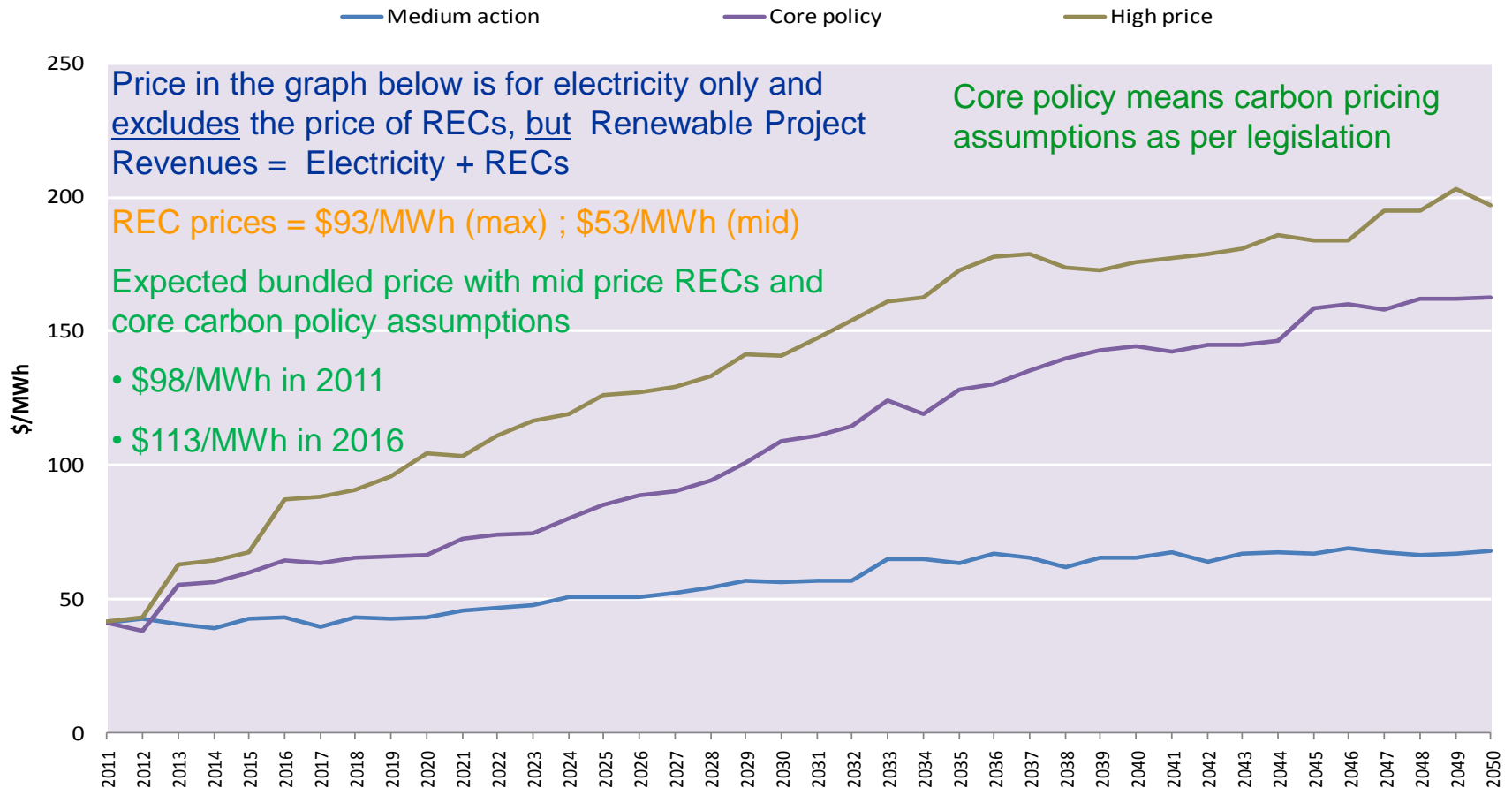
- > Potentially commercially viable at all stages of development
- > Close (10kms) off grid local customer (5-30MW) – then expand to on grid development (300 MW)
- > Transmission options for connection to market – potential growth areas
- > Long term price to NEM of 300 MW lower cost than with wind – inclusive of transmission cost
- > Independent energy/economic consultants* estimate power price at less than \$100/MWh delivered to Olympic Dam (*MMA)



Impact of Carbon pricing – Australian emissions (source SKM/MMA)



Impact of Carbon pricing – Australian wholesale electricity price (source SKM/MMA)



Paralana project – target revenues with electricity and RECs

Off grid market – next five years

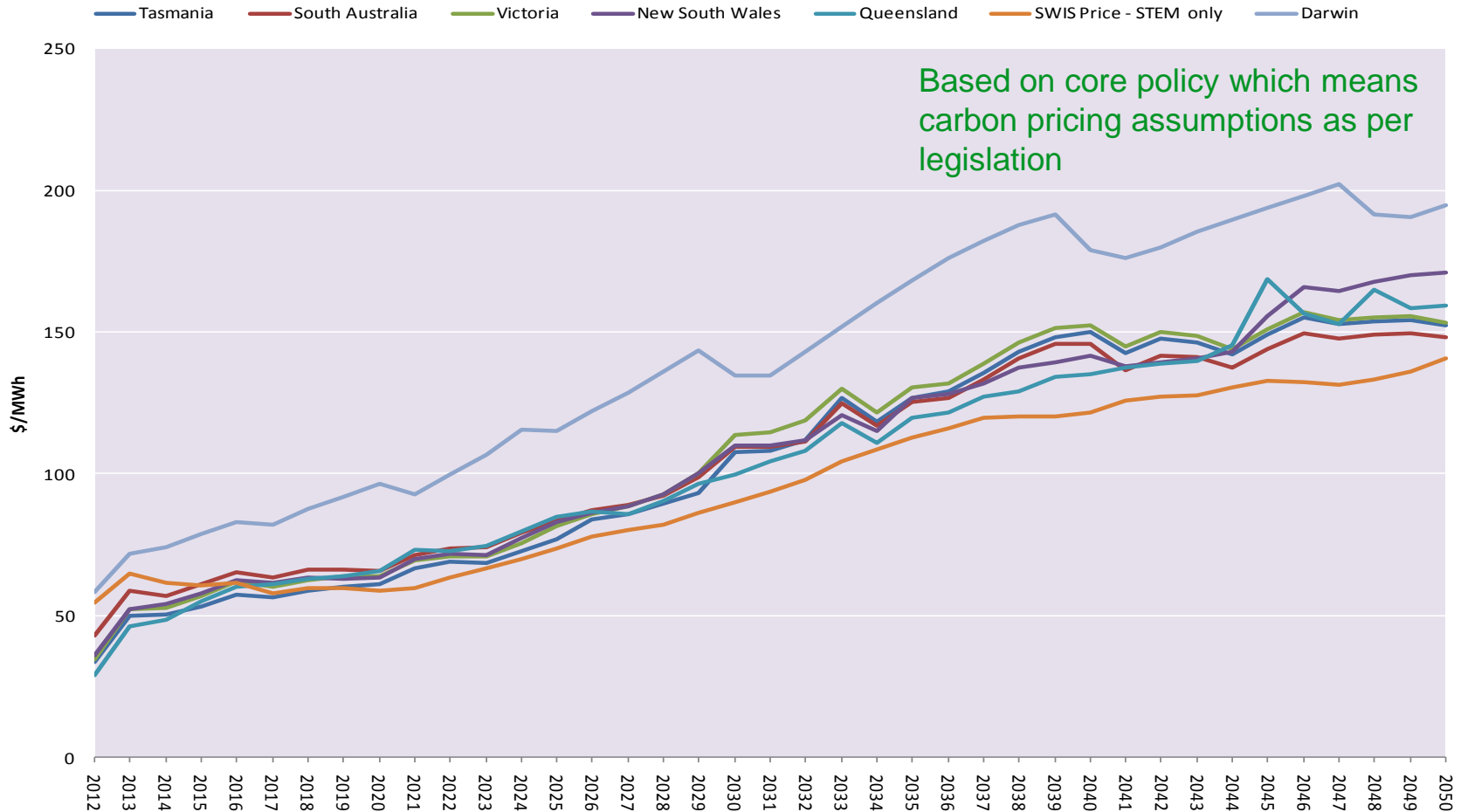
- > Aim to match current off-grid pricing in local market over the next 5 years
- > Bundled price for sale of output black and RECs expected to be > \$140/MWh due to current high off grid price at Beverley mine – assumes mid price RECs of \$53/MWh
- > JV retains the full value of black and RECs - no predetermined price - retain full upside
- > Potential for commercial viability at small scale 3.75 MW, 7.5 MW and 30 MW

NEM connected – beyond 2016

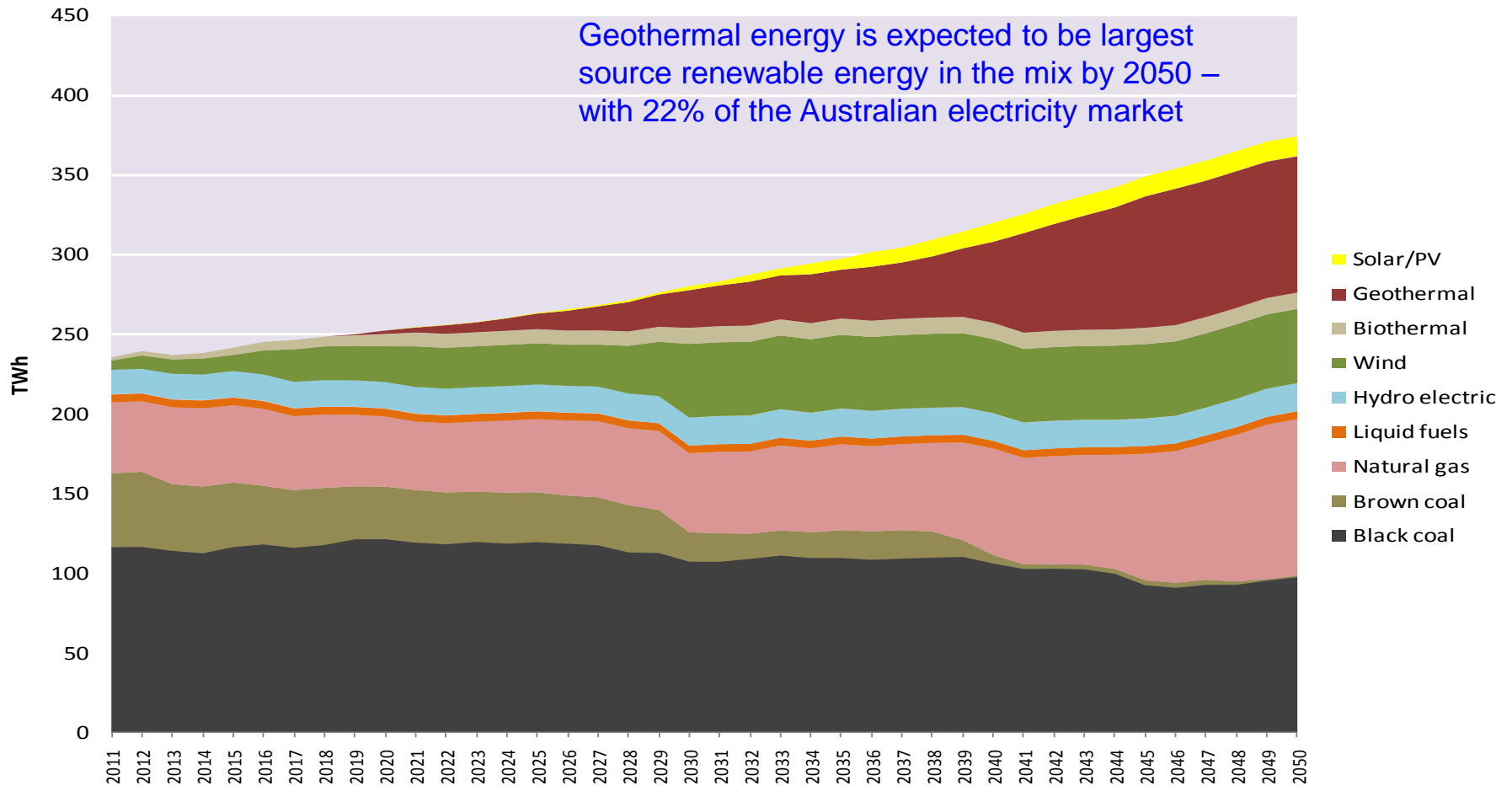
- > Aim for long term price of \$100/MWh delivered to National Electricity Market (NEM)
- > Assuming mid price RECs of \$53/MWh and current wholesale price of electricity in the NEM (refer previous slide) of around \$45/MWh – current opportunity is for \$98/MWh
- > With a carbon price of \$23/tonne of CO₂ the wholesale price of electricity is expected to increase to \$60/MWh by 2016 – making bundled price of over \$110/MWh
- > The actual pricing will be dependent on market trading in Carbon and RECs but provides a strong revenue opportunity for the Paralana geothermal energy project

*"Project is capable of short term & long term viability
and this is further strengthened by new carbon policy"*

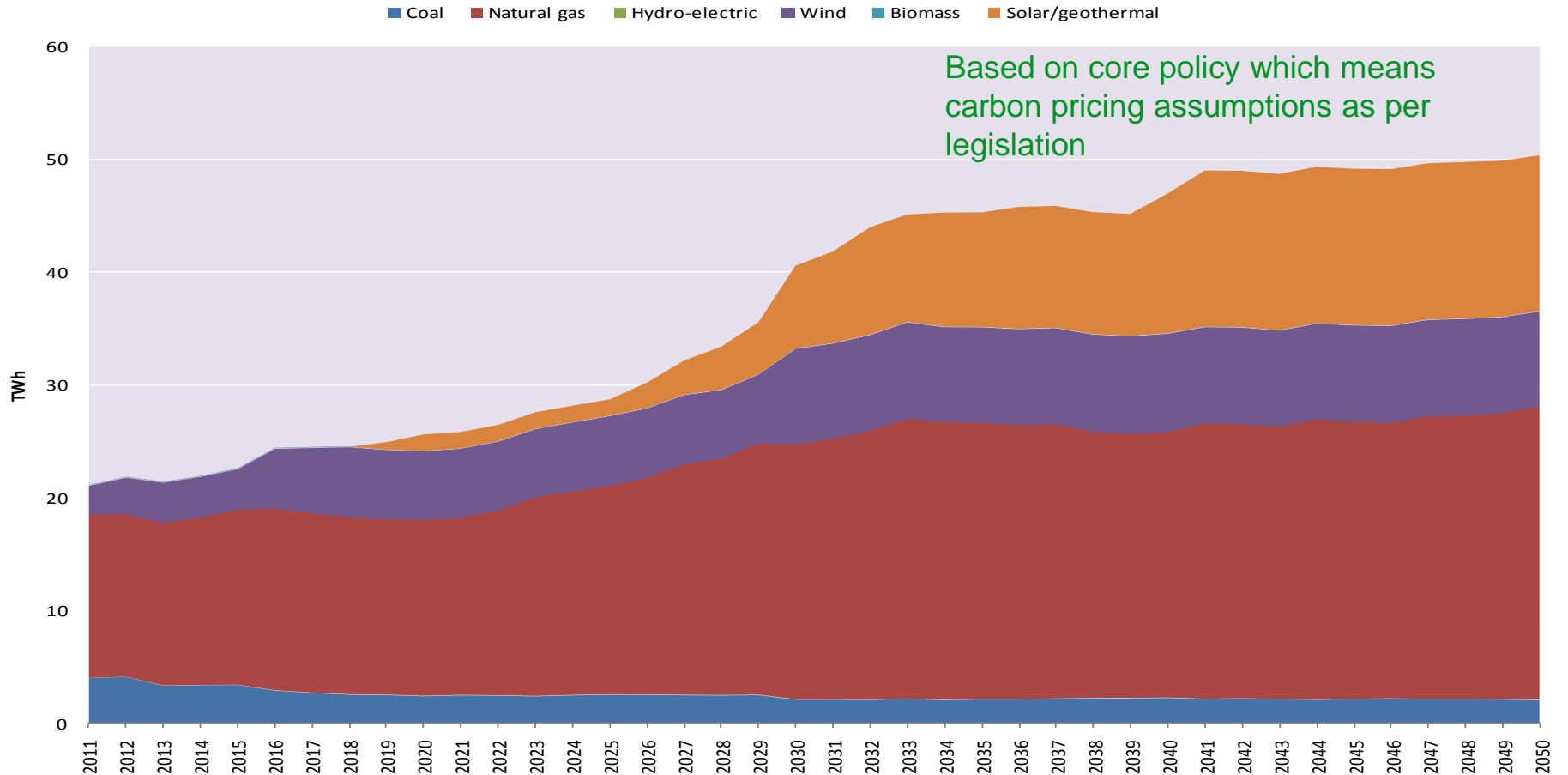
Impact of Carbon pricing – State wholesale electricity prices (source SKM/MMA)



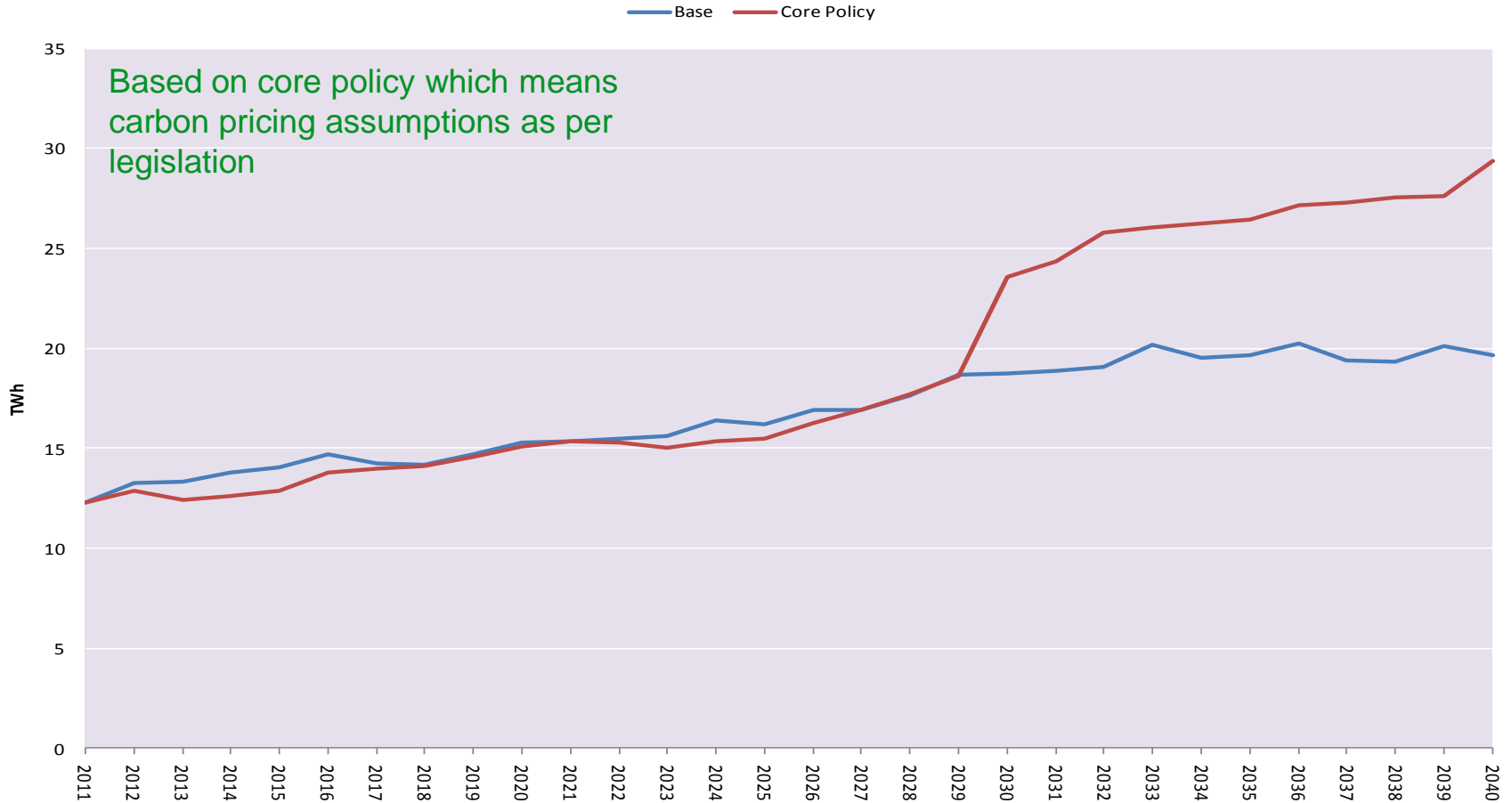
Impact of Carbon pricing – Australian power generation mix (source SKM/MMA)



Impact of Carbon pricing – South Australian power generation mix (source SKM/MMA)



Impact of Carbon pricing – Impact on SA generation (source SKM/MMA)



Summary and Conclusions

- > Geothermal energy has the potential to provide large scale base load power at competitive cost
- > The key challenge relates to demonstration of economic flows
- > Paralana project is well positioned with a clear path to market at various stages of development
- > Carbon pricing will provide a long term framework to underpin investment
- > The Australian power generation mix is expected to feature a large percentage (22% of total energy) supply coming from geothermal energy – particularly in South Australia

Summary and Conclusions

Australia needs clear and **stable** policy and regulatory framework for renewable & geothermal energy

- > **Price on carbon**
- > **Capital funding of projects**
- > **Investment in network connection**

Federal Government's new "Securing a Clean Energy Future" – Climate Change Plan is expected to drive investment in geothermal companies and projects



BE PART OF
PETRATHERM'S
BLUE SKY
FUTURE

www.petratherm.com.au