

# ASX Release



**PETRATHERM LIMITED**  
**ABN 17 106 806 884**

## **CEDA 2009 Energy Overview**

Petratherm Managing Director, Mr Terry Kallis, will later this morning present an update on the Australian Geothermal Industry and the Company's activities to CEDA's 2009 Energy Overview at the Hyatt Regency in Adelaide.

A key aspect of the presentation is an update on the Company's flagship Paralana Geothermal Energy JV Project.

The Energy Overview will be officially opened by the Hon Pat Conlon MP, SA Minister for Energy, and the keynote address will be given by the Hon Martin Ferguson, Federal Minister for Energy.

Other invited speakers include Ian Stirling (Chief Executive – ElectraNet), Christian Bennett (Group Executive, SANTOS), Michael Angwin (Executive Director, Australian Uranium Association) and Mark Headland (Regional Manager, Investec).

Refer attached presentation.

Yours faithfully

**Terry Kallis**  
Managing Director

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# CLEAN ENERGY FOR FUTURE GENERATIONS

# Geothermal energy in Australia

CEDA 2009 Energy Overview

Presented by Managing Director Terry Kallis

**Friday, October 2, 2009**

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

# Presentation overview

- > Key Messages
- > Geothermal energy technologies
- > Geothermal energy potential in Australia
- > Energy policy and geothermal
- > Petratherm – Company overview
- > Paralana geothermal energy JV project
- > Paralana 2 deep well drilling campaign



## Presentation – key messages

- > Geothermal energy has the potential to provide large scale, base load and low-cost renewable energy
- > Australia has the key ingredients for developing successful engineered geothermal systems (EGS) and hot sedimentary aquifer projects
- > While northern South Australia has the best known EGS (hot rock) geothermal resources, Victoria and SE of South Australia have the best known hot sedimentary aquifer resource potential
- > Geothermal projects face a number of challenges, including but not limited to – drilling, achieving adequate flow rates, power conversion efficiency, cost of access to, and delivery to market, induced seismicity and usage of water
- > There is strong government support – federal and state - for geothermal and renewable energy with capital funding and price of carbon

# Geothermal energy technologies

## Cost Drivers

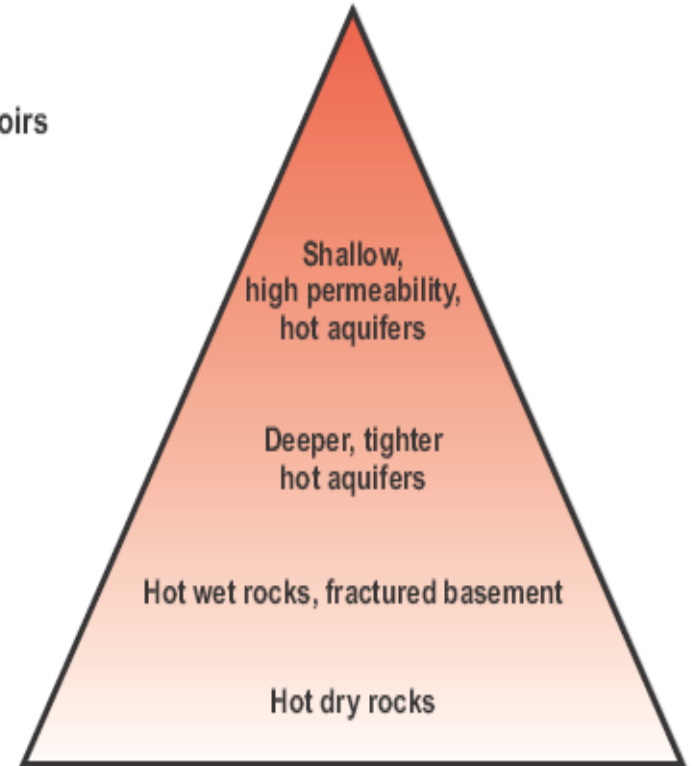
- > Temperature
- > Drilling Depth
- > Flow Rate
- > Network Connection
- > Generation Plant
- > High upfront costs – drilling, fracture stimulation, connection, plant
- > ***Project economics are geology and location specific***

Conventional reservoirs

Improved technology

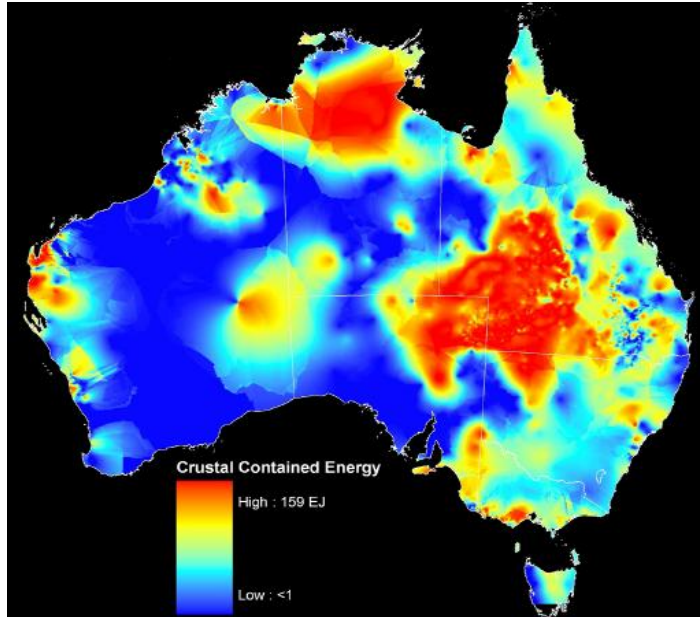


Unconventional



ENHANCED GEOTHERMAL SYSTEMS

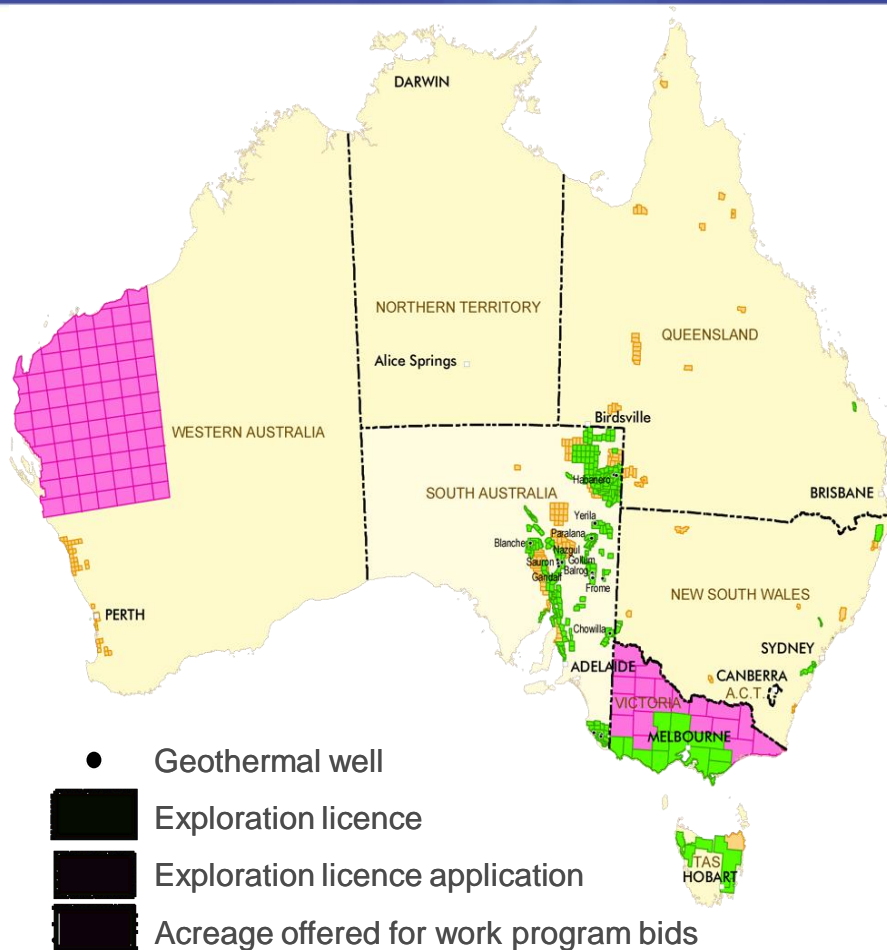
# Our geothermal resource in Australia



## Indicative Resource

- > Australia's hot rock energy is estimated to be 150°C to 5km, about 1.2 billion PJ
- > This is equivalent to about 20,000 times the annual primary energy use in Australia

# Growth in geothermal energy projects



## Industry Snapshot

- > GELS/GELAS
- > Australia 383
- > Expenditure more than \$1,500 Million
- > 48 companies in total
- > 10 ASX listed geothermal
- > 7 ASX listed energy

## Our landmark industry reports

- > Independent reports by McLennan Magasanik Associates – 2007 & 2008
- > Geothermal energy is expected to be the lowest cost from renewable energy by 2030 and directly competitive with coal by 2050
- > Geothermal energy is expected to build up to 2,200 MWs of base-load capacity by 2020
- > An estimated \$12 billion investment to develop capacity
- > This represents up to 40% of the Federal Government's 2020 Renewable Energy Target of 45,000 GWh - the equivalent of the output of around 6,000 MW of wind farms
- > Generation costs are expected to move rapidly down the cost curve from around \$120/MWh at small scale (10 MW to 50 MW) and decreasing to around \$80/MWh at large scale (300 MW or greater) by 2020

# Renewable energy policy and geothermal

## Strong Federal and State Government support

- > \$50 million geothermal drilling program with a maximum \$7 million per project
- > \$300 million Renewable Energy Demonstration Program
- > Review of electricity and gas networks by the Australian Energy Market Commission (AEMC)
- > Emissions Trading Scheme (CPRS)
- > Renewable Energy Target of 45,000 GWh by 2020
- > An increase in the REC penalty price from \$40/MWh to \$65/MWh and extending to 2030

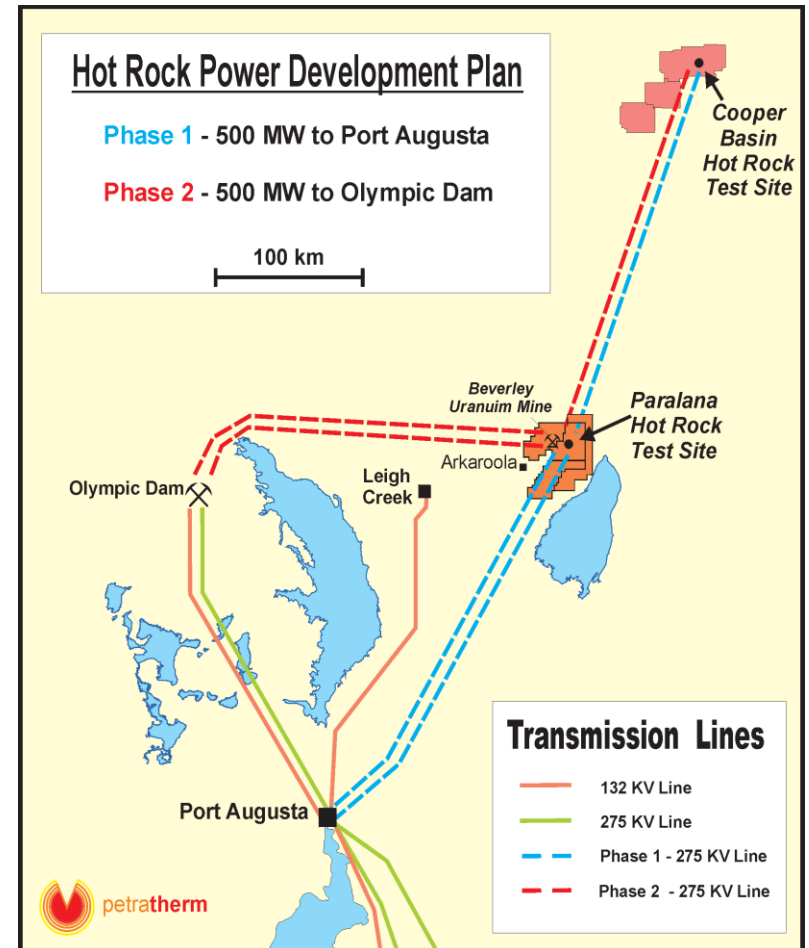
## Strong industry networks

- > Geothermal energy industry development framework
- > Australian Geothermal Energy Association (AGEA)
- > Australian Geothermal Energy Group (AGEG)



# Industry transmission plan – northern SA

- > 2009 independent report by McLennan Magasanik & Associates (MMA) shows savings in linking geothermal projects in the northern part of South Australia early to the National Electricity Market (NEM)
- > MMA estimates benefits of \$860 million for South Australian customers and \$2.8 billion for customers across the Australian market
- > Geothermal energy to displace higher cost forms of renewable energy
- > Potentially the first 'NERG' – network extension for remote generation – efficient connection of clusters of generation to be proposed by AEMC



# Our company



## Our company

- > Leading Australian geothermal exploration and development company
- > Projects spanning Australia, Spain and China
- > Flagship project – Paralana

## Other growth projects:

- > Madrid
- > Barcelona
- > Canary Islands, Tenerife
- > Victoria's East Gippsland Basin
- > China exploration agreement

# Corporate and financial

## Listed ASX:PTR

- > Shares on Issue: 94.45 million
- > Market Cap. \$30.2 million
- > Cash Position: \$13.2 million
- > Shareholders: 3,300 shareholders
  - > Minotaur Exploration 22 %
  - > Australian Ethical Investments 5 %

## Paralana Funding and Grants

- > Geothermal Drilling Program \$7 million and applied for Renewable Energy Demonstration Program - \$62.8 million
- > JV Funding: up to \$87 million plus equity share of project costs

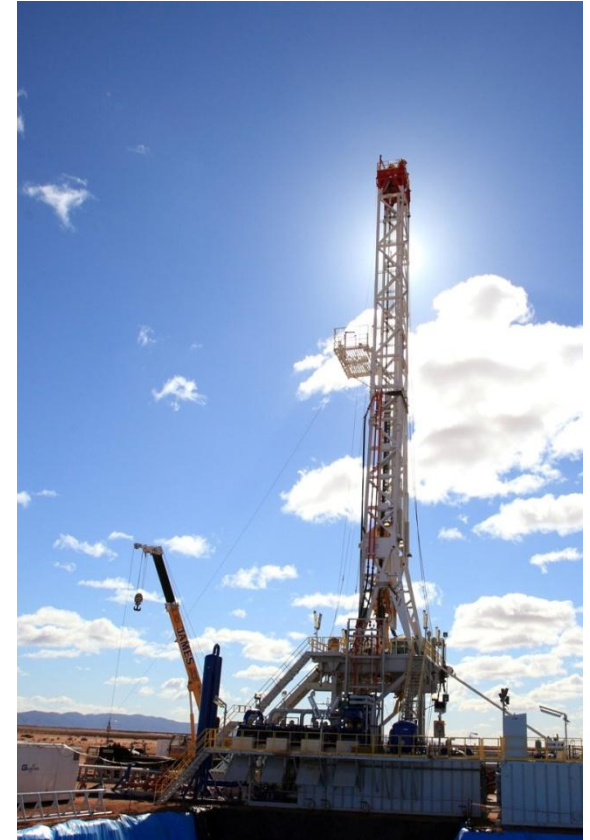
## Joint Venture Partners and Alliances

- > Paralana
  - > Beach Petroleum (up to 36 per cent for \$30m)
  - > TRUenergy (up to 30 per cent for \$57m)
- > Spain and Canary Islands
  - > Advanced discussions with several parties
  - > Cooperative agreement with Spanish Federal and Madrid Regional governments
- > China
  - > Conventional and Engineered Geothermal Systems
  - > Exclusive government supported exploration agreement

# Our business model

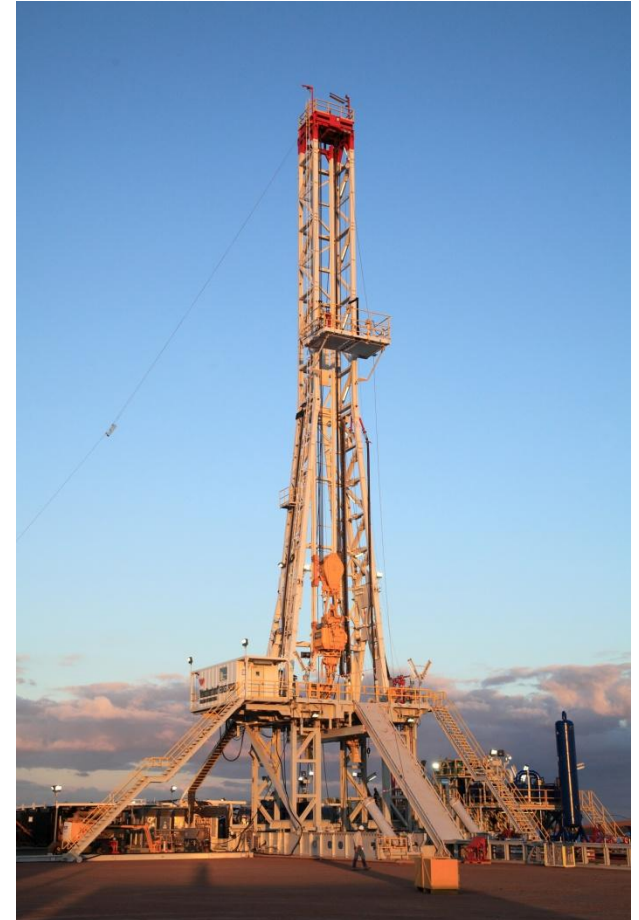
***“To explore for and develop emission free geothermal energy projects that are commercially sustainable”***

- > To develop a portfolio of quality geothermal energy projects
- > Explore both conventional and engineered geothermal systems – for power and heat
- > Find a favorable combination of geology and market conditions
- > Introduce joint venture partners with the right skills, risk appetite and funding ability

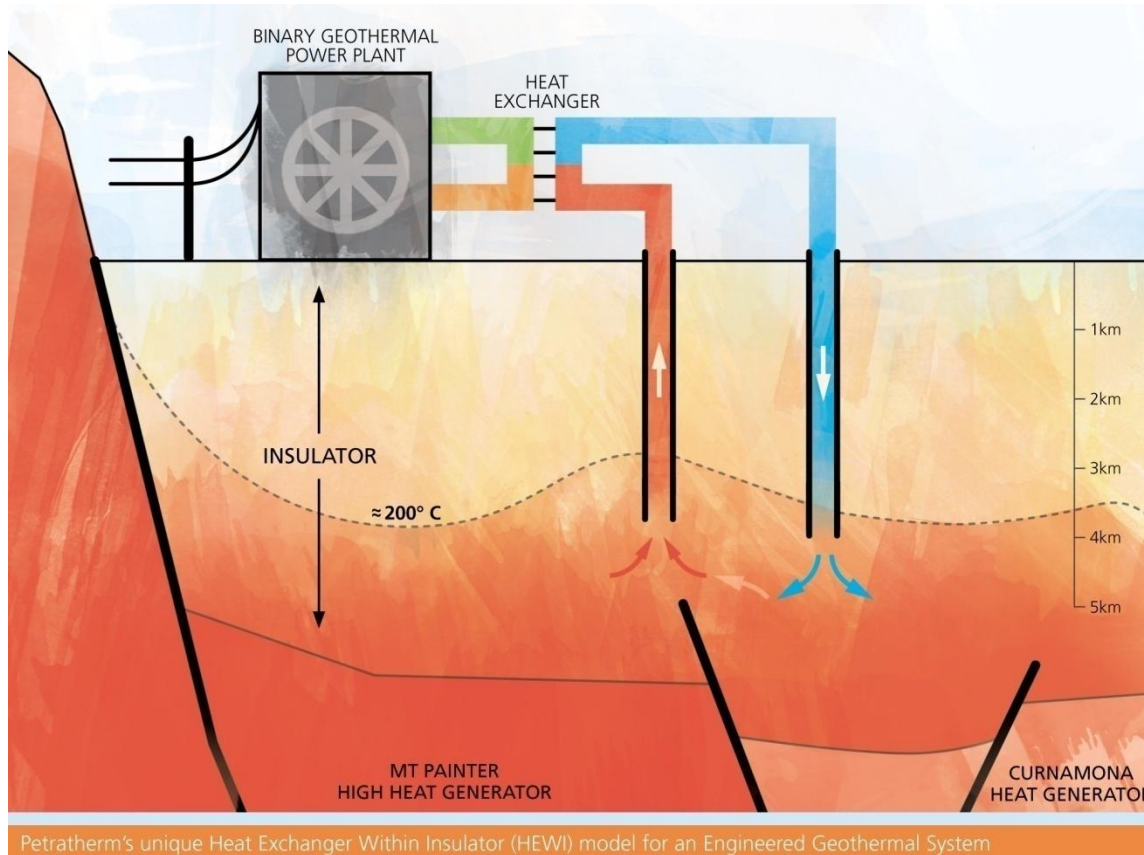


# What makes us different

- > Unique approach to exploration for heat
- > Heat Exchanger Within Insulator model (HEWI)
- > Quality international portfolio across the geothermal technologies of Engineered Geothermal Systems (EGS), district heating and volcanic
- > Flagship Paralana project has clear commercial advantages
  - > Customer nearby
  - > Excellent and abundant resource – estimated inferred resource of 230,000 PJ
  - > Unique path to commercialisation – local market then scale up to connect to NEM
  - > Strong and complementary Joint Venture partners – Beach Petroleum and TRUenergy
- > Clear business model



# Heat Exchanger Within Insulator (HEWI)



## HEWI at Paralana

- > The required heat exchanger is created in the porous insulating layer above the granite heat source
- > This is expected to reduce risk, cost and time

## Work schedule:

- > 2009 Drill first deep well
- > Fracture rock to create heat exchanger
- > 2010 Drill second well
- > 2011 Build 3.75 MW plant

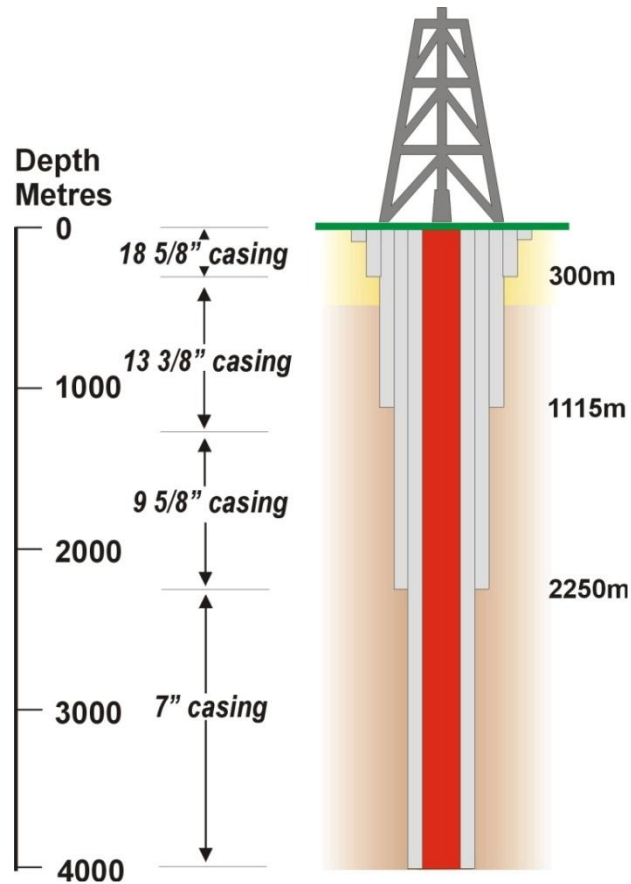
# Paralana geothermal energy JV project



Our Paralana project 600km north of Adelaide in South Australia

- > Deep drilling started June 30, 2009
- > Commercially viable
- > High heat flow with a predicted temp of 200°C at a depth of 3600 metres
- > Customer for initial 3.75MW plant at nearby Beverley Mine
- > Scale up plan to 30MW and beyond
- > \$5M REDI grant and \$7M GDP grants
- > Strong Joint Venture partners Beach Petroleum and TRUenergy

# Paralana geothermal energy JV project



Current drilling depth of Paralana 2 well is 2900 metres

- > A 200m deep micro-seismic array is installed
- > When Paralana 2 well reaches its target depth the design of the fracture stimulation begins
- > Water under pressure is used to fracture rocks to create an underground heat exchanger
- > The fracturing creates micro seismic events. These are monitored to help site the Paralana 3 well
- > Mid 2010: drilling of the Paralana 3 deep producer well
- > Early 2011: constructing the above ground power plant

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**BLUE SKY**  
**FUTURE**

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