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**Dr Nick Pashias** is Head of Equities and Portfolio Manager of the High Growth Shares Fund and Elite Opportunities strategy. Nick is responsible for researching stocks in the Metals & Mining and Telco sectors. He has 23 years industry experience and previously consulted on efficiency improvement & process streamlining in the mining industry. Nick holds a Ph.D. in Chemical Engineering and a Master of Applied Finance. He has authored this topical article.

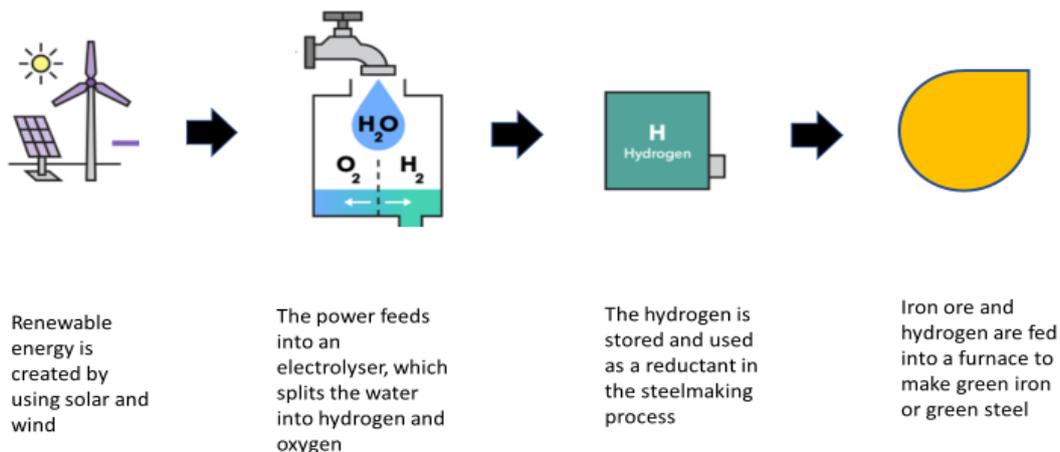
## Our climate change sweet spot: How Australia can produce “green steel”.

Australia’s natural resources, most notably in the north west, could see us at the forefront of global “green steel” production. Fortescue Metals (FMG), BHP and Rio Tinto (RIO) have the opportunity to have the iron ore they mine processed domestically by harnessing the abundant solar and wind resources in the region to create hydrogen which can be used as a reductant in the steel making process instead of coal.

With climate change and global warming becoming increasingly important across society, using hydrogen to produce green steel (and potentially other uses) could be a very sweet spot for Australia and our big miners. And potentially this could happen within a decade.

The process and resources needed to produce green steel are described in Figure 1. Hydrogen is both an energy source and the reductant in producing steel (just like coal/coke). As well as being an energy source, hydrogen binds with the oxygen in the iron ore to produce water; just like the carbon in coal binds with the oxygen in iron ore to produce carbon dioxide.

**Figure 1: Green steel production process**



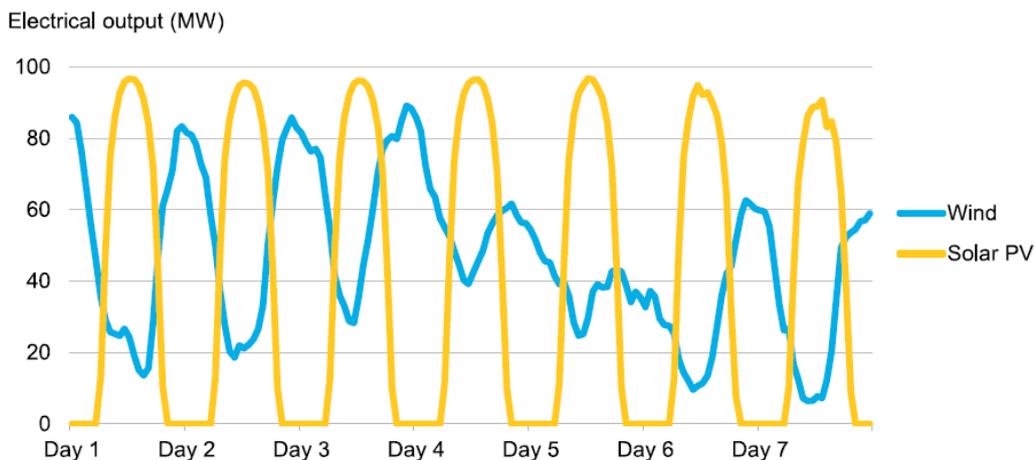
Source: Antares Equities; September 2021

### Renewable Energy: Australia’s unique position

Carbon free electricity remains elusive and is mainly produced via solar, wind, hydro or nuclear. Given Australia’s position on nuclear and our lack of hydro resources, solar and wind appear to be the only real alternatives. The right combinations of wind and sun are required to generate a consistent flow of electricity to power an electrolyser and ultimately create hydrogen.

**Figure 2: Potential compatibility of solar and wind generation**

**Hourly generation of a 100MW solar PV plant and a 100MW onshore wind plant in California over the period of one week**



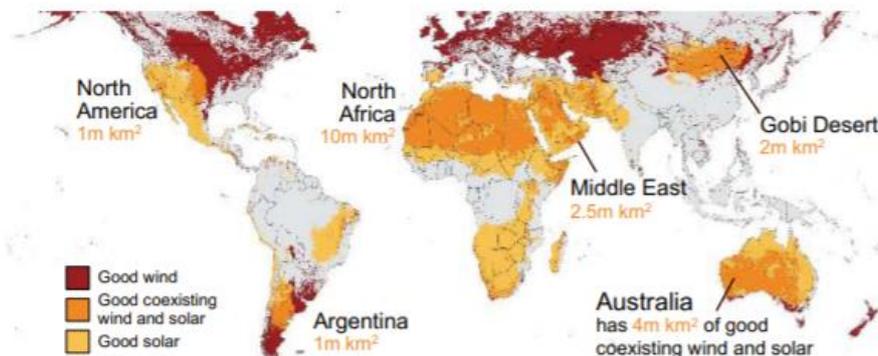
Source: BloombergNEF. Note: Profiles extracted from CAISO hourly generation data during June 30 - July 6, 2018.

Such climatic conditions only occur in limited locations around the world.

Fortuitously, as Figure 3 illustrates, one of these locations is in Western Australia. Work undertaken by the Grattan Institute highlights Australia’s renewable energy resource endowment is both large and rare, giving us a comparative advantage.

**Figure 3: Locations with high quality onshore wind and solar**

Locations with high-quality onshore wind and solar



Notes: Land higher than 3,000 metres is excluded because renewable energy resources are harder to use when they are in mountainous terrain. High-quality resources are defined to be areas with average wind power-density of at least 450 W/m<sup>2</sup> and average daily solar photovoltaic potential of at least 4.5 kWh/kWp. North Africa includes the Horn of Africa.

Sources: Grattan analysis of Global Wind Atlas (2020), Global Solar Atlas (2020) and U.S. Geological Survey and National Geospatial-Intelligence Agency (2010).

**Green Hydrogen**

Those who have studied chemistry may remember that hydrogen is the first element in the periodic table. In normal conditions hydrogen is a colourless, odourless, tasteless and highly flammable gas. Most of the earth’s hydrogen is locked in water (H<sub>2</sub>O) and in hydrocarbons such as methane (CH<sub>4</sub>).

There are two main methods of producing hydrogen. Green hydrogen is produced via the electrolysis of water while blue hydrogen is extracted from fossil fuels. Our focus is on the more climate friendly green hydrogen.

**Green hydrogen** is produced via an electrolyser. In an electrolyser an electrical current is passed through a water cell breaking up the water (H<sub>2</sub>O) into hydrogen (H<sub>2</sub>) and oxygen (O<sub>2</sub>). If the electricity production emits no carbon dioxide then the hydrogen is deemed to be carbon free or green.

Hydrogen gas is already produced in large quantities around the world; in 2018 approximately 117mt was produced, but most of it was consumed for its chemical properties rather than as a source of energy.

The problem with hydrogen has been its low density, high reactivity, low boiling point and high combustibility; which means hydrogen is difficult, costly and dangerous to transport. This limits its industrial application as a source of energy.

Enter ammonia. Ammonia (NH<sub>3</sub>) is a molecule with one nitrogen atom and three hydrogen atoms. Liquified ammonia contains more hydrogen – and therefore more energy per unit of volume than hydrogen gas. Furthermore, ammonia can be transported more safely and cheaply making it a perfect way to transport hydrogen. (Investing in companies that produce ammonia is another way to gain exposure to the de-carbonisation thematic.)

### **Green Steel: The Next Big Thing?**

The global steel industry produces around two billion tonnes of steel each year with a value of around US\$2.0 trillion depending on the market price. Coal is the principal source of energy. Steel production accounts for over three billion tonnes of carbon dioxide or around 8% of global emissions.

Given the magnitude of the problem and hence the corresponding reward for solving it, there have been many projects launched around the world looking into producing steel via alternative methods. Many have focused on using hydrogen, rather than coke/coal. If successful, this would have a significant impact on the volume of carbon dioxide produced and would render the steel “green”.

Green steel has been produced in a number of locations around the world but in small, subscale volumes. Reducing capital and operating costs remain the hurdle. However, as we have seen in many other industries, Wrights Law usually applies, as industries grow in scale bringing down unit costs.

**Wright’s Law:** While studying airplane manufacturing, Wright determined that for every doubling of airplane production, the labour requirement was reduced by 10-15%. In 1936, he detailed his full findings in the paper “Factors affecting the costs of airplanes.” Now known as “Wright’s Law”, or experience curve effects, the paper described that “we learn by doing” and that the cost of each unit produced decreases as a function of the cumulative number of units produced.

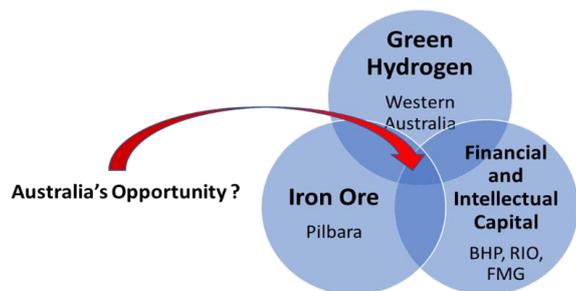
Given the intense focus on decarbonisation it is not impossible that the cost of hydrogen and the cost of green steel falls to a level that renders production economic. Furthermore, the prospect of consumers paying a premium for a car or washing machine made from green steel would bring forward the time to profitability.

### **The Lucky Country and Lucky Companies**

Australia, Western Australia, the Pilbara, BHP, Rio Tinto (RIO) and Fortescue Metals (FMG) are at a unique intersection where these emerging climate change related global trends overlap.

Western Australia, has the large land area where climatic conditions would allow the large and continuous supply of green hydrogen energy due to its fortunate solar and wind resources; the Pilbara has some of the world’s largest iron ore reserves and BHP, RIO and FMG all have the financial and emerging intellectual capital to exploit the massive opportunity to create green steel. And they have signalled, and allocated capital towards reducing carbon emissions which may include the production of green hydrogen and green steel.

**Figure 4: Australia's sweet spot**



Source: Antares Equities; September 2021

## Antares market & fund updates

Below is a brief review of how the Australian share market performed during the quarter as well as short commentaries on the Antares Funds and model portfolios, outlining their performance and the main contributors to performance.<sup>#</sup>

### Australia share market review

Australian shares generated a solid 1.8% return for the past three months, tempered by a disappointing September. The energy sector surged by 9.3% given the hike in oil and gas prices as supply shortages emerged. The Information Technology sector also delivered a strong quarterly return largely due to the takeover bid by tech giant Square for Afterpay. However, the Resource sector disappointed with a -9.3% return given the sharp fall in iron ore prices with weaker Chinese demand and the question marks around Chinese property developer Evergrande.

### Australian Equities Fund

The Antares Australian Equities Fund returned 4.3% (net of fees) for the September 2021 quarter, outperforming its benchmark S&P/ASX200 Total Return Index return<sup>1</sup> by 2.6%. The main contributors to quarterly performance were decisions not to own Fortescue Metals or Rio Tinto and an overweight holding in South32. Detracting from performance were decisions not to own Sydney Airport and Wisetech Global and an overweight holding in Northern Star Resources.

### Dividend Builder

The annual income yield to 30 June 2021 for Antares Dividend Builder Fund was 4.35% compared to its benchmark\* yield of 2.77%. Dividends were received from Alumina, Amcor, ANZ, APA, Aurizon, CBA, Coles, Downer, GPT, IAG, Iress, Medibank, Metcash, NAB, Scentre Group, Suncorp, Tabcorp, Telstra, Transurban and Viva Energy during the quarter. The Fund's net return for the September quarter was 5.6%<sup>1</sup>.

### Elite Opportunities Fund

The Antares Elite Opportunities Fund returned 2.6% (net of fees) for the September 2021 quarter, outperforming its benchmark S&P/ASX200 Total Return Index return of 1.7% by 0.9%<sup>1</sup>. Contributing to performance were decisions not to own Fortescue Metals or Rio Tinto and an overweight holding in South32. An overweight holding in BHP, together with decisions not to own Macquarie Group or Sydney Airport detracted from performance.

### High Growth Shares Fund

The Antares High Growth Shares Fund returned 4.1% (net of fees) for the September 2021 quarter, outperforming its benchmark S&P/ASX200 Total Return Index return of 1.7% by 2.4%<sup>1</sup>. Overweight holdings in Wisetech Global and Novonix and a short position in Fortescue Metals contributed to performance. Detracting from performance were overweight positions in Northern Star Resources, Sims and Polynovo.

### Ex-20 Equities Fund

The Antares Australian Equities Ex-20 Fund returned 3.9% (net of fees) for the September 2021 quarter, underperforming its benchmark S&P/ASX200 Total Return Index ex S&P/ASX 20 Total Return Index return of 4.9% by 1.0%<sup>1</sup>. Overweight holdings in IDP Education, Qantas and Wisetech Global contributed to performance. Detracting from performance were overweight positions in Ansell and Worley and not owning Sydney Airport.

### Listed Property Fund

The Antares Listed Property Fund returned 4.2% (net of fees) for the September 2021 quarter, in line with its benchmark, the S&P/ASX200 A-REIT Total Return Index return of 4.2%<sup>1</sup>. Underweight holdings in Stockland, Charter Hall Retail REIT and BWP Trust contributed to performance. Detracting from performance were an overweight position in Peet and underweight holdings in National Storage REIT and Centuria Capital.

<sup>#</sup>All returns are net of fees. Please refer to the following page for a summary of returns which are gross of fees. <sup>1</sup> Past performance is not a reliable indicator of future performance. Returns are not guaranteed and actual returns may vary from any target returns described in this document.

\*From 1 October 2021, the benchmark for Dividend Builder is the S&P/ASX 200 Total Return Index. This replaces the previous benchmark, the S&P/ASX 200 Industrials Total Return Index.

# Antares Investments Returns

Performance to 30 September 2021<sup>1</sup>

Professional Selection		1 mth %	3 mths %	1 yr %	3 yrs % pa	5 yrs % pa	10 yrs % pa	Since Inception % pa
<b>Antares Australian Equities Fund</b> S&P/ASX 200 Acc Index	<b>Net Return</b>	<b>0.7</b>	<b>4.3</b>	<b>41.3</b>	<b>8.1</b>	<b>9.0</b>	<b>10.0</b>	<b>9.4</b>
	Gross Return	0.7	4.5	42.2	8.8	9.7	10.8	10.3
	Benchmark Return	-1.9	1.7	30.6	9.7	10.4	10.8	9.5
	<b>Net Excess Return</b>	<b>2.6</b>	<b>2.6</b>	<b>10.7</b>	<b>-1.6</b>	<b>-1.4</b>	<b>-0.8</b>	<b>-0.1</b>
Gross Excess Return		2.6	2.8	11.6	-0.9	-0.7	0	0.8
<b>Antares Dividend Builder</b> S&P/ASX 200 Industrials Acc Index	<b>Net Return</b>	<b>0.5</b>	<b>5.6</b>	<b>43.4</b>	<b>8.4</b>	<b>6.7</b>	<b>11.1</b>	<b>7.5</b>
	Gross Return	0.5	5.7	44.3	9.0	7.3	11.7	8.2
	Benchmark Return	-0.8	4.5	33.7	10.0	9.7	12.7	8.2
	<b>Net Excess Return</b>	<b>1.3</b>	<b>1.1</b>	<b>9.7</b>	<b>-1.6</b>	<b>-3.0</b>	<b>-1.6</b>	<b>-0.7</b>
Gross Excess Return		1.3	1.2	10.6	-1.0	-2.4	-1.0	0
<b>Antares Elite Opportunities Fund</b> S&P/ASX 200 Acc Index	<b>Net Return</b>	<b>-1.3</b>	<b>2.6</b>	<b>38.2</b>	<b>7.6</b>	<b>9.6</b>	<b>10.3</b>	<b>10.6</b>
	Gross Return	-1.2	2.8	39.7	8.5	10.5	11.1	11.4
	Benchmark Return	-1.9	1.7	30.6	9.7	10.4	10.8	9.4
	<b>Net Excess Return</b>	<b>0.6</b>	<b>0.9</b>	<b>7.6</b>	<b>-2.1</b>	<b>-0.8</b>	<b>-0.5</b>	<b>1.2</b>
Gross Excess Return		0.7	1.1	9.1	-1.2	0.1	0.3	2.0
<b>Antares High Growth Shares Fund</b> S&P/ASX 200 Acc Index	<b>Net Return</b>	<b>-0.3</b>	<b>4.1</b>	<b>43.6</b>	<b>10.2</b>	<b>11.7</b>	<b>11.7</b>	<b>11.1</b>
	Gross Return	-0.1	4.4	45.8	11.5	13.0	13.0	12.6
	Benchmark Return	-1.9	1.7	30.6	9.7	10.4	10.8	8.4
	<b>Net Excess Return</b>	<b>1.6</b>	<b>2.4</b>	<b>13.0</b>	<b>0.5</b>	<b>1.3</b>	<b>0.9</b>	<b>2.7</b>
Gross Excess Return		1.8	2.7	15.2	1.8	2.6	2.2	4.2
<b>Antares Listed Property Fund</b> S&P/ASX 200 A-REIT Acc Index	<b>Net Return</b>	<b>-1.9</b>	<b>4.2</b>	<b>30.7</b>	<b>6.4</b>	<b>5.1</b>	<b>11.7</b>	<b>7.9</b>
	Gross Return	-1.8	4.4	31.7	7.2	5.8	12.5	8.7
	Benchmark Return	-2.2	4.2	29.8	8.6	7.1	13.2	7.8
	<b>Net Excess Return</b>	<b>0.3</b>	<b>0</b>	<b>0.9</b>	<b>-2.2</b>	<b>-2.0</b>	<b>-1.5</b>	<b>0.1</b>
Gross Excess Return		0.4	0.2	1.9	-1.4	-1.3	-0.7	0.9
<b>Antares Ex-20 Australian Equities Fund</b> S&P/ASX 200 ex S&P/ASX 20	<b>Net Return</b>	<b>-0.8</b>	<b>3.9</b>	<b>34.7</b>	-	-	-	<b>14.9</b>
	Gross Return	-0.8	4.1	38.0	-	-	-	17.7
	Benchmark Return	-1.0	4.9	26.9	-	-	-	7.7
	<b>Net Excess Return</b>	<b>0.2</b>	<b>-1.0</b>	<b>7.8</b>	-	-	-	<b>7.2</b>
Gross Excess Return		0.2	-0.8	11.1	-	-	-	10.0

Note: Performance reporting for the Antares Ex-20 Equities Fund commenced on 2 October 2019. Monthly reports can be accessed on the Antares Equities website. Inception for Antares Australian Equities Fund (3/7/1995), Dividend Builder (6/9/2005), Elite Opportunities (18/11/2002), High Growth Shares (7/12/1999) and Listed Property (28/2/1994).

**Disclaimer:**<sup>1</sup> Past performance is not a reliable indicator of future performance. Returns are not guaranteed and actual returns may vary from any target returns described in this document. Investment returns are based on exit prices, and are net of management fees and assume reinvestment of all distributions. Gross returns are provided to show performance against the investment objective.<sup>2</sup>Income yield is calculated as the sum of the income yields over the period to 30 June where the yield is income distributed during the period divided by the unit price (before fees) at the start of the distribution period. Benchmark yield is calculated as the sum of the monthly returns of the S&P/ASX 200 Industrials Total Return Index minus the monthly returns of the S&P/ASX 200 Industrials Index (price index)

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Antares Capital Partners Ltd, Room T2 Level 2, Pier 1, 800 Bourke Street Docklands, Vic 3008 GPO Box 2007, Melbourne VIC 3001 Telephone: 1800 671 849; Email: [investorservices@antaresequities.com.au](mailto:investorservices@antaresequities.com.au) Website: [www.antarescapital.com.au](http://www.antarescapital.com.au).

## Get in contact

**[antarescapital.com.au](http://antarescapital.com.au)**

Toll free: 1800 671 849

Email: [investorservices@antaresequities.com.au](mailto:investorservices@antaresequities.com.au)

Mail: GPO Box 2007 Melbourne VIC 3001