**INVESTOR PRESENTATION** 

**DEVELOPING A WORLD-CLASS** HALLOYSITE-KAOLIN PROJECT



Andromeda

METALS



**ASX:ADN** www.andromet.com.au



## **CORPORATE OVERVIEW**

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\$573M MARKET CAPITALISATION \$6.8M CASH \$0M

1,978M

FULLY PAID

ORDINARY SHARES

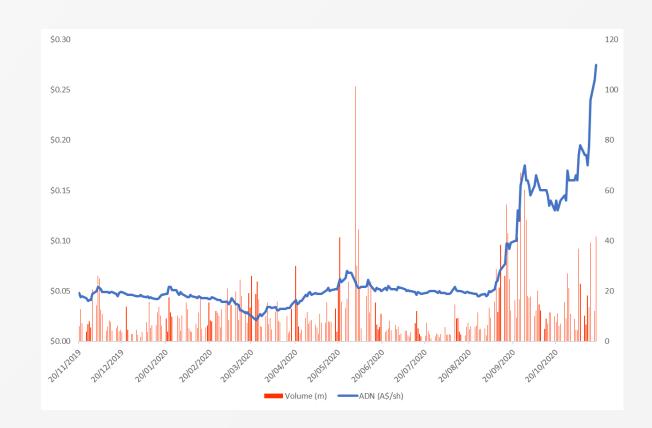
\$0.29c CURRENT SHARE PRICE

#### **OPTIONS**

• 171,932,838 listed (\$0.012 & expiry 30 Nov 2020)

#### **BOARD MEMBERS**

- Rhod Grivas Non Executive Chairman
- James Marsh Managing Director
- Joe Ranford Operations Director
- Nick Harding Finance Director
- Andrew Shearer Non Executive Director



## **ANDROMEDA ASSETS**

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### **HALLOYSITE-KAOLIN**

PRIMARY FOCUS

Great White Kaolin (ADN 75% JV with MEP 25%) and Mount Hope (100%)
Projects in South Australia

ADDITIONAL

#### **GOLD**

Evolution Mining JV Gold in Qld

Cobra Resources JV
Gold in SA

Gold Tenements
Pilbara WA

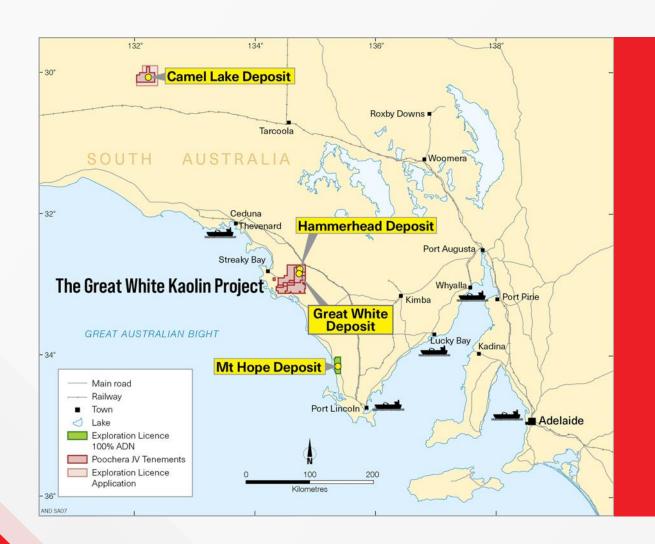
#### **COPPER**

Environmental Copper Recovery JV Copper in SA



## **GREAT WHITE KAOLIN PROJECT**

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# Primary Project Focus – Halloysite-Kaolin

- Great White one of the world's largest known high-purity halloysite-kaolin Reserves & Resources
- Current total resources of approx. 100Mt
- Located close to essential infrastructure
- Extremely robust Pre-Feasibility Study
- Multiple opportunities in Halloysite Nanotube Technologies
- High Purity Alumina (HPA) testwork continuing options under evaluation



## **KEY TAKEOUT**

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Andromeda Metals is a low capex, short payback period, large scale potential Halloysite- Kaolin miner



You already use Kaolin in a vast number of applications, every day and halloysite is much more valuable version



Global supply of high-quality
halloysite-kaolin is reducing –
Offtake LOI's for almost 1
million/tpa

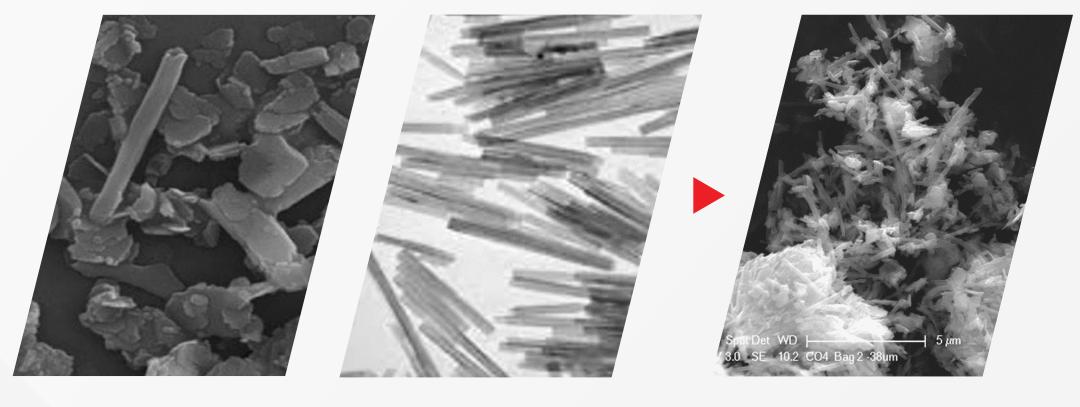


Andromeda aims to be the largest supplier of Halloysite-Kaolin and a world leader in associated nanotechnology



## WHAT IS HALLOYSITE-KAOLIN

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**Kaolinite Plates** 

Halloysite Tubes

The Great White Resource is a naturally occurring blend of tubes and plates



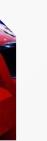
## **KAOLIN USES**

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# You already use kaolin in a vast number of applications, everyday



Ceramics



Transport



Medical



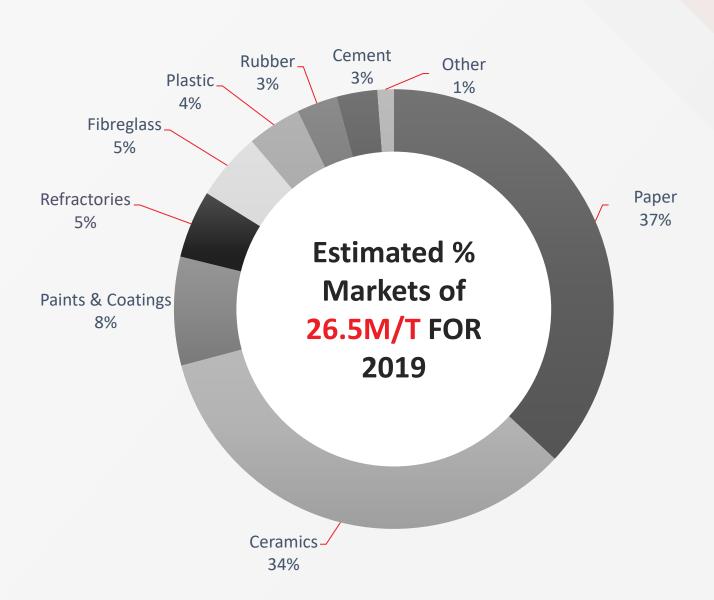
Plastic



Paint & Coatings



Product

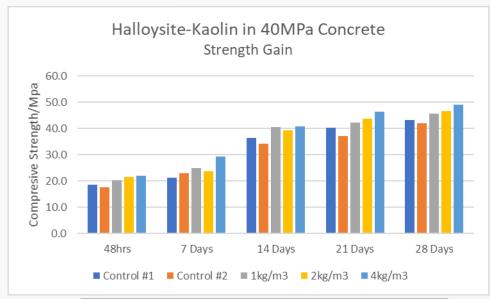


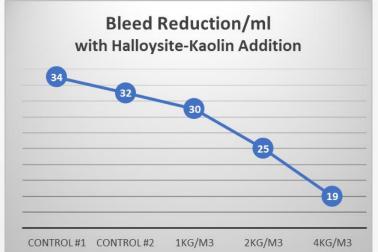


## **NEW HALLOYSITE-KAOLIN APPLICATION**

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#### **Exciting New Applications in Construction Products**







Halloysite-Kaolin Rheology Modifier being tested in a range of construction products



Addition levels as low as 1kg/m<sup>3</sup> of concrete show clear positive benefits in handling and strength



Australian Industry Standards
certification will be achieved on Nov
25<sup>th</sup> 2020



This opportunity represents a new huge high-value market with true global reach

## **HALLOYSITE & NANOTECHNOLOGY USES**

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# Most researched clay mineral in the world Use only constrained by supply shortage

>8000 Papers and 100's of Patents Granted

Great White Project halloysite is being tested in numerous emerging and existing applications

The Andromeda Metals/Minotaur Exploration 50:50 joint
R&D company Natural Nanotech along with funding
partners will have a \$1.5 million pilot production plant for
Carbon Capture operational this year to facilitate
commercialisation



Hydrogen Storage and Transport



Medical Delivery of Drugs



Construction



Batteries and Super-Capacitors



Carbon Dioxide
Capture/Storage and
Conversion to Fuels



**Polymers and Coatings** 



Water Purification



Agriculture/Delivery of Herbicides & fertilisers

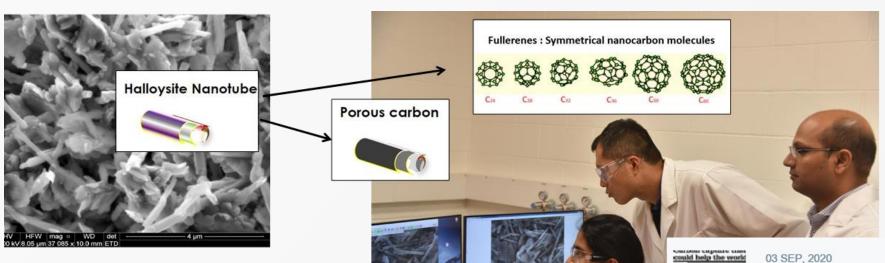


Remediation of contaminated soils



## **COMMERCIALISATION PROGRESS**

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Research Team: **University of Newcastle Global Innovation Centre Advanced Nanomaterials** 

Carbon capture that could help the world

Newcastle Herald, Newcastle

Sample	BET S.A (m <sup>2</sup> /g)	CO <sub>2</sub> adsorbed (mmol/g)	CO <sub>2</sub> adsorbed/ unit area (µmol)
Halloysite (PW90 B)	22	2.17	9.9
Halloysite Carbon	1076	19.5	18.1
Doped HC	416	8.7	20.9
Activated Carbon	747	3.7	4.9
Multi walled CNT	250	5.6	22.4

#### BY DAMON CRONSHAW

A \$1.5 million pilot production plant will be established at the University of Newcastle to develop nanomaterials that capture carbon dioxide, giving fresh hope to humanity's need to tackle climate change.

Professor Ajayan Vinu said the aim was to adsorb carbon emissions from coalfired power plants and the environment and convert it to clean fuel.



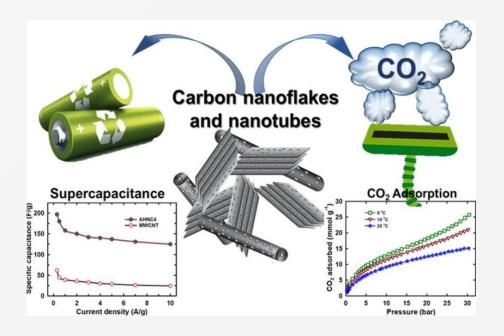
## CARBON CAPTURE IS LEADING THE WAY

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Professor Ajayan Vinu: Global Innovation Centre for Advanced Nanomaterials

..."the Great White halloysite-kaolin has been successfully synthesized to create advanced nanomaterials to specifically adsorb CO2 from a mixture of gases, up to 1.1 tonne of CO2 per tonne of material has been achieved and we are working at capturing 2 tonne of CO2 per tonne of material.

We are now constructing a pilot plant to make larger quantities of material for commercial scale testwork including converting the captured CO2 into methanol. If we can get this right, and install it in CO2 producing power plants and cement works, we can significantly reduce CO2 emissions and create a new Australian industry with global application"...





## **CURRENT HIGHLIGHTS**

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## **Great White Project PFS**

- 12.5Mt Ore Reserve\*
- High Halloysite component 9.7Mt
- NPV of A\$736m (pre tax / 8% discount rate)
- EBITA (LOM) A\$2.06B
- 26 year mine life (@500ktpa)
- 15 month payback
- IRR of 175%

#### **Mid Term**

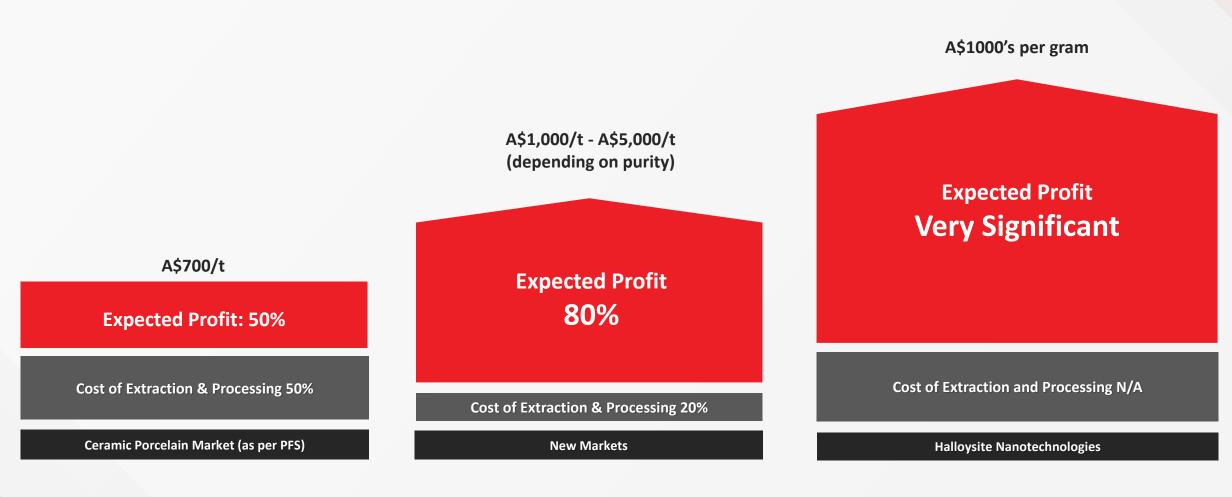
- Concrete application developments
- High purity halloysite
- Ultra high-purity kaolin evaluation
- Nanotechnology commercialisation
- High Purity Alumina

<sup>\*</sup> Andromeda ASX Announcement July 10 2020 – 'Maiden Ore Reserve for Carey's Well Deposit'



## **MARKET VALUE OVERVIEW**

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(1) Project economics have been established on market research provided by First Test Minerals a world authority on clay materials. The high grade, rare halloysite-kaolin product commands a US\$500/t (Ã\$700/t price) in the ceramics industries of China, and a number of countries throughout Asia, the Middle East, and Europe.

Not to scale

## **SO WHAT'S NEXT?**

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#### **IN PROGRESS**

- Definitive/Bankable Feasibility Study
- Mining lease approvals
- Ceramic customers final approvals
- Concrete and mine backfill application testing
- Secure an HPA alliance/collaboration partner
- Halloysite nanotechnology research and commercialisation

#### **ONGOING**

- Evaluation of additional industrial mineral opportunities
- High purity halloysite resource investigations

#### 2020/2021

- Additional halloysite-kaolin and ultra-high purity kaolin resources
- Customer offtake agreements for multiple applications

#### 2021

Obtain high purity halloysite resources

#### 2022

• Commencement of operations at Great White - Early 2022



## **IN SUMMARY**

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Andromeda has one of the world's largest resources of halloysite-kaolin



Simple business model with low impact mining



This is a high value industrial mineral selling into a low-volatility market



Andromeda is well positioned to become the world's leading producer of this mineral



Global demand is increasing, and supply is decreasing



Huge potential in new applications including concrete, nanotube technologies and HPA



Low capex project with a short timeline to operation



Opportunities to build a diversified industrial minerals business

# **THANK YOU**

#### **James Marsh**

Managing Director james.marsh@andromet.com.au



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#### **Cautionary Statements**

The preliminary feasibility study (Pre-Feasibility Study, PFS) referred to in this announcement has been undertaken to study a range of options to produce high-quality halloysite-kaolin product from the Kaolin Resource at Poochera in South Australia in order to provide Andromeda Metals with a basis for more detailed Definitive Feasibilities Studies for the Project. It is a technical and economic study to identify preferred mining, processing and infrastructure requirements but it has not finalised these. The PFS work has advanced assessments of environmental and socio-economic impacts and requirements but these are also not finalised. The estimation of ore reserves is yet to be done.

The Production Target referred to in this announcement is based on this PFS and supported mainly by Measured and Indicated Resources and only minor Inferred Resources. Andromeda Metals has concluded that it has reasonable grounds for disclosing a Production Target, however there is no certainty that the Production Target or the economic assessment will be realised.

The PFS is based on the material assumptions outlined elsewhere in this announcement. These include assumptions about the availability of funding. While Andromeda Metals considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the PFS will be achieved.

To achieve the range of outcomes indicated in the PFS, funding in the order of A\$28M, inclusive of working capital, is likely be required. Investors should note that there is no certainty that Andromeda Metals will be able to raise that amount of funding when needed. It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of Andromeda Metals' existing shares. It is also possible that Andromeda Metals could pursue other 'value realisation' strategies to provide alternative funding options.

Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the PFS.

This announcement includes forward looking statements. For further information on forward looking statements please refer to the end of this release.

#### **Forward Looking Statements**

Some of the statements contained in this report are forward looking statements. Forward looking statements, include, but are not limited to, statements concerning estimates of tonnages, expected costs, statements relating to the continued advancement of Andromeda's projects and other statements that are not historical facts. When used in this report, and on other published information of Andromeda, the words such as 'aim', 'could', 'estimate', 'expect', 'intend', 'may', 'potential', 'should' and similar expressions are forward looking statements. Although Andromeda believes that its expectations reflected in the forward-looking statements are reasonable, such statements involve risks and uncertainties and no assurance can be given that actual results will be consistent with these forward-looking statements. Various factors could cause actual results to differ from these forward looking statements include the potential that Andromeda's project may experience technical, geological, metallurgical and mechanical problems, changes in market prices and other risks not anticipated by Andromeda. Andromeda is pleased to report this summary of the Study in a fair and balanced way and believes that it has a reasonable basis for making the forward-looking statements in this announcement, including with respect to any mining of mineralised material, modifying factors, production targets and operating cost estimates.

This announcement has been compiled by Andromeda from the information provided by the various contributors. All financial assumptions and estimates are quoted in Australian Dollars ('A\$' or 'AUD') only, unless indicated otherwise.

#### **Competent Person's Statements**

Information in this announcement has been compiled by Mr James Marsh a member of The Australasian Institute of Mining and Metallurgy (AusIMM). Mr Marsh is an employee of Andromeda Metals Limited who holds shares and options in the company and has sufficient experience, which is relevant to the style of mineralisation, type of deposits and their ore recovery under consideration and to the activity being undertaking to qualify as Competent Persons under the 2012 Edition of the 'Australasian Code for reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC Code). This includes Mr Marsh attaining over 30 years of experience in kaolin processing and applications. Mr Marsh consents to the inclusion in the report of the matters based on the information in the form and context in which it appears.