

### **Disclaimer**

#### FORWARD LOOKING STATEMENTS

This presentation includes certain forward-looking statements of Eden's management. Forward-looking statements are statements that contemplate the happening of possible future events and are not based on historical fact. Forward-looking statements may be identified by the use of forward-looking terminology, such as "may", "shall", "could", "expect", "estimate", "anticipate", "predict", "probable", "possible", "should", "continue", or similar terms, variations of those terms or the negative of those terms. Forward-looking statements should not be read as a guarantee of future performance or results and may not be accurate indications of when or whether such performance or results will be achieved. Forward-looking statements are based on information known to Eden when those statements are made or management's good faith belief as of that time with respect to future events and are subject to risks and uncertainties that could cause actual performance or results to differ materially from those expressed in or suggested by the forward-looking statements. The forward-looking statements specified in this presentation have been compiled by Eden's management on the basis of assumptions (which may or may not turn out to be accurate) made by management and considered by management to be reasonable. Eden's future operating results, however, are impossible to predict because of risks and uncertainties, and no representation, guarantee, or warranty is to be inferred from those forward-looking statements. You are cautioned not to place undue reliance on these forward-looking statements.



#### **Disclaimer Cont.**

#### Forward-looking statements include, but are not limited to, the following:

Statements relating to Eden's future production capacity and sales levels, and business and financial performance; Statements relating to future research and development results and regulatory approvals of Eden's products; Statements relating to Eden's competitive position; and Other statements relating to future developments that you may take into consideration. Actual results of Eden's operations may differ materially from information contained in the forward-looking statements as a result of risk factors some of which include, among other things: global economic stability, continued compliance with government regulations regarding production and use of carbon nanotubes in the U.S. or any other jurisdiction in which Eden conducts its operations; changing legislation or regulatory environments in the U.S. and any other jurisdiction in which Eden conducts its operations; credit risks and product sales affecting Eden's revenue and profitability; exposure to product liability claims; changes and new competitive products in the specialty concrete admixture industry; the level of market acceptance and demand for EdenCrete<sup>TM</sup>; Eden's ability to effectively market all the product it can produce; Eden's ability to manage its growth, including implementing effective controls and procedures and attracting and retaining key management and personnel; changing interpretations of generally accepted accounting principles; the availability of capital resources, including in the form of capital markets financing opportunities; and general economic conditions.

This presentation has been prepared as a summary only and does not contain all information relating to Eden's assets and liabilities, financial position and performance, profits and losses and prospects: it should be read in conjunction with all of the publicly available information in relation to Eden which has been released to the Australian Securities Exchange (ASX Code: EDE).







## **Company Overview**

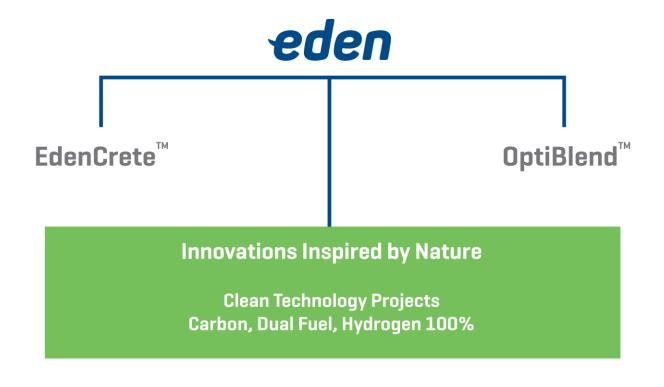
9	Issuer	Eden Energy Limited
נו מ	Exchange/Symbol	ASX: EDE
	Stock Price <sup>(1)</sup>	A\$0.23
D	Market Cap <sup>(1)</sup>	A\$280 million (EDE only)
	Cash <sup>(2)</sup>	≈A\$15.5 million
15	Debt	A\$0.00

1) As of 25 October 2016



## **Company Overview**

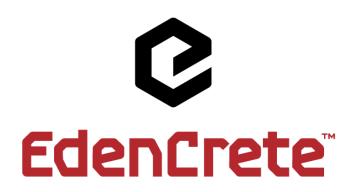






#### **EdenCrete**<sup>™</sup>

- - EdenCrete™ outperforms other admixtures by optimizing strength and other characteristics
- Permits use of less cement, concrete and/or steel reinforcement for same structural integrity



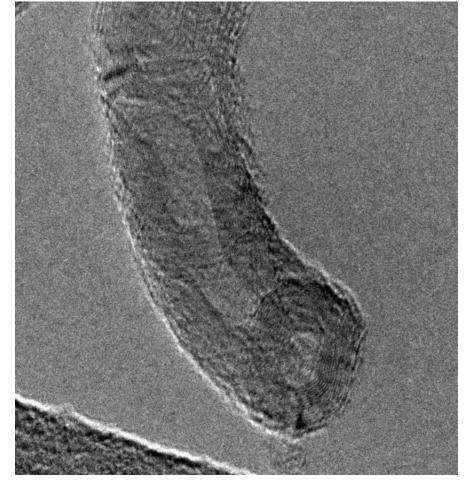
## Carbon Nanotubes (CNT)

Tensile Strength: 200-300x steel

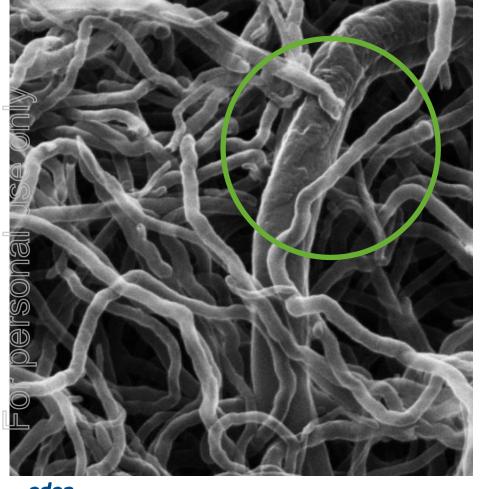
Weight: ~17% of weight of steel

**Strengthens concrete, plastics** 

Produces more durable concrete







#### **CNT in Concrete**

#### **CNT** provide:

- Nucleation points for cement hydration
- Ultra-strong nano-scale fibre re-enforcement

# **CNT** facilitate denser, tougher and stronger concrete

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Monash University - helium ion microscope image - CNT in fresh cement paste

	Products	Increases Compress ive Strength	Increases Split- Tensile Strength	Increases Flexural Strength	Reduces Shrinkage	Reduces Permeability	Increases Abrasion Resistance	Drawback
	denCrete						•	None
9	Fibers PP,PVA,ACRY- LOK)		•	•	•			Reduced workability, difficult to handle
7.7	Shrinkage Reducers				•			Strength reduction, expensive, reduces workability, impacts entrained air
	Steel Reinforcement	•			•			Expensive, corrosion potential, weight factor, job-site safety
	Surface Hardener					•	•	Potential alkali-silica reaction
	Bilica Fume, Fly Ash	•				•	•	Expensive, increased water, hard to handle, worker/workplace safety
5	Steel Fibres	•						Reduced workability, difficult to handle, job-site safety

## **CNT** in Concrete Applications



**Increased Abrasion Resistance** 

Road & bridges surfaces

pavements, floors



## Lower Permeability / Lower Shrinkage

Roads, bridges, runaways

Coastal and marine applications

Dams, spillways, sewer/water pipelines



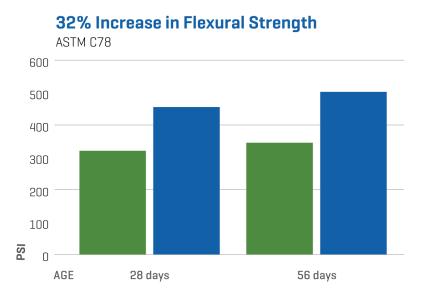
## Increased Compressive and Tensile Strength

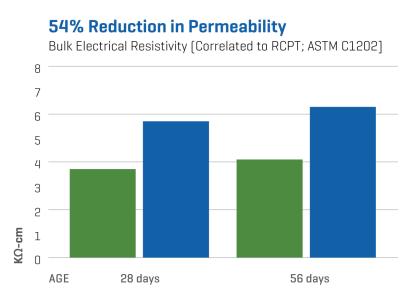
High rise buildings, bridges, retaining walls, pre-fabricated



#### **U.S and Australian Concrete Trials 2015-16**





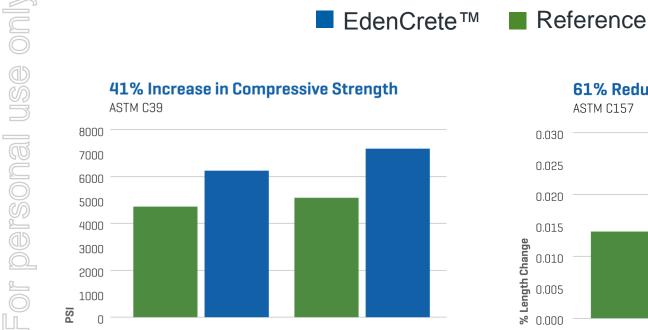


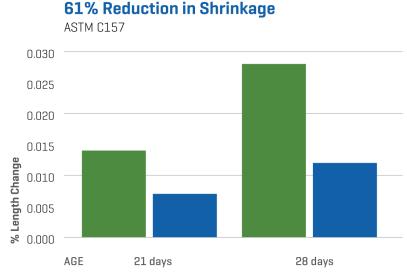


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#### U.S and Australian Concrete Trials 2015-16

56 days







0

AGE

28 days

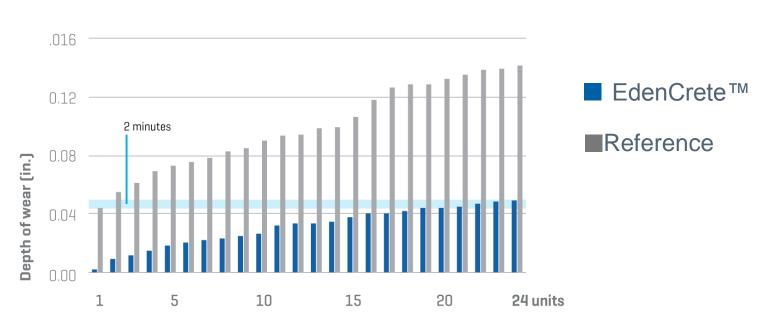
## ASTM C494 "S" - Results to 180 days

Testing by Intelligent Concrete LLC. Intelligent Concrete is entitled to receive royalties on sales of EdenCrete <sup>TM</sup>	% Increase of EdenCrete™ (4gal/yd³) Over Reference Age (Days)								
Test	1	3	7	28	56	90	180	365	
Compressive Strength (ASTM C39)	25%	35%	39%	41%	41%	39%	38%	12/16	
Flexural Strength (ASTM C78)		25%	19%	32%	Complete				
Split-tensile Strength (ACTM C496)	19% 22% Complete						Э		
Abrasion Resistance (ASTM C779 Proc C)					56%	59%	Com	plete	
Length Change (Shrinkage)(ASTM C157)	61% Reduction; Complete								
Time of Set (ASTM C403)	Reduced: Initial set 3 min, final set 4 min; Complete								
Freeze/Thaw Resistance (ASTM C666)	Reference 88.0, EdenCrete 96.4 – 9.5% enhancement; Complete								

#### **EdenCrete™ – Abrasion Resistance**

## **59% Increase in Abrasion Resistance**

ASTM C779, Proc. C





For personal use

#### **GDOT I-20 Trial**

August 2015

#### Improvement with EdenCrete™

Compressive Strength - 45.8% at 56 days

Abrasion resistance – 56% at 56 days

#### **Outcomes**

(20 min trial)

- GDOT approval to use in 24hr mix B class concrete
- 2<sup>nd</sup> field trial, class A concrete Q2/Q3 2016

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## **GDOT I-20 Field Trial – Update October 2016**



EdenCrete™ – No Visible Cracking

Control - Visible Crack Across Slab



## **Anticipated Cumulative Cost Comparison\***

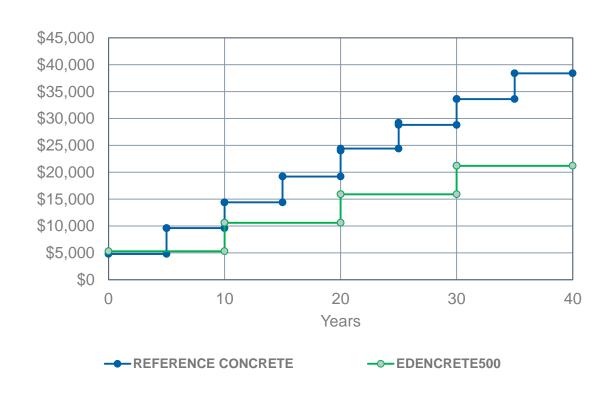
#### **Cost Benefit Analysis**

- Projected Extra Cost For GDOT
  - ightharpoonup GDOT costs /yd<sup>3</sup>  $\approx$  3% 20%
  - > Application Rate will vary for different targeted applications
- Anticipated Increased Service Life >100%
- Anticipated IRR < 50%+</li>
- Using EdenCrete™ , 60% more repairs achieved on the same budget in 25 yrs\*

<sup>\*</sup> Based on GDOT actual costs for I-20 Field Trial

## **Anticipated Cumulative Cost Comparison\***







## EdenCrete™ Performance versus Dose (Gallons per Yard)

Dosage Gallons/yd <sup>3</sup> *	Compressive	Flexural	Tensile	Abrasion Resistance	Shrinkage
1/8	15%	5%	7%	5%	6%
1/4	17%	7%	12%	13%	18%
1/2	19%	9%	16%	31%	22%
1	19%	11%	21%	33%	24%
2	28%	16%	27%	40%	27%
3	27%	26%	33%	43%	29%
4	41%	32%	46%	59%	39%

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<sup>\* 1</sup> gallon = 3.785 litres 1 yd<sup>3</sup> = 0.7464 m<sup>3</sup>

## **EdenCreteTM – First Commercial Project**

#### **Ultra High Wear / Abrasion Resistance Application**



Control Trial Slab
Significant cracks and
wear after 6 months



Typical ultra high load/ abrasive application at site



EdenCrete Trial Slab

No cracks of evidence of

wear

## **EdenCreteTM – First Commercial Project**

#### Itra High Wear/Abrasion Resistance Application

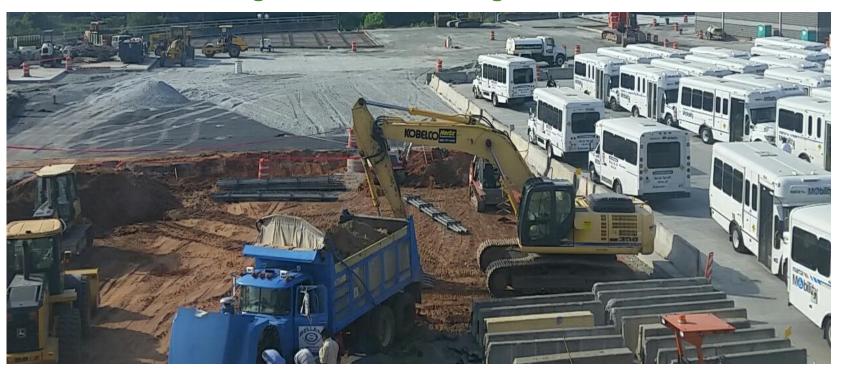
- 50% thickness vs new ultra high strength slab
- Only EdenCrete<sup>™</sup> used (no steel mesh or rebar).
- No significant sub-base preparations
- At least a comparable 5-year service life expected
- Total cost saving of approximately 45%





#### First Commercial Infrastructure Contact for EdenCreteTM

Georgia MARTA Bus Garage - Atlanta, GA





## **EdenCrete™ First Infrastructure Project**

#### **Georgia MARTA Bus Garage**

Results – Dosage rate:3 gallons/ yard³

- Compressive Strength Increase 38%
- Split Tensile Strength Increase 59%
- ➤ Modulus of Elasticity Increase 24%
- ➤ Abrasion Resistance Increase 47%
- Shrinkage Reduction 9%

Further order anticipated from MARTA





## **U.S Marketing Update – Initial Targets**

Interstate Highways (≈73,000km\*)

- Use ≈48mt of cement p.a. (≈40% of U.S cement) \*
  - ≈\$40 billion p.a. preservation/maintenance bill \*\*
- Structurally deficient/ functionally obsolete bridges in USA -146,418 or 24% \*\*\*
  - Annual total extra repair and operating costs to motorists US\$66 billion \*\*\*
    - Fixing America's Surface Transportation Act 2015 US \$225bn for highways- 5 yrs
      - \* Source: U.S Geological Survey Fact Sheet 2006-3127
      - \*\* Source: FHWA Highway Statistics 2013
      - \*\*\* Source: U.S DOT DOT Fact Sheet Highlight Grim State of U.S Roads and Bridges (July 9,2015)



## **U.S Marketing Update – Initial Targets**

#### Georgia Infrastructure

GDOT

14,700 bridges – 2,600 structurally deficient/ functionally obsolete\*

GDOT \$1.1bn annual budget – planned 76 lane miles trucks \$2.06bn

200 bridge repairs scheduled over next 2 years

MARTA

\$400m p.a. repairs – planned U.S \$2.6bn expansion of light rail network



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<sup>\*</sup> Source: U.S DOT - DOT Fact Sheet Highlight Grim State of U.S Roads and Bridges (July 9, 2015)

## **U.S Marketing Update - Progress**

#### **GDOT** and Other DOTs

- 1st GDOT Field Trial- I-20
- GDOT approval -24 hr Repair Mix
- GDOT proposes to specify use of EdenCrete<sup>TM</sup> in forthcoming tenders
- 2nd GDOT Field Trial- A Class
- Other DOTs already approached

#### **MARTA**

- 1st MARTA contract
- Further orders awaited



## **U.S Sales and Marketing**

#### Sales Team - Coverage of All Continental U.S

Eight appointed – two managers / six salespeople

#### Over 20 Trials now underway or planned across US:

- Pervious concrete underway
- Pre-cast –underway and scheduled
- Ready mix concrete underway and scheduled
- Low shrinkage concrete suitable for dams underway
- Shotcrete scheduled

#### Sales

Increasing sales anticipated over next six-12 months



## **U.S Production Scale-Up**

Location	Est. Cost US \$	Estimated Output U.S p.a.	Estimated Value <sup>(2)</sup> U.S \$ p.a.	Start Date	Date To Complete	Anticipated Source of Funds
Colorado Stage 1	Funding Complete	108,000 galls p.a.	\$2.7m	Q1 2016	Q2 2016	Equity (completed)
Colorado Stage 2	Funding Complete	≈2.4m galls p.a.	\$50m-62m	Q2 2016	Q1 2017	Equity (completed)
Georgia Stage 1a <sup>(1,3)</sup>	≈\$37m	12.5m galls p.a.	\$312.5m	Q4 2017/Q1 2018	Q1/Q2 2019	Equity, Cashflow, Incentives, Debt
Georgia Stage 1b <sup>(1,3)</sup>	≈\$35m	50m galls p.a. Including Georgia Stage 1a output	\$1.25 billion	2019/2020	2020-2022	Cashflow
Georgia Stage 2	≈\$60m	100m galls p.a. Including Georgia Stages	\$2.5 billion	2020/2021	20220-2023	Cashflow

<sup>(1)</sup> Land in Georgia is sufficient for expansion up to 10 stages (i.e. 500m galls. p.a. output).

<sup>(2)</sup> Based on Current Selling Price of EdenCrete™ - US\$25/ gallon- assumes all targeted production can be achieved and sold.

<sup>(3)</sup> Eden proposes to establish its large scale global production plant in Augusta, Georgia. The State of Georgia and the Augusta Economic Development Authority have agreed to provide a combined US\$24.7 million worth of financial incentives, including an IRB-financed grant of 112 acres of suitable industrial land worth approximately \$2.8 million, construction commitments aggregating approx. \$4.2 million and the balance being largely by way of abatement of future taxes and levies. Eden proposes to supply from Georgia, EdenCrete™ to the entire North American market and also export it to the rest of the world through the Port of Savannah.

### **CNT** in Plastics / Polymers

## UQ/ Eden- ARC Linkage Research Project

Highly Encouraging Preliminary Results with CNT in Nylon 6

- Excellent combination of high modulus (stiffness) and outstanding ductility.
- Superior ductility /comparable tensile strength vs super-tough commercial Nylons.
- Higher tensile strength vs comparable Nylon materials with similar ductility.
- Excellent dispersion of CNT.



### **CNT** in Plastics / Polymers Cont.

# UQ/ Eden- ARC Linkage Research Project

Highly Encouraging Preliminary Results with CNT in Nylon 6

- Visual clarity and transparency potentially suitable for a super-tough-film grade.
- Relatively low-cost processing method.
- Possible suitable future markets automotive and packaging markets.



## Greg Solomon

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**ASX: EDE** 

