

Unleashing the power of glass



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### **Business Overview**



#### Introduction

ClearVue Technologies Limited (CPV) operates in the Building Integrated Photovoltaic (BIPV) sector which involves the integration of solar technology into building components, specifically glass and building surfaces to produce renewable energy

### Key target markets

Agriculture and horticulture
Commercial and residential
Public amenities
Mobile, wearables and IOT applications
Motor vehicles

### Key investment highlights

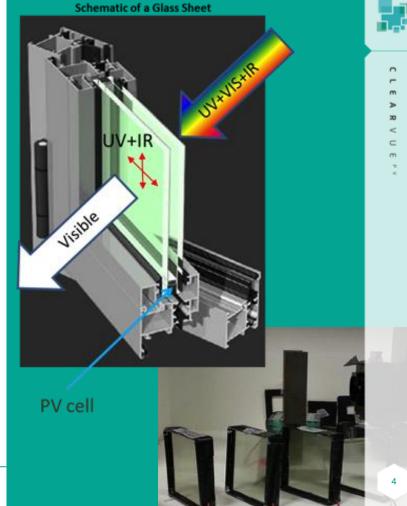
- Advanced building technology that uses clear glass to convert sunlight into energy
- Global market opportunity
- Patented technology 34 granted patents and 39 patent applications throughout the world
- Australian Government support In conjunction with Apex Greenhouses and Edith Cowan University, ClearVue was awarded a \$1.6m grant from the Australian Federal Government



### **Forefront of Nano-Technology**

### ClearVue<sup>PV</sup> has robust IP protection on all products

- Visible light (VIS) passes through the glass
- Micro & Nano particles interact with Ultra Violet (UV) radiation which is converted to longer wavelengths and scattered along with Infrared (IR) light to the edges of glass
- Insulation properties reduce heating and cooling costs
  - IR is collected by PhotoVoltaic (PV) cells Produces electricity
  - Reduces heat and blocks damaging UV and IR radiation



## **Corporate Snapshot**



**ASX code** CPV

**Ordinary shares** 95,020,300

Market capitalisation \$16.1m

(6 June 2018)

Cash raised at IPO \$5.0m

(May 2018)

GICS classification Capital goods

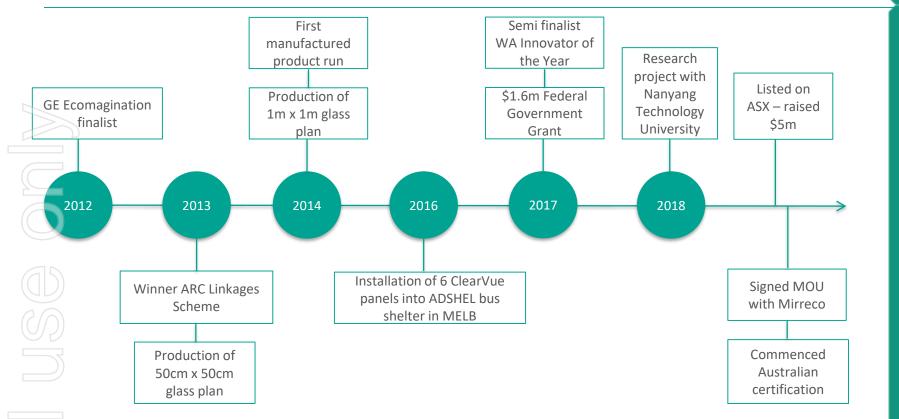
ClearVue secured \$5m through IPO and listed on the ASX on 25 May 2018

- High % of company shares are escrowed for 24 months –
   39,026,956 million in total
- Tight free float with top 20 holding 60.5%



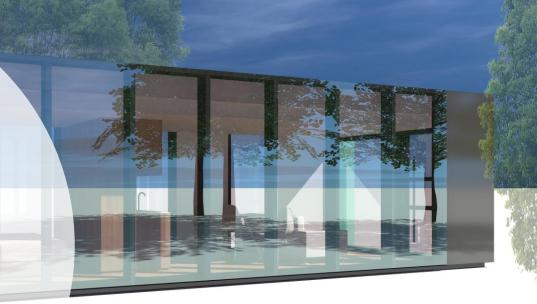








- Australian Standards (AS) certification testing (AS2047) of energy generating window product and curtain wall product (AS4284) has commenced
- Certification of ClearVue window and curtain wall products anticipated in Q3 2018
- ClearVue products to be launched at Australian Window Association's (AWA) Fenestration 2018 conference at Port Douglas, Queensland in September
- ClearVue signed MOU with Mirreco to become exclusive supplier for solar glass windows following successful development of the prototype micro Hemp Eco-home in Q4 2018



MIRRECO



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## **World Class Technology Partners**



ClearVue has partnered with Edith Cowan University (ECU) in Perth Western Australia to develop the IP that can convert a pane of glass into energy

ClearVue has entered into an exclusive agreement for contracted R&D for the development of ClearVue's core technologies.



ClearVue has signed a collaboration agreement for solar printing with Nanyang Technology University (NTU) (Singapore) and Singapore HUJ Alliance for Research and Enterprise Ltd research





### Electricity that could be generated Worldwide - Renewables



975,010 terawatt-hours



# Electricity presently generated Worldwide – Non-renewables dominate



23.322 terawatt-hours

### Ranking the renewables

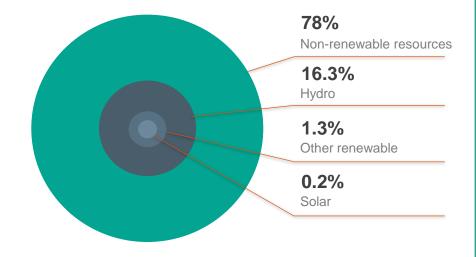
The sun's potential for power generation eclipses that of all other renewable energy sources. But for now solar power barely registers in the world's energy portfolio. It accounts for only a fraction of a percent of total electrical output – much less than hydropower or wind energy, which are cheaper to produce.

745,834 TWh

total solar could be generated

46.6 TWh

current solar's contribution



## **Market Opportunity**



Government legislations and energy needs will drive investments into solar



#### **US\$310 Billion**

investment into clean energy in 2014+ 16%





#### 5,500 million

square metres of glass produced each year



Value of the flat glass market





37%

increase in global energy demand

# Sources: United Nations, Climate Spectator, NanoMarkets

 $For bes-china-leads-the-world-in-renewable-energy-investment\ report\ July\ 2012$ 

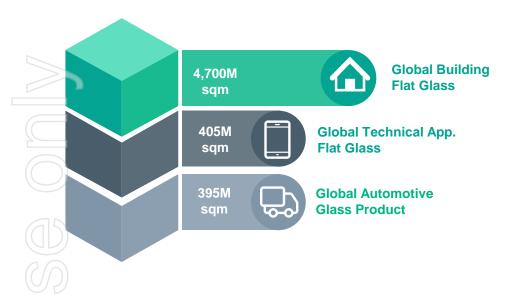
http://www.climatespectator.com.au/news/uk-track-hit-2020-green-energy-targets-decc

http://www.rechargenews.com/business\_area/politics/article323311.ece



### The Glass Market – Overview





Total Glass Market Size 5,500 sqm p.a. worth €23 Billion

#### **Global Glass Market Suppliers**

AGC

15%

SAINT-GOBAIN

14%



13%



12%

**Market share** 

54%

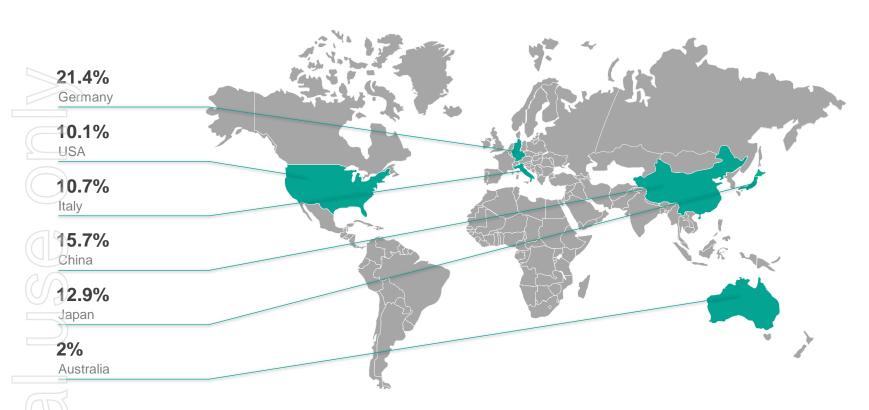
# Source: NSG Group and the Flat Glass Industry Report 2011



## **Solar Installed Capacity by Region**



Solar installed capacity is expected to grow by 1000% by 2030





**FACADE** 







DOOR



**WINDOW** 



**CURTAIN WALL** 



**SKYLIGHT** 



## **Agriculture and Horticulture Applications**



- Food and food security is global multi billion dollar industry. Key markets are China, Spain, Europe and USA.
- Technology presents opportunity for self powering greenhouse
- 26% of all food imported into the United States is a horticulture product.
- ClearVue<sup>PV</sup> granted \$1.6m from Australian Federal Government in Jan 2017 to build a 300-350m<sup>2</sup> greenhouse in conjunction with Apex Greenhouses and Edith Cowan University. Project to commence April 2017.



Architect's drawings of a proposed ClearVue greenhouse

#Source: United States Department of Agriculture

## **Commercial & Residential Applications**

largest market opportunity – at the moment demand is limited by product characteristics - no transparent products

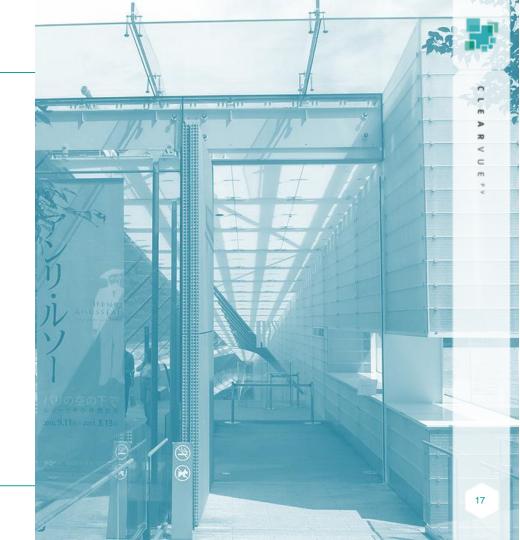
- By 2025 there will be more than 29 mega cities with 10 million plus people
- Buildings can be the source of their own energy needs
  - Insulation properties reduce heating and cooling costs
- Building managers can charge higher rents as the buildings meet a higher green star energy rating
- Sky lights are the fastest new window market in the USA



# Source: UN Report on World Urbanisation & World Energy Outlook Report 2014

## **Public Amenities Applications**

- Recharge mobile phones from a bus stop
- Free energy in public places, e.g. a library
- Provide energy to developing countries in buildings such as schools
- Awnings, Atriums, Sky Lights, Balustrades
- Waste management services and water purification
- ClearVue started bus shelter trial in Dec 2016 in conjunction with AdShel CVPV is being used to power shelter lighting and signage



## Mobile, Wearables and IOT Applications

### Limited by lack of transparent products

- ClearVue<sup>PV</sup> product is designed to cover the display area of electronic products, including wearables, phones, tablets, internet-of-things (IoT) devices, generating electricity to power these devices.
- True transparency is achieved by selectively transmitting light visible to the human eye, while converting invisible ultraviolet and near-infrared light into electricity
- This allows ClearVue<sup>PV</sup> to be integrated directly into the surfaces of electronic products with no degradation of device function or display clarity



## **Upcoming Milestones**



Plan to **certify product** (AS & ISO) in Q4 2018 and **commercialisation** in Q2 2019



Plan to establish manufacturer/ assembler licensees world wide



Continue R&D and products development. The company will be well positioned as the **global leader in** Smart Building Materials

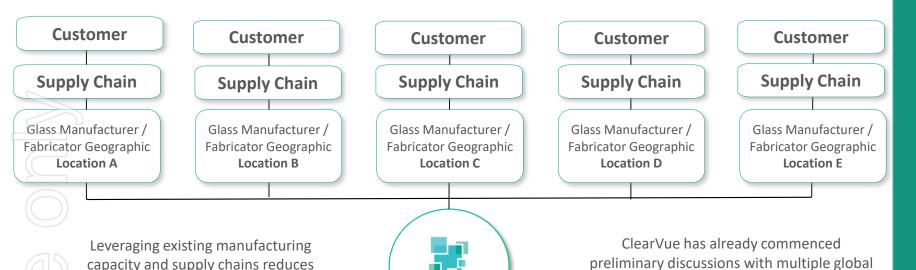


### **Distribution Model**

capacity and supply chains reduces

implementation risk and required capex





**Clear**VuePV

Relationship will be in the form of a ongoing licence agreement

glass manufactures and fabricators.

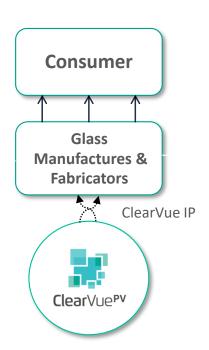
Licensees for Australia, Japan, Singapore China, Europe & United States have been identified

### **Revenue Model**





ClearVue receives royalty from all glass sold



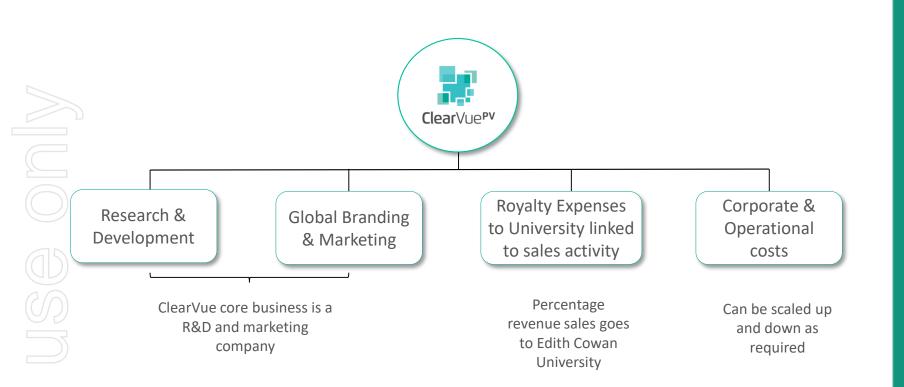
Global Glass Manufactures or Fabricators purchase licence to make or assemble ClearVue glass product directly or through wholesaler

ClearVue will <u>not</u> be the manufacturer of glass



## **Operational Model**





### **Board and Management**



Victor Rosenberg executive chairman/CEO

sales.

Serial
Entrepreneur. co
Globally recognised
for his contributions to
glass industry. exp
Extensive business
experience in senior
management and

Jamie Lyford executive director/ legal counsel

Technology
commercialisation, IP
and licensing lawyer
with over 20 years
experience. Previously
worked in BHP, IT
company ATOS and
ran Western Australia
Government
Innovation Centre

Sean Rosenberg

Member of the
Institute of Chartered
Accountants with over
10 years professional
experience in finance,
auditing and
accounting of listed
corporations

Ivan Wu non-executive/ corporate advisor

Corporate adviser to various private & ASX listed companies with over 20 years of corporate and commercial experience in the IT, resource and gas industries Stuart Carmichael

Member of the Institute of Chartered Accountants with over 20 years accounting and corporate finance experience.
Currently Non-Executive Chairman of Schrole Limited (ASX:SCL) and Serpentine Limited (ASX:S3R) and Non-Executive Director of De.mem Limited (ASX:DEM)



## **Why Invest**





ClearVue<sup>PV</sup> has already received strong product interests from around the world in the building & construction, agriculture and public amenities industries



Strong growth potential expected post commercialisation milestones



Received strong interest in manufacturer/fabricator partnership from Australia, Asia, Europe & MENA



Projected revenue drivers:
Building & Construction
Agriculture
External Applications





# thank you

unlocking the energy in glass



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