



ClearVue^{PV}

CLEARVUE TECHNOLOGIES LIMITED

INVESTOR PRESENTATION

Port Jackson Securities - 23 July 2021

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CAPITAL STRUCTURE & GOVERNANCE

Corporate and Capital Structure



Capital Structure

(as at 19 July 2021)

No debt.

Ordinary Shares on Issue 210,112,365

Options on Issue 13,275,247

AUD \$0.20 exercise price – exp. 31 Dec 2022 – 9,725,247

AUD \$0.25 exercise price – exp. 22 Dec 2023 – 800,000

AUD \$0.1425 exercise price – exp. 11 Jul 2024 – 2,750,000

Performance Shares 3,000,000

Performance Rights 10,000,000

Approx. Market Cap @ \$0.325 ≈ \$68 million

Unaudited Cash Balance (30 June 2021) ≈ \$15.9m

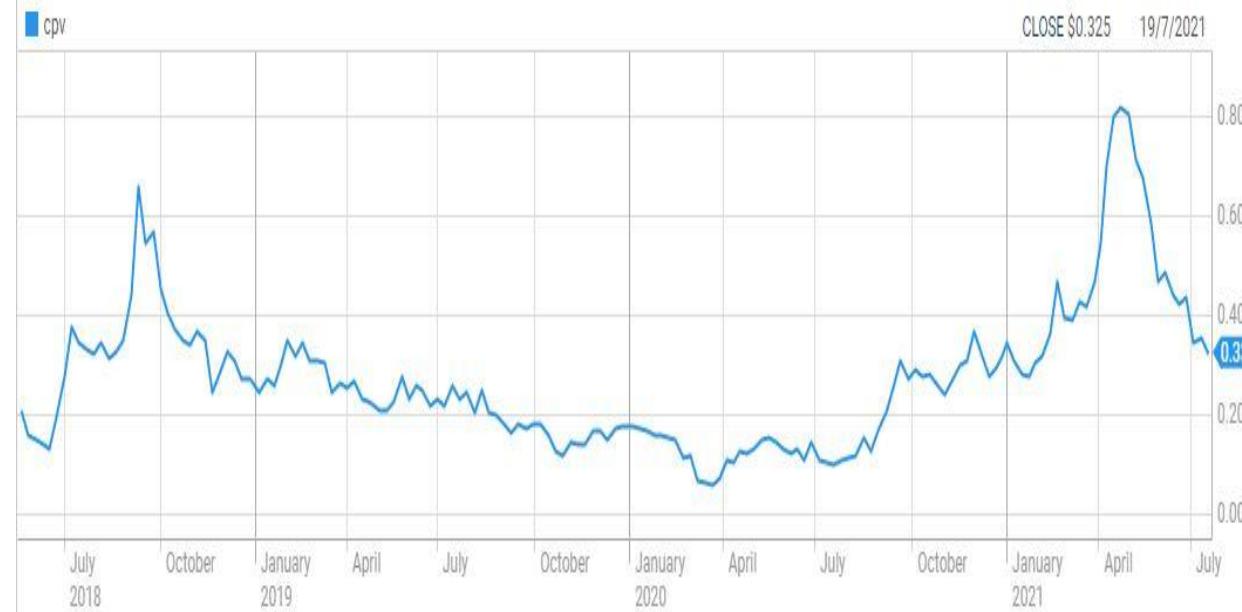
Shareholders

(as at 19 July 2021)

Top 20 holding 43.15% of Issued Capital

15.86% held by board and management

Share Price Performance (25 May 2018 – 19 July 2021)



Board

Directors	Role	Experience	Brief Bio
Victor Rosenberg	Executive Chairman & Founder	25 years glass industry	Serial Entrepreneur. Globally recognised for his contributions to glass industry. Extensive business experience in senior management and sales over approx. 50 years.
Stuart Carmichael	Non-Exec Director	20 years corporate finance	Member of the Institute of Chartered Accountants with over 20 years corporate finance experience. Currently Chairman of Schrole Group Limited (ASX:SCL) and K-TIG Limited (ASX:KTG), and Non-executive Director of De.mem Limited (ASX:DEM), Swick Mining Services (ASX:SWK), Osteopore Limited (ASX: OSX) and Harvest Technology Group (ASX: HTG).
Roger Steinepreis	Non-Exec Director	30 years corporate law	Corporate and resources lawyer with 30+ years' experience. Legal adviser to a number of public companies on a wide range of corporate related matters. Currently serves as Non-Executive Director on various Boards including Petronor E&P Limited (Oslo Access: PNOR), Latitude Consolidated Limited (ASX: LCD), and is Non-Executive Chairman of Apollo Consolidated Limited (ASX: AOP).
Deborah Ho / Brett Tucker	Joint Co Secretaries	Combined over 12 years corporate and compliance	Company Secretaries to a number of ASX listed and private companies and has been involved in numerous public corporate transactions and acquisitions. Mr Tucker is a Chartered Accountant and Ms Ho is an Associate of the Governance Institute of Australia.

Management

Key Management	Role	Experience	Brief Bio
Dieter Moor	European CEO	17 years BIPV industry experience	Former co-founder and CEO of ertex solar GmbH – a leading global BIPV supplier with more than 2000 projects delivered worldwide. Dieter has a background in civil engineering with extensive experience with sales and marketing of BIPV systems gained over the last 30+ years.
Jamie Lyford	COO & GC	25+ years IP law / technology commercialisation	IP and licensing lawyer with over 20 years experience. Previously worked in leading Australian and overseas law firms, BHP, global IT company ATOS and ran Western Australian Government Innovation Centre.
Geoff Edwards	CFO	30 years experience in CFO, senior financial and commercial roles	Geoff is qualified CPA with over 30 years experience in CFO (including ASX listed companies), senior financial and commercial roles across a variety of service organisations. During that time, Geoff has acquired a wealth of knowledge with start ups, mergers and acquisitions, high growth businesses, equity and debt capital raisings, turn arounds, building financial systems and procedures and strategic planning and implementation.

Technical Team

Key Management	Role	Experience	Brief Bio
Steve Coonen	VP Development – Products, Technology & Sales (North America)	38 years experience in photovoltaics; 26 year focus on BIPV	Steve Coonen is a photovoltaic consulting engineer, specializing in building integrated photovoltaics (BIPV) based in California. Mr Coonen is a pioneer in the BIPV field and whilst working on the ClearVue technology development pipeline assists with North American sales opportunities. Mr Coonen currently has over 3,000 BIPV systems fielded to his credit, including the California Academy of Science in San Francisco, the Whitehall Ferry Terminal in Manhattan and 1,500 new houses for Pulte Homes.
Dr Mikhail Vasiliev	Lead Scientist	20+ years physics	Mikhail has extensive science and technology background, from developing fibre-optic sensors and laser interferometers in the 1990's, to the design of solid-state lasers in the 2000's, followed by 15 years of experience as Senior Research Fellow at Edith Cowan University, where he concentrated on nanotechnology and materials science projects and still supervises PhD students. He has contributed to the design and development of Clearvue core components and technologies, including advanced low-e coatings, glazing systems, luminescent/diffractive interlayers, and solar window systems. He is a multi-skilled expert in the fields of optical physics, optical engineering, photonics, nano-engineered functional materials and also in scientific software development. Mikhail has a PhD (Physics), Victoria University (Melbourne, Australia) and has co-authored multiple (> 50) high-impact research articles published in international peer-reviewed journals.
Tao Zhang	Structural Engineer	16+ years engineering	Tao is a chartered professional engineer in both Australia and China with 16+ years experience. Tao works as Project Manager & Senior Technical Officer in ClearVue and leads our technical team on ClearVue product certification programs and is involved in all aspects of ClearVue's R&D efforts. Tao also supports our sales efforts and manages our global OEM manufacturer and supplier relationships.
Chris Cole	Mechatronic Engineer	Graduate mechatronic engineering	A recent graduate of Sydney University with a degree in Mechatronic Engineering (first class honours), Chris has a background installing sensing equipment on solar and wind farms. He is involved in the design, development, construction, programming and testing of our Smart Façade prototypes, and brings a knowledge of integrated software, hardware and AI systems to the team.

COMPANY & TECH OVERVIEW

Company & Technology Overview



Smart Building Technology Company



Creating smart building materials that are:

- Sustainable
- Energy Efficient
- Positive environmental outcomes

Part of the solution for achieving:

- Zero net energy
- Zero net carbon
- Reducing carbon footprint
- *Autonomous* clear functional windows

Technology & Product



A clear glass panel that is:

- Energy saving & producing
- Highly insulating
- Reduces carbon footprint
- Scalable
- Efficient – 3 to 4% conversion of radiance to energy

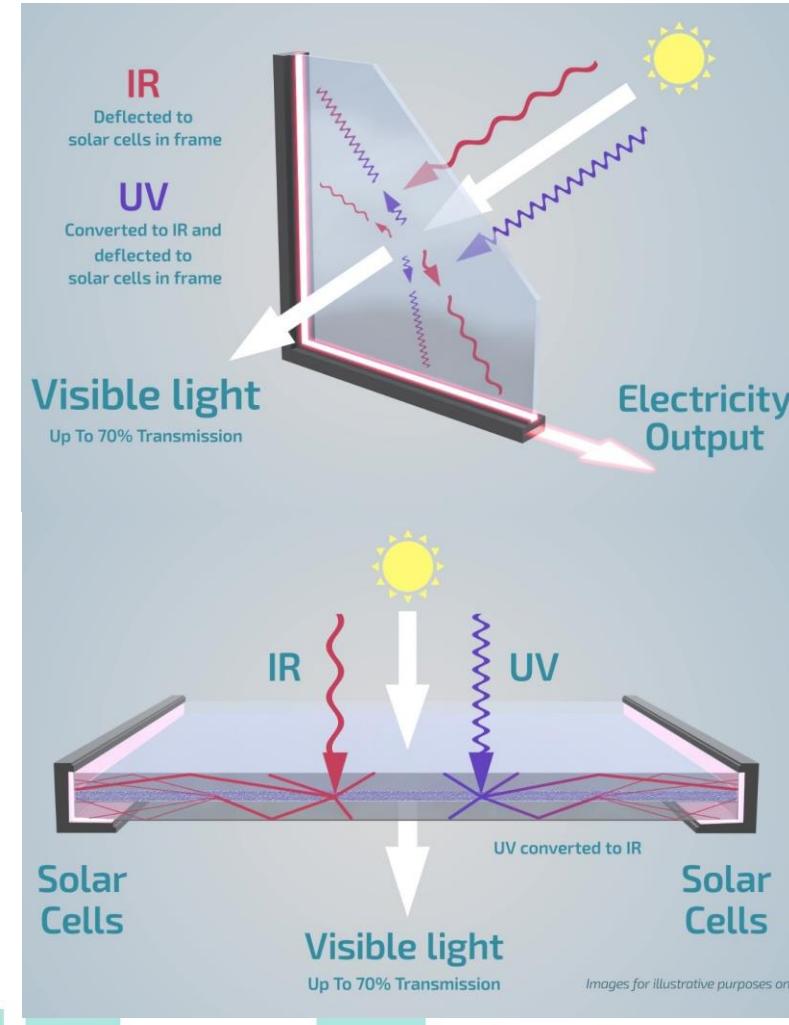
The ClearVue product can be used to achieve:

- *significant energy cost savings*
- *prevent unwanted solar radiation* (UV and IR) from entering a building; and
- then *converting the unwanted radiation into electricity*

Technology Overview



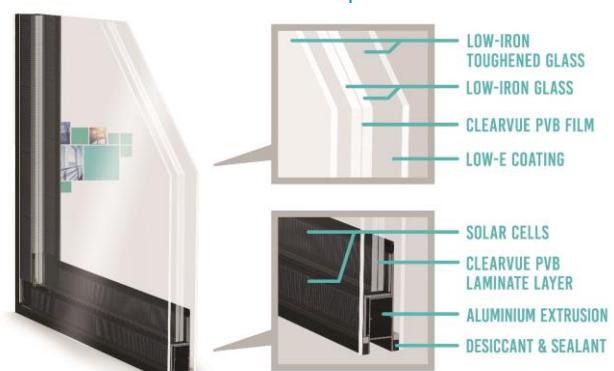
- ClearVue's patented technology sits within an activated interlayer between two panes of glass.
- Visible light (VIS) passes through the glass
- **Micro & nano particles** interact with Ultraviolet (UV) radiation which is down-converted to longer wavelengths and scattered along with Infrared (IR) light to the edges of the glass
- IR is collected by Photovoltaic (PV) cells and **produces electricity**
- Reduces heat and blocks damaging UV and IR radiation
- Insulation properties reduce heating and cooling costs
- Innovation pipeline of new technologies to improve power performance including R&D into inorganic quantum dots



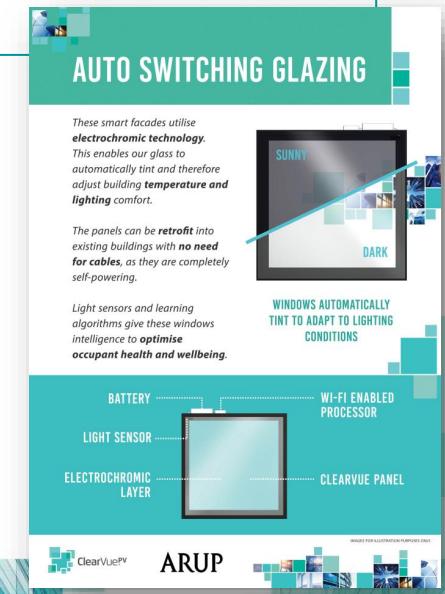
Products/Services Overview



- ❑ Solar PV Glass (Finished IGUs and Framed Windows)
 - ❑ fabricated and supplied by OEM suppliers and sold by ClearVue
 - ❑ Sizes: 3+m high x 1.6m wide (up to approx. 4.8 sqm)
- ❑ Solar PV Components for use by ClearVue licensees
 - ❑ PVB interlayer
 - ❑ Solar PV strips
 - ❑ Gen 2- glass panes with laminated PV
 - ❑ Gen 3 – PVB strips with integrated PV for lamination
- ❑ Royalty on licensee manufactured CPV products
- ❑ Licensee Support Services



- ❑ Smart Façade Panels (finished and framed)
- ❑ Smart Façade Components
 - ❑ Hardware microcontroller incl MPPT/battery controller/WiFi and other comms/IO platform for IOT sensors and devices
- ❑ Building Analytics / Data
 - Data collected, analysed and sold as a service from network of IOT connected windows (at building, community, city, global levels)



Smart Façade Developments



CLOSED CAVITY BLIND

This smart façade uses an **automated blind** to regulate building temperature and lighting comfort. The blind operates within a **closed cavity** and is powered by a small motor that activates in response to outdoor solar conditions and the requirements of the building occupants. Our ClearVue PV panel makes the system fully **self-powered**, removing the need for cabling to the façade.

BATTERY **BLIND MOTOR** **WI-FI ENABLED PROCESSOR**
CLEARVUE PANEL **BLIND OPEN** **BLIND CLOSED**
BLIND WITHIN CLOSED CAVITY

IMAGES FOR ILLUSTRATION PURPOSES ONLY.

ARUP

AUTO SWITCHING GLAZING

These smart facades utilise **electrochromic technology**. This enables our glass to automatically tint and therefore adjust building temperature and lighting comfort. The panels can be **retrofit** into existing buildings with **no need for cables**, as they are completely self-powering. Light sensors and learning algorithms give these windows intelligence to optimise occupant health and wellbeing.

WINDOWS AUTOMATICALLY TINT TO ADAPT TO LIGHTING CONDITIONS

BATTERY **LIGHT SENSOR** **ELECTROCHROMIC LAYER** **WI-FI ENABLED PROCESSOR**
CLEARVUE PANEL

IMAGES FOR ILLUSTRATION PURPOSES ONLY.

ARUP

MULTI-FUNCTION FAÇADE

This self-powered, multi-functional smart façade incorporates a **closed cavity blind** and a **smart ventilation system** to enable optimised control of lighting, temperature and air quality. The environmental multi-sensor monitors **light, temperature and CO₂**. The Wi-Fi enabled processor uses deep learning algorithms to learn the optimal conditions and can control both the blind motor and the ventilation system within the façade.

AUTOMATIC BLIND AND VENTILATION

BLIND MOTOR **BLIND WITHIN CLOSED CAVITY** **FAN**
ENVIRONMENTAL SENSOR **CLEARVUE PANEL** **BATTERY**
WI-FI ENABLED PROCESSOR

IMAGES FOR ILLUSTRATION PURPOSES ONLY.

ARUP

IP & Competitive Advantage Overview



- ❑ 85 granted patents and 40 patent applications throughout the World across 7 patent families covering CPV system and elements of system
- ❑ Design protection undertaken for latest versions of Gen 2 and Gen 3 shingled PV products (know-how and trade secret protection on method of manufacture to be used for these developments as well)
- ❑ Trade Mark protection undertaken in most key markets (SA and NZ proving to be only countries where main ClearVue PV branding may not be registrable – alternatives filed)
- ❑ Domain names (for key trade marks, as well as various generic descriptive type domains)
- ❑ Copyright protection on circuit layouts for hardware controller, software/config files for smart façade controller
- ❑ Market lead in clear solar glass (currently) - (market leader for tinted solar glass is Onyx)
- ❑ Comparative ease of manufacture and hence licensing; low CAPEX for licensees to participate
- ❑ Gen 1 Products Certified - USA – UL; Europe - MEA & IEC; Australia under AGWA & Intertek



Commercialisation Overview



Sales Opportunities

- Commercial High Rise Buildings
- **Protected Cropping – Greenhouses (LHF)**
- Showcase Deployments

Key Factors

- Government incentives
- Government regulation – disincentives
- ESG investment directives
- Climate and Geography
- Market Size

Key Locations

- USA
- Northern Europe (Germany)
- China (JV entry)
- Australia

Manufacturing Supply Chain

- PV Strips – China / Taiwan / US
- Interlayer - Europe / China / US
- Gen 2 Products – US (initially)

Market Entry

- Digital Campaigns & new website
- Licence arrangements (KPI's)
- Direct Marketing (feasibility study's)
- Showcase Deployments

Partners / Promoters

- Architects
- Façade Engineers
- Project Developers
- Property Fund Managers
- Resellers
- Greenhouse developers
- Growers



Small Home Applications



ARCFORMS
DESIGN INNOVATION

MIRRECO™

ClearVuePV

Mirreco mini-home project preparations well underway. Please see 30 September ASX Announcement for information:
<https://www.asx.com.au/asxpdf/20190930/pdf/44902xbqfldxnc.pdf>





Residential Applications

Villa Project
Hebei Province China



Case Study – Shopping Centre at Warwick Grove WA



- ❑ ClearVue has **successfully deployed** its technology at the Vicinity Group's **Warwick Grove Shopping Centre** in Western Australia.
- ❑ The atrium entry glass includes 18 of ClearVue PV's triple-glazed, low-e, power-generating IGU panels.
- ❑ The PV glass charges a battery for energy storage and is providing power for lighting and outside signage.
- ❑ Live data of power being generated is being publicly displayed on site inside the centre to provide centre management an insight into energy management and cost savings.
- ❑ **Peer-reviewed high-impact paper** published 24 September 2019 on the performance and efficacy of the Warwick Grove installation **confirms power performance and commercial importance** of the ClearVue product and technology. Paper reached **top 5% readership of all published research papers globally** shortly after publication.¹



¹ See: ASX Announcement <https://www.asx.com.au/asxpdf/20190930/pdf/44902xbqfldxnc.pdf> and Media Release <http://www.clearvuepv.com/scientific-paper-validating-cpv-technology-trending-globally-in-top-10-of-research-publications-tracked/>

Quantum Dot Research | Exciton CRC, Melbourne University & RMIT

- Article - pvMagazine, June 29 | Bella Peacock

“Nanoparticles enable completely clear, industry sized solar windows, targeting 5% efficiency”.



The European Energy Efficiency Fund (eef) Retweeted

ClearVue PV @ClearVuePV · 29.06.21

ClearVue featured in new PV Magazine Australia article ...

#ClearVue #ClearVuePV #solarglass
#solarwindows #BIPV #WIPV
#solargreenhouses #smartfacades
#smartcities #renewables #sustainability

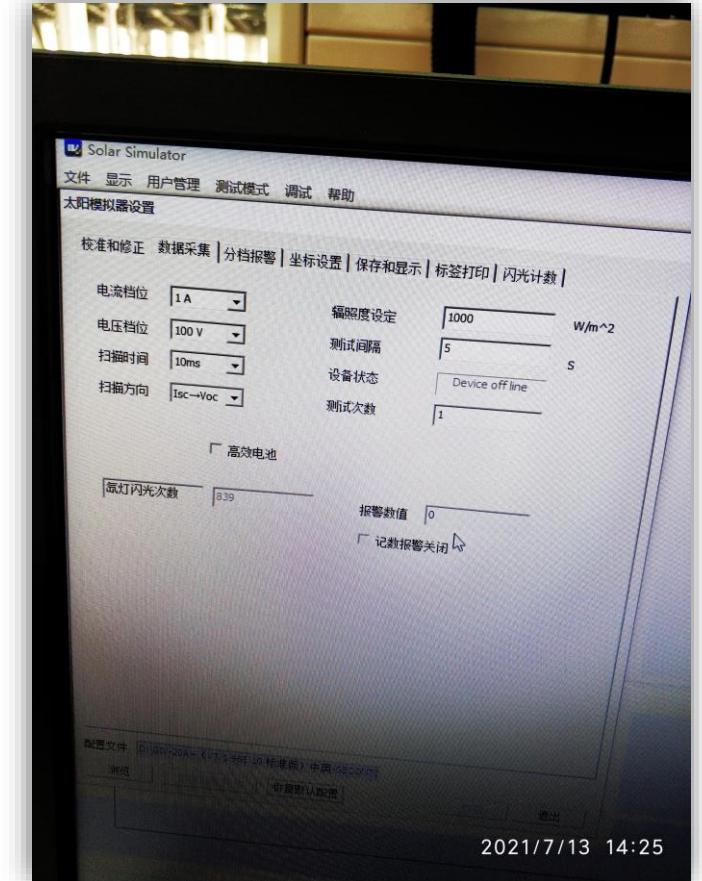
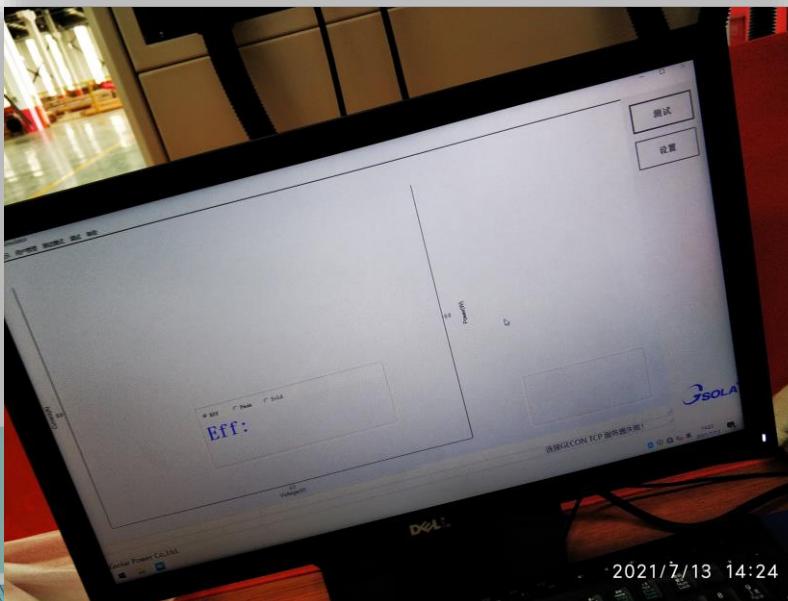
A small image of a man in a suit standing in front of a large glass building, likely the Melbourne University or RMIT facility mentioned in the text.

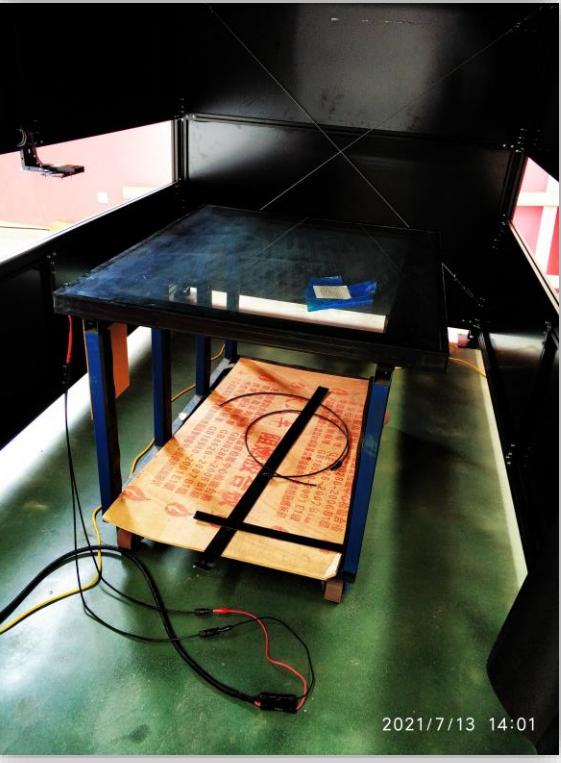
Nanoparticles enable completely clear, industry-si...
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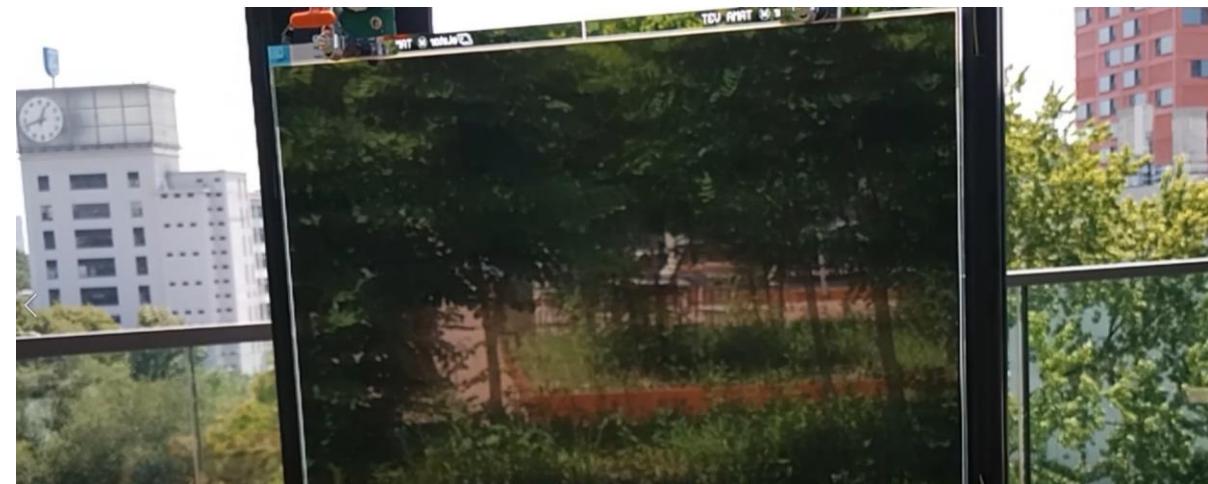
Product Quality Control – Testing Equipment

- Flash Tester
- Wet Leakage Tester
- Withstanding Voltage Insulation Resistance Tester





eLstar Dynamics BV – Joint Venture



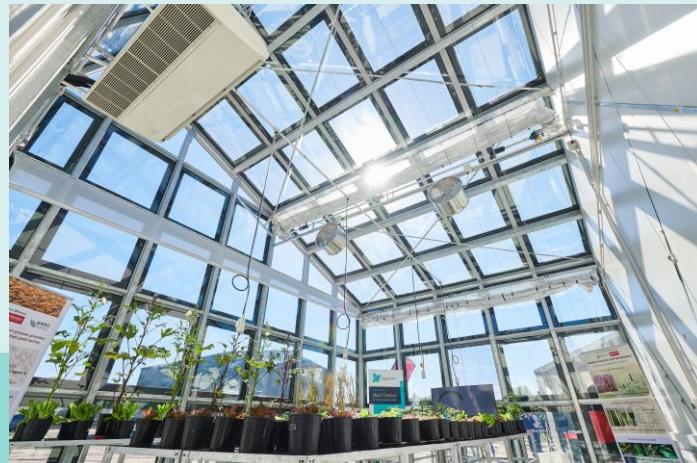
View through eLstar's latest prototypes in states of transition.

Murdoch University Solar Glass Greenhouse

- Officially opened 19 April 2021
- World first clear solar glass greenhouse
- Why is it so significant?
 - Renewable energy for sustainable food production
 - Environmental sustainability
 - Improved human health benefits
 - Higher crop yields
 - Supports agricultural research & development



Murdoch University Solar Glass Greenhouse



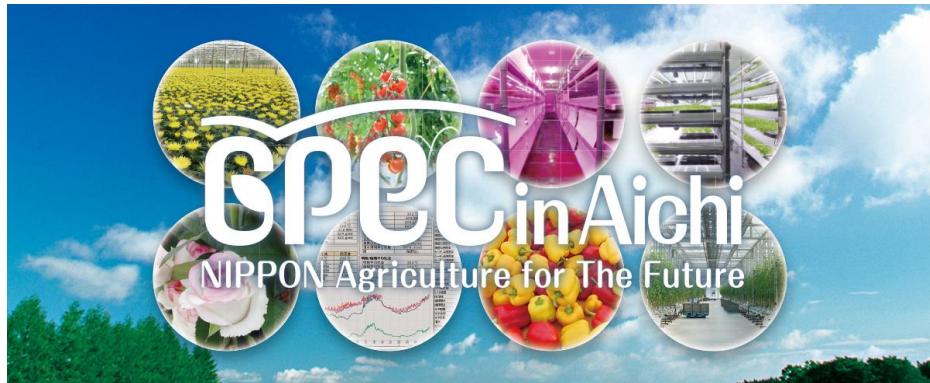
- Glazing and power performance data collection and analysis underway.
- Plant science trials have now commenced with a mixture of grains, legumes, fruit and vegetables (10 types, 480 plants total) including: wheat, barley, strawberry, lettuce, tomato, canola, dwarf bean, lupin, spinach and Arabidopsis.



Tomita Technologies Ltd.



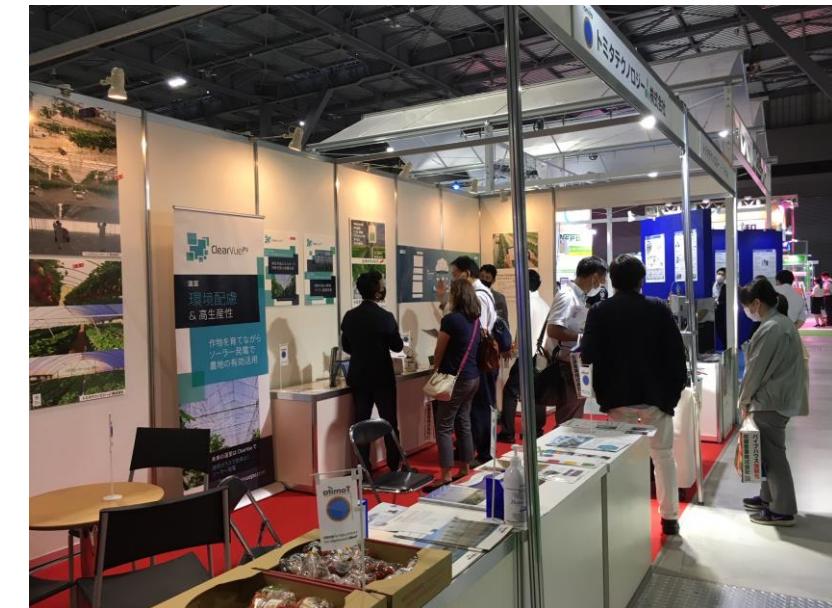
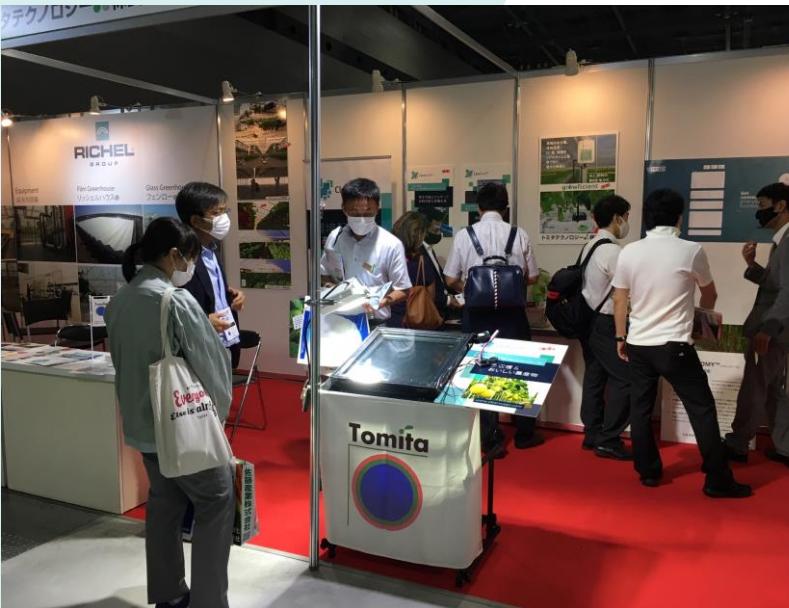
- Japan Licensee for Greenhouses
- GPEC – Greenhouse Horticulture & Plant Factory Exhibition / Conference – 14th – 16th July in Aichi, Japan



Mami Hashimoto – International Office Chief | Tomita Technologies Ltd

"A group of guests who attended the opening ceremony of the exhibition came to our booth second after being guided by the organizer, so we gave a presentation on Clear Vue. It turned out that it was attracting attention.

Our booth was lively as many people gathered at the ClearVue power generation demonstration exhibit."



Single & Double Glazing Product Development



Opens up new market opportunities

- Retrofit
- Transportation
- Markets not yet moved to multi-glazing

New Product Designs

- Based on previously announced improvements to existing technology platform

Availability

- Currently in trial and testing stages
- Estimated commercially available within 12 months, subject to certification and any production scaling issues



View through ClearVue's latest single glazing prototypes.

Investment Highlights

Attractive industry thematic

- ESG investment opportunity in global growth sectors of BIPV, smart cities and food security
- Unique with high consumer buy in
- Regulatory support across multiple jurisdictions – EU and US focus – change in Govt in US anticipated to impact growth
- Large Addressable Market

Proprietary Technology

- First in class product
- Strong IP portfolio
- Regulatory requirements met for sales in key regions
- Price competitive with payback period
- Strong product and tech development pipeline

Near term catalysts

- Showcase deployments – under way
- Continued deal flow
- High quality counterparty engagement

Refocussed Business

- Investor entry low remains compared to competitors
- New European CEO
- Experienced Board



Business and Revenue Model

ClearVue will derive revenues from:

- Direct sales:** The Company will initially sell and supply fully assembled IGU/window products direct to distributors and licensed channel partners in Australia and worldwide. Then, **as manufacturing licensees are appointed in different territories the revenue streams that follow will apply.**
- Component sales (US\$245 m2):** The company will sell technology/product components to its manufacturing licensees including its proprietary nano and micro particle doped activated interlayer *and* its proprietary mini solar photovoltaic strips for use inside of each PV integrated glazing unit*
- Additional revenue streams:** The company will sell its smart façade controller hardware and license associated software (and data) for additional revenue opportunities.
- Typical minimum sales requirements of a distribution only licensee or a manufacturing/distribution licensee is: 5,000 sqm for year 1, 10,000sqm for year 2, 20,000 sqm for year 3, 30,000 sqm for year 4 & 40,000 sqm for year 5.
- One licensee (only) achieving their performance criteria equates to over USD \$25m in revenue over 5 years.

Notes:

*Complete ClearVue IGU's initially to be sold in Australia by ClearVue to gain market acceptance. Approx. per sqm rate may change based on order quantities and scaling, country and project specific requirements.

Size of the Market



“By 2060, the world is projected to add 230 billion m² (2.5 trillion sq ft) of buildings, or an area equal to the entire current global building stock. This is the equivalent of adding an entire New York City to the planet every 34 days for the next 40 years.”¹

- North American market for window glass installed annually is currently estimated at USD \$120 billion.²
- Global market for building-integrated photovoltaic (BIPV) technologies was USD \$2.4 billion in 2016. Market to grow to USD \$4.3 billion by 2021 (with a compound annual growth rate (CAGR) of 12.2% for the period 2016 to 2021).³
- ClearVue’s target market represents in excess of 2.1 billion sqm² of glass per annum (total market size 5.5 billion+ sqm of glass per annum)⁴ (**Target Market**).
- It is expected that a small 10 floor 25,000 sqm building could deploy approx. 3,150 sqm minimum of ClearVue product (assuming 3 building sides of 50m long and part floors of 2.1m high only)⁵.
- A single large building, for example the One World Trade Center (Freedom Tower) New York City has over 93,000 sqm of glass.⁶

Sources:

1. <https://zero-code.org/>
2. <http://raymondjames.bluematrix.com/sellside/EmailDocViewer?encrypt=eddb1da-c175-47ab-b9c8-ca69c60f7531&mime=pdf&co=RaymondJames&id=REPLACEMEEMAIL&source=libraryView>
3. <https://www.bccresearch.com/market-research/energy-and-resources/building-integrated-photovoltaics-markets-report-egy072C.html>
4. https://www.nsg.com/~/media/NSG/Site%20Content/Temporary%20Downloads/Japanese/NSGFGI_2011%20EN2.ashx
5. ClearVue does not represent that it will be able to obtain such market share or that such revenue can be achieved. See **Disclaimer Slide Page 2**.
6. See ASX Announcement - Technical Update 28/03/2019 - <https://www.asx.com.au/asxpdf/20190328/pdf/443v6jr2zhbvm7.pdf>

COMPANY UPDATE

Recent & Upcoming Milestones



Announced first-half 2021

- Global digital marketing campaign and new website launched - 1 April 2021
- Signed Distribution Agreement with Tomita Technologies in Japan for Greenhouses – 12 April 2021
- Showcase project – Greenhouse Project Murdoch – opened 19 April 2021
- Listed onto OTC QB to better engage with US market – 26 April 2021
- Announced major product development – single and double glazed versions of product – 18 May 2021
- ClearVue forming JV with eLstar Dynamics BV in the Netherlands – 26 May 2021
- Plant science trials commenced at ClearVue Greenhouse at Murdoch
- Deployment into Sydney park project – deposit received, glazing ordered – 28 June 2021

Upcoming 2021

- Demonstration project - New York City
- Showcase projects: mini-home
- Fujisan Winery, Japan and Sydney park installations
- Securing additional licensees in target geographies (in progress)
- Completion of EU presence establishment
- Completion of JV establishment with eLstar Dynamics
- Conversion of showcase projects, licensees and marketing efforts into purchase orders – primary focus on US and European markets, focus on quicker sales (greenhousing)



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