

ASX Release | ClearVue Technologies Limited (ASX: CPV)

Appendix 4C & Quarterly Activities Report

**Highlights**

- ClearVue signed an OEM Manufacturing Agreement with YY Windows in China
- ClearVue appointed an exclusive distributor for Hong Kong and Macau Special Administrative Regions of China
- ClearVue announced completion of product certification testing with UL and IEC
- ClearVue signed an OEM Supply Agreement with BeyondPV of Taiwan for supply of solar PV strips used in the manufacture of its solar PV IGU products
- ClearVue signed a Collaboration Agreement with ROOTS Sustainable Agricultural Technologies (ASX: ROO)
- ClearVue provides updates on a greenhouse project with Aquagen Infrastructure Systems; the CRC-P greenhouse project at Murdoch University; the Mirreco mini-home; the Arup collaboration on smart façade concepts; the ROOTS trial greenhouse in Israel; and the Warwick Grove Shopping Centre trial
- ClearVue provides information on modelling work it has been doing with Solar Skyrise of Canada

**31 January 2020:** Smart building materials company ClearVue Technologies Limited (ASX:CPV) (**ClearVue** or the **Company**) is pleased to provide its quarterly cash flow and activities summary for the period ending 31 December 2019. Also provided is an update on current activities.

**Quarterly Activities**

**ClearVue Signs OEM Manufacturing Agreement with YY Windows**

On 19 December 2019, the Company announced that it has signed an OEM Manufacturing Agreement with Jiangsu YY Windows and Curtain Wall System Co. Ltd in China (**YY Windows**). Under the signed agreement YY Windows has become an OEM manufacturer for ClearVue and its licensed distributors. YY Windows operates a 40,000sqm fabrication facility in Jiangsu near Shanghai and is an experienced exporter to Australia, New Zealand and the United States.

**ClearVue Appoints Distributor for Hong Kong and Macau Special Administrative Regions (SARs)**

On 17 December 2019, the Company announced that it had appointed Full Treasure Engineering Limited in Hong Kong as its exclusive licensed distributor for the Hong Kong and Macau SARs of the People's Republic of China.

Full Treasure is an experienced distributor of leading-edge technical glazing products including polymer dispersed liquid crystal switchable glass and thermochromic tinting glass.

### **IEC Product Testing Completed – Clearing way for European Sales**

On 9 December 2019, ClearVue announced that it had completed the International Electrotechnical Commission, or IEC, certification testing against IEC standards 61730 and 61215 for electrical and product safety performance compliance. Product testing was completed by international standards testing company TÜV SÜD in Shanghai. IEC certification is a key requirement for the sales of the ClearVue solar PV IGU product in Europe and many other international markets. The product certifications give confidence to architects and engineers specifying the ClearVue products but along with the ClearVue patents also serve as an additional barrier to entry for copycat competitors.

### **UL Testing Product Testing Completed – Clearing way for US Sales**

On 28 November 2019, the Company announced that it had completed certification testing of its ClearVue solar PV IGU product in the United States with UL LLC (formerly known as Underwriters Laboratories) for UL 61730 certification. UL product certification is a key requirement for sales of ClearVue's product in the US and other international markets.

### **ClearVue signed an OEM Supply Agreement with BeyondPV of Taiwan**

On 18 November 2019 the Company announced that it had formalised an earlier signed MOU into a formal signed OEM Supply Agreement with BeyondPV of Taiwan. BeyondPV is a leading supplier of photovoltaic technologies and has been tasked with the design manufacture and supply of the mini solar PV strips for use in ClearVue's solar PV IGU's windows and smart façades. Under the Agreement BeyondPV will invest USD \$3.5m (indicative) to establish a dedicated production line to produce ClearVue's solar strip modules.

### **ClearVue signed a Collaboration Agreement ROOTS Sustainable Agricultural Technologies**

On 14 October 2019 the Company announced it has signed a Collaboration Agreement with ROOTS Sustainable Agricultural Technologies Limited (ASX: ROO) to explore complementary sales opportunities within the growing greenhouse sector and will construct a demonstration greenhouse that combines the ROOTS' Root Zone Temperature Optimisation (RTZO) with ClearVue's solar PV IGUs. The intent behind this trial will be to demonstrate that the ClearVue PV solution can power the ROOTS RTZO technology within the greenhouse and create an off-grid greenhouse with a highly controlled internal environment

## ***Corporate & Financial***

As at 31 December 2019, the Company had a cash balance of approximately AUD \$1.8 million. Please refer to the quarterly cashflow report (Appendix 4C attached) for further information.

## ***Market Update and Outlook***

### **Aquagen – Waste Treatment Greenhouse, Cape Cod MT, USA**

Since the announcement of our collaboration with US sustainability expert, Aquagen Infrastructure Systems (**Aquagen**) on 14 August 2019 ClearVue have been working with Aquagen on the integration of the ClearVue panels into a trial greenhouse project at Dennis-Yarmouth Regional High School in South Yarmouth, Massachusetts USA – such greenhouse will house an algae-based waste treatment system. The algae-based waste

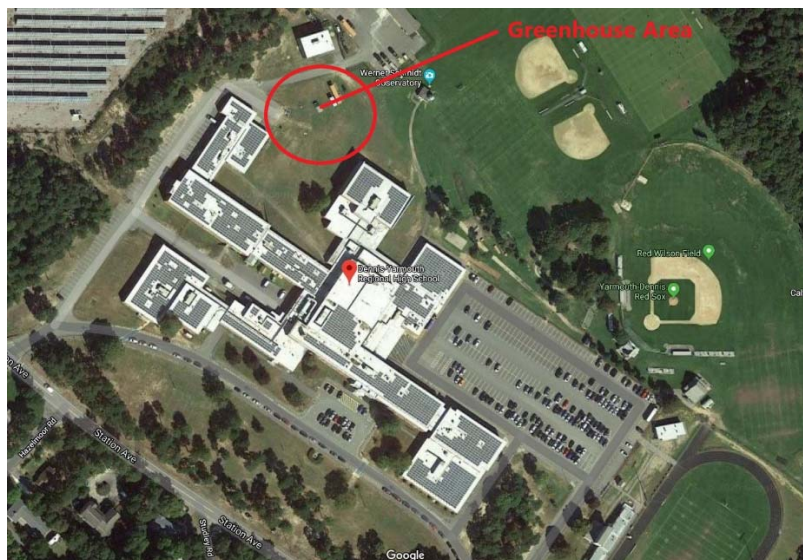
treatment system is a photobioreactor that relies upon light reaching the algae contained in pipes to assist with photosynthetic activity. The waste and wastewater is pumped through the same pipes where the algae consumes a majority of the solid waste and pathogens, producing clean water. The algae itself is then used for fertiliser and other uses.

The system requires power to pump the waste and wastewater through the algae containing pipes. The Company has provided eight (8) 1.2m x 1.2m ClearVue PV IGU panels for integration into (a part of the total glazed area of) the photobioreactor greenhouse. The greenhouse has been designed to demonstrate that the greenhouse for this application can be self-sustaining with the intent that the ClearVue IGUs will power the pumping of waste and wastewater through the system whilst still permitting visible light entry for photosynthesis.

ClearVue's IGU panels have recently been delivered to Aquagen with installation expected to commence within coming weeks. Subject to successful demonstration in this greenhouse trial, Aquagen anticipates the combined ClearVue and Aquagen solution to be implemented into a proposed larger STEM educational facility project at the school.



*Photos of existing Aquagen Waste Treatment Greenhouse, Cape Cod, Massachusetts USA*



*Site for Photobioreactor Greenhouse in Yarmouth, Massachusetts USA*

### **Arup collaboration on Smart Façade Concepts**

Further to the Company's announcement on 11 July 2019 the Company is pleased to advise that the consultancy agreement with Arup to develop its smart façade concepts is progressing well with the project scope being expanded to increase the number of prototypes being developed to 13 different designs. The project timeline has been extended as a result. The development work is proceeding well with a number of the hardware and software automation aspects having now been developed and are currently in testing. Prototype construction will now commence in February 2020 with initial prototypes expected to be delivered by the end of March. We look forward to updating the market further on progress in the coming months.

### **CRC-P Funded Greenhouse – Murdoch University**

Further to the company's market update released to ASX on 30 September 2019 ClearVue has been working with Murdoch and its selected building contractor to prepare updated plans and engineering drawings for the CRC-P grant supported greenhouse. These plans have recently been finalised and have been pre-approved before council lodgement which is anticipated to occur shortly. The order for the glass IGU panels have now been placed with OEM manufacturer Rocky for construction of the greenhouse with the first batch of IGU's anticipated to be delivered in mid-late February 2020 with the expectation that construction now commences during March of 2020.<sup>1</sup>

### **Mirreco – Hemp based Mini-home – Knutsford Precinct, Fremantle, Western Australia**

Further to ClearVue's market update on 30 September 2019 Mirreco has now set up its off-site fabrication facility and is currently in the process of manufacturing its hemp-based panels for construction of the mini-home. ClearVue has ordered the IGU panels from its OEM manufacturer YY Windows (as announced on [...] November 2019) for installation into the project with anticipated delivery before the end of May and installation into the mini-home to be completed shortly thereafter.<sup>2</sup>

### **ROOTS Israel – Trial Greenhouse**

Since our joint announcement with ROOTS Sustainable Agricultural Technologies Limited (ASX: ROO) on 14 October 2019 ClearVue and ROOTS have been designing a greenhouse in which to display the two companies' complementary technologies. The first such designs have been recently completed and the two companies are working together to take steps towards construction.

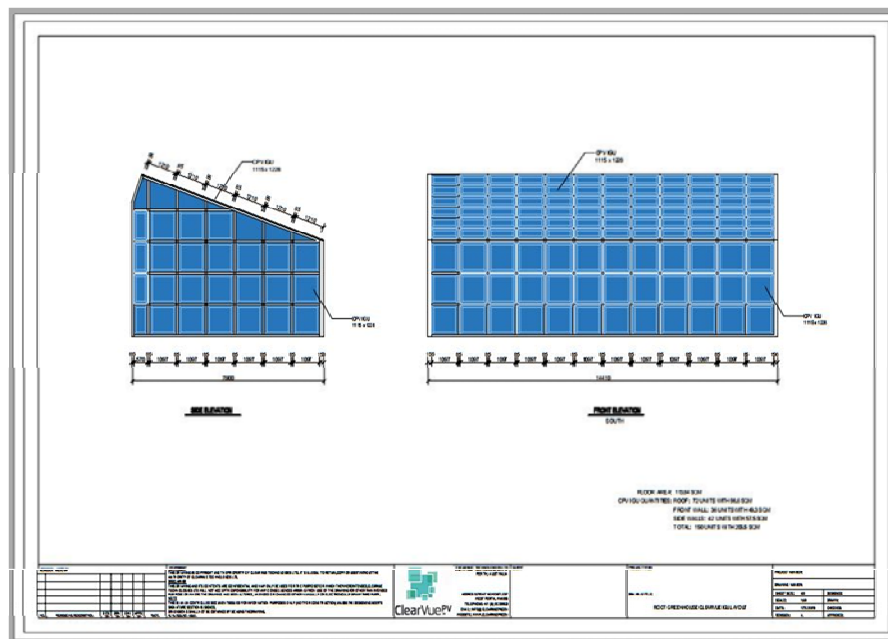
As previously announced ROOTS will be responsible for greenhouse construction including framing for the project and the supply of its technology into the project and ClearVue will supply its IGU glazing panels. Both parties will be responsible for designing a research plan and completing research on the completed greenhouse and plants grown within the completed greenhouse. Anticipated time for commencement of construction is May-June 2020.

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<sup>1</sup> However, it is not yet known whether the Wuhan 2019n-Cov coronavirus may impact production and delivery timelines.

<sup>2</sup> Again, it is not known whether the Wuhan 2019n-Cov coronavirus may impact production and delivery timelines.





*Initial Design of ClearVue/ROOTS demonstration greenhouse in Israel.*

## Solar Skyrise Modelling

ClearVue has over the past 6 months been working intensively with Solar Skyrise in Canada ([www.solarskyrise.com](http://www.solarskyrise.com)).

Solar Skyrise have developed software to assist architects, engineers, developers and building owners understand the real costs and benefits including returns, paybacks, total asset value increases (amongst many other considerations) to buildings through the installation of photovoltaics, building integrated photovoltaics and window integrated photovoltaic solutions.

The Solar Skyrise ‘SolarScore’ reports that are generated are described by Solar Skyrise as ‘the most detailed and accurate metric for understanding the feasibility, timing, and value of integrating solar into the full envelope of new and existing buildings.’

The Solar Skyrise technology uses real-time and location-based data to generate the SolarScore analyses and provides all the necessary data to understand the next steps for individual projects as well the prioritization and timing of investment across a property portfolio.

Solar Skyrise has worked with the ClearVue team on adapting their software and modelling to integrate and include the specific nuances of the ClearVue PV IGU characteristics and are working with ClearVue on modelling various potential pipeline projects as well as example deployments in different regions.

We look forward to updating the market further on this modelling work and this new collaboration in the coming months.



One Grand Central, New York

# SolarScore Overview

SYSTEM INVESTMENT

**\$131,137 USD**

Marginal Cost

Projected Unlevered Rate of Return

**73.99%**



**1 Year**

Projected payback period for the project



**17,161 kWh**

Annual energy produced by solar installation

**24.3 kW**

Size of system



**\$384,944 USD**

Total increase in the value of the asset



**192.2 Metric Tons**

Total project carbon emission reductions



By Jim.henderson - Own work. CC BY 3.0

Solar Skyrise's first page of a report on an example 875m<sup>2</sup> deployment of ClearVue PV IGUs to the southern side of the upper floors of One Grand Central in New York City showing less than a one-year payback.

### Warwick Grove Shopping Centre Trial

The trial at Warwick Grove Shopping Centre has continued to demonstrate the performance of the ClearVue product over the last year with results coming in close to what was originally predicted with daily and monthly averages for each of the months over Spring and Summer (to date) generating the following outputs (1):

	Modelled Generation kWh ( <b>without</b> electric losses from system, inverters, batteries etc.)	Total Monthly Generated kWh ( <b>with</b> electric losses from system, inverters, batteries etc.)(2)	Daily Average, kWh/day
July 2019	39	31.12	31.12kWh/31d = 1.004
August 2019	46	38.54	38.54kWh/30d = 1.243
Sept 2019	51	42.96	42.96kWh/30d = 1.432
October 2019	55	47.68	47.68kWh/31d = 1.538
November 2019	54	50.62	50.62kWh/30d = 1.687
December 2019	58	48.86	48.86kWh/31d = 1.576

**Notes:**

- (1) The data screen dashboard displayed at the Warwick Grove Shopping Centre and via the ClearVue website differs from these more accurate numbers included here which are extracted directly from the on-site hardware; and
- (2) The energy generation data within the third column of this table does not account for (ie. adds back) either the cabling and storage-related electric power losses (estimated at 10%), or the electric losses (conservatively estimated at 10-15%,) occurring at the DC-to-AC conversion stage in the microinverters used in this project (which also have not been optimally input-loaded due to system size and shape constraints).

### Chairman’s Comments

Commenting on the December quarter, Executive Chairman Mr Victor Rosenberg said:

*“The December quarter has seen the company complete its most significant milestones to date – successful completion of both the UL and IEC testing on the ClearVue IGU products to ensure electrical and product safety and performance as well completion of a number of steps towards building out and increasing the strength of our supply chain including formalising the arrangements with BeyondPV, signing new OEM manufacturer YY Windows in Shanghai, signing up a new distributor for Hong Kong and Macau in Full Treasure Engineering.*

*Additionally, ClearVue signed a collaboration agreement with ROOTS to share opportunities in the agriculture market and to build a combined demonstration greenhouse in Israel. The greenhouse market is looking increasingly important to the Company and will be one of the focuses for the Company during 2020.*

*Other work we have been doing in the last few months has been focussing on opportunities for sales by pitching and tendering for various at-scale projects. The work the ClearVue team has been doing with the*

*Solar Skyrise team in Canada has been critical to this process as their software solution is able to very accurately model the integration of our product into new or old buildings and provide a highly localised report specific to the building in any country or region and factor in local considerations such as geography, surrounding buildings, solar and tax incentives, carbon embodiment etcetera – all information critical to selling the ClearVue product into large construction projects.*

*The ClearVue team are looking forward to a very exciting 2020 - and are very much looking forward to updating the market and shareholders with our progress in the coming months."*

**Authorised by:**

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Executive Chairman

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**About ClearVue Technologies Limited**

ClearVue Technologies Limited (ASX: CPV) is an Australian technology company that operates in the Building Integrated Photovoltaic (BPIV) sector which involves the integration of solar technology into building surfaces, specifically glass and building façades, to provide renewable energy. ClearVue has developed advanced glass technology that aims to preserve glass transparency to maintain building aesthetics whilst generating electricity.

ClearVue's electricity generating glazing technology is strategically positioned to compliment and make more compelling, the increased use of energy-efficient windows now being regulated in response to global climate change and energy efficiency goals.

Solar PV cells are incorporated around the edges of an Insulated Glass Unit (IGU) used in windows and the lamination interlayer between the glass in the IGU incorporates ClearVue's patented proprietary nano and micro particles, as well as its spectrally selective coating on the rear external surface of the IGU.

ClearVue's window technology has application for use in the building and construction and agricultural industries (amongst others).

ClearVue has worked closely with leading experts from the Electron Science Research Institute, Edith Cowan University (ECU) in Perth, Western Australia to develop the technology.

To learn more please visit: [www.clearvuepv.com](http://www.clearvuepv.com)



### **Forward Looking Statements**

Statements contained in this release, particularly those regarding possible or assumed future performance, revenue, costs, dividends, production levels or rates, prices or potential growth of ClearVue Technologies Limited, are, or may be, forward looking statements. Such statements relate to future events and expectations and, as such, involve known and unknown risks and uncertainties. Actual results and developments may differ materially from those expressed or implied by these forward-looking statements depending on a variety of factors.