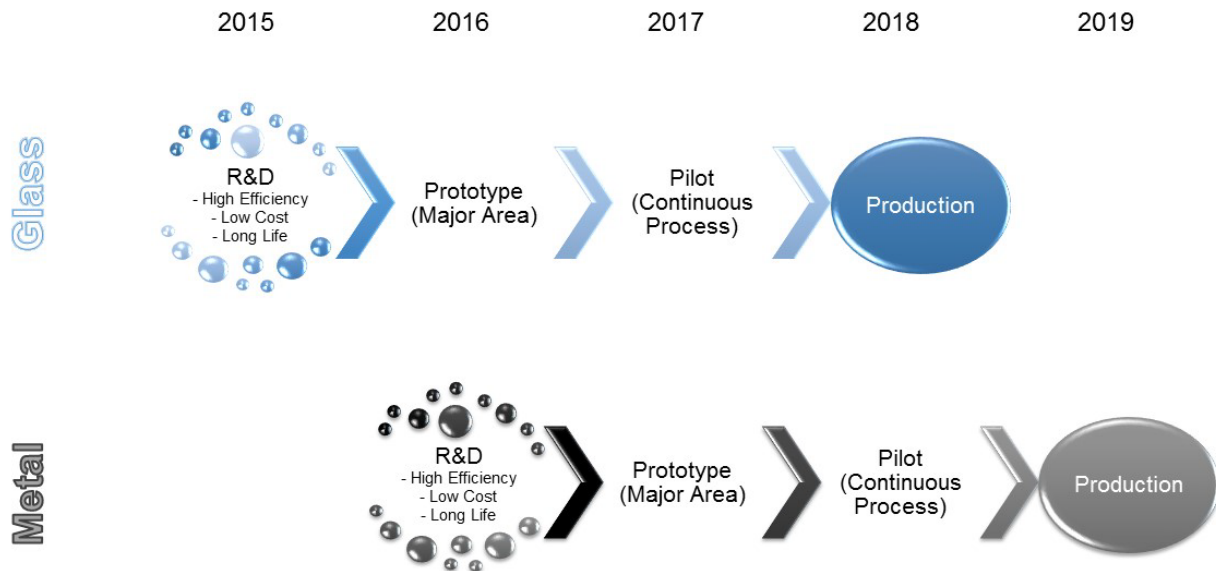


## Second Quarter FY 2017 – Quarterly Report & Appendix 4C

- **Dyesol Secures a \$2.5M Commonwealth Bank R&D Rebate Advance Facility**
- **Thermal Cycling Technical Advisory Board Milestone Achieved for PSC Strip Cells**
- **Innovate UK Supports Further Dyesol UK R&D**
- **Agreement Signed with Flinders University for Advanced Carbon Material Development**
- **Mini-MAD Prototype Achieves Exciting Scale-Up Progress**

### Commercial Schedule



### Corporate and Financial

Dyesol has accepted the Commonwealth Bank’s offer of a \$2.5 million R&D Rebate facility. The facility effectively allows us to access government R&D rebates quarterly or in advance of end of year. Previously, rebates have only been accessible after financial year end. We are pleased that our activities and financial management has met with approval during due diligence. CBA appears to have largely replaced the CEFC in this important role in clean energy finance by providing cheaper and more accessible advanced funding. In this respect, the CEFC has paved the way and shouldered the early stage product risk.

Turkish, European and Asian business discussions are all in progress. Nesli DSC in Turkey has recently been reinvigorated with new capital and management, indicating that it will again win the confidence of the Ministry of Science, Industry and Technology after some recent turmoil. There are regular updates to potential JV partners on the progress of the pivotal mini-MAD and MAD projects.

We are also eagerly awaiting news from federal government departments and agencies on a number of pending and significant grant applications. The unexpected delays are industry wide and not confined to Dyesol.

There is plenty of “noise” elsewhere, as highlighted in last quarter’s commentary, but we are not surprised to see there has been little subsequent substantiation of some reasonably inflated technology claims. We remain confident that Dyesol is leading the world in the scale-up and industrialisation of this exciting technology. The technical challenge of scale-up is formidable and we will undertake very comprehensive third-party testing and validation at critical stages of development. The data will do the talking, either through CSIRO or Newport Laboratories in the US. In January, Dyesol received a \$50,000 Innovation Connections grant to undertake this external validation with the CSIRO in Australia.

## Research and Development

Dyesol received a favourable review of progress against its quarterly thermal cycling Technical Advisory Board (TAB) milestone. The work was undertaken in collaboration with CSIRO to stringent IEC 61646 standards and the durability test involved 200 cycles of -40 °C to + 85 °C for strip cells and modules. This was a demanding test and far exceeds anything likely to be encountered in the real environment. Strip cells achieved a strong pass with less than 10% degradation, and modules failed marginally. The average module performance degradation after 200 thermal cycles from -45 °C to +85 °C was 13%. While this exceeded the 10% test pass criterion, faulty encapsulation was clearly identified as the failure mechanism for modules not meeting the 10% target. This problem has since been isolated and rectified. The TAB provisionally agreed that the progress was significant and compelling, accepting the thermal cycling milestone as passed. Dyesol seeks to excel, and fresh tests are already underway to confirm that the thermal cycling test can be successfully passed with modules for the purposes of IEC 61646 without any qualification.

Dyesol has entered into a R&D collaboration agreement with Flinders University of South Australia. This continues a long historical relationship with some of its senior academic staff. The project builds on promising carbon nanotechnology developed over the last ten years for enhancing conversion efficiency in Dyesol’s preferred carbon architecture perovskite solar cells. Dyesol has exclusive use and benefit in relation to all technology developed under the agreed work programme. Of particular interest to Dyesol is the rapid pathway to large volume raw material scale-up using the Flinders’ process technology, coupled with Flinders’ broad experience in carbon-contacted functional semiconductor devices, including photovoltaic cells, particularly PSC.

Dyesol UK Ltd is being supported by Innovate UK, the UK’s technology innovation body, to undertake a funded project aimed at optimising the structure, performance and stability of perovskite solar cells (PSC) through novel interface engineering approaches, in conjunction with its project partner CPI, based in the North of England. The value of the new grant is £75,000. The activity is linked closely to that supported by the much larger EPSRC grant of £800,000 involving Dyesol UK, Cristal and York University. The project will incorporate several treatments at critical interfaces within the device that are known to constrain solar cell efficiency, and to develop technologies that can be applied to commercially viable manufacturing approaches. Dyesol will apply its fundamental knowledge of device physics and fabrication knowhow to novel processes being developed within CPI with the overall aim of enhancing the performance and stability of its PSC technology.

Alongside the above, Dyesol has also reinforced its contribution to the Solliance collaboration with additional resources specifically allocated towards process development and scale-up for device architectures consisting entirely of inorganic charge transport materials. This approach is essential to ensuring that high durability, high performance devices can be integrated into metal and flexible substrates

for Building Integrated PV (BIPV) applications. Forthcoming durability milestones on Dyesol's Technology Development Plan will confirm this approach, and validate its preferred architectures, materials and processes that are developed in Manchester, UK together with its extensive partner network. Initial results are extremely promising and, as detailed below, Dyesol's association with EPFL for pure research, alongside complete access to Solliance's world-class facilities and industrialisation capability will accelerate commercialisation.

Elsewhere, our joint activity with Professor Grätzel at EPFL in Lausanne has achieved conversion efficiencies of greater than 20% using purely inorganic hole transport materials (HTMs), an important development in material architecture over the basic Spiro based system. As presented to Dyesol shareholders by Dr Damion Milliken CTO at the AGM in November, the various all inorganic charge transport material technologies currently under development by Dyesol represent the "Gen 2" technology pipeline. These material sets will facilitate not only opaque substrate devices such as Metal BIPV panels, but also a technology pathway for ongoing product enhancement for glass substrates, including higher efficiency carbon cells and light-transmitting systems for View Glass BIPV applications.

Dyesol was very pleased this quarter that our foundational patent covering use of all inorganic charge transport materials, filed back in 2013, received its first formal jurisdictional grant. This clearly demonstrates the Company's strong intellectual property position, and provides a barrier against competition in the PSC commercialisation space.

### **Manufacturing and Technical Collaborations**

The technology development highlight for the quarter was undoubtedly the showcasing of our early stage prototypes at the November AGM. These are known as mini Major Area Demonstration (MAD) prototypes – 650 mm x 450 mm. Production of the mini-MAD prototypes is an essential step in the scale-up of PSC technology. Moreover, it serves to demonstrate that performance achieved at the strip-cell and module scale can be replicated successfully at a magnitude higher or more. Here we refer principally to efficiency and durability, in its many forms. In addition, cheaper, abundant materials and streamlined fabrication processes are continually being introduced to help span the gap between the laboratory and industrial readiness.

In two areas of meaningful progress during the quarter, the Glass Group has now significantly optimised both larger area coating and scribing. At every step we are methodically addressing critical areas of technical risk and taking steps forward towards mass manufacture.

Phase II of the VDL collaboration is being co-ordinated in lock-step with mini MAD. This is the Design and Engineering phase due for completion at the end of February. While it has run 2 months over time, extra time has been used to identify cheaper equipment suppliers that has helped reduce the MAD budget by approximately 40% to 50%. Unsurprisingly, Asian equipment suppliers have improved significantly in quality in more recent years and are cheaper than their European equivalents. The substitution is particularly valuable for what we describe as non-critical items where performance compromise is negligible. During the quarter, Dyesol also received notification from the Australian Department of Industry approving the Company's Overseas Advance Finding for VDL's inputs to Dyesol's scale-up programme, ensuring positive confirmation for mini MAD, MAD and Pilot costs to be claimed against the R&D Tax Incentive scheme in Australia. This is an excellent financial outcome.

As we launch into prototype development we have had to source additional factory floor space. Fortunately, we have identified a number of possibilities locally. We are very keen to remain clustered in the one precinct where rent is low cost and there is synergy between administration, materials manufacture and prototype development. This will open possibilities for pilot plant development later in the year once the

MAD prototype work has been completed. This anticipates taking a MAD 600 mm x 1200 mm panel and automating the process as the penultimate step for mass manufacture.

## Financials

The net operating monthly cash burn (Sec. 1.9) for the second quarter averaged \$982k excluding the FY 2016 R&D rebate receipt of \$3.8m. Net cash usage from operating and investing activities for the six months to 31 December 2016 totalled \$1.7m including the R&D rebate.

At the end of the second quarter, cash balances totalled \$3m.

Since the end of the quarter, Dyesol has drawn down an initial \$1.75m from its CBA advance facility further increasing cash at bank.

### About DYESOL LIMITED

Dyesol is a global leader in the development and commercialisation of Perovskite Solar Cell (PSC) technology – 3<sup>rd</sup> Generation photovoltaic technology that can be applied to glass, metal, polymers or cement. Dyesol manufactures and supplies high performance materials and is focussed on the successful commercialisation of PSC photovoltaics. It is a publicly listed company: Australian Securities Exchange ASX ([DYE](#)) and German Open Market ([D5I](#)). Learn more at [www.dyesol.com](http://www.dyesol.com) and subscribe to our mailing list in English and German.

### About PEROVSKITE SOLAR CELL TECHNOLOGY

Perovskite Solar Cell (PSC) technology is a photovoltaic (PV) technology based on applying low cost materials in a series of ultrathin layers encapsulated by protective sealants. Dyesol's technology has lower embodied energy in manufacture, produces stable electrical current, and has a strong competitive advantage in low light conditions relative to incumbent PV technologies. This technology can be directly integrated into the building envelope to achieve highly competitive building integrated photovoltaics (BIPV).

The key material layers include a hybrid organic-inorganic halide-based perovskite light absorber and nano-porous metal oxide of titanium oxide. Light striking the absorber promotes an electron into the excited state, followed by a rapid electron transfer and collection by the titania layer. Meanwhile, the remaining positive charge is transferred to the opposite electrode, thereby generating an electrical current.

- Ends -

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# Appendix 4C

## Quarterly report for entities subject to Listing Rule 4.7B

Name of entity

**DYESOL LIMITED**

ABN

**92 111 723 883**

Quarter ended ("current quarter")

**31 DECEMBER 2016**

### Consolidated statement of cash flows

1.	Cash flows from operating activities	Current quarter \$A'000	Year to date (6 months) \$A'000
1.1	Receipts from customers	325	665
1.2	Payments for		
	(a) research and development	(1,022)	(1,912)
	(b) product manufacturing and operating costs	(70)	(128)
	(c) advertising and marketing	(80)	(138)
	(d) leased assets	(202)	(383)
	(e) staff costs	(1,291)	(2,587)
	(f) administration and corporate costs	(622)	(1,177)
1.3	Dividends received(see note 3)	-	-
1.4	Interest received	7	18
1.5	Interest and other costs of finance paid	(14)	(24)
1.6	Income taxes paid	-	-
1.7	Government grants and tax incentives	3,867	4,092
1.8	Other (provide details if material)	-	-
<b>1.9</b>	<b>Net cash from / (used in) operating activities</b>	<b>898</b>	<b>(1,574)</b>

## Consolidated statement of cash flows

2.	Cash flows from investing activities	Current quarter \$A'000	Year to date (6 months) \$A'000
2.1	Payments to acquire:		
	(a) property, plant and equipment	(41)	(89)
	(b) businesses (see item 10)	-	-
	(c) investments	-	-
	(d) intellectual property	-	-
	(e) other non-current assets	-	-
2.2	Proceeds from disposal of:		
	(a) property, plant and equipment	-	-
	(b) businesses (see item 10)	-	-
	(c) investments	-	-
	(d) intellectual property	-	-
	(e) other non-current assets	-	-
2.3	Cash flows from loans to other entities	-	-
2.4	Dividends received (see note 3)	-	-
2.5	Other (loans to related parties-net)	6	(28)
<b>2.6</b>	<b>Net cash from / (used in) investing activities</b>	<b>(35)</b>	<b>(117)</b>
<b>3.</b>	<b>Cash flows from financing activities</b>		
3.1	Proceeds from issues of shares	-	-
3.2	Proceeds from issue of convertible notes	-	-
3.3	Proceeds from exercise of share options	-	-
3.4	Transaction costs related to issues of shares, convertible notes or options	-	-
3.5	Proceeds from borrowings (leasing funds)	215	276
3.6	Repayment of borrowings	-	-
3.7	Transaction costs related to loans and borrowings	-	-
3.8	Dividends paid	-	-
3.9	Other –Treasury shares purchase	-	(169)
<b>3.10</b>	<b>Net cash from / (used in) financing activities</b>	<b>215</b>	<b>107</b>



## Consolidated statement of cash flows

4.	Net increase / (decrease) in cash and cash equivalents for the period	Current quarter \$A'000	Year to date (6 months) \$A'000
4.1	Cash and cash equivalents at beginning of quarter/year to date	2,006	4,561
4.2	Net cash from / (used in) operating activities (item 1.9 above)	898	(1,574)
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(35)	(117)
4.4	Net cash from / (used in) financing activities (item 3.10 above)	215	107
4.5	Effect of movement in exchange rates on cash held	(27)	80
4.6	<b>Cash and cash equivalents at end of quarter</b>	<b>3,057</b>	<b>3,057</b>

5.	Reconciliation of cash and cash equivalents at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts	Current quarter \$A'000	Previous quarter \$A'000
5.1	Bank balances	3,057	2,006
5.2	Call deposits	-	-
5.3	Bank overdrafts	-	-
5.4	Other (provide details)	-	-
5.5	<b>Cash and cash equivalents at end of quarter (should equal item 4.6 above)</b>	<b>3,057</b>	<b>2,006</b>

6.	Payments to directors of the entity and their associates	Current quarter \$A'000
6.1	Aggregate amount of payments to these parties included in item 1.2	211
6.2	Aggregate amount of cash flow from loans to these parties included in item 2.3	-
6.3	Include below any explanation necessary to understand the transactions included in items 6.1 and 6.2	
	Directors and associates remuneration	211

7.	Payments to related entities of the entity and their associates	Current quarter \$A'000
7.1	Aggregate amount of payments to these parties included in item 1.2	-
7.2	Aggregate amount of cash flow from loans to these parties included in item 2.3	-
7.3	Include below any explanation necessary to understand the transactions included in items 7.1 and 7.2	

8.	<b>Financing facilities available</b> <i>Add notes as necessary for an understanding of the position.</i>	<b>Total facility amount at quarter end \$A'000</b>	<b>Amount drawn at quarter end \$A'000</b>
8.1	Loan facilities	2,500	NIL
8.2	Credit standby arrangements	NIL	NIL
8.3	Other (please specify)		
8.4	In January 2017, the Company established a \$2.5 million Financing Facility with the CBA that allows an advanced drawdown of up to 90% of accrued Research and Development Tax Offset credits. The eligible R&D tax offset cash rebate expected from the ATO for the financial year ending 30 June 2017 forms the primary security for the Facility. The financing facility incurs a line fee of 4% on the Facility Limit, and a Liquidity Fee of BBSY (Bank Bill Benchmark Rate for the Funding Period) plus 0.25% p.a. on amounts drawn down.		

9.	<b>Estimated cash outflows for next quarter</b>	<b>\$A'000</b>
9.1	Research and development	900
9.2	Product manufacturing and operating costs	65
9.3	Advertising and marketing	70
9.4	Leased assets	195
9.5	Staff costs	1,285
9.6	Administration and corporate costs	590
9.7	Other (provide details if material)	-
<b>9.8</b>	<b>Total estimated cash outflows</b>	<b>3,105</b>

10.	<b>Acquisitions and disposals of business entities (items 2.1(b) and 2.2(b) above)</b>	<b>Acquisitions</b>	<b>Disposals</b>
10.1	Name of entity	-	-
10.2	Place of incorporation or registration	-	-
10.3	Consideration for acquisition or disposal	-	-
10.4	Total net assets	-	-
10.5	Nature of business	-	-



## Compliance statement

1. This statement has been prepared in accordance with accounting standards and policies which comply with Listing Rule 19.11A.
2. This statement does give a true and fair view of the matters disclosed.

Sign here:



Date: 31 January 2017

Print name:

Richard Caldwell, *Managing Director*

## Notes

1. The quarterly report provides a basis for informing the market how the entity's activities have been financed for the past quarter and the effect on its cash position. An entity that wishes to disclose additional information is encouraged to do so, in a note or notes included in or attached to this report.
2. If this quarterly report has been prepared in accordance with Australian Accounting Standards, the definitions in, and provisions of, *AASB 107: Statement of Cash Flows* apply to this report. If this quarterly report has been prepared in accordance with other accounting standards agreed by ASX pursuant to Listing Rule 19.11A, the corresponding equivalent standard applies to this report.
3. Dividends received may be classified either as cash flows from operating activities or cash flows from investing activities, depending on the accounting policy of the entity.