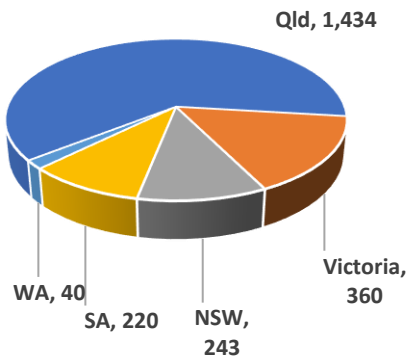


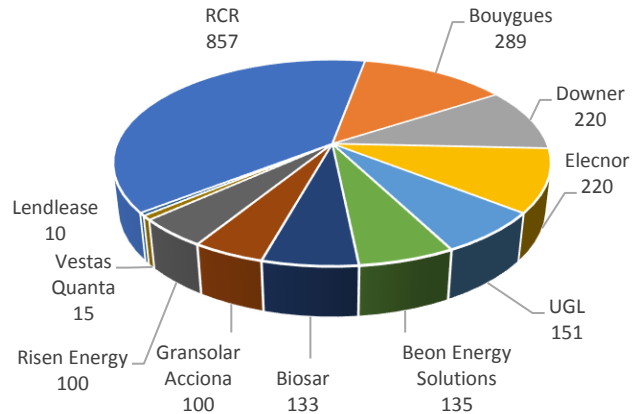
Solar

There are currently 34 solar projects under in construction phase, totalling 2,297MW.

Capacity by State (MW)



Capacity by EPC Contractor (MW)

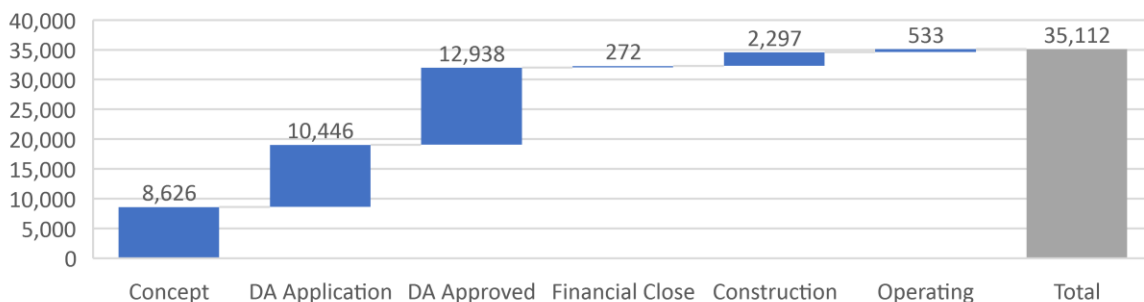


Rystad Energy's view on the market (June 2018)

Key milestones in a solar project's lifecycle are **mechanical completion**, where the EPC contractor has finished construction work; **energisation**, where the project is connected to the grid and starts to inject electricity; **commissioning**, which is a process of gradually testing and increasing production; and **provisional acceptance**, when the owner takes control of the project once it has passed the testing regime.

While several of these milestones can be un-transparent, data from the network operator AEMO provides insights into the energisation and commissioning of individual projects. We can see the projects that are close to connection, those which have been energised and those which have achieved full production.

Large scale project pipeline (MWac)



Source: Sera Analytics

Only 5% of projects expected are fully operational (2018)

So far, of the 2.1 GW AC of large scale solar capacity Rystad expected to be commissioned this year, only 0.1 MW AC is fully operational. This comes from six projects, the largest of which is in New South Wales (Griffith and Parkes, both owned by Neoen). Smaller projects have also been commissioned in Queensland (Conergy's Lakeland), South Australia (Whyalla Stage 1 and Peterborough) and Western Australia (Garden Island).

- Griffith – **Bouygues**
- Parkes – **Bouygues**
- Conergy – **BMD**
- Whyalla and Peterborough – **Elecnor**

Currently, there are a further six projects that have been energised and are in the middle of the commissioning phase. Three are in Queensland (Sun Metals, Clare and Longreach), with one in each of Victoria, South Australia and New South Wales: Gannawarra, Bungala Phase 1 and Manildra respectively.

- Sun Metals - **RCR**
- Clare - **Downer**
- Longreach – **RCR**
- Gannawarra – **RCR**
- Bungala – **Elecnor**
- Manildra - **RCR**

These projects amount to 449 MW AC, almost equal to the total operating capacity of utility scale solar in Australia. Commissioning schedules vary between projects, with larger solar installations unsurprisingly taking longer to commission. But we anticipate all six of these projects will be fully operational by July.

ARENA projects

It has been suggested the first 12 solar plants funded by ARENA were likely bid too aggressively and with onerous contract terms for contractors.

Applicant	Project name	Size (MW AC)	Total project cost (\$m)	Nearest town	Contractor	FY18 MLF	FY19 MLF	Δ
Origin Energy	Darling Downs Solar Farm	110	217	Dalby, QLD	RCR	0.9607	0.9709	1%
Edify Energy with Solar Choice	Whitsunday Solar Farm	58.1	122	Collinsville, QLD	Bouygues			
Neoen Australia	Parkes Solar Farm	50.6	108	Parkes, NSW	Bouygues	1.0476	1.0336	-1%
Genex Power	Kidston Solar Farm	50	126	Kidston, QLD	UGL	1.0115	0.8979	-11%
Manildra Solar Farm	Manildra Solar Farm	42.5	109	Manildra, NSW	RCR	1.0346	1.0223	-1%
RATCH Australia Corporation	Collinsville Solar	42	96	Collinsville, QLD	UGL	1.0126	0.9494	-6%
Neoen Australia	Griffith Solar Farm	25	55	Griffith, NSW	Bouygues	1.1162	1.0603	-5%
Canadian Solar (Australia)	Oakey Solar Farm	25	48	Oakey, QLD	RCR	0.9779	0.9818	0%
Neoen Australia	Dubbo Solar Farm	24.2	56	Dubbo, NSW	Bouygues			
APT Pipeline (APA Group)	Emu Downs Solar Farm	20	47	Cervantes, WA	UGL			
Goldwind Australia	White Rock Solar Farm	20	45	Glen Innes, NSW	UGL	0.8468	0.8413	-1%
Canadian Solar (Australia)	Longreach Solar Farm	15	29	Longreach, QLD	RCR	0.9689	0.8934	-8%
TOTAL		482	1,057					

Bouygues issues well-documented

Southern Cross Electrical Engineering are subcontracting to Bouygues on a number of solar projects. The Supreme court heard arguments with respect to LD's between the two parties. A summary of the legal issues can be found here: <http://kreisson.com.au/wp-content/uploads/2018/01/Bouygues-Construction-Australia-Pty-Ltd-v-Southern-Cross-Electrical-Engineering-Ltd.pdf>

RCR has the biggest share of ARENA funded projects

RCR won ~\$400m of these projects. Taking Manildra as an example: Manildra was announced in March 2017; RCR's scope of work included engineering, procurement, construction ("EPC") and commissioning, of the solar farm, including associated substations and grid connection works. Construction was to commence in June 2017 and **completion was expected to in June-quarter 2018.**

According to First Solar's [May update](#):

"A significant milestone was achieved in **April** with the Manildra Solar Farm achieving its **AEMO registration**. The solar farm was connected to the Manildra substation allowing for back energisation and commencement of hot commissioning activities. Construction activities moved closer to completion with half the plant ready for energisation subject to commissioning testing. Piling activities were complete in April with block one seeing the last of the tracker and module installation progressing well toward target completion".

Manildra Solar has been operating since April 2018; but according to new owner, [New Energy Solar](#), "full commercial operation" has not yet been achieved. That is, it has energised to the grid and is now going through the process of operating a low capacity (10-15%), it will then increase to 50% output and finally after further testing move to 100% or full commercial operation. This process should take around a month to complete, but in this instance, it is taking longer (driven in part by AEMO and in part by the NSP). It is therefore likely that some milestones have been missed and RCR is likely to be incurring LD's.

It has been suggested that projects are negative working capital; that is a 10-15% mobilisation payment and the client paying for material orders.

This project (developed by First Solar) is an SPV and backed by project financing. According to First Solar, gearing is 75-80% and operating DSCR is 1.25-1.30x. There is also a PPA with EnergyAustralia (EA). As such, delay LD's (if assumed by RCR) would likely equal contracted revenue from EA and could amount to something in the range of \$50-100k / day.

Given the thin layer of equity in the project (~\$22m), the fact that the asset has been sold (CPs yet to be satisfied) to [New Energy Solar](#); even if a contractor has claims there is limited equity in which to fund those claims. Potentially claims can offset some of the LDs, but this is difficult to work out because it would be contractual.

Developer issues

It appears there are many issues for developers, but one that stands out that may have an impact on contractors is that project returns are deteriorating. This is relevant because if projects cannot make a return, the propensity to deal with contractors on claims is likely low.

Curtailment

New calculations on line losses and grid congestion AEMO has resulted in some new solar and wind farms suffering major losses in their calculated output.

The worst affected by [AEMO's newly released "marginal loss factor" calculations](#) are those wind and solar farms **located furthest from the main load hubs, in north Queensland, in western NSW** and some in Victoria. **Many projects have suffered cuts of between 10-22%.**

MLF, or marginal loss factor, is applied to the amount of exported electricity to allow for electricity losses in transmission networks. They act as a "multiplier" of revenue and big cuts can seriously affect the business plan of a new or existing plant, and could "make or break" a project. The MLF calculates the difference between how much is produced by the power facility, and measured at its meter, and how much is estimated to be delivered to customers, and so how much is paid, or credited, by AEMO.

The calculation depends on a range of factors – the quality and length of the line, the existence or distance of local demand, and how much other generation is in the same area. And the estimates change each year. The changes unveiled by AEMO in late March are dramatic for some plants, and represent what the market operator says is a major change in the way electricity is flowing across the grid.

In Queensland, for instance, the electricity is "flowing south", rather than north, because of the increase in generation in the northern part of the state and the reduction in load in central Queensland.

The worst hit in the latest assessment is the 53MW Broken Hill solar farm, owned by the AGL-linked PARF, which has had its MLF calculation slashed from 1.2456 to 0.9789, or 22%.

With respect to the above discussion on financing and tight DSCR's, a 20% curtailment would push a project geared to 80% into default.

Depending on what MLF developers had plugged into their model and what AEMO calculates at completion could significantly impact on project returns.

Connection Issues

The long and the short of it is this: there are connection delays across most, if not all, solar projects.

There is a combination of factors: some contractors are delivering late, but all projects are dealing with connection issues given Australia has the most stringent rules. AEMO set the minimum standard (which is onerous) but then there is an additional layer of rules made by the various NSPs. The NSPs have been significantly more involved than AEMO.

The key issue appears to be the minimum standard issued by AEMO called the [Generator Performance Standard](#) (GPS). AEMO's **requirement for the GPS are changing rapidly vs 12-months ago**. The reason why it is changing appears to be the significant amount of solar that has / is connecting to the grid with respect to grid stability.

In some (if not most) cases, the contractor has assumed responsibility for delays (at least in the case of early projects bid (those presently under construction). No one knew how hard it would be to deal with AEMO and the NSPs.

Contractor issues

It has been suggested by several Solar industry players that early projects were bid very competitively, and contractual terms were in the favour of Developers and not contractors. By and large it was a new market for Australian contractors and the consensus is that RCR and Downer were very aggressive in securing early projects to build out expertise for the coming pipeline of work.

Construction contract – Governs various elements of the construction of the facility including the supply and assembly of equipment (such as turbines or PV panels) and construction of the balance of the plant comprising civil and electrical works.

Most of the current projects under construction are under EPC, implying the Contractor is obliged to deliver a complete facility to a Developer who need only ‘turn a key’ to start operating the facility). According to PWC, the major advantage of the EPC Contract over the other possible approaches is that it provides for a single point of responsibility.

An EPC **Contract delivers all of the requirements listed below in one integrated package.**

PWC has an excellent piece: [Construction, operation, regulatory and bankability issues for utility scale renewable energy projects](#).

In one section when referring to assessing bankability, it says lenders will look at a range of factors and assess a contract as a whole. Therefore, in isolation it is difficult to state whether one approach is or is not bankable. Generally speaking the Lenders will require the following elements to be included for a contract to be considered to be ‘bankable’:

- **A fixed completion date**
 - In general, if this date is not met the Contractor is liable for Delay Liquidated Damages (DLDs). DLDs are designed to compensate the Project Company for loss and damage suffered as a result of late completion of the facility. To be enforceable in common law jurisdictions, DLDs must be a genuine pre-estimate of the loss or damage that the Project Company will suffer if the facility is not completed by the target completion date. The genuine pre-estimate is determined by reference to the time the contract was entered into. DLDs are usually expressed as a rate per day, which represents the estimated extra costs incurred (such as extra insurance, supervision fees and financing charges) and losses suffered (revenue forgone) for each day of delay.
- **A fixed completion price**
 - The fixed-price element of the contract usually implies the risk of cost overruns and the benefit of any cost savings are to the Contractor’s account. The Contractor usually has a limited ability to claim additional money, which is limited to circumstances where the Project Company has delayed the Contractor or has ordered variations to the works.
- No or limited technology risk
- Output guarantees

- **Liquidated damages for both delay and performance**
 - LDs are likely being incurred by contractors with respect to delays involving GPS acceptance. LD's are likely linked to the PPA revenue (where applicable).
 - It is important that the solar PV facility commences operation on time because of the impact on the success of the project and because of the liability the Project Company will have under other agreements (eg under a PPA or financing agreements). This is why DLDs are imposed.
- **Large caps on liability** (ideally, there would be no caps on liability, however, given the nature of EPC Contracting and the risks to the Contractors involved there are almost always caps on liability)
 - most EPC Contractors will not, as a matter of company policy, enter into contracts with unlimited liability. Therefore, EPC Contracts for power projects cap the Contractor's liability at a percentage of the contract price. This varies from project to project; however, an overall liability cap of 100% of the contract price is common. In addition, there are normally sub-caps on the Contractor's liquidated damages liability. For example, DLDs and PLDs might each be capped at 15% of the contract price, with an overall cap on both types of liquidated damages of 25% of the contract price.
- **Restrictions on the ability of the Contractor to claim extensions of time and additional costs.**

Clare Solar Farm

If you take Downer for example; it was awarded the Clare Solar farm project on 30 December 2016. At the time it said: "Construction is scheduled to commence in early 2017 and is expected to take 12 months". The developer was FRV.

According to this article "[Queensland's biggest solar farm connects to the grid](#)" - Clare solar farm connected to the grid on **15 May 2018**. From the above timetable, **construction was 5-6 months late**. I don't know all of the reasons why it was late but one of the reasons was connecting delays – I just don't know where contractually the blame is). What I do know, is that it is in dispute. It's likely there are LDs and it's likely that Downer is putting in claims to recover costs to offset those LDs). From my guy at FRV, he simply said it will be a negotiation and a settlement done between their number and Downer's number).

Construction issues / delays / cost blow-outs

Projects are not typical *construction* projects, more *assembly*, with the key risk being productivity, logistics and getting material to site.

The cost structure is ~70% procurement, ~10% blue-collar workers, 10% white-collar and ~10% margin.

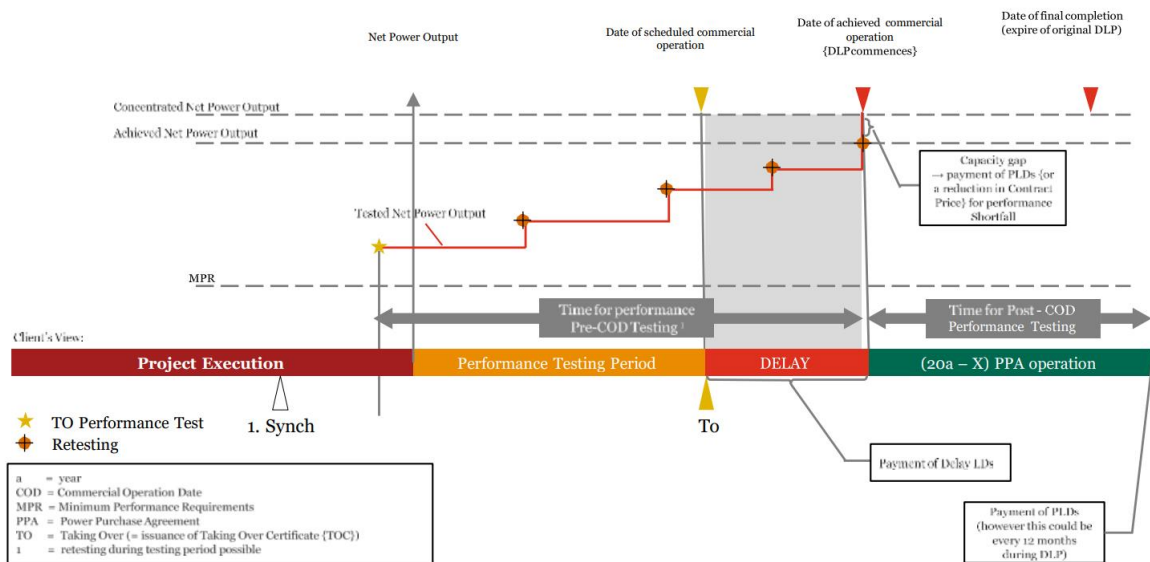
Given the cost structure and the fact that procurement has been locked in, there is nowhere to save money if contractor costs have been underestimated. The 10% margin can be easily eroded by additional labour costs and where scheduling milestones have been missed LDs could easily send contracts to loss-making for the contractor.

With respect to working capital, it has been suggested that projects are negative working capital; that is a 10-15% mobilisation payment and the client paying for material orders.

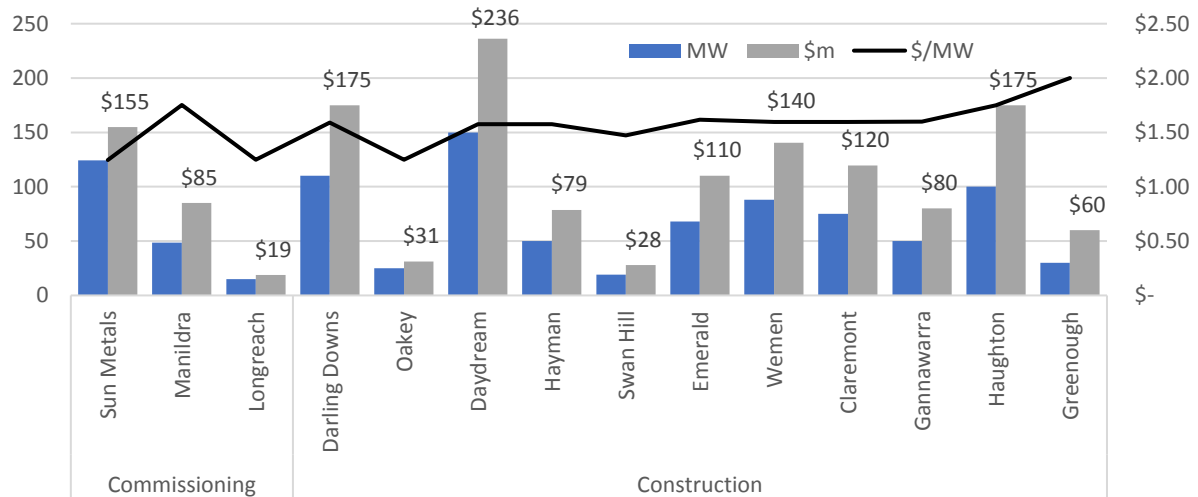
Operationally, it appears that some (if not most) contractors have mispriced assumptions around productivity. This has potentially already eroded margin and in some cases the productivity issues have led to schedule delays and therefore delay LD's.

Broadly, the solar projects were bid on 3-month design and 9-month construction and contractors are starting to work out they cannot completion (under previous labour costs / productivity assumptions) in 9 months.

Diagrammatic representation of performance testing, performance guarantee and compensation arrangements for a sample solar PV project



RCR has ~\$1.5b value of Solar Projects under construction (total value, not WIH)



Given the above statement on LD's presumably it is incurring costs on projects below and possibly Darling Downs:

- Sun Metals - due for completion in **1Q18**
- Manildra – due for completion by **2Q18**
- Longreach - had its official inauguration 22 May 2018. It is being progressively commissioned and is currently operating at 50% capacity (as of May 2018).

Darling Downs (APA) and Daydream (Edify Energy) are the biggest projects under construction.

Darling Downs – According to the [May construction update](#): “Works on the substation, connecting the solar farm to the Powerlink network, are also progressing well and the next phase of the project will see commencement of commissioning in May. The plant output will then be gradually increased until the ultimate 110MW plant capacity will be reached in **September 2018**”.

Daydream – Construction was scheduled to commence in **3Q17**. According to [Origin Energy](#), was expected to start generating electricity in **mid-2018**.

Recently won projects

Emerald, Wemen, Claremont, Gannawarra, Haughton and Greenborough have all been recently secured. It may be fair to assume that RCR has learned from previous projects; but that still leaves ~\$800m projects that might be considered “risky”.

A bullish argument might be that RCR has worn some pain and set it up well for a further ~\$5b of pipeline – but market consensus appears to be that many of these projects will not be developed.

WIP

It should be noted at 1H18 there was a working capital *improvement* of \$16m after a *deterioration* of \$7m in FY17.

The significant increases in WIP is a concern. WIP from 30 June 2017 to 31 December 2017 increased by \$208m vs a revenue increase of \$133m.

That is WIP as a percentage of revenue has moved from 35% to 52% in 6 months.

The question is what has been booked into WIP?

There is a risk the increase in WIP was driven by cost overruns and subsequent claims back to client on these solar projects.

Any LD’s being incurred or additional costs (increased labour) would likely be cash; and the risk is that claims are being booked to WIP. A poor 2H18 cash flow result may indicate this is the case. Given these projects appear to be positive cash flow and the potential for mobilisation payments to be received in the half; a working capital draw would indicate claims could be in the range \$50-100m.

- Perhaps coincidental, but this is the first (4D) interim report with balance sheet notes on Receivables (note 6) and Payables – probably because of the quantum of the increases.

NOTE 6.	TRADE AND OTHER RECEIVABLES	31 Dec 17 \$'000	30 Jun 17 \$'000
	Trade Receivables	118,473	131,940
	Provision for Impairment of Receivables	(932)	(854)
	Net Trade Receivables	117,541	131,086
	Amounts Due from Customers Under Construction Contracts	493,273	285,386
	Total Trade and Other Receivables	610,814	416,472

Amounts Due from Customers Under Construction Contracts	Section	2017 \$'000	2016 \$'000
Contract Costs Incurred and Profits Recognised		1,868,844	1,444,045
Progress Billings		(1,599,915)	(1,388,600)
Amounts Due from Customers Under Construction Contracts		268,929	55,445
Recognised and Included in the Consolidated Financial Statements as Amounts Due			
From Customers Under Construction Contracts Included in Trade and Other Receivables	4.1	285,386	81,805
To Customers Under Construction Contracts - Deferred Revenue	4.7	(16,457)	(26,360)
Amounts Due from Customers Under Construction Contracts		268,929	55,445

Included within Section 4.1 are project receivables associated with RCR delivering large scale construction projects. Project receivables are amounts due to RCR from customers that have not been invoiced. Some of these project receivables are made up of claims and variations, both approved and not approved by the customer. Estimates are made in relation to claim and variation positions and Management assesses the recovery prior to recognising the amount in the Financial Statements.