

Project briefing

EUROPE'S FLAGSHIP POST-SUBSIDY PROJECT UP CLOSE

Project name: Don Rodrigo

Location: Near Seville, Andalusia, Spain

Capacity: 175MW

It is ironic that Spain, whose government is infamous for its history of damaging PV policy U-turns, is also now home to the figurehead project of large-scale solar's return in Europe after years of hiatus. The Don Rodrigo project in the southern region of Andalusia is the first mega-scale PV system to go without subsidies on the continent, standing at 175MW capacity. Ever since Spain retroactively dumped feed-in tariff support for solar projects in 2012, investors have turned away from the prospect of Spanish solar, which was further tarred by the infamous, but now withdrawn 'Sun Tax' on self-consumption of PV generation. This meant that only solar without subsidy would offer freedom from the whims of government. It would take a culmination of loosened EU trade restrictions, technological advances and some adept forward planning to make this a reality in Europe. The head of solar at Germany-based company BayWa r.e., which delivered the Don Rodrigo project, believes that the plant is a huge milestone in solar fast becoming the cheapest source of electricity, with projections for it to be significantly cheaper overall than not just conventional sources of power but even wind energy in the near future.

Notably, Don Rodrigo is BayWa's largest project to date, is said to have the longest power purchase agreement (PPA) of its kind in Europe and was sold to one of Germany's top four largest asset managers. This stamp of approval from the big league of the investment community – MEAG Munich, the asset management division of insurer Munich Re and ERGO – would have helped to quell any fears about the viability of BayWa's project. The acquisition went through in December last year although this is not the first instance of such a transaction, since MEAG bought UK-located solar parks from BayWa in 2014 and 2015.

At first, investors had said the company was crazy going into Spain after the tariff cuts, but the unsubsidised model meant the project had an independence that was

largely free from government interference.

"We said, in fact, it's not a feature of Spain to have government support; it's a feature to not have it, to have the least to do with the government as possible," says Benedikt Ortmann, managing director of BayWa r.e. Solar Projects.

It is this independence created by no subsidy support that allowed BayWa to go back into Spain as a bright land of opportunity rather than seeing it as a graveyard for solar. And the Don Rodrigo project's significance, of course, extends beyond Spain into the whole European continent as a result of this new model, because wherever solar can go without subsidy the final hurdle of economics has also been cleared.

The time is right

An unsubsidised project means there is no tax incentive or FIT, says Ortmann, who is keen to stress that this is separate from a merchant project that does not have a long-term PPA and is exposed to the spot price market.

Ultimately, the project's lack of subsidies demonstrates that it is not only possible to operate a large solar plant on the grid in Europe, but that PV power can be cheaper than that of coal-fired power plants. It symbolises the first nail in the coffin for coal and the first step towards this solar model becoming plausible in other parts of the continent, even further to the north.

BayWa was wondering back in 2012 where post-subsidy PV would first become a reality in Europe, if at all, says Ortmann, but it earmarked the areas of highest irradiation including Southern Spain, Italy, parts of Greece and Turkey. The decision was soon narrowed to Spain and Italy before political and economic situations, grid availability, land costs and the sheer size of BayWa's planned plant meant that Spain was chosen. There was no special technique being applied to the project, rather a focused investigation into where grid parity could happen first.

Timing the project with the downward trajectory of solar module prices was key, given that panels have historically accounted for around 50% of the cost of a PV project, says Ortmann. It was widely

accepted back in planning stages that prices would continue to fall and that industry-wide belief could be seen played out in real time by the record solar tariffs being set in auctions across the globe. In each case there was still at least a year longer timeframe to complete projects so those low bids were dependent on prices continuing to lower during the period before purchasing the modules, or the developer would come unstuck. The beauty of the solar is of course that, once installed, it becomes totally independent of the oil price and interest rate fluctuations over a couple of decades or as long as the plant remains active.

However, much of the Don Rodrigo project relies on Chinese-made equipment. Intrinsic to the reliance on module price, therefore, was the long-awaited removal of the Minimum Import Price (MIP) on Chinese imports of solar panels to Europe in September 2018.

"With MIP it would have been impossible," says Ortmann. "So that's the reason why we always said the MIP is a damage to the European economy as 80% of the value added on a PV system is not coming from the panels, but from all other parts like BOS, construction, project development, O&M etc., so making panels artificially high or costly is actually a measurement against solar in Europe."

Most of the industry is now using China not just for cost, but even for the quality of panels, adds Ortmann – noting that almost all of the top 10 manufacturers come from China.

Off-take first

Electricity generated by Don Rodrigo will be sold via a 15-year PPA with the heavy-weight Norwegian hydropower company Statkraft. A fixed price for five years was put in place to ease the worries of investors, with a floor price scheme brought in for the remaining 10 years.

"In Europe PPAs of length beyond even five years are completely unusual, because we have the liquid market there, you have the stock exchange," says Ortmann. "There's also a huge counterparty risk associated with that."



By Tom Kenning

"This is why when we were approaching the market, nobody was willing to go for 15 years' duration, but on the other side we had interviews with banks and they were of course more cautious about long-term risks regarding the merchant exposure."

This caution led to the banks asking for a long-term PPA for the first time, so there was a three-party approach between BayWa, the banks and potential off-takers.

Building Don Rodrigo

BayWa r.e. has already commissioned 2GW and manages more than 5GW of plant output, so it was well versed in solar and Don Rodrigo turned out to be a relatively straightforward development.

"It was very easy, because, at the time, nobody else was there, so the government as a municipality, the landowner, literally everybody was very keen to attract us. It was very good," says Ortmann. "It was agricultural, but very rough agricultural land. Down there in southern Andalusia it's very dry so you have to really water everything, so it was more or less abandoned and it was next to a huge waste disposal site, so not really attractive from others' points of view."

For equipment, BayWa decided to do a 50:50 between its two most favoured module suppliers, Astronergy and GCL, to avoid exposure to delivery risks from only having one supplier. Don Rodrigo also uses Chinese inverter firm Huawei's 'smart' technology to optimise the plant through data-driven monitoring opportunities.

The BayWa r.e. service team will also be responsible for the ongoing operations

and maintenance (O&M) of the plant, which was completed without any delays or complications, except for a port incident that made site access difficult.

The modules were first to be brought in through Spanish harbours, but a combination of inexperience and confusion over the MIP meant that the harbours blocked BayWa's transportation, says Ortmann, so the company had to shift the load to Amsterdam before transporting the panels overland back to Spain.

How to clean the panels is still under discussion. Water could be used from a nearby reservoir that was used for farming originally, but the possibility of using robotic cleaners is still in play.

"It's a question of cost and efficiencies and maintenance of those robotics," adds Ortmann.

Stamp of approval

BayWa's quick sale of the project to MEAG was a great success. The price of the sale has not been disclosed, but German commercial bank Norddeutsche Landesbank (NORD/LB) had provided a construc-

tion bridge loan of €100 million in August 2018.

Discussing the sale, Ortmann says it "is clearly a signal from investors that they now are overcoming the feed-in tariff times and seeing that unsubsidised solar is a viable business case for them. Having the Statkraft PPA as a potential counterpart, Nord/LB was actually very happy to provide a long-term facility, however Munich RE was acquiring the project and they preferred to buy full equity so we had to give the loan back to the bank."

A subsidy-free future

The Don Rodrigo project will be the marker for when people look back to see at what point European solar's shift to an unsubsidised model became reality for the largest-scale plants, but there are several smaller subsidy-free projects operating in Italy, Portugal and even in the UK where the local firm Anesco has combined batteries with solar.

Furthering the model within Spain, X-ELIO has signed a 15-year PPA with Nexus Energía for 100MW in Murcia, and Luxcara has signed a PPA with Alpiq for a 45MW project in Espejo.

BayWa itself is working on Don Rodrigo II, which will be constructed this year and there are several projects in the pipeline with 1-2GW in Spain up to 2022-23 as well as projects in Italy, France and most other countries in Europe.

Ortmann is optimistic about the chances of subsidy-free solar proliferating across the continent, adding that it is hard to see it going any other way unless there is a major hindrance to Chinese supply:

"As panels are getting even cheaper nowadays, we can extend the area where subsidy-free solar is possible further north, even in countries like UK people are talking about unsubsidised solar, which if you had asked me five years ago I would never have expected.

"That's now the ultimate tipping point we reached, that solar energy is cheaper than any other conventional energy source and that's actually good news for climate change and good news for our society."

Don Rodrigo key facts

- Modules: >500,000 Astronergy and GCL polycrystalline modules with maximum efficiency of 17.6%
- Site: 265 hectares
- Balance-of-system: fixed-tilt on 1,500V(DC) architecture
- Annual generation: 300GWh
- Completion time: 10 months to complete
- Cabling: 3,000 kilometres
- Inverters: HUAWEI String inverters SUN2000-60/100 KTL