SUSTAINABLE BUSINESS MAGAZINE speaks to Andrew Moles, Director, Solar at PCL Construction, about driving down costs, optimizing energy generation, and constructing renewable projects in diverse markets.

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PCL Construction – one of the largest contracting organizations in North America – is involved in solar projects globally. Having started out offering solar exclusively in Ontario, by early 2017, the last time Sustainable Business Magazine spoke to PCL Construction, the company had successfully repositioned its solar capabilities to reach all markets in which it operates, including Canada, the United States, the Caribbean, and Australia. (See Sustainable Business Magazine issue 2/17 for the full feature.)

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IMPROVING COSTS

“In the first half of 2018, we picked up another 165MW of solar projects,” says Andrew Moles, Director, Solar at PCL Construction. “That’s one 86MW project, one 66MW project, and one 18MW project. For one of those projects, between the base design and our optimized design, we were able to lower the capital costs by 7%, while at the same time increasing the electricity generation by almost 3% resulting in a significant reduction of the client’s Levelized Cost of Electricity (LCOE).”

PCL uses an “Expert to Expert (E2E)” approach with each client team, involving a combination of engineers and advanced modelers in conjunction with the client’s own design team to achieve the most efficient design solutions. “We’re very focused on driving down the costs of projects through creative design while increasing the performance at the same time,” says Mr. Moles. “We have the very best design engineers in-house who are solely focused on optimizing solar projects. We also have cutting-edge, internally-developed software, which means we can very quickly adjust performance modeling, designs, and pricing. Between the software and our engineering team, we’re able to decrease the levelized cost of electricity (LCOE) across projects, which creates greater return opportunities for our development partners.”

With experience, PCL has been able to draw lessons which drive down costs for subsequent projects. “It’s about continuous improvement through every project we design and build,” says Mr. Moles. “We always look back and say: ‘Could we have tweaked something? Could we have done something differently?’ We also stay up to date with the new technology that’s coming out, and make sure our design approach integrates the new technology in such a way that we can get value out of it. In this way, we ensure we’re constantly driving down the LCOE, looking to get it at par with or below other electricity sources.”

NEW HOMES FOR SOLAR

With more sophisticated software, affordable, optimized solar generation becomes an option even in more challenging environments. “Our 3D modelling tools for tracker...
systems allow us to accurately model solar performance even in very rough, hilly terrain,” explains Mr. Moles. “Projects built on squares in flat ground in the desert are fewer and fewer now. There are a lot of areas where the land isn’t the most attractive where it makes sense to build solar. Those areas have been lagging in construction and in LCOE, simply because the grading requirements and geotechnical conditions are a little more challenging. With our internal software, we can accurately model the site to minimize the grading requirements for trackers or fixed-tilt solutions while still guaranteeing a good performance ratio at the end of the day.”

With their combination of internal software and engineering expertise, PCL have been able to install successful projects in some unusual places. “Years ago, I referred to a solar project as a ‘solar farm’, as many of us in the industry do,” says Mr. Moles. “A farmer who I was speaking to took exception – because a solar project really isn’t a farm. But more recently, we built the 60MW Southgate Solar Project which really is a ‘solar farm’. The land is still used for grazing sheep! We had to implement a few different provisions in the design and construction to ensure that everything was protected from the sheep, but essentially the developer has reduced their operating and maintenance costs because they don’t have grass cutting costs. Although you’ll only ever hear me refer to these as ‘solar projects’ now, it was eye-opening to see that you can innovate to retain the original use of the land in some of these respects.”

TECHNOLOGICAL INNOVATIONS

In addition to their modeling software, PCL have integrated IT into their processes to improve efficiency and transparency. “We have a fully paperless and automated quality control and scheduling program, which enables owners, lenders, and independent engineers full access into what’s happening daily onsite,” says Mr. Moles. “This system has been driving the industry forward, allowing contractors and owners to work together, as well as cutting down on both management staff and review time for all technical documents. We’ve also developed internal
software for commissioning, which identifies minor issues onsite within twelve hours, and allows us to commission these sites faster than anyone else in the industry.” Through PCL’s continued focus on these systems, they are able to deliver projects with increasing confidence in on time delivery with better overall project performance.

**BANKING ENERGY**

As the cost equation changes in the solar industry, new opportunities are emerging to store collected energy in battery systems. “PCL has built four battery storage projects to date,” says Mr. Moles. “Three of those were stand-alone grid connected projects, and one of those was integrated with solar into a facility. In addition to those, we’ve been building battery storage solutions at our off-site manufacturing plant, PCL Agile, and deploying those to sites where they’ll be connected. “Offsite construction is not a new concept, but it is one that has been slow to grow and develop in parts of North America. Although we are seeing some traction in the market for accelerated building practices, at PCL we recognized the opportunities, including quality and speed to market, that have made it thrive in the global industry, and we wanted to get in front of this.”

Today, with the decline in battery technology pricing and the improvement in the controls, as well as a need driven by grid challenges and intermittent generation from renewable energy, a new market is coming for battery energy projects. “We’re seeing a lot of stand-alone requests for battery energy storage projects,” says Mr. Moles. “Also, the majority of our projects from 2020 onwards for solar and wind have a component of battery storage worked into the project. We expect this trend to continue, and for more and more renewable energy projects to have batteries deployed alongside them. As this technology evolves, PCL wants to ensure that we are on the leading edge of this wave as it revolutionizes the energy grid.”

**VALUED RELATIONSHIPS**

Since the first time Sustainable Business Magazine spoke to PCL Construction, in 2015, the company’s renewable energy division has undergone a huge transformation, widening their area of operations to cover not just Canada but the United States, the Caribbean, and Australia. “PCL is an industry leader, and we employ best practices with respect to safety, environment, and quality in all our projects,” says Mr. Moles. “We understand the local markets and local requirements in all the places we do work, which means we ultimately understand the different permits and connection requirements that are paramount to meeting client deliverables. As we start looking into solar battery storage and wind projects in some of these different markets, it gives us an advantage – because we already work there, and we know the lay of the land.”

When operating in diverse markets, PCL ensures they involve the local communities. “It’s really important for us to make sure we’re not viewed as coming in as a foreign entity, bringing a bunch of our workers in, and then leaving with all the money from the project,” says Mr. Moles. “So we hold open houses and hire as many local businesses and personnel as possible. Two of our recent projects have First Nations as an ownership partner. We’ve been putting a big focus on increasing opportunities for First Nations personnel in and around the communities where our projects are being built. That doesn’t just mean jobs on the project; it also means training, so they can gain skills and hopefully continue working in the solar industry.”

**SUBSIDY-FREE**

As the solar industry matures, it is becoming more able to compete with traditional fossil fuel energy production. “Ultimately, the market is becoming more and more cost-competitive with other types of electricity,” says Mr. Moles. “The ultimate goal throughout North America and globally is to drive the solar market into a subsidy-free environment. By optimizing performance and balancing with capital costs and operational costs, we’re driving the industry in that direction fairly aggressively.”

In doing so, PCL are able to develop projects in new markets, some of which don’t have subsidies for renewables. “Like any new industry, sometimes it takes subsidies to get it moving forward,” says Mr. Moles. “But it isn’t responsible to assume that subsidies are always going to exist. To really change the world from an electricity standpoint, renewable energy technology needs to be able to compete with traditional forms of energy generation. We’re there in a lot of markets now. It’s our goal to take this approach everywhere PCL operates, all across North America, throughout the Caribbean, and to Australia, to drive the cost down as far as we can. This will mean, ultimately, the consumer is getting renewable, clean electricity, at no additional charge. We’ll continue to grow solar, wind, and battery storage project portfolios in all our markets, with an ultimate goal of driving the industry to a subsidy-free environment.”

For more information about Spark Power, visit [www.sparkpower.ca](http://www.sparkpower.ca)