

Power Finance & Risk

Exclusive Insight on Power M&A and Project Financing



PFR Q&A: Cryptocurrencies and the Grid 2021. *Page 8*

● PROJECT FINANCE

GSRP wraps solar, storage financing

Goldman Sachs Renewable Power has wrapped a \$655.9 million debt package for a solar-plus-storage project in California. *Page 7.*

● LATIN AMERICA

GIP acquires Mexican IPP

Global Infrastructure Partners has acquired Mexico's fourth-largest independent power producer. *Page 19.*

● PEOPLE & FIRMS

Citi's Jack Paris joins investment manager

Jack Paris, a managing director and co-head of power, utilities & renewables at **Citi**, has left the bank for a role at an investment manager. *Page 22.*

Buyer tees up Primary Energy acquisition financing

Taryana Odayar

London-based fund manager **Sustainable Development Capital** (SDC) is slotting debt financing into place to support its purchase of an additional stake in **Primary Energy Recycling Corp.**, a portfolio of waste-heat-to-power and cogeneration projects supplying steel mills in the Midwest.

The firm's **London Stock Exchange**-listed investment vehicle, SDCL Energy Efficiency Income Trust (SEET), which already owns a 65% stake in the portfolio, is planning to buy the remaining 35% from a consortium led by **Fortistar**, *PFR* has learned.

SDCL has tapped **Investec** to lead a \$50 million four-year loan to back-lever its acquisition of the remaining stake. Lender discussions are already underway and a deal is expected to be reached by the end of September. The other members of the Fortistar-led consortium that hold the remaining 35% interest include **John Hancock Life Insurance Co.**, **Prudential Capital Group** and **Ares Capital Corp.**

SEET bought its initial 50% stake in Primary Energy for \$110 million in February 2020, as previously reported *PAGE 5»*



The Primary Energy Portside gas-fired combined-heat-and-power plant

Case Study: Cardones-Polpaico, Chile

In a deal that took almost a year to close, **Interchile**, a subsidiary of Colombia's **Interconexión Eléctrica** (ISA), raised about \$1.2 billion of bonds to refinance a sprawling transmission portfolio interconnecting the entire northern half of Chile. **Carmen Arroyo** has the story.

The mammoth project is the 753 km (467.89-mile) 500kV dou-

ble-circuit Cardones-Polpaico transmission line, which runs from the center to the north of the country, crossing the regions of Atacama, Coquimbo, Valparaíso and Santiago.

InterChile originally financed the asset in 2016, bringing it online three years later in June 2019. At that point, the sponsor began searching for *PAGE 18 »*

Dominion offloads California, Utah solar

Taryana Odayar, Alfie Crooks

Dominion Energy has struck deals to offload its interests in two separate solar portfolios – one located in Utah that it co-owns with **Clearway Energy**, and another spanning both California and Utah that it co-owns with a **JP Morgan** portfolio company.

In the first deal, Clearway has agreed to pay \$335 million, subject to working capital *PAGE 6»*

Basalt, DCO kick off district energy biz sale

Alfie Crooks

Basalt Infrastructure Partners and **DCO Energy** have launched a sale process for a jointly owned portfolio of district energy systems.

TD Securities launched the sale process for the eight district energy networks in mid-August, *PFR* has learned, under a process codenamed Project Diamond.

DCO and Basalt had initially mandated TD on a *PAGE 7»*



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● PPA PULSE

TC ENERGY SIGNS OFFTAKE FOR ALBERTA WIND FARM

Vancouver-based renewables developer **Elemental Energy** has signed a power purchase agreement with a Canadian pipeline operator for the output of a solar project in Alberta.

TC Energy will buy the output of the 20 MW East Strathmore Solar Project under the terms of the deal. Construction started on the project last fall to bring it online later this year.

The asset is located in Wheatland County, about 70 km (43 miles) east of Calgary.

CHILE SETS PRICE CEILING FOR 2021 POWER AUCTION

Chile's **National Energy Commission** has announced the maximum price of the bids to be awarded as part of this year's renewable power auction.

The agency will award 15-year power purchase agreements totaling 2.31 GWh to power distribution companies (discos) across the country.

The price ceiling will range from \$37/MWh to \$41/MWh, depending on which set of hourly time blocks that bidders bid into, the cheapest being the 11pm to 8am block and the most expensive being the 6pm to 11pm slot.

Bids were presented by 29 companies earlier this month. The winners will be announced on August 27.

The PPAs kick in as of January 2026 ([PFR, 8/9](#)).

BRAZIL APPROVES SEPTEMBER POWER AUCTION

Brazilian power regulator **Aneel** has approved an auction to be held on September 30 which will award power purchase agreements to solar, wind, hydro and thermal power plants in the country.

The A-5 procurement process will distribute 15-year contracts for wind and solar assets, 25-year contracts for hydro assets and 20-year PPAs for thermal projects.

The contracts will kick in in January 2026.

Aneel approved the auction on August 24, noting that developers had registered 1,694 projects totaling 93,859 MW, which would be able to bid into the auction.

The move follows the closing of the A-3 and A-4 procurement process in July ([PFR, 7/9](#)).

LIMA AIRPORT SIGNS RENEWABLES PPA

Lima Airport Partners (LAP), the concessionaire for Lima's Jorge Chávez International Airport, has reached an agreement with **Engie Energia Peru** to supply renewable energy for the airport's new and existing terminals.

LAP will purchase up to 28.8 MW of electricity to power the entirety of its operations with renewables, according to the deal announced on August 18.

Engie will supply power for a second terminal being built at the airport from September 2021 onwards, and to the existing terminal from January 2022. The contracts will last for the remainder of LAP's concession, ending in December 2031.

The LAP consortium is owned by **Fraport** (80.01%) and **IFC** (19.99%). ■

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Feel free to contact **Richard Metcalf**, editor, at (212) 224-3259 or richard.metcalf@powerfinancerisk.com

GENERATION AUCTION & SALE CALENDAR ●

These are the current live generation asset sales and auctions, according to Power Finance and Risk's database.

Generation Sale DATABASE

Seller	Assets	Location	Adviser	Status/Comment
Actis	Saavi Energia	Mexico		GIP has purchased the company as of the third week of August (see story, page 19).
Ares Management Corp	Navisum	US	Scotiabank	Bids for the company are due in mid-August (PFR, 8/2).
Atlantic Power	Curtis Palmer (60 MW Hydro)	New York		Innergex and Hydro-Québec have agreed to buy the portfolio as of the third week of August (see story, page 5).
Balanced Rock Power	Balanced Rock Power	Utah	Lazard, Macquarie Capital	The sponsor has secured an equity investment as of early August (PFR, 8/16).
Basalt Infrastructure Partners, DCO Energy	Project Diamond	US	TD Securities	The sponsors launched the sale process the third week of August (see story, page 1).
Blackrock	Kingfisher (298 MW Wind)	Oklahoma	Agentis Capital	DIF Capital Partners has agreed to buy the asset. The deal will close in the third quarter (PFR, 6/14).
Broad Reach Power	Broad Reach Power	US	Citi	Marketing materials circulated in April (PFR, 5/10).
Basalt Infrastructure Partners, DCO Energy	DB Energy Assets	US	TD Securities	The sale process kicked off in mid-August (see story, page 1) (PFR, 5/17).
Carlyle Group	Valcour Wind Energy (612 MW Wind)	New York	Nomura Greentech	AES and Alberta Investment Management has agreed to buy the portfolio as of August 13 (PFR, 8/23).
Clênera	Clênera (90%)	Brazil	Nomura Greentech	Enlight Renewable Energy has agreed to buy the stake, as of early July (PFR, 7/12).
Colbun	Colbun Transmission	Chile	JP Morgan, BTG Pactual	APG, Celeo Redes have received approval to buy the company as of August 3 (PFR, 8/23).
Colombia	ISA (Transmission, 51.4%)	Colombia	Bancolombia, HSBC, BTG Pactual	Ecopetrol closed the purchase of the stake on August 20 (see story, page 19).
Columbia Basin Hydropower	Banks Lake (500 MW Storage)	Washington	Green Giraffe	The bank distributed teasers in April (PFR, 5/17).
Cypress Creek Renewables	Cypress Creek Renewables	North Carolina	Morgan Stanley	Eight bidders have been identified during the second round, as of mid-May (PFR, 5/24).
Dominion Energy	Portfolio (530 MW Solar, 50%)	California		Clearway has agreed to buy the stake as of the third week of August (see story, page 1).
	Portfolio (154 MW Solar, 67%)	California, Utah		Dominion has agreed to sell its stake in the portfolio as of the third week of August (see story, page 1).
EDF Renewables	Ventos de Bahia III (181.5 MW Wind, 50%)	Brazil		Omega has agreed to buy the asset as of July 28 (PFR, 8/9).
FlexGen Power System	FlexGen Power System	US	Citi	Apollo Global Management is making an investment in the company as of the third week of August (see story, page 5).
Glidepath Power Solutions	Project Wolf (3.1 GW Storage)	US	Guggenheim Securities	Teasers were distributed during the week of April 19 (PFR, 5/3).
Global Infrastructure Partners	Freeport LNG (Gas, 25%)	Texas	Rothschild & Co	The sponsor has mandated the bank to sell its minority stake in the project as of early June (PFR, 6/7).
Diamond Generating	Tenaska Gateway Generating Station (854 MW Gas, 67.8%)	Texas	Whitehall & Co	The bank distributed teasers in April (PFR, 5/17).
Gasco	Copiapo (150 MW Solar, 50%)	Chile		Gasco has inked a deal to sell the stake as of July 30 (PFR, 8/9).
HPS Investment Partners, Temasek	Cypress Creek Renewables	North Carolina	Morgan Stanley	EQT Partners has emerged as the winning bidder for the firm, as of early July (PFR, 7/12).
International Electric Power	Tejas Verdes (10 MW/50 MWh Storage)	US	BNP Paribas	First round of proposals is due in mid-August (PFR, 7/26).
Nexamp	Nexamp	US	Marathon Capital	The firm has received an equity injection from Generate Capital as of the third week of August (PFR, 8/23).
NextEra Energy Resources	Portfolio (590 MW Wind, Solar)	US		The company is dropping the portfolio into its yieldco, as announced on July 23 (PFR, 8/16).
Origis Energy	Project Gator	Florida	OnPeak Capital, Goldman Sachs	Teasers were circulated in June (PFR, 7/26).
Prospect14	Project Anthracite (1.3 GW Solar, Storage)	Pennsylvania, Virginia	Jefferies	Marketing materials for the sale process circulated during the week of April 26 (PFR, 5/3).
Rockland Capital	Portfolio (773 MW Gas)	Illinois	BNP Paribas, Scotiabank	The sponsor is taking bids for the portfolio on July 27 (PFR, 7/26).
Source Renewables	Community Solar Portfolio (23 MW)	New York		The sale launched in the third week of March (PFR, 3/29).
Southern Power	Partin Solar (50 MW Solar)	North Carolina		The sponsor recirculated teasers for the project in the second week of March (PFR, 3/15).
SunGrid Solutions	SunGrid Solutions	Canada	Javelin	The firm circulated teasers for the equity injection in July (PFR, 8/2).

● New or updated listing

The accuracy of the information, which is derived from many sources, is deemed reliable but cannot be guaranteed.

To report updates or provide additional information on the status of financings, please call Taryana Odayar at (212) 224 3258 or e-mail taryana.odayar@powerfinancerisk.com

PROJECT FINANCE

Deal Book is a matrix of energy project finance deals that Power Finance & Risk is tracking in the energy sector.

Live Deals: Americas

Sponsor	Project	Location	Lead(s)	Deal Type	Loan Amount	Tenor	Notes
Capital Dynamics	California Flats Battery Energy Storage System (60 MW/240 MWh Storage)	California	Goldman Sachs, US Bank	Tax equity			The sponsor has secured the investments as of early August (PFR, 8/16).
Castleton Commodities International	Riverview Power (1.4 GW Gas)	New York, Texas	Morgan Stanley	Term loan B	\$205m	7-yr	The deal, which will refinance the portfolio, was launched in mid-April (PFR, 5/3).
Celsia	Tesorito (198.7 MW Gas)	Colombia	SMBC, Santander		\$140m-\$150m		The sponsor has mandated the banks as of early May (PFR, 5/17).
Cox Energy America	Sol de Vallenar (308 MW (DC) Solar)	Chile					The sponsor is looking for debt for the asset as of February 12 (PFR, 2/22).
Daroga Power	Portfolio (33 MW Fuel cell)	US		Tax equity	\$205m		The sponsor is raising financing as of late March (PFR, 4/5).
Generadora Metropolitana	Portfolio (600 MW Solar, Gas)	Chile	Credit Agricole	Term loan	\$600m-\$650m		The sponsor is expected to tap a club of banks, with the deal expecting to close by late September (PFR, 8/2).
				Private placement	\$300m-\$350m		
Goldman Sachs Renewable Power	Project Slate (300 MW, 561MWh Solar, Storage)	California	Natixis	Senior debt	\$655.9m		The sponsor has closed the deal (see the story, page 7).
Intersect Power	Radian (420 MW (DC) Solar)	Texas	Bank of America				The sponsor is preparing to raise debt for its development-stage projects, as of early June (PFR, 6/14).
	Aramis (100 MW Solar, Storage)	California					
I Squared Capital	Atlantic Power portfolio (1,160 MW Gas, Biomass, Coal)	US	RBC Capital Markets, MUFG	Term loan B	\$360m	6-yr	The banks met on March 18, with commitments due on April 1 (PFR, 3/22).
				Ancillary facilities	\$45m		
Key Capture Energy	Portfolio (250 MW Storage)	Texas					The sponsor was conducting pre-marketing for debt as of February (PFR, 2/15).
Macquarie Infrastructure and Real Assets	Wheelabrator Technologies, Tunnel Hill Partners	US	Credit Suisse	Term loan	\$1bn	7-yr	The sponsor is combining and refinancing the portfolio companies, with commitments taken on March 19 (PFR, 3/15).
				Ancillary facilities	\$400m	5-yr	
Matrix Renewables	Portfolio (81.7 MW (DC) Solar)	Colombia	IDB Invest	Term loan	\$31m	18-yr	The sponsor is securing debt arranged by IDB Invest as of mid-May (PFR, 5/24).
	Portfolio (154 MW (DC) Solar)	Chile	BNP Paribas				The sponsor mandated the bank for a financing in February (PFR, 5/17).
NextEra Energy Resources	Sky River (77 MW Wind)	California					The sponsor is arranging financing for the asset as of the third week of May (PFR, 5/31).
Pattern Energy Group, Samsung Energy Partners	Armow (180 MW Wind)	Ontario	AssociatedBank, Bayern LB, Credit Agricole, SocGen, Caixabank, SMBC, SMTB	Refinancing	C\$1.2b	18-yr	The deal is expected to close in July (PFR, 6/7).
Repsol, Ibereolica	Odessa (Wind, Solar)	Chile			\$220m		The sponsors are nearing financial close on the deal, as of the first week of August (PFR, 8/9).
Savion	Westoria Solar (200 MW Solar)	Brazoria County, Texas	CIT Bank, ING Capital	Term loan	\$79m	C+5yr	The sponsor is working on the financing as of February (PFR, 2/22).
				Tax equity	\$95m		
				Ancillary facilities	\$38m		
Terra-Gen	Edwards Sandborn (1,118 MW/ 2,165 MWh Solar, Storage)	California	Deutsche Bank, BNP Paribas, ING Capital, Mizuho Bank, CoBank, Kookmin Bank, Rabobank, KeyBank	Construction loan	\$400m		The sponsor has secured the debt package as of the first week of August (PFR, 8/9).
			JP Morgan	Tax equity	\$328m		
				Ancillary facilities	\$76m		
VTRM Energia Participações	Piaui II and III (409.2 MW Wind)	Brazil	BNDES	Construction loan	\$317.6m		The bank has agreed to finance the assets, as of the second week of July (PFR, 7/26).

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NORTH AMERICA MERGERS & ACQUISITIONS ●

Apollo commits \$150m to energy storage technology firm

Apollo Global Management is making a \$150 million commitment in Durham, North Carolina-based energy storage technology firm **FlexGen Power Systems** to support the growth of the company and its offerings.

The investment is being made in partnership with FlexGen's existing investors, **Altira Group** and the founding investment group led by **Jerry Miller** and **Mark Dreyfus**.

Since its inception in 2009, FlexGen has supported the deployment of more than 1.2 GWh of energy storage systems across the

US and abroad for utility-scale, microgrid and C&I customers.

"FlexGen's energy storage solutions bridge the gap of reliability for the grid and help accelerate the adoption of renewables by shifting renewable power consumption to times when it is needed most," said **Olivia Wassenaar**, a senior partner and co-lead of natural resources at Apollo.

The advisers on the deal are:

- **Vinson & Elkins** – legal counsel to Apollo
- **Citi** – financial advisor to FlexGen
- **DLA Piper** – legal counsel to

FlexGen

Over the last 18 months, Apollo has invested in several ventures within the energy transition, including:

- A \$265 million equity and convertible debt investment in Italian-owned offshore wind developer **US Wind** ([PFR, 8/14/20](#))
- A joint venture with **Altius Renewable Royalties Corp** to grow renewables royalties company **Great Bay Renewables** ([PFR, 10/13/20](#))
- An energy efficiency venture with Irish HVAC company

Johnson Controls

- An investment in electric-driven gas compression company **TOPS**

- An investment in sustainable bioenergy producer **AS Graan-ul Invest**

Meanwhile, Apollo's 'Spartan' series of special purpose acquisition vehicles have announced or completed mergers with electric vehicle company **Fisker**, residential solar financing fintech **Sunlight Financial** ([PFR, 1/25](#)) and most recently, pan-European EV charging company **Allego** ([PFR, 7/29](#)). ■

Atlantic Power locks in buyers for NY hydro assets

Atlantic Power has agreed to sell a portfolio of run-of-river hydro projects in New York state to a pair of Canadian buyers.

Innergex Renewable Energy and **Hydro-Québec** have agreed to pay \$310 million for the 60 MW Curtis Palmer portfolio, plus an earn-out payment subject to **NY-ISO** market pricing.

The assets are the 12 MW Curtis Mills and 48 MW Palmer Falls facilities in Corinth, which sell their energy, RECs and capacity to **Niagara Mohawk Power Corp** under a power purchase agreement expiring on the earlier of either December 31, 2027, or the cumulative delivery of 10,000 GWh of electricity (which is expected in 2026).

Once the PPA expires, the facilities will sell their energy, RECs and

capacity into the NY-ISO market.

The deal is slated to close in the fourth quarter of 2021, subject to regulatory approvals – including from the US **Federal Energy Regulatory Commission** and under **Hart-Scott Rodino** – as well as customary closing conditions.

"The acquisition of Curtis Palmer represents an opportunity for Innergex to apply its 30 years of expertise in managing small run-of-river hydroelectric facilities, while leveraging Hydro-Québec's experience in New York to get a foothold in a new market," said **Michel Letellier**, president and CEO of Innergex.

ACQUISITION FINANCING

To finance the acquisition, In-

nergex is arranging a common equity offering, while concurrently issuing common shares to its shareholder Hydro-Québec under a private placement, so that the company can maintain its ownership interest.

CIBC Capital Markets, National Bank Financial, BMO Capital Markets and **TD Securities** are the underwriters on the C\$175 million (\$139 million) common equity offering.

The bought-deal offering is priced at \$19.40 per share for a total of 9.02 million shares, and the underwriters have a 30-day green-shoe option to buy a further 1.35 million shares at the offering price.

To allow Hydro-Québec to maintain its 19.9% equity stake in Innergex, 2.24 million com-

mon shares in the company have been issued to Hydro-Québec at the same offering price through a C\$43.5 million (\$34.5 million) private placement.

The offering and private placement are expected to close by September 3, subject to regulatory approvals, including from the **Toronto Stock Exchange**.

The deal marks the first 50:50 joint acquisition for the two companies under their Strategic Alliance, which was formed in 2020 so as to pool their renewable energy sector expertise and accelerate growth in North America, Latin America and Europe.

It is also the second opportunity for Hydro-Québec to subscribe for additional common shares of Innergex, following its purchase of the remaining 50% interest in **Energía Llama** in July ([PFR, 7/12](#)). ■

Buyer tees up Primary Energy acquisition financing

◀FROM PAGE 1 ([PFR, 4/24/20](#)). Investec had refinanced the assets shortly before they were put on the market, with a \$225 million seven-year term loan which was priced at 300 basis points over Libor, and closed in February 2019 ([PFR, 2/28/19](#)).

At the start of this year, SEET purchased a further 15% stake in the portfolio, funded from existing cash reserves, and bringing its ownership interest up to 65% ([PFR, 1/4](#)). The Primary Energy portfolio comprises five projects, which are located within the In-

diana Harbor Works and are fully integrated into various steel mill facilities.

Three of the projects are waste-heat-to-power plants, while the fourth is a 50% interest in an industrial energy efficiency project, all located at a steel mill

owned by **Cleveland-Cliffs** following its acquisition of **Arce-lorMittal USA** in East Chicago, Indiana.

The fifth and final project is a gas-fired combined-heat-and-power plant, called Portside, which services **Midwest Steel**, a subsidiary of **United States Steel Corp** in Portage, Indiana. ■

● NORTH AMERICA MERGERS & ACQUISITIONS

Dominion offloads California, Utah solar

«FROM PAGE 1 adjustments, for the remaining 50% stake in a seven-project portfolio in California totaling 530 MW (see table below). Dominion owns the remaining interests in the projects through an unusual tax equity partnership.

The deal is expected to close in the fourth quarter of 2021, subject to customary closing conditions.

Clearway plans to partially fund the acquisition with about \$210 million-\$240 million of non-recourse project level debt, resulting in a net corporate capital commitment of about \$95 million-\$125 million.

“With this transaction, Clearway will invest in new growth at attractive economics, increase its long-term contracted cash flow from utility-scale solar, and further diversify its portfolio on a regional basis,” said **Christopher Sotos**, Clearway’s president and CEO.

The assets came online in 2016 and are contracted to **PacifiCorp** under 20-year power purchase

agreements, with about 15 years left of remaining contract life. Clearway levered up the portfolio with a roughly \$300 million private placement toward the end of last year ([PFR, 9/21/20, 10/31/20](#)).

The debt was issued through Utah Solar Holdings, the intermediate-level holding company that sits on top of the yield company’s existing 50% stake in the assets. **Citi** was the placement agent on the deal, which is said to have been priced at 295 bp over US Treasuries ([PFR, 10/22/20](#)).

The assets were previously encumbered with debt at the project level, but the project debt is understood to have been repaid at the beginning of September.

The projects are grouped into two portfolios known as Four Brothers (Enterprise Solar and the three Escalante projects) and Three Cedars (Iron Springs and Granite Mountain West and East, all of which are located in Cedar City). The holdco debt runs through to the end of the PPAs, at which point there is a balloon

Assets that Onward is acquiring:

Project	Location	Size
Pavant Solar	50 MW	Millard County, Utah
CID Solar	20 MW	Kings County, California
Cottonwood Solar	24 MW	Kern, Kings and Marin counties, California
Camelot Solar	45 MW	Mojave, California
Columbia Two	15 MW	Mojave, California

repayment, exposing the lenders to a degree of recontracting or merchant risk, according to a deal watcher ([PFR, 10/22/20](#)).

In order to reach the 1.2 times debt service coverage ratio required for an investment grade credit rating, Clearway entered into a solar revenue put with **kWh Analytics** to guarantee the projects’ production at a certain level.

MORE SOLAR FOR ONWARD ENERGY

Dominion has also agreed to sell its ownership interests in a portfolio of solar assets in California and Utah that it co-owns with a **JP Morgan** portfolio company called **Onward Energy**.

The company owns the portfolio on a 67:33 basis with Onward, which was formed at the start of this year through the merger of two portfolio companies of **JP Morgan Asset Management**’s infrastructure investment funds, namely **Southwest Generation** and **Novatus Energy** ([PFR, 1/13](#)).

The portfolio comprises five solar assets totaling 154 MW. Four of the assets are located in California, while the fifth is in Utah (see table above).

The parties to the deal have requested US **Federal Energy**



“With this transaction, Clearway will invest in new growth at attractive economics.”

Christopher Sotos, Clearway’s president and CEO

Clearway Energy’s Utah Solar Portfolio:

Project	Location	Size
Enterprise Solar	Iron County	80 MW
Escalante Solar I	Beaver County	80 MW
Escalante Solar II	Beaver County	80 MW
Escalante Solar III	Beaver County	80 MW
Iron Springs Solar	Cedar City	80 MW
Granite Mountain Solar West	Cedar City	50 MW
Granite Mountain Solar East	Cedar City	80 MW
	Total Capacity	530 MW

Regulatory Commission approval for the transaction by October 19, according to paperwork filed with the Commission.

Dominion acquired two of the California assets, which total 60 MW, from **Recurrent Energy** in 2014 as part of a larger portfolio acquisition ([PFR, 4/3/14](#)). It bought the other two California projects, totaling 52.6 MW, from **EDF Renewables** later that same year ([PFR, 9/15/14, 6/24/14](#)).

Toward the end of 2014, Dominion bought the fifth Utah-based asset from **juwi solar**, marking its solar foray into the state ([PFR, 11/14/14](#)). ■

NORTH AMERICA MERGERS & ACQUISITIONS ●

Basalt, DCO kick off district energy biz sale

◀FROM PAGE 1 strategic review of the assets earlier this year, as previously reported ([PFR, 5/7](#)).

A deadline has not been set for the first round of bids, although the sponsors plan to assess interest in the portfolio just after Labor Day, says a source close to the situation.

The portfolio comprises:

- The Detroit Thermal underground steam distribution system
- Wilmington District Energy System in Delaware
- Energy Center Dover in Del-

aware

- The MW Hartford Steam System in Connecticut
- Midtown Thermal in Atlantic City
- A project at **Montclair State University** in New Jersey
- Several assets in Massachusetts, Franklin and Burlington, New Jersey

All the assets are held under Basalt and DCO's **DB Energy Assets** joint venture, which was formed in 2017 when Basalt's Infrastructure Partners II fund bought a stake in a generation

portfolio owned by DCO Energy ([PFR, 1/17/18](#)).

They collectively supply 140 MW of electricity as well as 2.6 million lb/hour of steam, 56,000 tons of chilled water capacity and 122 million Btu/hour of hot water capacity to 189 buildings.

The gas-fired Detroit Thermal network comprises three operating gas-fired steam generation facilities and 42 miles of distribution piping in Detroit. It has heated Detroit buildings and businesses for more than 100 years.

Last summer, Basalt and DCO refinanced Detroit Thermal with an \$85 million package led by **MUFG** ([PFR, 6/23/20](#)). The portfolio's revenues are underpinned by contractual cashflows from Detroit-based corporations and healthcare facilities.

In 2020, DB Energy also signed a \$50 million revolving credit facility to support its acquisition of the 104 MW Energy Center Dover cogeneration plant in Delaware from Clearway ([PFR, 10/30](#)). **Santander Bank** provided the line of credit. ■

NORTH AMERICA PROJECT FINANCE ●

GSRP lassoes solar-plus-storage financing

Goldman Sachs Renewable Power (GSRP) has wrapped a \$655.9 million debt package for its recently acquired Project Slate solar-plus-storage project in California.

GSRP bought the 300 MW solar project, which comes with a 140.25 MW/561 MWh battery storage component, from **Recurrent Energy** at the beginning of this year ([PFR, 1/13](#)).

Since then, **Natixis** has acted as administrative agent and joint

lead arranger on a \$515.9 million senior secured credit facility that closed in June. Earlier this year, the bank was sole lead arranger on a \$150 million equity bridge loan, the proceeds of which will be used to fund GSRP's equity contribution to the project.

Located in Kings County, the asset is expected to come online at the end of this year. It has power purchase agreements in place with five different offtakers, four of which will buy both solar and

energy storage capacity, while one will only buy solar generation.

The PPAs are of varying lengths, ranging between 17 and 25 years.

The offtakers are:

- **Silicon Valley Clean Energy**
- **Central Coast Community Energy** (3CE, formerly known as **Monterey Bay Community Power**)
- **Stanford University Power**
- **San Francisco Bay Area Rapid Transit District** (BART)
- **Power and Water Resources Pooling Authority** (PWRPA). ■

Cypress Creek invests \$68m in South Carolina solar

Cypress Creek Renewables is expanding its presence in South Carolina with an up to \$68 million investment in a solar project in the state.

Located in Anderson County, the 50 MW solar project will power 9,100 homes annually once completed. In South Carolina, the company has developed both utility-scale and distributed solar projects, and operates 27 solar facilities totaling 520 MW.

"Cypress Creek has been part of our state's business community for years, and we look forward to the company expanding its presence in South Carolina with this new solar project in Anderson County," said South Carolina Governor **Henry McMaster**. ■

Greenbacker ups investment in hydro owner-operator

Greenbacker Capital Management is increasing its investment in an owner and operator of small hydro power plants in New York state.

The company is Denver-based **Clear Energy Renewables**, formerly known as **Clear Energy Hydro**, which will use the funds to finance the acquisition and upgrades of two hydro facilities in New York.

The investment is being made through The Greenbacker Development Opportunities Fund

(GDEV), which aims to provide flexible capital to small- and medium-sized renewable energy developers.

The fund made an initial investment in Clear Energy Renewables at the end of last year, as previously reported ([PFR, 1/19](#)). The company used those proceeds to acquire and modernize two hydro assets in New York, while upgrading a third facility in the state that it already owned.

"This expanded investment is an indication of our confidence in

Clear Energy's ability to operate small-hydro facilities efficiently and profitably, as well as our ongoing belief in the promise of distributed hydroelectric power, both as an investment that generates solid, consistent returns and as a viable alternative to other, more polluting forms of generation," said **Benjamin Baker**, a managing director and principal at the Greenbacker fund.

Locke Lord acted as legal counsel to Greenbacker on its latest investment. ■

Power Finance & Risk



PFR Q&A: Cryptocurrencies and the Grid 2021

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EDITOR'S NOTE

*In 2013, the value of one Bitcoin passed the \$1,000 mark for the first time. A Texas judge declared Bitcoin a currency in the same year, prompting **Bloomberg** to add it to its stock ticker three days later, with the first multi-million-dollar Bitcoin robbery taking place months after that.*

Fast forward to August 2021, and the value of one Bitcoin stands at about \$48,136 at the time of writing. And since the Bitcoin boom of 2013, a deluge of over 10,000 “Alt coins” – marketed as alternatives to Bitcoin – have spilled into the cryptocurrency market.

Bitcoin was able to reach this point just five years after its launch in 2008 because of its underlying blockchain technology – a revolutionary, decentralized electronic cash system that allows payments to be transacted between parties without the need for a trusted financial institution to process them.

Some of the most recent examples of blockchain being deployed in the energy sector have been for emissions trading, generating renewable energy certificates and managing load imbalances on the grid. Meanwhile, various exchange platforms are considering using crypto tokens in energy trading, while a number of energy start-ups are utilizing ‘initial coin offerings’ as a way of raising funds.

However, mining bitcoins is known to be a very energy-intensive process, as it requires vast networks of computers to constantly compete against each other to solve complex mathematical problems that result in the addition of blocks of data to an immutable electronic ‘ledger,’ as well as an incentivizing mining reward in Bitcoin.

*In this way, Bitcoin mining consumes about 93 TWh of electricity per year, which is more than the electricity consumed annually by countries such as Finland and Kazakhstan, according to the **University of Cambridge’s** Bitcoin Electricity Consumption Index.*

Bitcoin’s share of the world’s total yearly electricity production is 0.42%, fueled mainly by hydro power, coal and natural gas, as well as oil, nuclear power and renewables, according to a 2020 survey by the university. This electricity can be sourced either from local grids, or by miners directly connecting their equipment to local power plants.

*In this Q&A interview with **Digital Power Optimization**, CEO **Andrew Webber** and COO **Alex Stoecker** discuss the intersection of cryptocurrency mining and energy project finance, its impact on the market for both renewable and thermal assets in the US, and what independent power producers and financiers need to consider when assessing opportunities within this sector.*

Taryana Odayar
Editor

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● PFR Q&A: CRYPTOCURRENCIES AND THE GRID 2021

PARTICIPANTS:



Andrew Webber, Founder and CEO, **Digital Power Optimization**



Alex Stoewer, Chief Operating Officer, **Digital Power Optimization**



Taryana Odayar, Editor, **Power Finance & Risk** (moderator)

Taryana Odayar, PFR: Let's kick off the discussion with a broad question: how does cryptocurrency mining and blockchain technology fit into the energy sector?

Andrew Webber, DPO: Some cryptocurrencies, Bitcoin being one of them and the largest, use a lot of power to maintain the network that they operate on – the blockchain if you will. And so, this global network of computers, several million of them by most estimates, operate constantly and that consumes a large amount of power.

This power traditionally has been drawn mostly from China. There's been a lot of mining activity in China that is now moving and dispersing around the world to other locations, much of which is going to find its way into North America. North America consumes maybe 1.5 to 1.8 GW of power on an ongoing basis for the or the purpose of cryptocurrency mining. We expect that that could grow by as much as 10 times in the next three years.

And these computers are finding their way to North America. There's good infrastructure, good power generation, well managed grids, and so this is a natural fit to find its way here.

Odayar, PFR: Where are you seeing the most opportunities within this part of the market?

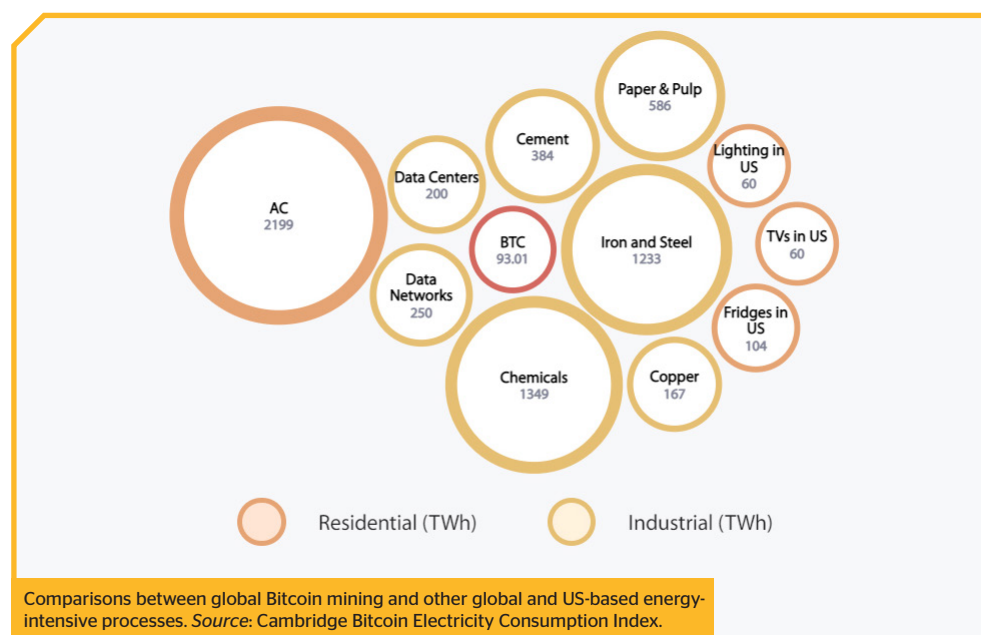
Webber, DPO: We think of cryptocurrency mining as a tool to be used by the energy sector for its own benefit. Essentially it allows power producers to capture far more value for their energy than they otherwise could have

through traditional offtakes – selling into the grid or selling to **Amazon** or **Google** under a PPA – or selling to some third-party cryptocurrency miner.

We advise our power generation partners and clients that, in many cases, the first and best use of their power is going to actually be a vertically integrated cryptocurrency mine, where they use this process for their own benefit on-site, before that energy is ever sold to a third-party or touches someone else's infrastructure. Otherwise, there is low value power that's stranded, or assets that are not operating at 100% capacity, renewable resources that are being curtailed for lack of demand, and

prices in some jurisdictions that can even go negative. All of these are situations in which we like to think DPO, as a manager of this as a service, can help these power producers and utilities make better, more efficient use of their energy and their generation assets.

Alex Stoewer, DPO: The biggest opportunity here, we think, is for energy companies themselves to get into this business because right now, very few energy companies are doing this and most of them aren't fully aware of the capabilities of this technology. So, we think this is a huge opportunity over the next few years.



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Odayar, PFR: Cryptocurrency mining is usually scrutinized as being a very energy-intensive process, but enthusiasts tout it as a means of resolving grid demand-response issues and spurring the development of renewables. How does it achieve that?

Webber, DPO: These computers generally run most of the time, but you can turn them on and off. This is unlike traditional data centers, like what you would expect with Amazon or Google or Netflix, where those entities want that to be up 24/7 with zero downtime, because their customers want access to that data and those tools that they are supplying.

With cryptocurrency mining, it's much more just an economic calculation where, if grid prices move higher where it becomes uneconomic to mine crypto, you can just turn your computers off, essentially curtailing your own operations. And so, in periods where there's some sort of challenge with the energy grid, be it a heat wave where everyone is running their air conditioning or a winter storm that has knocked out some transmission and prices go higher, cryptocurrency miners don't really want to mine with exceptionally expensive power. \$300/MWh, \$400/MWh becomes unprofitable. And so, they just turn themselves off. That then allows that power to be supplied to a hospital or a middle school, and so this activity automatically and is naturally incentivized to react to situations of varying demand.

It's a very flexible tool which on a grid-wide basis can function very much like a battery. It doesn't replace batteries, but in some ways can be an alternative to a battery where, based on different geographies, you can shut down certain crypto miners to allow that power to be then available in one region but keep other miners up in a different region, all on the same grid. And that allows you to better balance load supply and demand across a given grid, and make it more economic and more profitable for these various entities to operate in this industry.

Stoewer, DPO: You also mentioned in the question about it spurring the development of more renewable energy. We think that crypto mining is a huge tool to help to spur the development of additional renewable assets that

otherwise might not have been built because it adds so much revenue to the top line of the new assets faster. That project otherwise might not have been economic, so we think that ultimately the more crypto mining moves to North America and Western Europe, the more renewables will be built there. And the more green energy is going to be available for crypto mining and other uses.

Webber, DPO: And not only from the demand side, but also from a development planning component in terms of how large you might size the renewable energy asset. There might be situations where a 100 MW solar development doesn't quite pencil out on its own. The financing won't work, or the market is just not there. But if you could upsize it to a 110 MW or 120 MW asset with a vertically integrated crypto mine as a partial but constant offtaker, you can actually create that project. It can exist in this world because the combined cash flows and the combined profitability make it financeable and it can get done. So, you've created an energy asset through this strategy that otherwise would not have existed, and you can supply a community with the excess that you are not using for the crypto mine.

Odayar, PFR: In terms of structuring power purchase agreements with cryptocurrency mining companies as offtakers, what are some of the typical structures available, and how do you think about the credit quality of these companies?

Stoewer, DPO: So, our view here is that a PPA is not necessarily the best way to go about this. We think that ultimately this industry is going to move towards energy companies doing this for their own account and not needing to sign a PPA with some third-party who's going to take the lion's share of profits from the crypto mining operation. So, what DPO does is we go straight to the energy companies, and we advise them on how best to take advantage of this opportunity for their own account without needing to sign a PPA that might only be \$1 or \$2 or \$3 more than more than they otherwise would get from somebody else.

There are also no crypto mining companies that we're aware of right now that are anywhere near investment-grade. So, this makes it hard to finance assets if you're looking at it

just as an apples-to-apples comparison with the development of an asset that would be under a long term PPA. You need to rethink the business model a little bit and think about doing this as part of the development itself and it's a portion of the capex that's associated with the development. The asset scale is also associated with the build out of the crypto mine. It's not necessarily going to absorb the entire power generation of the asset, it might be maybe 10% of the asset. The other 90% you could sell under a traditional PPA to a creditworthy offtaker, and you'll still wind up achieving much, much better economics if you do it that way.

From a lending standpoint, there are lenders that are stepping in and are going to be lending against the development of assets that have crypto mining rigs attached, but these are not going to be the same lenders that are providing extremely cheap financing to pure-play PPA-based renewable developments. Now the capital might be a little bit more expensive, but ultimately it's going to be a huge opportunity for everybody.

Webber, DPO: It's in the name itself – power purchase agreement – you're selling power to someone else, and we advise people not to do that. Sure, you might make a little extra by doing it that way, but if you're doing what we suggest instead, we can capture two times, three times, maybe even five times the amount of revenue.

That's a hard concept for people to get their head around at first, as pretty much the only reason you talk to a power producer is to buy their product as cheap as you can. We suggest that often the best and first use for that power could be using it for yourself, so there is no PPA, there is no third-party, there is no contract. You control your power generation asset, you control the crypto mine, you own all the cash flows and you keep all of the flexibility inherent with a vertically integrated structure where it's sort of a perpetual option where you can either mine crypto if it's more profitable, or sell power into the grid if that's more profitable. It's a perpetual option that you control by vertically integrating without a PPA.

Odayar, PFR: Looking at DPO's own business model, the aim seems to be to resolve

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load imbalances and underutilization problems, while also creating profits for generators, by using any excess power to mine cryptocurrency and sell it for US dollars. In practice, how does this work?

Webber, DPO: Instead of selling energy to someone else and allowing them to create some upside using that commodity, by using it for yourself in this vertically integrated structure where you own and control of the assets and all the cash flow, that gives you flexibility. As you would expect, power producers don't really understand the idea of cryptocurrency mining or how to execute a strategy or build out a crypto mining operation, so DPO brings that expertise to them and we say, 'Let's look at your portfolio. Let's look at your pipeline of new developments. Where are you considering batteries? Where do you have a PPA that might be expiring? Where is the grid offtake just not very good? Where do you have assets that are suffering from curtailment?' All of these are situations where we might be helpful.

And DPO does the work that a power producer doesn't necessarily want to do. We help them source the cryptocurrency mining computers, design and finance the mine, build out the infrastructure, set up and install the computers, operate them on an ongoing basis, manage cryptocurrency wallets, and convert that cryptocurrency back into US dollars or Euros or what have you, on a daily basis if they like. And we put that currency right back into their bank account.

Odayar, PFR: So, it's about generating a new and novel income stream for these power producers.

Webber, DPO: That's right.

Odayar, PFR: Any impact that the price fluctuations in Bitcoin or other cryptocurrencies might have on this process and the revenues obtained?

Webber, DPO: The short answer is, it's less than you might think. Cryptocurrencies are a pretty volatile space and from the outside looking in, it can appear that there's a huge amount of risk inherent in doing something along the lines of what we suggest. The reali-

ty is, it's not quite as bad as it looks. There are some shorter-term risks where you know you can certainly have a bad period of a couple of months if the market is trending away from you in a pretty dramatic fashion.

But over the long term, the upsides and downsides tend to balance themselves out. There are a number of ways to hedge out some of the risks. You can use futures contracts to help mitigate some of the spot price fluctuations, you can actually price loans for your equipment in Bitcoin rather than dollars, which removes some of the spot price risk, and then of course there's natural built-in mechanics as to how Bitcoin is mined that benefit those with the lowest cost power and those who would choose to vertically integrate.

So, you can create a more stable downside for yourself by doing it in the way that we're suggesting, rather than trying to buy power from a power producer, or by a power producer trying to sell power to a crypto miner.

Odayar, PFR: And typically, is it mostly Bitcoin that is being mined, or can it be any other cryptocurrency? Is it up to the power producer to decide?

Webber, DPO: Yes. Without going too far down the rabbit hole, Bitcoin was built on an encryption algorithm called SHA-256. Many other cryptocurrencies are built on the same algorithm. It works quite well in that the computers that you would use to mine Bitcoin can also mine many, many other currencies. It just so happens that Bitcoin is the most liquid market. So, if your intention is to sell your production and create a US dollar or Euro revenue stream, you need a liquid market to sell into, and Bitcoin by far has the largest most liquid markets.

So, for those power producers that are operating at a relatively large scale, that is going to be the simplest and most consistent place to liquidate their production and therefore where most larger miners will be. Mining Bitcoin, for the most part, but you do have that flexibility. You can mine different coins if there's a significant economic upside to mining one versus the other. On Tuesday, you could be mining Bitcoin, on a Wednesday mining Bitcoin Cash, and on Thursday an entirely different coin.

Odayar, PFR: There's a finite amount of Bitcoin – 21 million – that can ever be mined. What happens when we hit that number?

Webber, DPO: That's expected to occur in the year 2140, so we have a little time!

In addition to the new coins that are created, as an incentive for miners to continue to operate their computers and secure this network, they also receive their pro rata share of the transaction fees, so whenever someone sends Bitcoin from one on-network wallet to another on-network wallet, there's a transaction fee that's very small, but that does accrue to the miners.

So, as this network expands over the next 119 years, with more adoption, theoretically there will be more transaction volume, and that alone will be enough to sustain the market rather than the new supply of coins being created.

Odayar, PFR: When you're having these conversations with power producers and grid operators about fitting their power plants with crypto mining rigs, what are some of the most common questions or concerns that you hear?

Webber, DPO: That's a good question. First, this is a relatively regulated environment. In the energy space, their first inclination is to make sure that they're allowed to do this, and we constantly reassure them that we have looked into this and it's not illegal to mine cryptocurrency anywhere in the US or Canada and frankly, most of the world.

The regulations that they *would* run into are how they use that power from the utility regulation side, and so we help them navigate that. But by and large, if you are using your own power, on your own site, for your own purposes, then it's considered self-generation for the most part and you can use it for what you want.

If you were trying to sell that power to a third party, as an IPP you raise the awareness of the regulators and you might end up being considered a utility. So, we think that again, the flexibility of doing it yourself and vertically integrating is a benefit.

On top of that, the power and energy space is just getting its head wrapped around this to

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some extent, and so there are a lot of questions about how this works. A lot of the questions that you're asking today about how much risk is there in the prices, and how do the mechanics work, and what if it all goes bad – we walk them through that and help offer transparency and alignment. Our partners really value that transparency where we show them these risks and say, 'Look, this might not work with your assets, or there might be some jurisdictions where it's just not going to fly.'

But, for the most part, there are ways to structure that make sense, so those are the risks that you would expect when asked, 'How do you finance this? How do you protect your downside risks?' etc.

Stoewer, DPO: The additional question that we get is the capital outlay. It is a relatively capital-intensive project that they're going to be undertaking here, and they want to understand exactly what that's going to be, how long the infrastructure lasts, what the payback period is, and the economics behind it. Things like that.

The real key there is the payback period tends to be under two years for the entire outlay, including the infrastructure and the mining computers. So, you don't necessarily need to believe that this is going to be a great strategy for you for 10 years or more. Unlike with many other energy assets, you only need to believe that over the course of the next two years, something is not going to go wildly wrong and you'll get your money back and probably make an outstanding profit as well.

Odayar, PFR: Crypto mining computers have been around for quite a long time, but the hardware has been continuously upgraded over the years. How does that fit into the picture?

Webber, DPO: There have been a few iterations. The rate of change in new advancements in terms of gross computing power as well as relative efficiency is plateauing to some degree, and so there hasn't been as much uptick in that piece of this industry lately as people might think.

The lifetime of the computers really does depend on a few factors. It's not so much that the hardware breaks down. The hardware does break down and there's maintenance

capex that's required. Fans, wiring, things that must be replaced, but that's not the major issue. The major issue is that eventually, at some point, when there's enough other competition that has been added to the network, your older computers are capturing only their pro rata share and their pro rata share is just not enough to justify their electrical expenditure, so you'll turn them off.

Basically, they become unprofitable. The time frame over which that happens can depend on a number of factors. One, how quickly new competition is increasing or decreasing. It can go both ways – when people come out of the system, it's good for the participants that remain, and when people are added to the system, it's not as good for the participants that are already there. And then, the second big piece of that is the spot price. So, as Bitcoin's spot price moves around, you can either become more or less profitable. Any given item of hardware, any given computer, will have a certain profitability level. So, your power price or how much you are paying for your power or how much you are producing in the case of a power producer, also plays into that. If someone is buying energy at \$70/MWh, they will become unprofitable and their machines will become obsolete and have to turn them off sooner than yours if you're producing power at \$20/MWh, again as a vertically integrated offtaker. So, it depends. That's a long answer, but it really does depend, and is beneficial to those that are going to be large-scale power producers as they will have the longest machine life and the most profit while they're running.

Odayar, PFR: On a state-by-state basis, which US states would you say have the most encouraging policies or incentives for implementing these cryptocurrency-mining-as-a-service solutions for power assets?

Webber, DPO: Being an independent power producer versus a utility is the first issue for consideration. We are talking to a number of utilities and we're happy to help them, we're enthusiastically helping them and we're excited that they are taking this seriously. That being said, we think it's easier for an IPP to do this today versus a utility, as there's just less red tape for them to get through.

In terms of geography, the unregulated markets are going to be easier than the regulated markets. In terms of state-by-state, there are some states that are taking the steps of actually trying to incentivize crypto mining – Kentucky being one of them. I think either in Montana, Wyoming, or both actually, it is incentivized.

As this evolves, it's going to get quite interesting because there is an inter-state competitiveness where you can create jobs and you can create tax base with this new cutting-edge industry and some states are going to take advantage of that. Others, maybe less so, but I think even outside the US, this is a global offering. Western Europe is not traditionally heavily into crypto mining, but we think there's a future there as well. We're talking to power producers in Latin America that are developing a huge amount of new renewable energy projects. And they're very open to this because of the flexibility that it offers with how to develop those projects from the planning stages, not even retrofitting an existing asset, but saying, 'How do I integrate this intelligently right from the planning stages?' And we're talking with a huge number of groups that are all across the US and globally about that, so the global nature of this and the even playing field that it presents create a lot of opportunities for groups that otherwise might not have been involved.

Odayar, PFR: And what about right here in New York? What have been some of the latest developments on the regulatory side?

Webber, DPO: New York state had previously taken the effort of trying to ban cryptocurrency mining completely. I think that effort very quickly shifted into trying to ban cryptocurrency mining using non-renewable energy sources, and that relatively quickly fell away. It doesn't seem that there's a huge appetite to try to ban the usage of the energy itself.

We continue to think that in the long run, this is going to be driven by renewables. By and large, we think it's such a great tool for the renewable space that they can't really help but pay attention to it, and so I think this is naturally going to shift toward renewable energy anyway. But for now, there's certainly no federal ban and it seems to be one of those things where states are mostly taking a wait-

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and-see approach. There were a few early moves, but we don't really see a huge amount of effort toward banning this activity right now. Ultimately, the type of generation that you're using, whether it's renewable or fossil fuel-based, whether it's to make neckties or to keep the lights on during a Yankees game, the question that societies are asking, is 'What are we doing with those generation types?' Not, 'Should we allow this use or ban that use?' And I think that's the direction this is going to take.

Odayar, PFR: Is there is an education gap when it comes to approaching investors and power producers about retrofitting their plants with crypto mining rigs? And what are some of the most common misconceptions about cryptocurrency mining and the way it fits into the energy sector?

Webber, DPO: It's an ongoing debate and I think people have very strong views about this. Frankly, we find a lot of it breaks down into how much they understand or don't understand about cryptocurrency mining and

the objections to it as being wasteful. And again, that comes down to the debate about what is a waste and what is not a waste of energy, and who gets to decide that. And I think this is actually a pretty interesting tool to help people think about that more intelligently and say, 'Should we be using energy for these other uses that maybe don't have that much societal value? Or should it be redirected to where society is in fact placing a high value on that?'

The Bitcoin network use case for energy is a relatively new one, but I think it's grown in importance. Blockchain technology and how that plays out is anyone's guess, but I think it's early days.


Stoewer, DPO: There's absolutely an education gap between people in the tech world who are very familiar with blockchain and people in the energy industry who are very familiar with different types of technologies, but not necessarily blockchain or cryptocurrency mining. And that is what DPO works to fill. We spend basically all day, every day, talking to energy companies and explaining

to them how this works and helping them think through how they might be able to use crypto mining in order to boost their own revenue and maximize the efficiency of their own projects.

There are some common misconceptions in the energy industry that we have found. One is that cryptocurrency mining is extremely complicated and it's something that takes months to understand and is totally different from anything else. It really is not. It's an industrial process that converts energy into cryptocurrency, which you can turn into dollars in the same day if you want, and it looks and feels a lot like a traditional data center, except it's actually much simpler than a traditional data center – you don't need the same levels of redundancy that you have in a traditional data center.

Once we help power producers understand that cryptocurrency mining itself is not complicated at all and help them think through exactly what that means, that helps to close the education gap pretty significantly.

And then another common misconception



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is that by entering into cryptocurrency mining, they are effectively just going long Bitcoin and buying into the Bitcoin hype. That's not the case. Like Andrew said before, you're actually relatively insulated from volatility over time from cryptocurrency prices, and we help them understand why exactly that's the case as well.

Odayar, PFR: Can you name any real-life scenarios where cryptocurrency mining-as-a-service would have been most helpful for power generators, for example in terms of mitigating load imbalances or improving grid resilience?

Webber, DPO: The immediate example that comes to mind is what happened in Texas in February this year, with the winter storm and the issues with power generation and transmission. There are crypto miners in Texas and they did turn themselves off because they do not want to keep those computers running when grid prices are \$2000/MWh. That's a bad way of making money, so you turn your computers off, which is a good thing for Texas, because now that power can serve some other use.

That's an interesting model that's going to grow. And if you had had cryptocurrency miners, with a 100 MW mine here and a 200 MW mine there, spread strategically throughout the state, when you have transmission issues, you just call up the local crypto miner. In fact, you don't even need to call him up, because he's going to curtail and turn himself off anyways if the grid prices go higher and it becomes uneconomic. This is a naturally occurring phenomenon where this industry is tailor-made to set itself up to increase grid stability. How regulators, how the utility industry and the power generation industry incorporates this in the coming decade is going to be incredibly interesting and it's going to solve a lot of problems that people have been trying to solve.

Now, we don't think this is the only tool and we don't think it's going to work in every single scenario, but it's a complement in some cases to batteries. In five years, when you're developing a new energy asset, you're going to have to check the box of, 'Do we have a storage strategy for this asset? Do we have a green hydrogen strategy for this asset? Do we have a

crypto mining strategy for this asset?' It's going to be a very standard question that starts to be asked of these groups and most of them today are not quite prepared for it, so we want to help.

Odayar, PFR: You mentioned the concept of crypto miners automatically shutting down if it becomes unprofitable to mine coins. How exactly does that work?

Webber, DPO: It's fairly simple. If the grid prices go above the amount of revenue you're creating by mining Bitcoin for any given period of time, then you're better off just not running computers because you're going to lose money, and so you have this natural incentive to turn them off. And that's just as simple as throwing a switch and saying, 'Hey, this is costing me money to keep these turned on right now, so I'm just going to flip them off.' It requires no real notice, no forewarning, and you could just turn them back on whenever grid prices come back down to a level that's acceptable.

DPO has actually filed a patent that allows protection of some of our control mechanisms, and some software that we're developing that helps to better manage that process. As grid prices fluctuate, and as a power producer's opportunity costs for their power move around for any given option, we can automate the on-off function of our computers to exactly match the best possible outcome for what they have available versus what their offtake options are.

Odayar, PFR: Are there any particular generation types that are most complementary when it comes to selecting which power plants to install crypto mining rigs on?

Webber, DPO: It's a different sort of puzzle for each type. Frankly, each one has its benefits and drawbacks with regard to cryptocurrency mining.

A stable, 24-hour source is going to be easier and simpler, but oftentimes that might cost more than renewable intermittent sources like solar or wind. While solar or wind might be cheaper per MWh, but you only get them during certain times a day or when the wind is blowing. So, it creates different challenges,

but it creates different opportunities as well. The short answer is, you have this capital outlay and then you want those computers earning their return as close to 24/7 as possible.

As I mentioned, you can certainly turn them off – it's just an economic calculation. But the longer you run them, the more frequently you run them, the better your return, and so the balancing act for a renewable producer is going to be, how do you deploy this an intelligent way? How do we deploy this in a way that's thoughtful with regard to our asset? What it generates, it's cost of generation, it's time and our opportunity costs. What else could we do with the power instead of what these guys are suggesting?

All of those are pieces of the puzzle that we help put together.

Odayar, PFR: What do the profiles of some of the power producers that you've reached out to look like, so far?

Webber, DPO: We have been speaking to absolutely everyone. We've talked to hydro groups, we've talked to some of the largest wind and solar developers in North America – easily half of the top 10 largest developers out there today – Wall Street firms that own tens of GWs of power generation assets, and also natural gas.

Even if you are a fossil fuel source today, you're going to have these questions and we want to be thoughtful about what this means for them as well and help them do this in a way that's rational and environmentally friendly. And I think there are ways of doing that. There are crypto miners today operating on fossil fuel assets, but then offsetting their carbon footprint.

Ultimately, we do think of ourselves as an ally to the entire energy space, but again, we do think that 10 years from now, this is going to be an absolute boom for the renewable sector. Even sooner than that. It's going to become kind of a standard practice for the renewable space. It's happening today.

Odayar, PFR: There are a number of cryptocurrency mining companies that buy generation from coal-fired power plants, like the Colstrip plant and Hardin Generating Station in Montana, via power purchase agreements. Is that something that

● PFR Q&A: CRYPTOCURRENCIES AND THE GRID 2021

DPO would consider helping power producers with at some point as well?

Webber, DPO: We certainly can, and we do talk to some partners for whom the idea of a vertically integrated self-owned crypto mine might be a step too far at this time and help them think through other options, which include us just buying their power and running our own crypto mine. There are some middle ground options as well which involve them spending some capex for infrastructure, but not necessarily buying mining computers for themselves, and instead potentially bringing third parties on to their site and paying them a higher price for the power plus infrastructure. And we've helped negotiate some arrangements, especially with some of these Chinese groups that are leaving China and trying to redeploy and sign agreements where they can take up space at a location that wouldn't want to purchase its own computers.

So, there are flexible options depending on what someone might want to do. And, of course we can also help find and structure third-party capital for those who like the idea but don't have a balance sheet to do this.

All those are options. It just really boils down to what our partners might want to do and their risk and capex. We've been building relationships with capital partners on the equity and lending side over the course of the past year and a half. And so, if the capex is a hurdle for power producer, we're able to help bridge that gap and create a deal that is good for everybody.

Odayar, PFR: You mentioned Chinese miners leaving their country and redeploying elsewhere. Can you talk a little bit about what's happening there and why that's the case?

Webber, DPO: Sure. Without getting into too much of the political backdrop of why, ultimately, the situation today is that China has banned cryptocurrency mining, and in fact is severely clamping down on the trading of cryptocurrencies. Their economic structure is one where a certain element of control is required of their capital base. So, this is a bit of a challenge for them to manage and regulate, and so they've made the decision to essentially ban or curtail it completely.

A lot of the world's cryptocurrency mining computers had been operating in China. It has extremely cheap power, especially in the wet season. In the Sichuan Province, there's virtually free hydro energy during that time. And so, there was a huge amount of crypto mining there, upwards of 60% of the global hash rate or global network.

With this ban, which happened in the last three to four months, there's been an exodus of these groups, accounting for upwards of eight to 10 GWs worth of mining computers that need to find a new home. The challenge today, is where are they going? Where is there enough excess power generation to take them as well as the related infrastructure? And the answer is, there's just not enough available. So, DPO can help with the relocation of some of these Chinese mining groups to have access to power generation and access to the infra-

structure allowed around the North American electrical space and secure a great deal for those with excess energy or those willing to sell it to some of these groups.

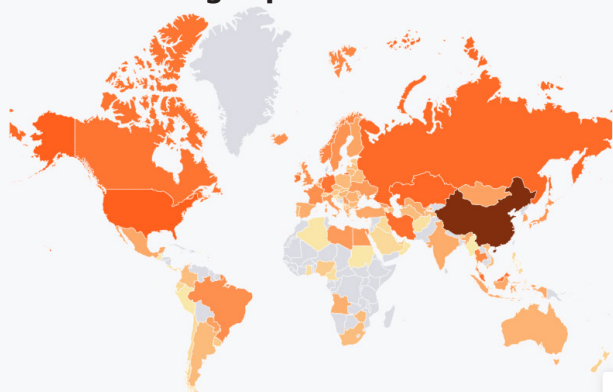
Odayar, PFR: Would CFIUS (the Committee on Foreign Investments in the United States) have any sort of jurisdiction over Chinese miners coming into the US and setting up camp at power plants here?

Webber, DPO: It's a fair question. I suppose it very much depends on the structure of the deal being arranged. There are foreign companies operating in the United States and as long as you're checking all the boxes from a regulatory compliance standpoint, there's no real security implications around this. It's just an industrial process, regardless of who owns the power generation or the infrastructure or the computers. It's an unfamiliar process to many, but not one that is necessarily overly complex. DPO helps hold the hand of our partners as they work through this and figure out how to engage, but ultimately, there's nothing around this that should cause too much concern about an international client setting up some of their assets here.

Odayar, PFR: We've covered state regulations and talked a little bit about federal regulations in this space as well. Do you think further guidance or clarity from the SEC could help too?

Webber, DPO: Absolutely. From here, the story for crypto is going to be one of institutional adoption and integration with existing infrastructure and systems to bring it much more into the mainstream. And it's been happening, it's just not necessarily on the front page of *The New York Times*. They talk about the energy usage and all these things that make headlines, but the reality is that many, many large banking institutions are using this technology today and have been using it for quite some time. **BlackRock** just invested in two cryptocurrency mining entities. So, the story of institutional adoption is here. Further clarity from the regulatory authorities will only increase that. There's plenty of CIOs and CFOs sitting on the sidelines today because they just don't know, and it's just a step too far for them, and frankly they have a day job. They can't

Global Bitcoin mining map



Average monthly hashrate share by country based on local mining pool data. Source: Cambridge Bitcoin Electricity Consumption Index.

PFR Q&A: CRYPTOCURRENCIES AND THE GRID 2021 ●

spend their day learning just about crypto. They have a company to run.

And so, I think getting a little additional clarity from the appropriate regulators will give a lot of confidence for these entities to actually start to partake and benefit from all of this. Again, this isn't something that people should be afraid of. It's something that they are afraid of because they just don't understand it yet. The more they understand it, the more clarity there is going to be, the less scary it all looks and then you're going to see huge uptake and adoption in my opinion.

Odayar, PFR: You noted that this is something to watch out for over the next decade. Apart from further regulatory guidance and investor education or comfort around all this, what else do you think might aid or speed up the adoption of cryptocurrency-mining-as-a-service in the energy sector?

Webber, DPO: The last six months has done a lot. **Elon Musk's** tweets, the headlines that **Tesla** can make in and around this space, the dramatic movement in spot prices over the last eight to 10 months, and then the China ban has all brought to the forefront much of this conversation. I think the last six months has dramatically accelerated the pace at which power producers should be thinking about this. It really has forced their hand a bit, and if you're a power producer and you think your peers and competitors aren't looking into this, you're crazy, because they absolutely are.

People think everybody owns Bitcoin already and they think everybody already understands cryptocurrency and it's already in the past. I think that's like saying the Internet had its day back in 1995. 25 years from now, you're going to look back at the amount of influence that this activity had across the energy sector and it will be immense.

Stoewer, DPO: This is also part of the wider story of the transition of energy grids worldwide from traditional fossil fuel-based power plants to largely intermittent green renewable energy. There's also obviously been a massive uptick in interest around energy storage and investments into different types of energy storage companies. Everybody is searching for that Holy Grail that's going to make it so you can turn off those last fossil fuel power

plants, and crypto mining is going to be part of that transition. This is an alternative to energy storage and a much more cost effective one today.

Odayar, PFR: On a related note, what is the potential for creating blockchain-based platforms for trading renewable energy certificates (RECs) here in the US? And using tokens in energy trading as well?

Webber, DPO: There are some miners that operate off of fossil fuel sources, who then essentially use RECs as an offset and say, 'Look, we're behaving environmentally responsibly here by offsetting our emissions.' That market is something that is just now starting to grow. From a technology standpoint, blockchain actually is a really great technology upon which to base these trading applications and the tracking of green energy production versus non-green energy. RECs themselves will likely start to trade on a blockchain of some sort, which again will just ease transaction friction for the power producers that use these RECs as a tool.

And then, of course, there's the ability for a new type of coin or token that can track and reflect the value of green energy relative to fossil fuel-based energy as it applies to the production of Bitcoin. In other words, we think there's a way in the relatively near future where those entities mining off of truly, demonstrably green energy will actually be able to capture a higher value for their cryptocurrency production than if they had they been mining off of fossil fuel sources, and so that will further incentivize more and more of this activity to be undertaken at green assets rather than fossil fuel-based assets.

It's a bit of a rabbit hole, but suffice to say, it's something that matches well with blockchain technology, and it seems there's a lot of demand for something like that, and therefore there are a lot of people working on it.

Odayar, PFR: On a broader level, it seems that blockchain is being used to track pretty much anything these days – from Cargill tracking Thanksgiving turkeys from farm to store, to De Beers tracking diamonds from mines to retailers. What's the scope for using blockchain in contract negotiations and execution in the power space?

Webber, DPO: The good thing for the energy space is a lot of this will be invisible and frictionless, where they won't even necessarily know that things are being done differently. But you might have some fees that get lowered because there used to be an intermediary in this process that isn't there anymore, because blockchain created a more effective or quicker and cheaper way of doing what used to be done.

These improvements will be happening all around you, from the tracking of individual electrons that are hitting a PV panel to where they went, where they were used. All of these things lend themselves well to being tracked in a distributed, immutable ledger, much like Bitcoin or some other blockchain. All of these technologies will ultimately be built into tools that will look familiar and easy to use. The companies that make the best user interface will succeed because they're making it easy for people to do this.

Odayar, PFR: Any other interesting developments at the intersection of blockchain, cryptocurrency mining and energy?

Webber, DPO: I think it's just the pace at which this is evolving, probably unexpectedly and perhaps unbeknownst to many in the energy industry, that are still not fully familiar with what's happening and to what degree. DPO has been around a little while. We've been here since February of 2020, telling this exact same story all through COVID all through **Elon Musk's** tweets and all through the China shut down and really explaining what was going to happen and what was happening. And so, I think the speed with which this is changing is catching people off guard.

I would just encourage people to sit up and start subscribing to some newsletters and seeing what's happening because this is coming. It's coming relatively quickly, and the ways that you can take advantage of it and use it to your benefit are many and varied.

I firmly believe that those who identify this as something worth paying attention to are going to look back in five years and be very happy they did. Those who do not are going to kick themselves a little. ■

● CASE STUDY

Case Study: Cardones-Polpaico, Chile

◀FROM PAGE 1 debt to refinance the asset, reaching out to potential bookrunners by September 2020.

Around April 2021, the sponsor tapped **JP Morgan, Goldman Sachs** and **Scotiabank** to raise \$1.2 billion to refinance the asset in the bond market. The 35-year bonds were issued on July 19 in Reg S/144a format. Listed on the **Singapore Exchange**, the bonds have an initial yield of 4.5%.

Moody's Investors Service assigned a Baa1 rating to the notes in its preliminary report on July 13, while **Fitch Ratings** gave the bonds a BBB+ rating on July 27. Fitch noted that Interchile's rating reflects a transmission line portfolio with predominantly availability-based, regulated revenues.

The deal "allows us not only to refinance commitments under favorable conditions of high liquidity and low rates, but it is also an important step to reinforce bonds with [the] capital market and investors," added Interchile's CEO, **Gabriel Melguizo**, in a statement on August 9.

The deal also "reflects the level of maturity we have reached, and the trust we generate at the international level as a responsible company with a long-term commitment with sustainable energy development of Chile," continued Melguizo. "Energy transmission is the core of the much-wanted decarbonization of the country's energy matrix."

The proceeds will be used to repay the outstanding debt on the portfolio, which is backed by the cash flows of the 11 transmission projects in the portfolio. The funds raised will also be used to pay hedge termination costs and for other corporate purposes, noted Fitch in its July 27 report.

Two of the 11 assets make up about 85% of the portfolio's capacity. They are:

- The 753 km (467.89-mile) 500kV double-circuit Cardones-Polpaico transmission line
- The 192-km Encuentro-Laguna transmission line

Eight of the remaining projects are upgrades of the Cardones-Polpaico line, while the last project expands two substations associated with the Encuentro-Laguna line, which began operations in 2017.

The legal advisers on the deal included:

- **Mayer Brown** – international to sponsor
- **Barros & Errázuriz** – local to sponsor
- **Clifford Chance** – international to lenders

"We are extremely proud to have supported our clients and Interchile on the company's debut in the international capital markets, with a record green bond issuance," said Clifford Chance partner **Hugo Triaca**, in a statement on August 2.

THE DEAL

The refinancing has been in the works since September 2020, when Interchile reached out to banks to refinance its Chilean transmission portfolio. At the time, it was seeking bookrunners for a \$1 billion bond issuance to repay its debt.

The deal took longer than expected to broker, according to deal watchers. On the one hand, the sponsor faced high swap breakage costs, which slowed down the process. At the time, a source close to the situation estimated the cost of prepaying the existing project finance loan to be around \$20 million. The costs

were perceived to be an obstacle as ISA, the sponsor's parent company, is a government-owned entity ([PFR, 11/16/20](#)). The Colombian government owns a 51% stake in the firm, while **Empresas Públicas de Medellín** and private investors own the remaining 49% interest.

On the other hand, Interchile put the financing on hold during winter to focus on a separate project – its bid for independent power producer **Colbún's** transmission business, **Colbún Transmisión**. However, the sponsor did not win and Colbún struck a deal to sell the business to a joint venture between Dutch fund **APG** and **Celeo Redes** in March ([PFR, 5/5](#)). Once the process closed, Interchile reactivated the refinancing of its Cardones-Polpaico transmission portfolio, managing to complete it by July.

ISA had already arranged similar bond issuances in the capital markets. Last year, in Peru, ISA subsidiary **Consorcio Transmanto** (CTM) issued a \$400 million 15-year bond for another transmission asset, upsizing the deal by \$200 million in September. Another affiliate, **ISA CTEEP**, had completed a similar transaction in Brazil, becoming the first transmission company in the country to issue green debentures, totaling R\$621 million (\$119.63 million).

ORIGINAL FINANCING

The proceeds of the July bond issuance replaced the layer of debt arranged in 2016 for the transmission portfolio, comprising a \$737.6 million dual-currency term loan, and provided by a syndicate of six banks. The 15-year package, which closed on February 12, was led by **BBVA**.

The other banks on the deal were:

- **Banco del Estado de Chile**
- **Credit Agricole**
- **Natixis**
- **MUFG**
- **SMBC**

BBVA also arranged a \$68 million VAT facility alongside Banco del Estado and **Banco Bice**.

The financing was intended to cover 70% of the overall \$1 billion cost of the project.

The transmission portfolio had been in the works for about four years before that, when Chile's **Ministry of Energy** awarded the asset to Interchile in 2012. However, the project faced delays as local communities opposed the construction of the transmission line.

However, with the full support of then-minister of energy **Máximo Pacheco**, the Chilean government pushed the project forward. The line was needed to reduce power costs in the country and enhance the grid's reliability. It was also designed to allow generation from solar and wind projects to be transmitted to load centers.

In December 2015, Interchile secured all the environmental permits needed to bring the project online by December 2017. Still, further delays meant that the transmission line would not start commercial operations until June 2019.

The line is split into the following sections:

- Cardones to Maitencillo – 137 km
- Maitencillo to Pan de Azúcar – 212 km
- Pan de Azúcar to Polpaico – 404 km

Milbank and local law firm **Morales y Besa** worked with the lenders on the deal. As in the refi, Mayer Brown and local firm Barros & Errázuriz acted as the sponsor's legal counsel. ■

LATIN AMERICA MERGERS & ACQUISITIONS ●

GIP acquires Mexican power producer

Global Infrastructure Partners (GIP) has acquired Mexico's fourth-largest independent power producer for an undisclosed sum.

GIP announced the acquisition of a 100% stake in Saavi Energía – previously owned by **Actis** – on August 19.

The deal marks GIP's first direct equity investment in Mexico. GIP

previously supplied Saavi with a \$325 million secured term loan through its GIP Spectrum Fund [in September 2020](#) which is to be repaid as part of this transaction.

Saavi was formed from the rebrand of **InterGen's** former Mexican portfolio, which was [purchased by Actis in 2018](#).

It primarily serves the Mexican power market, with additional

reserve capacity serving certain markets in California.

Its portfolio totals 2.2GW and includes:

- Six combined-cycle gas-fired plants
- Three compression stations
- 65 km (40 miles) of associated natural gas pipelines

The company previously held a 50% stake in the Energía Sierra Juárez wind project, but it [sold the stake to Semptra Energy's](#)

[IEnova](#) in a deal which closed in March 2021.

"Partnering with a global leader in infrastructure investing is an exciting opportunity to deliver on Saavi Energía's strategic vision for growth to help meet Mexico's energy needs," said **Jaime Tupper**, CEO of Saavi Energía. "During the last three years, we have transformed the Company into an independent, Mexican leader in the energy space." ■

Ecopetrol closes acquisition of ISA

Colombian state-owned **Ecopetrol** has completed its purchase of a 51.41% stake in transmission company **Interconexión Eléctrica** (ISA) from the Colombian **Ministry of Finance and Public Credit**.

The deal closed on August 20 after the parties secured the necessary approvals for the transaction, according to an ISA filing with Chile's **Comisión para el**

Mercado Financiero.

The Colombian government will still indirectly control ISA as it owns an 88.49% interest in Ecopetrol.

The oil company bought 100% of the government's shares in ISA for Ps 25,000 (\$6.29) per share, for a total of Ps14.2 trillion (\$3.58 billion). The firm had been in exclusive negotiations

with the Colombian government since February and announced the purchase agreement in early August ([PFR, 8/13](#)).

The acquisition is part of Ecopetrol's broader strategy to diversify away from oil and become a comprehensive energy company.

ISA is a holding company with interests in 51 entities across the energy, transport and telecommunication sectors.

ISA's shareholder breakdown is as follows:

- **Government of Colombia** (state) – 51.41%
- **Empresas Públicas de Medellín** (state) – 8.82%
- Private investors – 39.77%

The financial advisers on the process include:

- **Bancolombia** – to Ecopetrol
- **HSBC** – to Ecopetrol
- **BTG Pactual** – to the government
- **Financiera de Desarrollo Nacional** (FDN) – government ■

LATIN AMERICA PROJECT FINANCE ●

Ecuador ups power procurement plans by 1.44 GW

Ecuador's **Ministry of Energy and Non Renewable Natural Resources** has updated its power generation plans to include an additional 1.44 GW of renewable electricity by 2031.

The expanded capacity will come from wind, solar, biomass and hydro facilities in the country, which will require investments totaling \$2.2 billion.

The planned capacity is divided into four blocks. The first two

blocks are each 500 MW in size, while the third block is 120 MW and the fourth is 320 MW.

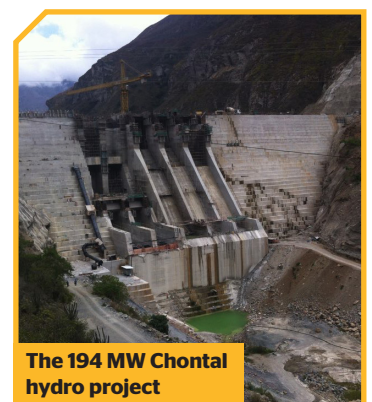
The first block of projects is due online by 2024. To ensure the assets come online in time, the government plans to launch procurement processes for the renewable energy projects.

Other projects that are under development in the country include:

- The 2.4 GW Santiago hydro project

- The 596 MW Cardenillo hydro facility
- The 194 MW Chontal hydro project
- The 50 MW Chachimbiro geothermal asset

In July, the ministry had already announced that it was preparing to launch an auction to procure 500 MW of renewable generation in the country, up from its originally planned target of 200 MW ([PFR, 7/22](#)). ■



The 194 MW Chontal hydro project

Aneel greenlights wind, solar duo

Brazilian power regulator **Aneel** has approved the start of commercial operations of a wind and solar project pair totaling 34.3 MW in the country's northeast.

Casa dos Ventos is planning to bring online its 21 MW Ventos de Santa Martina 11 wind farm in Rio Grande do Norte, through its subsidiary **Ventos de São Felipe**

Energias Renováveis. The asset is fitted with five wind turbines which are 4.2 MW in size each.

Meanwhile, **Salgueiro Energias Renováveis** will bring on-

line the 13.3 MW Salgueiro III solar facility in Pernambuco.

Aneel gave the sponsors the green light for the assets on August 19, allowing them to inject their output into the **National Interconnected System** starting on that date. ■

● LATIN AMERICA PROJECT FINANCE

AES preps permits for Chilean wind farm

AES Andes has begun the permitting process for a 258 MW wind farm in Chile's Biobio region.

The Rinconada project, situated between the Los Angeles and Laja municipalities, will require an investment of \$365 million, according to filings with Chile's **Environmental Evaluation Service**.

The asset will inject its output into the grid through a 220

kV transmission line connected to the Santa Clara substation, which is being built to bring on-line the 73 MW Campo Lindo wind farm.

Construction is expected to begin in late 2023.

The Campo Lindo facility is part of AES's renewables portfolio that is held under its Chile Renovables subsidiary. The

sponsor sold a stake in the portfolio to **Global Infrastructure Partners** (GIP) in July, as previously reported ([PFR, 7/16](#)).

The portfolio also includes:

- Los Olmos – a 100 MW wind project
- Mesamavida – a 67 MW wind project
- Andes Solar IIa and IIb – a roughly 500 MW solar project. ■

Aneel OK's Brazilian wind farm

Brazilian power regulator **Aneel** has authorized the start of commercial operations for a 33.6 MW wind farm in the state of Bahia.

The project is the EOL Campo Largo XII facility within the mu-

nicipality of Sento Se, which is owned by **CLWP Eólica Parque XII**, a subsidiary of French developer **Engie**.

Separately, Aneel has also approved the trial period for the 33 MW UTE William Arjona project

in Mato Grosso do Sul, owned by **Delta Geração de Energia Investimentos e Participações**, and the 4.2 MW EOL Ventos de Santa Marina facility in Rio Grande do Norte, owned by **Ventos de Santa Amélia**. ■

Sponsor trio to develop green hydrogen plant in Chile

GNL Quintero, **Acciona Energia** and **Enagás** have teamed up to develop a green hydrogen plant in Chile's Valparaíso region.

The 10 MW Bahia de Quintero project will be located between the communes of Puchunca-

vi and Quintero, nearby GNL Quintero's regasification terminal.

It will require an investment of \$30 million, according to an August 19 statement by GNL.

The Bahia de Quintero project will generate green hydrogen

from a mix of renewable power projects to decarbonize Chile's energy matrix.

Enagás holds a majority stake in GNL Quintero, with a 45.4% interest. Other shareholders include Canadian pension fund **OMERS** and oil firm **ENAP**. ■

Engie, Enaex plan green hydrogen asset in Chile

French firm **Engie** and explosives manufacturer **Enaex** have begun the permitting process for a green hydrogen facility in the Chilean region of Antofagasta that they announced 10 months ago.

The 26 MW HyEx facility, located near the city of Tocopilla, will require an investment of \$47 million.

The project, which is a pilot, is expected to start operating in 2025. A 2 GW complex is expected to be built afterwards and

brought online by 2030.

Enaex, a subsidiary of holding firm **Sigdo Koppers**, will use the hydrogen from the plant to produce ammonia for its local Prillex de Mejillones operations.

The project is the second green hydrogen facility to file for environmental permits in Chile this month. The first was the 10 MW Bahia de Quintero facility, which is being developed by **GNL Quintero**, **Acciona Energia** and **Enagás** in the Valparaíso region ([PFR, 8/23](#)). ■



Hydrogen will be used to produce ammonia for the Prillex de Mejillones operations

Chile's Lancuyen plots solar park

Chilean developer **Grupo Energía Lancuyen** is planning to develop a 9 MW solar park in the country's Nuble region.

Construction on the San Juan Solar project is expected to begin in May 2022, according to paperwork submitted with Chile's **Environmental Evaluation Service**.

The project will require an investment of \$10 million and inject its output into the grid through a 13.2 kV transmission line. The wire will be connected to the Chillan substation, which is owned by a local distribution company.

The project will qualify for pricing benefits under the PMGD (*Pequeños Medios de Generación Distribuida*) distributed generation scheme.

Lancuyen has already begun the permitting process for 11 other small-scale solar projects in the country, which will also qualify as PMGD assets.

Its PMGD portfolio includes:

- Lirios – 9 MW in O'Higgins
- Ligua – 6 MW in O'Higgins
- Lontué 2 – 6 MW in Maule
- El Peumo – 9 MW in Valparaíso
- La Farfana – 9 MW in Valparaíso
- Nogales – 9 MW in Valparaíso
- Santa Teresita – 9 MW in Santiago's metropolitan region
- Santo Tomás – 9 MW in Santiago's metropolitan region
- Los Boldos – 9 MW in Santiago's metropolitan region
- La Paz – 9 MW in Santiago's metropolitan region
- Las Puntillas – 9 MW in Santiago's metropolitan region ■

PEOPLE & FIRMS

Citi's Jack Paris bids adieu, joins investment manager

Jack Paris, a managing director and co-head of power, utilities & renewables at **Citi**, has left the bank for a senior leadership role at an infrastructure and real estate-focused investment manager.

Paris has joined **InfraRed Capital Partners** in the newly created role of head of the Americas, based in New York. He will focus on leading and growing the firm's US platform and will also oversee its North American renewables strategy, which was launched with a \$250 million commitment from **Sun Life Financial** last year, when the company acquired an 80% stake in **InfraRed**.

"Since the commencement of

our partnership with Sun Life in July 2020, we have been building out **InfraRed's** presence in core infrastructure and renewable energy in the Americas," said **Werner von Guionneau**, CEO at **InfraRed**. "Paris' extensive experience and expertise in the market will allow us to take a major step forward on this journey."

Paris will report to **Harry Seekings**, **InfraRed's** head of infrastructure.

This is the second major addition to the **InfraRed Americas** team this year, following the appointment of **Jay Crawford** as head of asset management, Americas in February. Crawford joined from **Cogentrix Energy**,

where he was a senior vice president, asset management, having also worked at **Calpine Corp** and **NextEra Energy Resources**.

Meanwhile, **Citi's** renewables coverage will continue to be led by Paris's co-head, **Philip ten Bosch**, while **Joe Sauvage**, chairman of the Global Power group, will fill Paris's role on an interim basis, **PFR** understands.

Sauvage was head of the group until early last year, when Paris and ten Bosch were named co-heads and Sauvage was elevated to chairman (**PFR**, 2/25/20).

Before **Citi**, Paris had held senior positions at **Lehman Brothers** and **CIT Group**. He started his career at **KPMG**. ■

New PF partner at Holland & Knight Colombia

Holland & Knight has appointed **Maria Juliana Saa Hoyos** as a partner in its Bogotá office.

Saa Hoyos has been a senior counsel at the firm since 2014. She specializes in project finance and structured finance transactions in the energy and infrastructure sectors.

Prominent transactions she has advised on include:

- Alupar's Nueva Esperanza – La Virginia transmission line
- Trina Solar's Bosques de Los Llanos I solar project

Before joining **Holland & Knight**, she worked at **Rodríguez-Azuero Abogados**.

Rodríguez-Azuero Abogados.

The firm also named **Inés Elvira Vesga Gaviria** as a new partner focused on energy and natural resources. She has been with **Holland & Knight** since 2019, having previously worked at **Norton Rose Fulbright** and **Dentons**. ■

Southern Company's CFO to retire

Andrew Evans, the CFO of Atlanta, Georgia-based gas and electric utility **Southern Company**, is retiring at the end of this year.

Evans has spent nearly 20 years at **Southern Company**, including the last four as CFO. Before that, he had been president, chairman and CEO of **Southern Company Gas**, formerly **AGL Resources**, which he joined in May 2002.

He will step down as executive vice president and CFO on September 1, and stay on as a senior adviser to the CEO until he retires from the company on December 31. Once he retires, he plans to join the board of directors at **Southern Company's** subsidiary, **Georgia**

Power. Meanwhile, **Daniel Tucker**, Georgia Power's executive VP, CFO and treasurer, will succeed Evans as CFO of **Southern Company** on September 1.

"It's been an honor and a privilege to serve at **Southern Company** and work alongside our industry-leading management team," said Evans. "I consider myself extremely fortunate to be able to make this decision at this stage in my life, and I'm confident that Tom, Dan and company management will continue to drive the business forward."

"Tucker began his career with **Southern Company** in 1998 and has held various positions at its subsidiaries over the last 23 years,

including in financial reporting, financial planning, investor relations, treasury and enterprise risk management. "Drew's retirement and Dan stepping into the CFO role are part of our robust, long-term succession planning, which is structured to help ensure that we have a well-qualified pipeline of leaders," said **Tom Fanning**, **Southern Company's** chairman, president and CEO.

Succeeding Tucker as CFO and treasurer of Georgia Power is **Aaron Abramovitz**, **Southern Nuclear's** VP of business operations for its Vogtle III and IV nuclear power plants. Abramovitz had previously been director of investor relations, having joined **Southern Company Services** in 2002. ■

Nautilus names new CFO

Nautilus Solar Energy has appointed **Camelia Miu** as its new CFO.

The New Jersey-based solar developer recruited Miu from Chicago-based distributed generation solar developer **SoCore Energy**, where she had been vice president of project finance.

Miu brings over 20 years of experience in accounting and reporting, financial planning and analysis, and project finance to the role, including 15 years in the renewable energy industry.

Other roles that Miu has held at **SoCore** include director of financial planning and analysis, as well as director of acquisitions investments and financial advisory after **Engie North America's** takeover of the company in 2018 (**PFR**, 3/5/18).

Before **SoCore**, Miu worked as director of finance and senior manager of financial planning and analysis at **Goldwind USA**. She joined that company from **E.ON Climate & Renewables**, where had been an assistant VP, finance.

"Nautilus is a leader in community solar and has been extremely successful in expanding its presence throughout the US," said Miu. "I'm thrilled to join a dynamic team in their mission of providing access to solar power renewable energy benefits and look forward to helping **Nautilus** grow and manage its portfolio." ■

● PEOPLE & FIRMS

BMO banker heads to Marathon Capital

Marathon Capital has hired a managing director from **BMO Capital Markets** as it beefs up its Houston-based energy transition advisory team.

In his new role, **Jonathan Hough** will advise Marathon's midstream and downstream oil and gas clients as they pursue their energy transition objectives and strategies. Hough had worked at BMO for more than 11 years, where he led the firm's US midstream business.

"My midstream and downstream experience, paired with the knowledge, expertise, and proven track record of the Marathon Capital team, will enable us to provide sound advice and actionable strategies to O&G companies as they optimize their businesses to meet their Energy Transition goals and objectives," said Hough.

He began his career at **Deutsche Bank**

and went on to hold positions in the energy investment banking teams at **Credit Suisse** and **Goldman Sachs**, and also worked at New York-based private equity fund manager **Growth Capital Partners**.

Hough is the latest in a slew of departures from BMO, including the head of the bank's power, utilities and infrastructure group, **Paul McNutt**, the group's head of mergers and acquisitions, **Andriy Falenchuk**, and **Rahul Shah**, group head of corporate banking, who are all planning to join **Mizuho** in mid-October ([PFR, 7/29](#)).

Meanwhile, **Credit Suisse** power and utilities investment banking MD **Michael Proskin** is taking up a new position at BMO later this year, as most of the Swiss bank's power team relocates to other rival banks ([PFR, 8/13](#)). ■

Truist adds MD from BMO

Truist Securities has hired a new managing director in its power & utilities division from **BMO Capital Markets**.

Andrew Rosenbaum has joined the bank after leaving his previous post as MD, US power, utilities and infrastructure at BMO, which he held for three years. His departure follows a recent exodus from BMO which saw three senior bankers, including **Paul McNutt**, head of power, utilities and infrastructure, leave for **Mizuho**

([PFR, 7/29](#)). Meanwhile, **Sunil Moser**, a senior MD in Truist's power & utilities division, recently left the firm after nearly five years in its power and utilities investment banking team ([PFR, 4/27](#)).

Rosenbaum joined BMO in 2018 after spending over eight years at **RBC Capital Markets** where he worked as an MD, US power, utilities and infrastructure. Before that, he spent seven years at **Lehman Brothers**, including as a senior vice president, after serving as a lieutenant for the **US Coast Guard**. ■

Starwood's former head of originations lands new job

Starwood Infrastructure Finance's former head of originations has started in a new role at a commercial bank in New York.

Claudine DiSario joined **JP Morgan Chase** as an executive director in its New York offices as of this month. DiSario was among the bankers who were laid off from Starwood Infrastructure Finance – as **Starwood Property Trust's** infrastructure lending team is known – last September as part of the firm's response to the fallout of the Covid-19 pandemic ([PFR, 9/30/20](#)).

At the time, a person close to the situ-

ation explained that the eliminated roles were not being utilized due to market conditions as the firm pivots away from term loan A business toward higher yielding term loan B-style loans.

DiSario had been with **GE Energy Financial Services** for 11 years before its infrastructure credit team and \$2.5 billion project finance loan book was acquired by Starwood in 2018 ([PFR, 9/25/18](#)). Before that, she had been an assistant VP in **CIT Bank's** energy investment banking team, underwriting power, midstream, and oil and gas transactions for investment in CLOs. ■

● NEWS IN BRIEF

● PROJECT FINANCE

BLUE HYDROGEN PLANNED FOR CORPUS CHRISTI

Howard Midstream Energy Partners' Javelina refinery in the Port of Corpus Christi on the western Gulf of Mexico is to be converted into a blue hydrogen plant under plans by the midstream energy company and the **Port of Corpus Christi Authority**. The Javelina facility is located at the Texas port.

● LATIN AMERICA

INTERCHILE EXPANDS SUBSTATION PAIR

Interchile, a subsidiary of Colombia's **Interconexión Eléctrica** (ISA), is moving forward with the construction of two substations in Chile. The sponsor has wrapped expansion work on the 220 kV Nueva Pan de Azúcar substation in Coquimbo, and is also expanding the Nueva Maitencillo substation in Atacama.

GRUPO ENERGETICO BREAKS GROUND ON DR WIND FARM

Grupo Energetico 23 (GE23) has started constructing the second phase of the 48.3 MW Guzmancito wind farm in the Dominican Republic. The new phase, dubbed Guzmancito II, comprises an additional 50 MW wind unit in the Puerto Plata Province. It will require a \$128 million investment.

● PEOPLE & FIRMS

ARNOLD & PORTER HIRES PF PARTNER

Christopher Willott has joined law firm **Arnold & Porter's** corporate and finance practice group as a partner, based in New York. Willott works with sponsors, borrowers, banks, multi-lateral institutions and export credit agencies on the development, construction and financing of energy projects.

● CORPORATE FINANCE

SOFTBANK, SAUDI ARAMCO-BACKED STORAGE BIZ RAISES \$100M

Softbank and **Saudi Aramco**-backed **Energy Vault** has secured \$100 million in a series C fundraising round to support the growth of its gravity-based energy storage platform. The proceeds will support the rollout of the company's EVx platform, which is expected to debut in the US by the fourth quarter of this year.

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