

SIGNINA CAPITAL AG

**WATER INFRASTRUCTURE
QUARTERLY REPORT – Q4 2021**



Waste Water, Mt. Holly, NJ

A New Jersey-based Wastewater Treatment Plant where original funds were partly used to mount solar panels to increase energy efficiency of the plant, lower costs over time, and provide energy to the local municipality. The state of New Jersey requires electricity suppliers to secure a portion of their electricity from solar facilities located in NJ, creating a natural market for Solar Renewable Energy Credit (SREC) trading credits. The project not only reduces the plant's energy consumption but also improves its overall efficiency. We can surely extend our reach in this area and currently look at a broader investment opportunity in the same sector.

Sustainable Sewerage, Ontario

The Sustainable Sewerage market in Ontario currently undergoes a significant change when it comes to consolidation and strong demand for renewal of existing plants. Amongst others we are working with a public company which has developed a technology providing sewage collection and water treatment. It offers an all-in-one solution which is both cheaper to install and operate than traditional systems. The existing projects are all government linked and work closely with municipalities and we are currently working towards a PPP pipeline for its sewerage system. The provincial regulations regarding sewerage mean that many municipalities are required to change/install systems in the coming years. We have been implementing the first parts of the portfolio of existing projects and we will continue to implement more under the same framework. The constant diversification increased the security for the investors but also allows us to further reach into this market. The investment model has not changed, but the reach within Ontario has become broader.

Industrial Re-use, Blue Planet, California

The project is a carbon capture and mineralization project based in Pittsburg, CA. The project will capture both wastewater and CO2 emitted from a gas-fired power plant and combine these with locally sourced demolished/returned concrete as a process input material to produce several different "CO2 sequestered" and "up-cycled" aggregate products for use by Bay Area businesses, governments and consumers in a wide range of low-carbon, high-value concrete mix designs. The wastewater and steam will be obtained from either the local power plant or from the sanitation district that can provide wastewater and the ammonia needed from their treatment plant which is located adjacent to the plant. As a result, either method will use recycled water, which is legislatively supported in California. The whole process revolves around reusable and recyclable products. The carbon dioxide mitigation, waste water usage and demolished concrete process input provide a process producing recycled aggregates while reducing carbon dioxide.

Hydropower, Marseilles, Illinois

A lock and dam hydroelectric water power project located on the Illinois River. The site has obtained a FERC License (expires 2061) and is finalising development. Once the site is connected and producing energy it will provide power to the local municipalities and income will be generated by the power purchase agreement in place.

Hydropower, Braddock, Pennsylvania

A lock and dam hydroelectric water power project located on the Monongahela River, Pittsburgh. The site has obtained a FERC License (No. P-13739) with a 5.25MW capacity and is finalising development. The site, once producing energy will provide power to the local area with income being generated via the sale of the energy.

CURRENT PROJECTS

2021 ended up being a year with significant movement in the Global Climate Change debate which culminated with the COP26 conference in November. Only time will tell regarding the growth of the regulations and continuous push towards carbon zero. Companies are starting to show their carbon emissions according to the Scope 1, 2, 3 standards.¹

Presently Scope 1, 2 are clear and look to become market standard while Scope 3 is a lot harder to calculate. All these updates assist the market and projects we work with whether it is waste water, hydro or water treatment. It appears the world opens up in 2022 with a strong opportunity pipeline with favourable conditions and regulations going forward.

REGIONAL MARKET INFORMATION

NEWS IN BRIEF

The windfall in US infrastructure spending won't be coming from the government alone.

<https://qz.com/2100641/us-infrastructure-bill-presents-new-opportunity-for-public-private-partnerships/>

Certified Green Issuance Reaches \$200bn - Expansion of Climate Bonds Standard in 2022 – Basic Chemicals, Cement, Steel in pipeline.

<https://www.climatebonds.net/2022/01/certified-green-issuance-reaches-200bn-expansion-climate-bonds-standard-2022>

EU's taxonomy and green bonds regulations bolster sustainable finance market.

<https://www.iflr.com/article/b1w88zqx5l9gsx/eus-taxonomy-and-green-bonds-regulations-bolster-sustainable-finance-market>

CLEAN AND GREEN: FROM THE GREENHOUSE TO YOUR HOUSE²

If you resolved to eat healthier, fresher, and more local in 2022, winter can be the most challenging season.

Colder weather definitely gives Mother Nature the upper hand. The abundance of “storage” vegetables like onions, carrots, potatoes, and other roots may not be very exciting. Vegetables in the produce department often must travel far distances, leaving them looking tired and wilted.

Leafy greens from the greenhouse, like those grown by Revol Greens or Mastronardi, are as clean as possible from all the special care and attention that goes into the growing process. No need for pesticides, herbicides, or harsh chemicals. The secure and protected greenhouse environment is tightly controlled against animals, pests, contaminants, and weeds. Water sources for Revol Greens are carefully managed and water is sterilized using chemical-free UV light and ozone.



Water use is top of mind, especially in California and the Southwest where drought continues to be a threat to agriculture. Revol Greens' Grown Clean and Green™ process uses 90% less water than traditional field-grown greens; just 1 pint per container of leafy greens compared to 12 gallons on field product. With regional greenhouses in Minnesota, California, Georgia, and soon Texas, lettuces travel fewer miles from greenhouse to your house.

PUMPED HYDRO PROVIDES VAST MAJORITY OF ENERGY STORAGE FOR RENEWABLES³

To cut U.S. greenhouse gas emissions in half within a decade, the Biden administration’s goal, the U.S. is going to need a lot more solar and wind power generation, and lots of cheap energy storage.

Wind and solar power vary over the course of a day, so energy storage is essential to provide a continuous flow of electricity. But today’s batteries are typically quite small and store enough energy for only a few hours of electricity. To rely more on wind and solar power, the U.S. will need more overnight and longer-term storage as well.

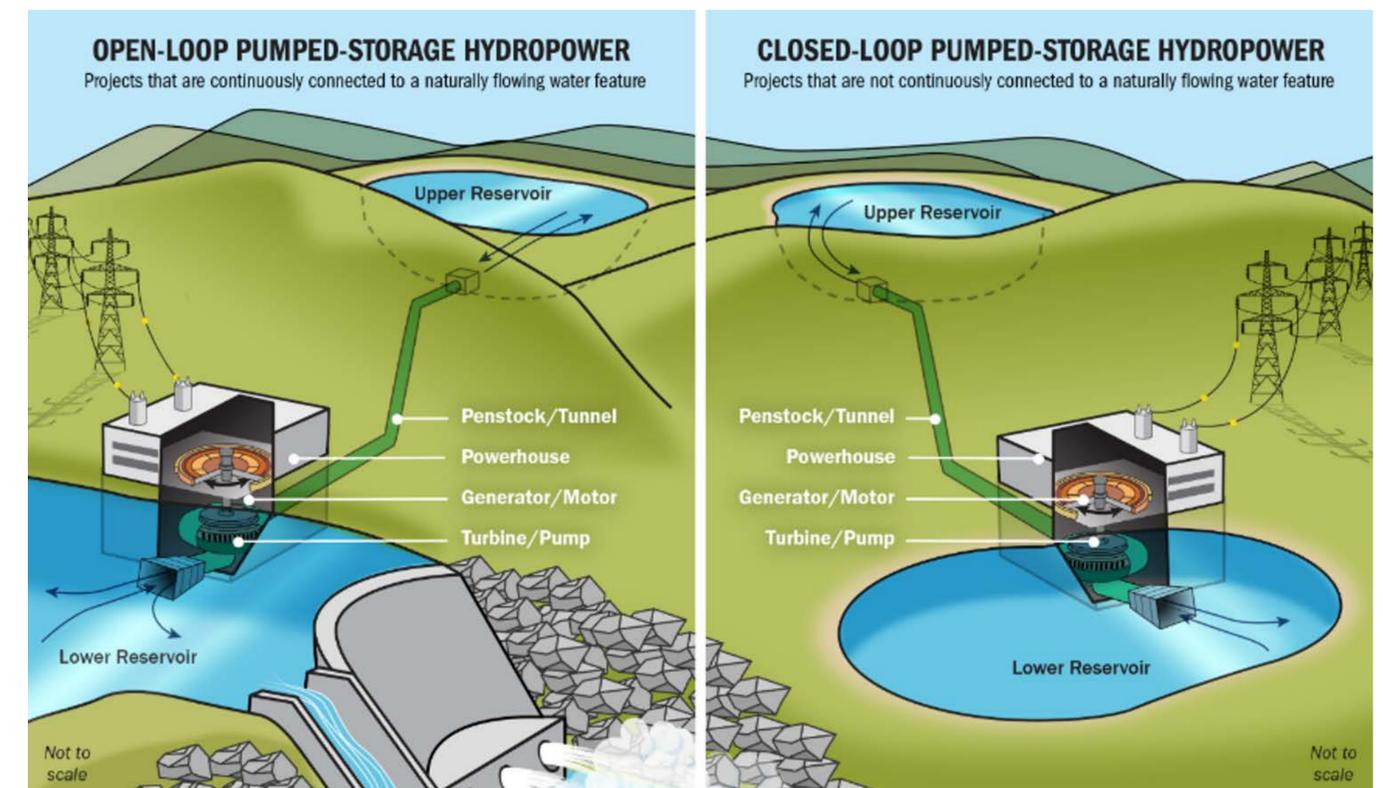
While battery innovations get a lot of attention, there’s a simple, proven long-term storage technique that’s been used in the U.S. since the 1920s.

It’s called pumped hydro energy storage. It involves pumping water uphill from one reservoir to another at a higher elevation for storage, then, when power is needed, releasing the water to flow downhill through turbines, generating electricity on its way to the lower reservoir.

Pumped hydro storage is often overlooked in the U.S. because of concern about hydropower’s impact on rivers. But what many people don’t realize is that most of the best hydro storage sites aren’t on rivers at all.

Batteries deployed in homes, power stations and electric vehicles are preferred for energy storage times up to a few hours. They’re adept at managing the rise of solar power midday when the sun is overhead and releasing it when power demand peaks in the evenings.

Two types of pumped-storage hydropower; one doesn’t require a river.⁴



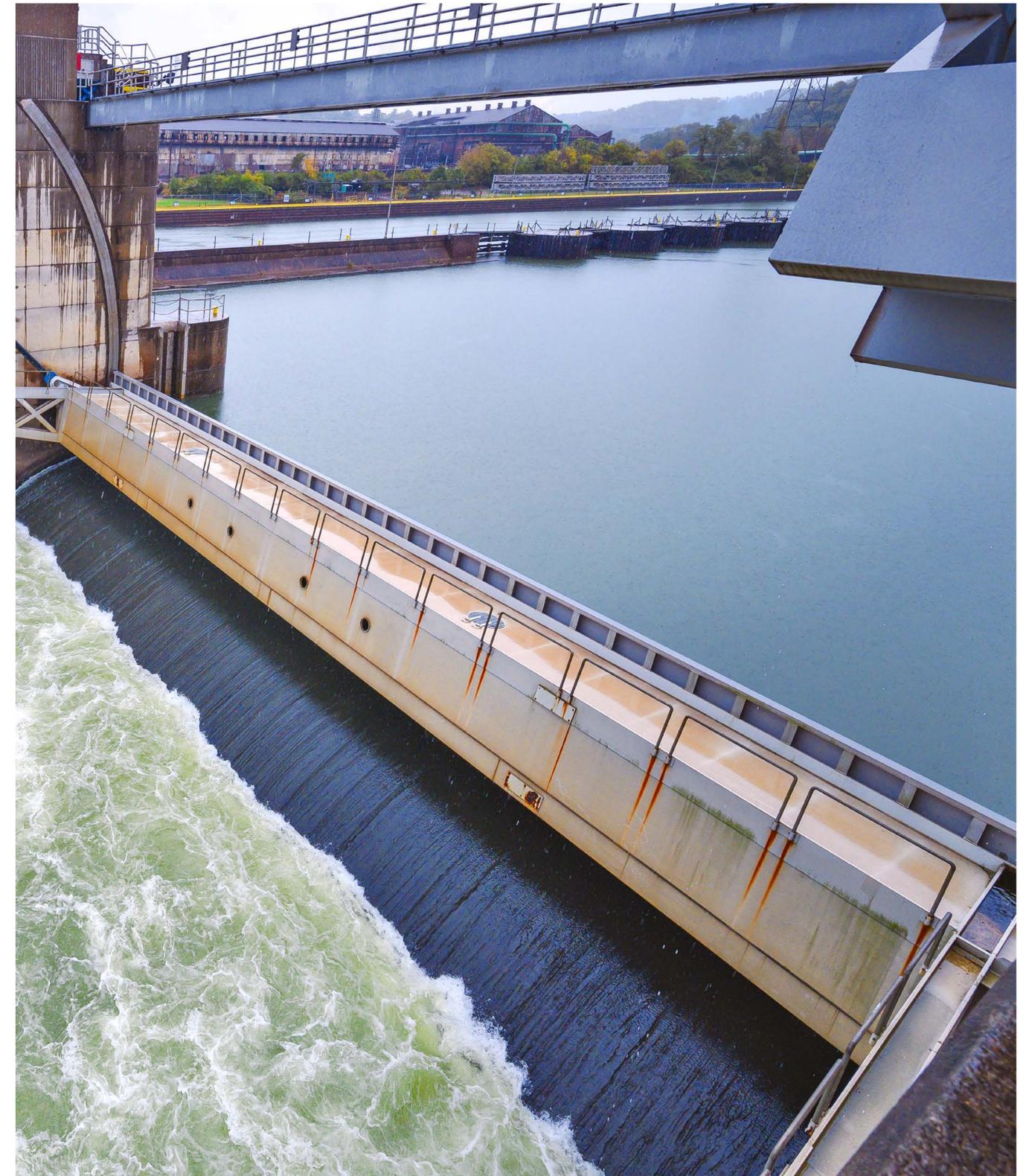
Pumped hydro, on the other hand, allows for larger and longer storage than batteries, and that is essential in a wind- and solar-dominated electricity system. It is also cheaper for overnight and longer-term storage.

In 2021, the U.S. had 43 operating pumped hydro plants with a total generating capacity of about 22 gigawatts and an energy storage capacity of 553 gigawatt-hours. They make up 93% of utility-scale storage in the country. Globally, pumped hydro's share of energy storage is even higher — about 99% of energy storage volume.

Pump hydro projects can be controversial, particularly when they involve dams on rivers that flood land to create new reservoirs and can affect ecosystems.

The water can cycle between upper and lower reservoirs for a hundred years or more. Evaporation suppressors — small objects floating on the water to trap humid air — can help reduce water evaporation. In all, the amount of water needed to support a 100% renewable electricity system is about 3 litres per person per day, equivalent to 20 seconds of a morning shower. This is one-tenth of the water evaporated per person per day in the cooling systems of U.S. fossil fuel power stations.

Little pumped storage has been built in the U.S. in recent years because there hasn't been much need, but that's changing. In 2020, about three-quarters of all new power capacity built was either solar photovoltaics or wind power. Their costs have been falling, making them cheaper to build in many areas than fossil fuels.



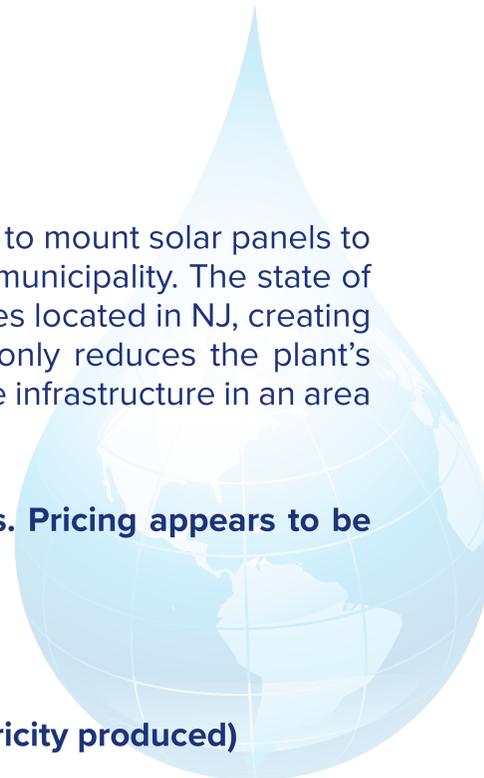


WASTE WATER | MT. HOLLY, NEW JERSEY

A **New Jersey-based Wastewater Treatment Facility (WWTF)** where funds were partially used to mount solar panels to increase energy efficiency of the plant, lower costs over time, and provide energy to the local municipality. The state of New Jersey requires electricity suppliers to secure a portion of their electricity from solar facilities located in NJ, creating a natural market for Solar Renewable Energy Credit (SREC) trading credits. The project not only reduces the plant's energy consumption but also improves its overall efficiency. It also helped in 2010 to improve the infrastructure in an area that was hard hit during the financial crises.

The site continues to operate and provide energy with the usual stronger summer months. Pricing appears to be stable.

- Monitor PPA component
- Monitor SREC eligibility and prices on the market (1 SREC for every 1000kW-hours of electricity produced)
- Monitor regulatory shifts in clean energy incentive programs (RPS) and timelines
- Document any changes to the investment expectations
- Online monitoring of the solar power as well



- ✓ Accounts in balance
- ✓ SREC prices stable
- ✓ Incoming receivables within range of model
- ✓ Costs within range of model
- ✓ Meets target return of 7-9%

UN SDG	ICMA CRITERIA	ESG POLICY SOLUTION
<p>6 CLEAN WATER AND SANITATION</p>	<p>Renewable energy</p> <ul style="list-style-type: none"> • Climate change mitigation • Natural resource conservation • Pollution prevention and control 	<p>Clean energy creation – solar panels provide clean renewable energy</p>
<p>7 AFFORDABLE AND CLEAN ENERGY</p>	<p>Climate change adaptation</p>	<p>Pollution reduction – the Waste Water Treatment Facility (WWTF) utilizes the solar panels energy via a power purchase agreement. This reduces the heavy amount of energy required by the WWTF which would otherwise be coming from non-renewable sources of energy</p> <p>Energy efficiency – the proximity of the site to the waste water facility offers a high energy efficiency</p>
<p>ESG RISK MITIGATION</p>		<ul style="list-style-type: none"> • Renewable Energy consumption • Water Consumption



- ✓ Accounts in balance
- ✓ Project updates
- ✓ Incoming receivables within range of model
- ✓ Meets target return of 7-9%
- ✓ Interest payments made on time

SUSTAINABLE SEWERAGE | ONTARIO

The Canadian wastewater market is highly fragmented. The market requires small impact installations, rather than traditional centralised large waste water treatment plants. Our existing 200 projects are government linked and only fully licensed projects with no planning risks are being considered. Signina focuses on business consolidation of mid-sized businesses, operating in project sizes of \$5-50m. The small to mid-range business growth is supported by shifting demographic developments into smaller, satellite communities, as well as a stable favourable regulatory environment.

With wastewater rates rising steadily, the risk-reward associated with Signina's consolidation strategy is readily apparent and has picked up pace since its start in 2008. With larger institutional mandates we have triggered more deals diversifying from the existing projects. The investment model has not changed, but the reach within Ontario has become broader. Sustainable sewerage has become a major concern over the past couple of decades. The Safe Drinking Water Act 2002 (regulates the operation of potable water treatment plants and the pipe network) and the Ontario Clean Water Act 2006 (regulates actions required to protect source water from contamination, through assessment and implementation of measures to protect the water sources). The majority of the contracts are in municipalities that are rated A or higher by rating agencies. In addition there are various municipalities that do not carry any debt.

The operations picked up in Spring and summer. Renewals and negotiations have remained dynamic with the current uncertainty with many of the Covid delayed sites likely to go back online this year. Some of the new potential contracts have come to fruition in the past couple of months. There also remains a pipeline of new business and contracts which are being assessed.

UN SDG

ICMA CRITERIA

ESG POLICY SOLUTION

6 CLEAN WATER AND SANITATION



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



Sustainable water and wastewater management:

- Pollution prevention and control
- Natural resource conservation
- Climate change adaption

Eco-efficient and/or circular economy adapted products, production technologies and processes

- Climate change mitigation
- Natural resource conservation

Sustainability - providing finance and assistance in creating and maintaining infrastructure for wastewater treatment and clean water

Pollution prevention - by creating sustainable sewerage infrastructure the need for septic tanks and landfill sites are heavily reduced. The waste water treatment assists an ongoing global problem with handling waste and impurities

ESG RISK MITIGATION

- Water Re-use
- Water Pollution



INDUSTRIAL RE-USE | BLUE PLANET, CALIFORNIA

The project is a **carbon capture and mineralization project based in Pittsburg, CA**. It captures both wastewater and CO₂ emitted from a gas-fired power plant and combine these with locally sourced demolished/returned concrete as a process input material to produce several different “CO₂ sequestered” and “up-cycled” aggregate products for use by Bay Area businesses, governments and consumers in a wide range of low-carbon, high-value concrete mix designs.

The wastewater and steam will be obtained from either the local power plant or from the sanitation district that can provide wastewater and the ammonia needed from their treatment plant which is located adjacent to the plant. As a result either method will use recycled water, which is legislatively supported in California. The whole process revolves around reusable and recyclable products. The carbon dioxide mitigation, waste water usage and demolished concrete process input provide a process producing recycled aggregates while reducing carbon dioxide.

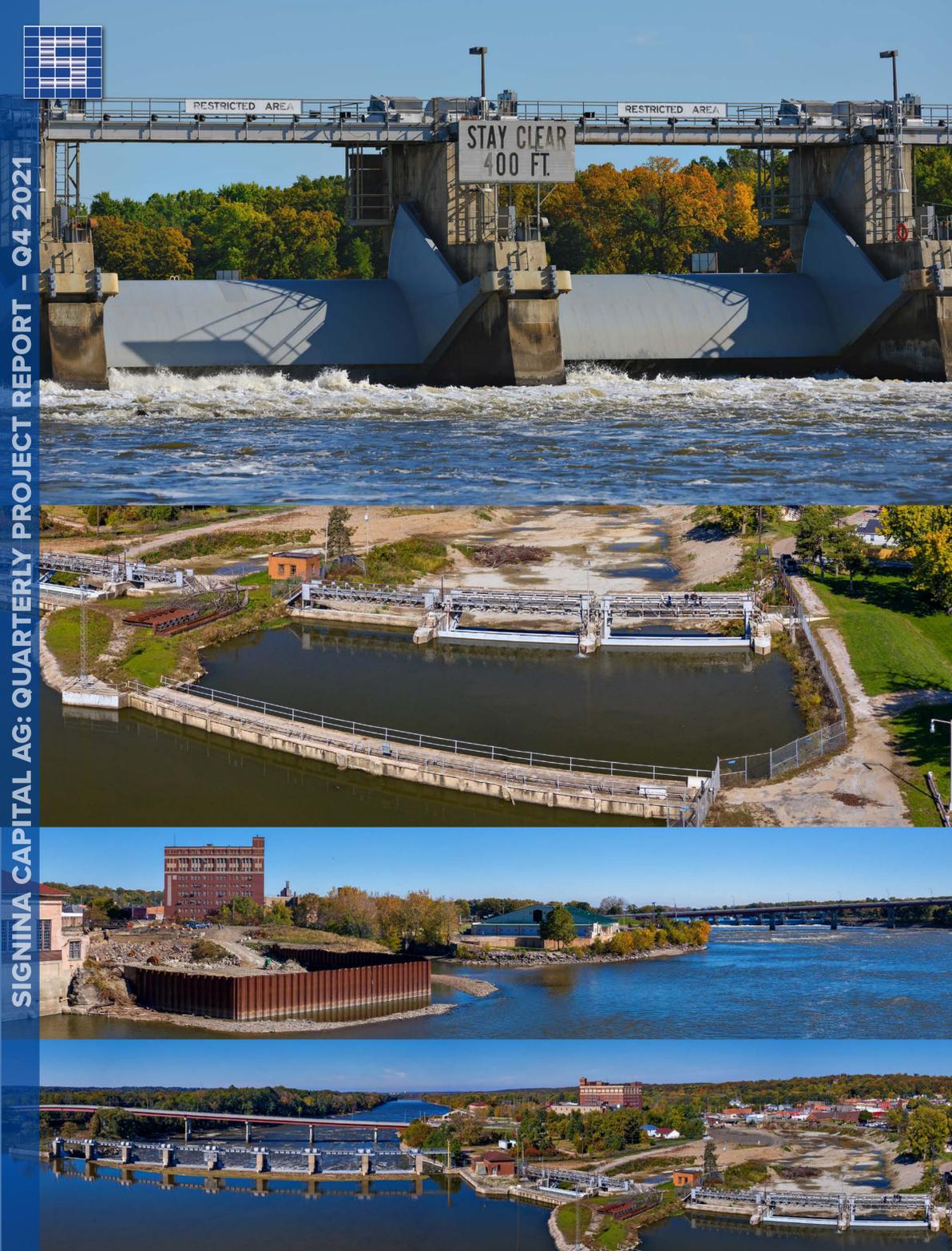
The project and technology company continues operate as expected and gain momentum.

- Maintain monthly communication with project team
- Document changes and delays to the permitting process



UN SDG	ICMA CRITERIA	ESG POLICY SOLUTION
<p>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</p>	<p>Climate change adaptation Green Buildings</p> <ul style="list-style-type: none"> • Climate change mitigation • Natural resource conservation • Pollution prevention and control 	<p>Reuse of wastewater – the water will be obtained from either the local power plant or from the sanitation district. This results in recycling the wastewater</p>
<p>11 SUSTAINABLE CITIES AND COMMUNITIES</p>	<p>Eco-efficient and/or circular economy adapted products, production technologies and processes</p> <ul style="list-style-type: none"> • Climate change mitigation • Natural resource conservation 	<p>Recycling products – the process also uses locally sourced demolished concrete as a process input to create aggregate products for use in the Bay Area</p>
<p>13 CLIMATE ACTION</p>		<p>Sustainable buildings – the aggregates created in the process are from renewable and green sources. This in turn does not impact the environment negatively and meets the goal of sustainable cities and communities</p>
<p>ESG RISK MITIGATION • Water Re-use • CO₂ Emissions Neutrality • Pollution</p>		

- ✓ Accounts in balance
- ✓ Permitting process on schedule
- ✓ Timeline on Track
- ✓ In line to meet target return of 7-9%



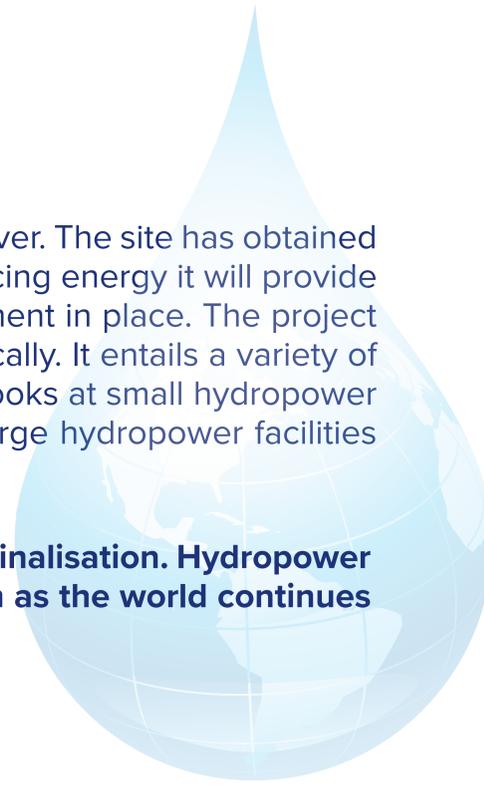
- ✓ Accounts in balance
- ✓ Regulatory requirements kept to date
- ✓ Costs within range of model
- ✓ Timeline on Track

HYDROPOWER | MARSEILLES, ILLINOIS

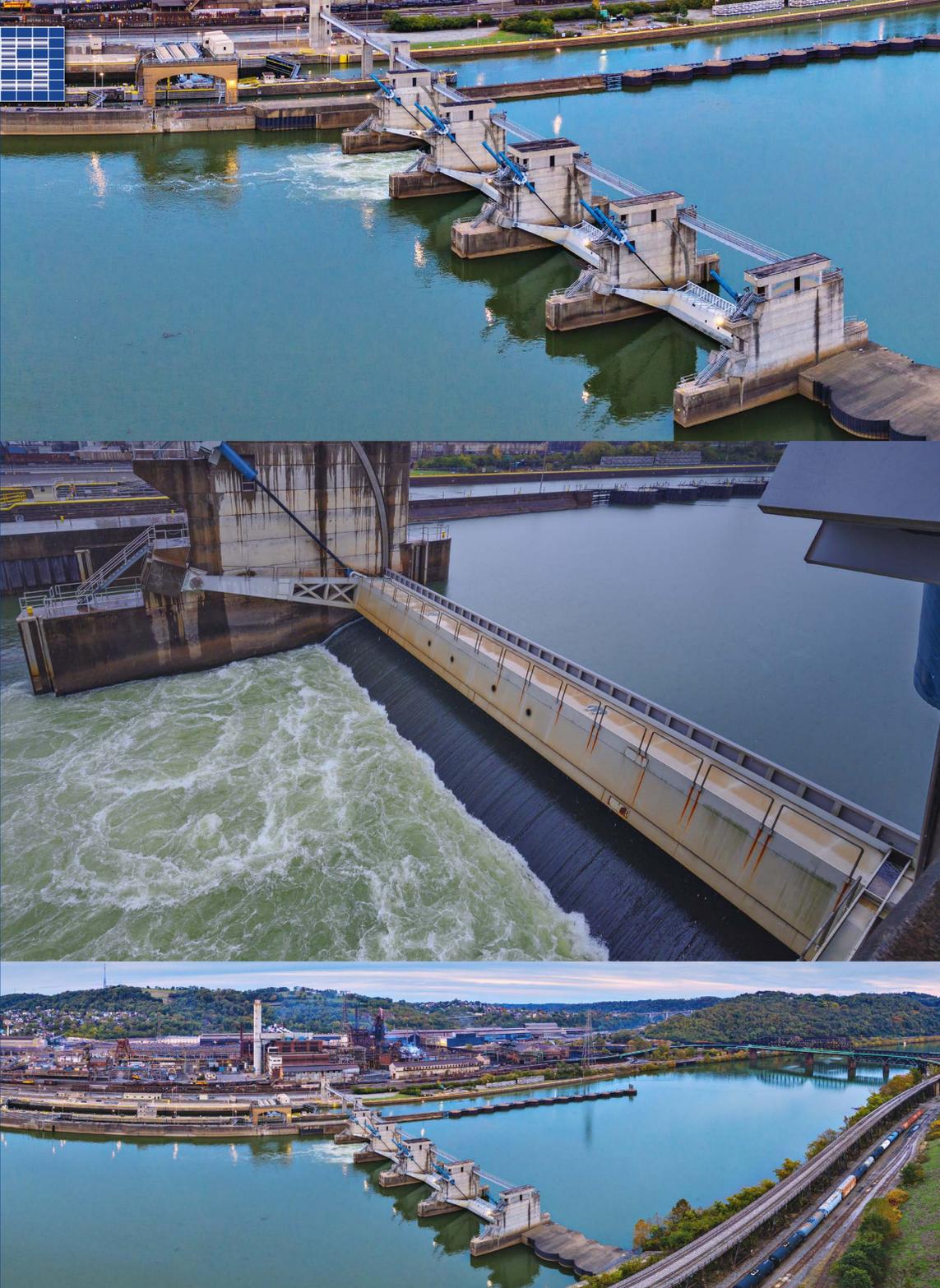
Hydropower, Illinois: A lock and dam hydroelectric water power project located on the Illinois River. The site has obtained a FERC License (expires 2061) with a 10.26MW capacity. Once the site is connected and producing energy it will provide power to the local municipalities and income will be generated by the power purchase agreement in place. The project is considered a small- or mid-sized project and has reduced the environmental impact dramatically. It entails a variety of environmental rules from the EPA that have been fulfilled with the FERC licence. The mandate looks at small hydropower facilities (below 25 MW) as such sites have minimal impacts on the surrounding area unlike large hydropower facilities which often have negative impacts on the surrounding environment.

The project continues to move slowly both on from a construction aspect as well as any PPA finalisation. Hydropower continues to be a hot topic in the clean energy movement and will likely pick up momentum as the world continues to reopen. There is now some uptick in the pricing too which is being monitored closely.

- Maintain monthly communication with onsite project manager
- Document any changes to the investment expectations
- Monitor the financial reporting, cash flows and accounts



UN SDG	ICMA CRITERIA	ESG POLICY SOLUTION
 <p>7 AFFORDABLE AND CLEAN ENERGY</p>	<p>Renewable energy</p> <ul style="list-style-type: none"> • Climate change mitigation • Natural resource conservation • Pollution prevention and control 	<p>Renewable energy creation - hydropower is a clean renewable source of energy which can be sold via a PPA agreement or via merchant wholesale pricing on hydropower exchanges</p>
 <p>14 LIFE BELOW WATER</p>	<p>Energy efficiency</p> <ul style="list-style-type: none"> • Climate change mitigation • Pollution prevention and control <p>Environmentally sustainable management of living natural resources and land use</p> <ul style="list-style-type: none"> • Natural resource conservation • Biodiversity • Climate change adaptation 	<p>Environmental management – the small hydropower market goes through a rigorous environmental approval process to make sure there is minimal impact to the surrounding region</p> <p>Biodiversity conservation – the environmental approvals for such projects include aquatic preservation to ensure the natural environment is not negatively impacted</p>
<p>ESG RISK MITIGATION • Project Size under 25mw • Renewable Energy Production</p>		



HYDROPOWER | BRADDOCK, PENNSYLVANIA

Hydropower, Pennsylvania: A Lock and Dam Hydroelectric Water Power Project located on the Monongahela River, Pittsburgh. The site has obtained a FERC license (expires 1965) with a 5.25MW capacity. It is a similar project to Illinois and is in an advanced stage in the PPA negotiations to lock in a price for the first few years post commissioning. Furthermore the project has received state grants.

The project is going through remains in its final approvals in order to construct the Hydropower plant. Alongside this step there have been discussions with some local groups to regarding PPA offtakes for when the site should be operational.

- Maintain monthly communication with onsite project manager
- Document any changes to the investment expectations
- Monitor the financial reporting, cash flows and accounts



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<p>ESG RISK MITIGATION • Project Size under 25mw • Renewable Energy Production</p>		

- ✓ Accounts in balance
- ✓ Regulatory requirements kept to date
- ✓ Costs within range of model
- ✓ Timeline on Track

LATEST DEVELOPMENTS

The main areas from last quarter remain at various stages of progress. To elaborate on the current pipeline:

1 The Hydropower opportunity remains. The timeline remains unclear but has strong demand as the clean tech movement continues to crystallise. We see an increase of demand for REPAs (Renewable Energy Purchase contracts) that are quickly representing a good alternative to normal PPAs. Nevertheless, pricing has changed significantly and we have active demand to strike off-take agreements from a variety of counterparties. The current discussion surrounding inflation is positive for our existing pipeline.

2 As our team has been to Canada during November and December we have witnessed a lot of market transaction first hand. The current price drivers make it more interesting to have a consolidated view of the market and we are in the process of unlocking a lot of that potential.

3 Carbon linked projects – while we are not looking for direct carbon offset projects, the market is becoming much stronger to the point where we look for carbon linked projects, or even see the potential advantage for our current projects (for example Blue Planet and its link to the concrete market).

4 Agricultural Greenhouses – the article in this report describes the leafy greens opportunity set. Via our sources we are finding that such greenhouses are becoming more popular especially as they require less water, energy and transport. Such greenhouses are popular in Europe and the technology has been tried and tested. This opportunity set is developing very fast and we will report separately on our latest added offering.



REFERENCES

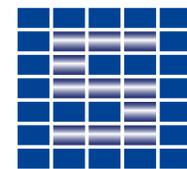
- 1. ZERO IN ON... Scope 1, 2 and 3 emissions.**
<https://www2.deloitte.com/uk/en/focus/climate-change/zero-in-on-scope-1-2-and-3-emissions.html>
- 2. Clean and green: From the greenhouse to your house.**
<https://www.sfgate.com/sponsoredarticles/lifestyle/green-living/article/Clean-and-green-From-the-greenhouse-to-your-house-16748219.php>
- 3. Pumped Hydro Provides Vast Majority Of Energy Storage For Renewables.**
<https://cleantechnica.com/2022/01/20/pumped-hydro-provides-vast-majority-of-energy-storage-for-renewables/>
- 4. Open or Closed: Pumped Storage Hydropower is on the Rise.**
<https://www.pnnl.gov/news-media/open-or-closed-pumped-storage-hydropower-rise>



SIGNINA CAPITAL AG

Zurich-based Signina Capital AG was established in 2006. Signina is a full spectrum advisory firm in the water infrastructure sector. The team has more than 100 years of combined industry experience. They have placed in excess of USD 1 billion of capital with the private and public sector into environmentally and commercially strategic water infrastructure assets. It is currently overseeing more than USD 500 million of active water infrastructure assets.

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