SHARC ENERGY SYSTEMS

MANAGEMENT DICUSSION AND ANALYSIS

For the six months ended June 30, 2019

August 29, 2019

The following management's discussion and analysis ("MD&A") of the financial condition and results of the operations of SHARC International Systems Inc. (the "Company" or "SHARC") for the six months ended June 30, 2019 has been prepared to provide material updates to the business operations, liquidity and capital resources of the Company since its last annual management discussion & analysis, being the Management Discussion and Analysis ("Annual MD&A") for the year ended December 31, 2018. This interim MD&A does not provide a general update to the Annual MD&A, or reflect any non-material events since the date of the Annual MD&A.

This MD&A has been prepared in compliance with the requirements of section 2.2.1 of Form 51-102F1, in accordance with National Instrument 51-102 – Continuous Disclosure Obligations. This discussion should be read in conjunction with the audited financial statements of the Company for the years ended December 31, 2018 and 2017, and the unaudited condensed consolidated interim financial statements for the six months ended June 30, 2019 together with the notes thereto. Results are reported in Canadian dollars, unless otherwise noted. In the opinion of management, all adjustments (which consist only of normal recurring adjustments) considered necessary for a fair presentation have been included. The result for the six months ended June 30, 2019 are not necessarily indicative of the results that may be expected for any future period. Information contained herein is presented as at August 29, 2019 unless otherwise indicated.

The unaudited condensed consolidated interim financial statements for the six months ended June 30, 2019, have been prepared using accounting policies consistent with International Financial Reporting Standards ("IFRS") as issued by the International Accounting Standards Board ("IASB") and interpretations issued by the International Financial Reporting Interpretations Committee ("IFRIC"). The unaudited condensed consolidated interim financial statements have been prepared in accordance with International Standard 34, Interim Financial Reporting.

For the purposes of preparing this MD&A, management, in conjunction with the Board of Directors, considers the materiality of information. Information is considered material if: (i) such information results in, or would reasonably be expected to result in, a significant change in the market price or value of SHARC's common shares; or (ii) there is a substantial likelihood that a reasonable investor would consider it important in making an investment decision; or (iii) it would significantly alter the total mix of information available to investors. Management, in conjunction with the Board of Directors, evaluates materiality with reference to all relevant circumstances, including potential market sensitivity.

Further information about the Company and its operations is available on SEDAR at **www.sedar.com**.

Caution Regarding Forward-Looking Statements

This MD&A contains certain forward-looking information and forward-looking statements, as defined in applicable securities laws (collectively referred to herein as "forward-looking statements"). These statements relate to future events or the Company's future performance. All statements other than statements of historical fact are forward-looking statements. Often, but not always, forward-looking statements can be identified by the use of words such as "plans", "expects", "is expected", "budget", "scheduled", "estimates", "continues", "forecasts", "projects", "predicts", "intends", "anticipates" or "believes", or variations of, or the negatives of, such words and phrases, or state that certain actions, events or results "may", "could", "would", "should", "might" or "will" be taken, occur or be achieved. Forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those anticipated in such forward-looking statements. The forward-looking statements in this MD&A speak only as of the date of this MD&A or as of the date specified in such statement.

Forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause SHARC's actual results, performance or achievements to be materially different from any of its future results, performance or achievements expressed or implied by forward-looking statements. All forward-looking statements herein are qualified by this cautionary statement. Accordingly, readers should not place undue reliance on forward-looking statements. The Company undertakes no obligation to update publicly or otherwise revise any forward-looking statements, whether as a result of new information or future events or otherwise, except as may be required by law. If the Company does update one or more forward-looking statements, no inference should be drawn that it will make additional updates with respect to those or other forward-looking statements, unless required by law.

Message from CEO Lynn Mueller - A Practical Approach to Tackling Climate Change

After completing research and development in 2017 by a dedicated team of engineers and designers, I am pleased to say that our innovative SHARC™ and PIRANHA™ heat recovery systems have successfully made harnessing the power of wastewater commercially viable. With so many systems in place, we are now playing a vital role in combatting climate change and contributing to a more sustainable environment and economy. This success has allowed the company to move to a new level of growth and become a sales-focused, world-leading green energy engineering leader.

The model behind SHARC's rise is simple. It has tapped into a private sector business solution that can mitigate and assist in significantly reducing the $1 trillion USD in energy that is wasted down drains each and every year. That waste, and the associated energy production needed to serve and replenish that waste, account for 70% of all greenhouse gas emissions from buildings.

SHARC is the most practical and easy-to-install technology on the market that is designed to address climate change. As we continue to attain success, the company intends to tell the story behind its rise and showcase its world-class clean energy solutions in key markets. We have developed an especially strong market niche with unparalleled results in carbon reduction in real estate developments and district energy hubs.

Some 36 industrialized countries have pledged to reduce their heat-trapping carbon emissions to specified levels and eliminate fossil fuels use within the next 20 years as part of new climate action policies. This positions SHARC to become a world-class player as governments, on the municipal level and beyond, lead the charge around the world to transition into a green energy future.

Since inception, the Company has had several achievements and successes. It has installed 25 systems providing heating and cooling to more than 10 million square feet of commercial, residential, and public spaces on four continents. Furthermore, it has explored new international markets and has successfully developed an efficient method of deploying this technology and supporting services.

The Company has developed a preferred system of service delivery through a focus on equipment sales and leasing, Heat Supply Agreements ("HSA") through SHARC owned energy centres and operations and maintenance contracts on customer owned SHARC technology. Through an efficient system of service delivery, SHARC continues to work with end-users to improve their energy efficiency and carbon reduction programs.

The worldwide threat to our planet posed by climate change demands a sustainable plan from every city and nation, from every resident and business in order to reduce carbon emissions and ensure a high quality of life for future generations.

Everyone has a role in this global struggle, and SHARC intends to do its part and become a world leader in fighting climate change and leaving the world a better place for future generations.

Lynn Mueller

President & CEO, SHARC International Systems Inc.

Description of Business

The Company was incorporated under the Business Corporations Act (British Columbia) on February 4th, 2011. The Company's shares are listed on the Canadian Securities Exchange (the "CSE") under the trading symbol "SHRC"; the Frankfurt Börse (FRANKFURT: IWI) and in the United States (OTCQB: INTWF).

The Company provides wastewater heat exchange products and services. The registered office of the Company is located at 1443 Spitfire Place, Port Coquitlam, British Columbia, V3C 6L4.

On September 5th, 2017, the Company changed its name from International Wastewater Systems Inc. to SHARC International Systems Inc.

How the Idea of Wastewater Heat Recovery Was Realized

After a brief retirement from Earth Source Energy that lasted for three days, Lynn Mueller, soon to be President and CEO of SHARC International Systems Inc., believed that he still had more to contribute to preserve the world for future generations. With more than twenty-five years of experience in geothermal heat pump marketing and sales, while sitting in his kitchen and watching hot water go down the sink, he had a simple idea: "What if we could recover the heat from the heated water going down the drain and re-use it?" This led Mueller to do some more research on the concept's potential, and his findings on just how much water is wasted annually were staggering:

- Worldwide, one trillion dollars' (USD) worth of energy goes down the drain each year
- An average person in North America uses 60 gallons of water per day, 40% of which is heated and goes into the sewer system contributing to higher temperature levels
- $40 billion worth of recoverable thermal energy goes down the drain in residences across Canada and the United States

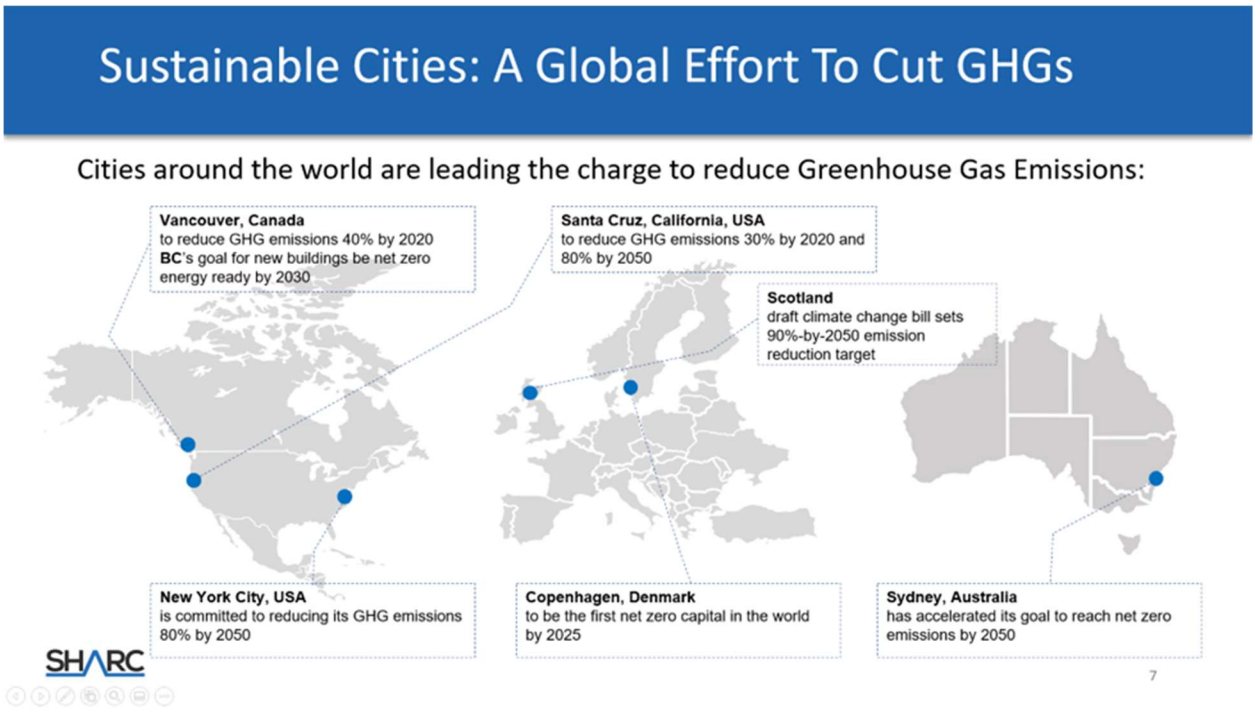
Recognizing the scale of the problem, Mueller reached out to his long-time friend and former colleague, Daryle Anderson, Director of SHARC International Systems Inc., to be his partner in what would become a new industry. Today, the idea has become reality with 22 operating installations and 3 installations underway globally. Around the world, governments at all levels are changing legislation to reduce greenhouse gas emissions.

Mueller knew that being first to market in a new industry would necessitate:

- Education and awareness
- Training
- Setting the standards

R&D will be a continuous process in the evolution of "heat recovery" as the company continues to be the industry leader and ready for all markets.

Notably, in many countries, the Herculean efforts to cut greenhouse gas emissions are being led at the municipal level, as represented by the figure on the following page:



Going Public Transaction and Corporate Structure Overview

The Company's wholly owned subsidiary, Sharc Energy Systems Inc. (formerly International Wastewater Heat Exchange Systems Inc.) ("SES") was incorporated under the Business Corporations Act (British Columbia) on May 30th, 2011. On October 27th, 2015, the Company completed the acquisition (the "Acquisition") of SES pursuant to a share exchange agreement dated September 4th, 2015 (the "Agreement"). The Acquisition constituted a reverse takeover ("RTO").

The Company either wholly owns or owns a percentage of the following subsidiaries:

Company	Location	June 30, 2019 Ownership %	Dec 31, 2018 Ownership %
SHARC Energy Systems Inc. ("**SES**")	Canada	100	100
SHARC Energy Ltd (formerly IWWS (UK) Ltd. ("**SHARC UK**")	UK	100	100
SHARC Caledonia Ltd. ("**Caledonia**")	UK	40	40
SHARC Highlands Ltd. ("**Highlands**")	UK	100	100
Bandwidth Energy Ltd. ("**Bandwidth**")	UK	50	50
Green SHARC Ltd. [1]	UK	100	100
SHARC Energy Services (UK) Ltd. [1]	UK	100	100
SHARC Energy Systems Australia Pty Ltd. ("**SHARC Australasia"**) [1]	Australia	80	80
2336882 Ontario Inc. [1]	Canada	100	100

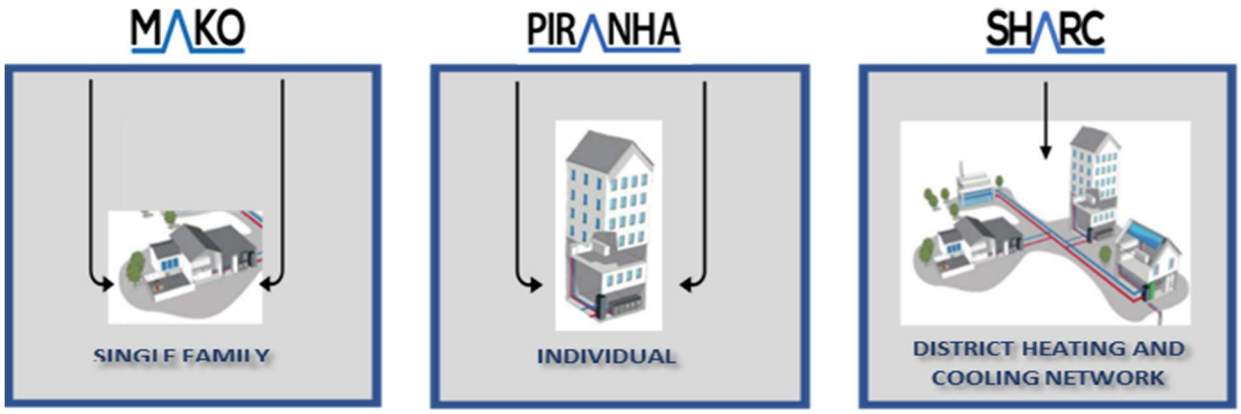
[1] The subsidiary was inactive at period end.

Products

The Company has invented, tested, and installed three revolutionary machines which extract thermal heat from wastewater to provide cost-effective, eco-friendly space conditioning and water heating:

- MAKO – Single-family home application
- PIRANHA – Multi-unit residential and commercial application
- SHARC – District heating and cooling network application

These products and their respective scopes of applications are illustrated in the figure below.



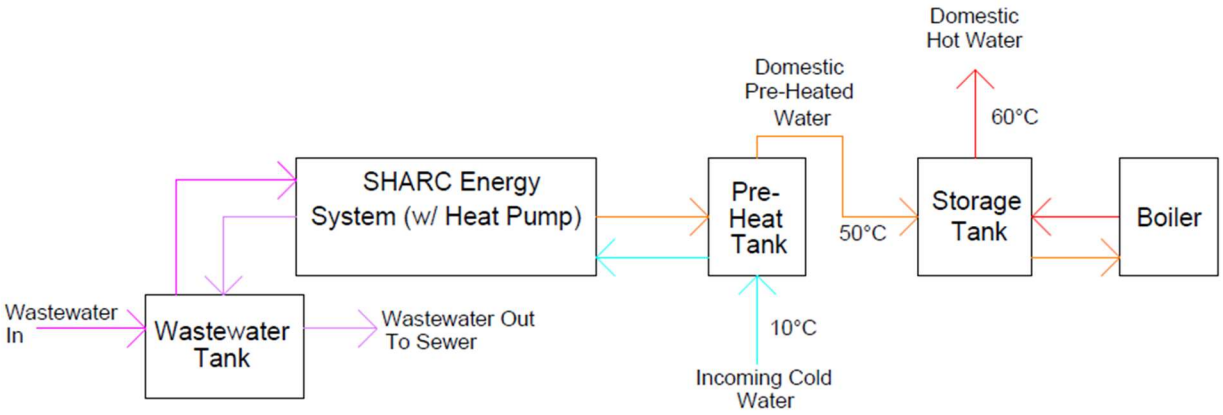
The associated research and development process involved building and testing the technology in-house. Thereafter, the technology was demonstrated in pilot projects in North America, Europe, Australia, and Asia to prove that SHARC technology can perform as designed. After seven years of R&D, the Company has moved to commercialization and is investing in commercial infrastructure to manage future growth and further establish identified green energy markets

The current R&D projects are as follows:

- MAKO - Single-family unit expected to be launched 2nd Quarter (Q2) 2020, currently undergoing testing in a single-family residence in Coquitlam, British Columbia
- PIRANHA HC - Designed for heating and cooling, expected to be launched in Q3 2020.

How SHARC Systems Work

The figure below shows a general schematic of a wastewater heat recovery system integrated into a traditional boiler system. The heat recovery technology serves to transfer heat from a wastewater flow into a facility's domestic water supply, thereby offsetting the energy demand on the boiler. This cuts the system's overall CO_2 emissions by reducing the amount of fossil fuels otherwise required for hot water production.



The benefits of the SHARC system include:

- Limitless supply of thermal energy from wastewater
- Significant reduction in global carbon emissions
- Lower utility bills for corporate and residential users
- Greater energy security
- Rapid cost recovery on capital investment
- Sustainable heating and cooling for a greener planet
- Odourless
- Industry acceptance with many international awards
- Government carbon reduction and efficiency incentives

SHARC is Getting Industry Recognition and Winning Awards

The industry is witnessing SHARC's success and it is being recognized by peers and competitors alike with the following awards:

- 2018 Water Canada Company of the Year
- 2018 Water Canada Project/Technology of the Year
- 2018 Water Canada People/Private Sector Organization of the Year
- 2017 Green Gown Award for Innovation
- 2017 Scottish Renewable Energy Innovation Award
- 2016 Green 50 Induction: Lynn Mueller
- 2016 ARI Green Building Product of the Year Award
- Nominated for the 2018 Manning Innovation Award

Overall Business Model & Growth Strategy

The Company is looking to focus on markets that align its environmental goals with SHARC through building code and environmental policy change supported by renewable energy incentives provided to promote these changes.

SHARC's current focus is on the United Kingdom ("UK") and British Columbia, Canada ("BC") market in terms of the deployment of its resources. SHARC will continue to sell SHARC technology products into additional markets but will not invest its own resources unless financially feasible. Current markets with active sales and relationship discussions outside of the UK and BC are China, Korea, Mexico, United States, Australia and New Zealand.

Within the UK and BC, the Company has flexibility in how it intends to generate revenue and shareholder value. The sales and value models can be clearly identified under the following:

- Equipment Sales and leasing (also referred to as "OEM")
    - Customer purchases or leases SHARC technology products for its needs, whether it is energy savings, carbon reduction goals and/or building code requirements.
    - Servicing and maintenance are performed by SHARC for a fee or outsourced to local techs supported by SHARC.
    - An example of equipment sales is Sechelt Water. (see Global Installations)
    - An example of leasing is Lake Louise Inn. (see Global Installations)

- Design, Build and Operate ("DBO")
    - Customer purchases a district heating system designed, built, operated and maintained by SHARC where the customer benefits from heat supply revenues to customers of the district heating system and Renewable Heat Incentives ("RHI") provided by the government.
    - SHARC benefits from the sale of the district heating system and operations and maintenance contract for the equipment.
    - An example of this would be Stirling District Heating Project (see Global Installations)

- Design, Build, Finance and Operate ("DBFO")
    - SHARC designs, builds, operates and finances (owns) a district heating system where SHARC will benefit from heat supply revenues secured through Heat Supply Agreements ("HSA") with customers/tenants and RHI payments received from the government.
    - SHARC creates long term, sustainable value for shareholders and develops an asset that can be refinanced or sold to a customer.
    - An example of this would be the Clyde Gateway District Heating Project. (see Global Installations)

No matter the method, each installation will provide the Company short- and long-term residual income and shareholder value.

United Kingdom Business Model & Growth Strategy

Business model

The UK business model currently provides customers with a full turnkey service under DBO and DBFO models that offsets or negates the need for gas supplies.

The models include:

- Work package procurement and operational oversight by the SHARC team
- Building services adjustments
- SHARC package plant room, including heat pumps, buffer vessels, and wider system controls
- Design and operational oversight by the SHARC team
- Heat Supply Agreements ("HSA") with customers to provide the customers heat load requirements while benefitting from the Renewable Heat Incentive ("RHI") tariff payments from the United Kingdom government.

Intellectual Property

Through the Borders College installation (see Global Installations – Borders College, Galashiels, Scotland), the Company has developed technical and administrative (ie. contracts) intellectual property integral to the development of the UK market and replicable to other global markets. The following is a list of the intellectual property created:

- Use of Sewer Agreement templates to be utilized with 12 UK water & sewage companies
- Connection of SHARC Technology with heat exchangers, sewer lines and heat pumps
- Development of HSA.

Growth Strategy

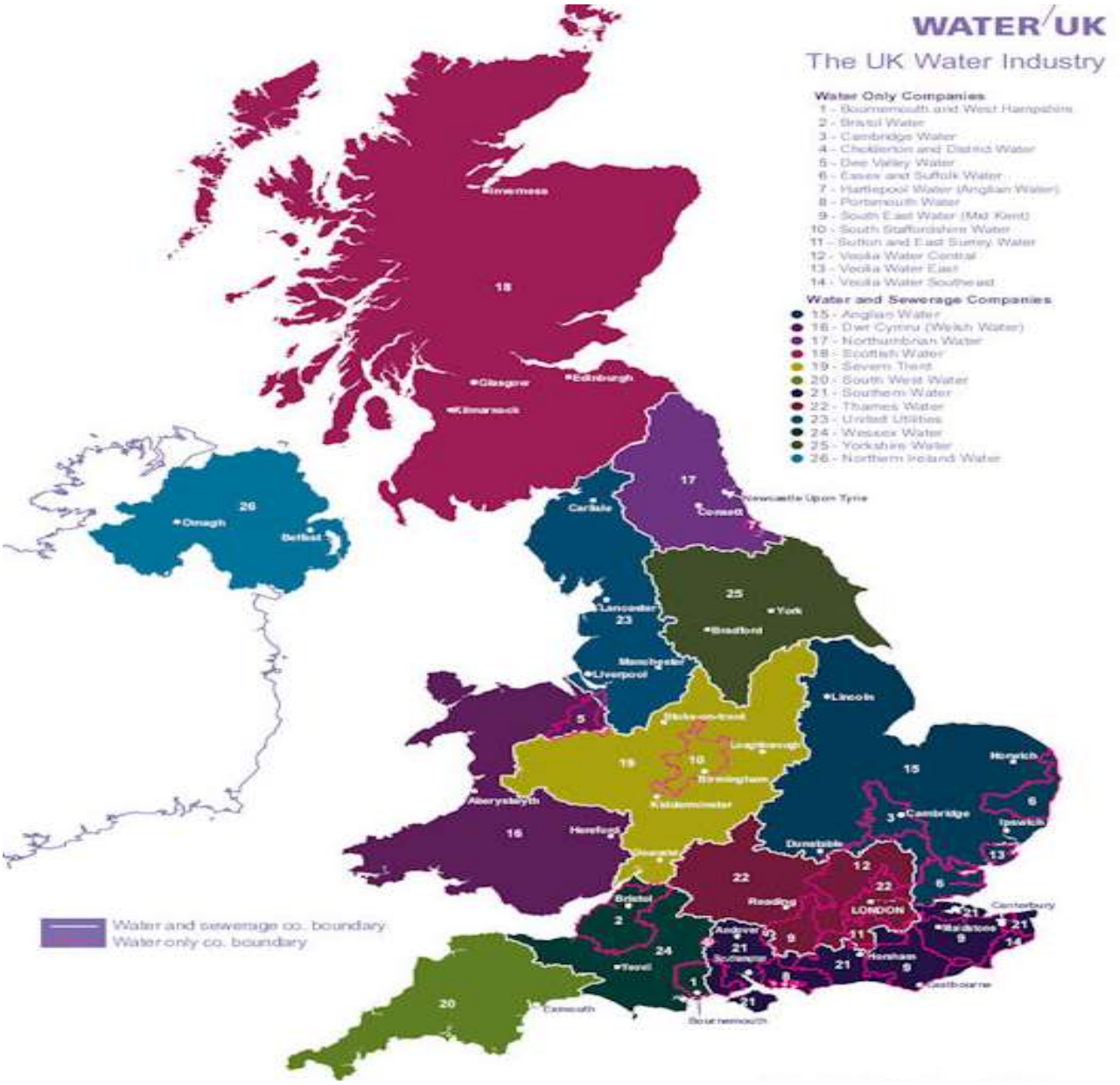
The UK water and sewage rights are held by twelve companies. Developing relationships with all twelve will be integral in developing the UK market.

Currently, the Company has a 50% ownership in a Special Purpose Vehicle ("SPV"), or subsidiary, named Bandwidth Energy Limited with Scottish Water Horizons Ltd. through the development of the Company's relationship with Scottish Water. It is expected that this partnership will create long term economic benefits to our shareholders and measurable impact on the reduction of greenhouse gas emissions. The remaining 11 water and sewage companies are the following:

Water and Sewage Companies	Approximate areas served
Anglian Water	East of England
Dwr Cymru (Welsh Water)	Wales
Northumbrian Water	North East England
Severrn Trent Water	West Midlands, East Midlands, Chester
Southern Water	South East England
South West Water	South West England
Thames Water	Greater London, Thames Valley
United Utilities	North West England
Wessex Water	South West England
Yorkshire Water	Yorkshire and the Humber
Northern Ireland Water	Northern Ireland

The Company is in advanced discussions with a number of the above companies on sewage heat recovery energy centres and relationships within their districts.

The following is a visualization of the UK Water and Sewage rights:



BC Business Model & Growth Strategy

Business model

The BC business model currently operates through OEM arrangements.

The models include:

- SHARC package plant room, including SHARC technology products, heat pumps, buffer vessels, and wider system controls
- Retrofitting gas heating infrastructure with the Piranha
- Design and operational oversight by the SHARC team
- Leasing units with the ultimate goal of securing large-scale adoption with specific industry verticals (ie. Hotel chains, breweries, laundromats, aquatic and fitness centers, etc.)

Growth Strategy

The City of Vancouver in British Columbia, Canada, has set a goal of achieving net zero emissions for new construction by 2030. To work towards this, the City is implementing the BC Energy Step Code to incentivize developers to meet more stringent levels of energy-efficiency. Moreover, local utilities BC Hydro and FortisBC are themselves offering consumers incentives to support energy-saving technologies. These include:

Efficiency BC Custom Performance Program – **Fortis BC**

- For small-, medium-, or large-scale new construction projects
- Will pay 100% of the incremental costs associated with purchasing and installing SHARC Energy Systems heat recovery equipment
- Maximum incentive of **$500,000** per year
- Also pays for an energy feasibility study up to a maximum of $25,000
- Eligibility requirements can be found at https://www.fortisbc.com/rebates/business/commercial-new-construction-performance-incentives

EfficiencyBC Custom-Lite Program – **BC Hydro**

- For medium-scale projects looking for electrification of their energy use
- Will fund a portion of the incremental costs associated with purchasing and installing SHARC Energy Systems heat recovery equipment
- The Program offers capital incentives up to maximum **$48,000** incentive per customer
- The Program also offers Energy Study funding up to a maximum of $2,000
- Eligibility requirements can be found at https://betterbuildingsbc.ca/incentives/cleanbc-custom-program/

EfficiencyBC Custom Program – **BC Hydro**

- For large-scale projects looking for electrification of their energy use
- Will fund a portion of the incremental costs associated with purchasing and installing SHARC Energy Systems heat recovery equipment.
- The Program offers Capital Incentive of up to maximum **$200,000** incentive per customer.
- The Program also offers Energy Study funding up to a maximum of $25,000.
- Eligibility requirements can be found at https://betterbuildingsbc.ca/incentives/cleanbc-custom-program/

These incentives help promote the adoption of SHARC technology right in its own backyard.

New construction projects are supported by EfficiencyBC Custom Performance Program through Fortis BC. However, new construction projects adopting SHARC technology has longer sales realization lead time. This is due to typical new infrastructure development timelines required.

The Company has identified the retrofit of current heating systems installed in hotels, residential buildings, care homes, laundromats, craft breweries and other verticals that require larger hot water loads as the shortest sales lead time with sale to installation plausible within a 3-month timeline. This is supported by EfficiencyBC Custom Programs through BC Hydro and is an ideal fit for the Piranha.

SHARC will focus on developing the retrofit pipeline while working on building the new infrastructure pipeline providing short- and long-term value to shareholders.

Sales Cycle

The Company's sales cycle is more extended than most established technologies for its SHARC district heating projects. This is primarily because, to date, the bulk of projects supported by the Company are more widely infrastructure based, involving extended periods of development and planning. Moreover, the innovative and pioneering nature of the Company's approach to heat delivery requires a significant amount of engagement and educational support to get customers and their technical engineering teams comfortable with the technology and its capability.

As a result of the experience gained through the Company's development phase, including feedback from customers and other stakeholders, the Company is able to provide earlier and more detailed technical information to the customers in an effort to reduce the project gestation periods, which have historically ranged between 12 to 36 months. Additionally, through the development of strategic relationships with infrastructure partners such as ENGIE and AECOM, who trade in the public sector through framework agreements and established operating arrangements, the Company is seeing an increased pipeline of opportunity with an accelerated delivery plan.

The Piranha sales cycle is a much shorter process and is critical in creating an economically and environmentally sustainable company as it can be installed as a retrofit. The Company is focused on establishing the Piranha within the British Columbia market and expanding into other markets such as the rest of Canada and California.

Competition

The Company has several fringe competitors who offer an alternative for heat recovery. Because of the strength and robustness of SHARC's systems, the following competitors do not provide a threat currently with their present product portfolio:

HUBER ThermWin

Based in Germany, HUBER specializes in water and wastewater treatment. As part of that, they offer wastewater filtration and heat extraction equipment (called the ThermWin), but it in general the system lacks the flexibility to be integrated into the wide variety of projects that SHARC offers. The design team or client would have to consider both higher up-front capital costs and a reduced COP (coefficient of performance) due to equipment design. In addition, the equipment is not suitable for standard buildings due to their method of wastewater solids extraction and non-odour-free design.

Rabtherm Energy Systems

Rabtherm Energy Systems is another German manufacturer that takes an alternative approach to wastewater heat recovery. Unlike SHARC and HUBER, whose systems are external to the primary wastewater flow, Rabtherm's products are integrated into or replace the sewer line itself. They use heat exchangers lining the bottom of the pipe or embedded into the pipe walls with the intent of capturing the heat from the wastewater and transferring it to other equipment for reuse. Massive infrastructure costs and the issue of sediment build up on the bottom of the sewer pipe lead to long payback periods. Additionally, without a wastewater holding tank, it runs the risk of low-flow periods when heat cannot be recovered.

RenewABILITY Power-Pipe

The Power-Pipe is a heat recovery system produced by RenewABILITY Energy Inc., involving a heat extraction coil wrapped around a drainpipe. The intended purpose to capture wastewater heat as it passes through the drainpipe into the coil. The recovered heat is transferred to the building's hot water source.

The system is completely passive, with no moving parts, and so it requires no energy to operate. However, it entails extremely long payback periods due to low heat recovery rates (and thus energy cost savings) relative to installation costs. Moreover, in multi-family dwellings, one must consider the possibility of having to access the Power-Pipe though other owners' properties.

Global Installations

The following is a sample of these projects:

Installations - *In order to test the scalable solutions for the organization the Company has embraced a variety of opportunities to establish the most productive and profitable route to market.*

In 2016, the company announced it has been successful in its bid to secure grant support from the Scottish Governments Low Carbon Infrastructure Transition Program **("LCITP").** This success stimulated a significant shift in the UK operation, establishing Scotland as the home of our design engineering and project delivery team.

In 2017, the company progressed the Aqualibrium and Clyde Gateway projects to ready status and achieved financial close on the subsidiary special purpose vehicles ("**SPV"**) established to build and operate the systems.

Alongside the provision of SHARC equipment, the UK operation also provides support for the enabling works to facilitate our service provision, including civil engineering to connect to the adjacent sewer systems and install buried heat distribution pipework, alongside building services adjustments to client properties enabling them to consume the SHARC heat supplies efficiently.

Through the SPVs (Bandwidth Energy Ltd – a joint venture with Scottish Water Horizons and SHARC Highlands, a wholly owned subsidiary established to construct the Clyde Gateway project), the Company will benefit from Heat Supply Agreements ("**HSA"**) from these projects.

Aqualibrium, Campbelltown, Scotland

This project is the first in partnership with Scottish Water Horizons, the commercial arm of Scottish Water through a jointly-held subsidiary, Bandwidth Energy Limited. Working with Scottish Water Horizons, the Company has continued to promote the use of design-build-finance-operate arrangements (**DBFO**) in the deployment of this project, with the capital investment being funded via grants from the LCITP and commercial debt from Scottish Water Horizons Ltd. ("**SWH"**).

The capital investment will be repaid via heat supply agreements entered into with Argyll & Bute Council, enabling the council to adopt the Company's products and services with no capital outlay at the commencement of the project. This is a model that the joint venture with Scottish Water Horizons favours exploring on all new projects.

This project broke ground on July 18th, 2018 and is expected to help the Argyll & Bute Council achieve their Renewable Energy Action Plan targets and deliver 144 tonnes of CO_2 emission reductions per year, anticipated to increase annually as the UK electricity grid decarbonizes.

This project has been financed as follows:

- $895,253 (£517,517) of grant funding provided by the Scottish Government's Low Carbon Infrastructure Transition Programme ("LCITP")
- $1,046,116 (£604,726) in debt financing from SWH
- Remainder is to be funded by the Company.

SHARC Energy Ltd., a 100% wholly owned subsidiary of the Company, is acting as the developer on the project.

As of June 30, 2019, the Company has cumulatively recognized development revenue of $1,686,470 and costs of $2,215,479 resulting in a net loss of $529,009. Upon completion of Aqualibrium, the project will earn recurring heat supply revenues, RHI payemnts and ultimately begin recouping any of its up-front loss with the additional investment being required to grow the future relationship with Scottish Water and the project pipeline that comes with it. On March 23rd, 2019, Aqualibrium generated 1 kWh of energy, which is a significant milestone for the project. Commissioning is scheduled for Q3 2019.

The revenues earned from the development phase of the project are reported in the Company Consolidated Financial Statements as revenue and the costs as cost of goods sold in the Consolidated Statement of Loss and Comprehensive Loss. As previously mentioned, the additional capital outlay required is viewed as an upfront investment into the relationship with SWH and the pipeline of projects that come with this relationship. The Company will have the ability to recoup this investment as, upon commissioning, the project will operate under a 20-year Heat Supply Agreement generating monthly cash flows. The income or loss generated by Bandwidth will be reported as a gain or loss on equity investment in the Consolidated Statement of Income/Loss and Comprehensive Income/Loss with the Company's equity in the project reported on the Statement of Financial Position.

Figure 1 - Aqualbrium Campbeltown

Figure 2 - Aqualbrium Campbeltown

Clyde Gateway, Glasgow, Scotland

In Scotland, the Clyde Gateway is Scotland's biggest and most ambitious regeneration program. It is a partnership between Glasgow City Council, South Lanarkshire Council and Scottish Enterprise, backed by funding and direct support from the Scottish Government (source: www.clydegateway.com). The development is schedule to come to final completion in 2028.

The Company reached financial close on this project in June 2018, under which the company had secured project financing to DBFO a new SHARC owned district heating service in the Dalmarnock area of the Clyde Gateway. SHARC technology is being deployed to provide 2 MW of heating and cooling capacity to supply the neighbouring properties to the Company's energy centre over the next 20 to 50 years. Figure 3 and 4 on the next page illustrate the service area of the energy centre. Furthermore, it should be noted that SHARC is able to expand servicing area, with a smaller investment required as the main infrastructure will be in place, to the other side of the River Clyde which is visual in Figure 3.

The anchor tenant, Andrew Muirhead & Son Limited, has signed a 5-year Heat Supply Agreement, alongside the provision of a utility concession to supply the new occupiers of the buildings being constructed by Clyde Gateway in the area. This will allow the Company to benefit from providing heat and cooling capacity to new tenants

Alongside the energy centre, the building will become the European headquarters for SHARC Energy, housing operations and design services in the 2,000-ft² office accommodation and provide production and distribution facilities in the 8,000-ft² factory.

The Clyde Gateway project asset is held within a 100% wholly owned subsidiary, SHARC Highlands Ltd. The project currently is projected to cost £5,205,650 (before grant subsidies) and has been financed as follows:

SHARC Highlands Ltd.
$2,913,477 CAD (£1,684,188) in LCITP grant funding
$1,729,900 CAD (£1,000,000) through a loan forming a debt facility provided by Energy Saving Trust Limited (EST)
$778,455 CAD (£450,000) provided by Clyde Gateway Developments Ltd.
Remainder is to be funded by the Company

Clyde Gateway Costs vs Funding

Costs		**Funding**	
Source	**Value (£)**	**Source**	**Value (£)**
Design & Consultancy	£294,547	Clyde Gateway Loan	£450,000
Construction	£4,007,493	Loan from EST	£1,000,000
Material	£903,610	Total Grants	£1,684,188
Total Cost	£5,205,650	Total External Funding	£3,134,188
Net Difference Provided by SHARC			**£2,071,462 ($3,608,073 CDN)**

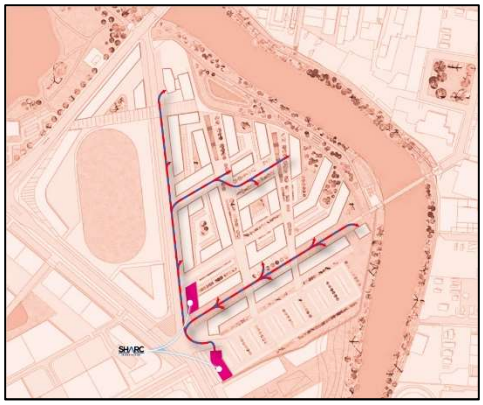


Figure 3 – Site - SHARC's Clyde Gateway

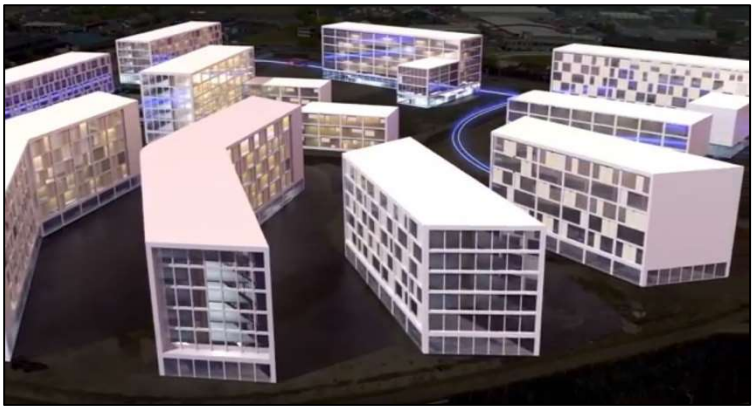


Figure 4 - Rendering of SHARC's Clyde Gateway site

In the case of Clyde Gateway, this is a Company owned asset and any adjustments will be shown as an increase in asset value on the balance sheet. The recognized amount on the balance sheet is cost less the grant funding received to date.

Upon completion of Clyde Gateway, the project will earn recurring heat supply revenues and RHI payments will be recognized as revenues with any applicable costs being consolidated i. This project broke ground on August 30th, 2018 and commissioning is scheduled for Q4 2019.

Review the following video here for future highlights of Clyde Gateway.

Stirling District Heating Project, Stirling, Scotland

In a further exploration to test the scalable business model, the company entered into a subcontract agreement with FES Support Services Ltd to supply technology and know-how to the district heating plan being developed between Scottish Water and Stirling Council. The Stirling project as of May 30th, 2019, is 90% complete. The remaining 10% of the project consists of site commissioning.

Borders College, Galashiels, Scotland

This system is connected to the local wastewater system and provides around 85% of the heat needed by the Galashiels Campus with no impact the normal operation of the wastewater network, to target reducing the associated carbon footprint by 250 tonnes per year. Alongside Scottish Water Horizons, the Company has helped Borders College win the "Best Newcomer" category at the prestigious Green Gown Awards and the "Innovation of the Year" award at the Scottish Green Energy Awards.

The Green Gown Awards, established in 2004, recognize the exceptional sustainability initiatives being undertaken by universities and colleges. With sustainability becoming increasingly important, the Awards have become established as the most prestigious recognition of best practice within the further and higher education sector.

Similarly, the Scottish Green Energy Awards were established by Scottish Renewables, the voice of renewable energy in Scotland, to recognize, support, and celebrate exceptional contributions from a wide range of stakeholders involved in the Scottish Energy revolution and assisting the Scottish Government to realize the full economic, social, and environmental benefits of renewable energy for the country.

As of April 5th, 2019, Borders College has passed 2 gigawatt hours (GWh) of heat delivered since it began operations as was noted in news release dated May 23, 2019. With 223 tonnes of carbon savings achieved since the system was commissioned the project has provided SHARC Energy a significant opportunity to test and learn the limits of the system in a live environment and has become a powerful demonstration of how wastewater heat recovery can support the decarbonisation of heat in the UK.

In a further development, the Company has agreed a second phase of works with the college, including an opportunity to optimize the project using solar photovoltaic ("Solar PV") technology and a capital restructuring of the SHARC Caledonia SPV. This will enable the facility to be used to test a variety of new technologies that will improve efficiency of the SHARC's systems and provide a site to demonstrate for prospective targets the full range of benefits of moving to heat pump technology. Currently, Borders College creates a cash outflow of approximately $50k per year for the Company without a means to subsidize the spend through the generation of income. This potential opportunity would provide the Company a chance to recoup its costs.

District of Columbia Water and Sewer Authority Headquarters, Washington, DC, USA.

This system was completed and commissioned in July 2018 and provides the 168,000-ft2 building with a combination of heating, air conditioning, and water heating. Savings are projected to be 35% for cooling and 85% for heating while saving 5 million gallons of freshwater per year that otherwise would have been used by the cooling towers. This building is designed to LEED® Platinum Class A standards and is the greenest building in North America.

Figure 5 - District of Columbia Water and Sewer Authority Headquarters

Lake Louise Inn, Lake Louise, B.C., Canada

Lake Louise Inn, managed by Canadian hotelier Atlific Hotels, is SHARC's first installation in Alberta and the fourth Piranha installation across Canada. It is also the first ever installation in a hotel, an enterprise that produces and wastes significant quantities of hot water. The system allows for the hotel to collect hot water from their laundry systems and reuse the heat in future laundry loads. It is anticipated that Lake Louise Inn will benefit from CO2 savings of 33 tonnes per year.

Southeast False Creek Neighbourhood Energy Utility, Vancouver, B.C., Canada

This facility is a large-scale district heating network serving Vancouver's Olympic Village, in operation since 2010. It uses thermal energy from wastewater paired with water to water heat pump technology to provide space heating and hot water throughout the Southeast False Creek neighbourhood for 395,000 m2 of residential, commercial, and institutional space. In 2017, two Sharc modules were installed for filtration of wastewater, with associated CO_2 reductions of 6,000 tonnes per year. It is expected to be expanded to further its capacity in the future.

Sechelt Water Resource Centre, Sechelt, B.C., Canada

This project was implemented to supply space heating and cooling at a state-of-the-art wastewater treatment plant using their untreated influent. The SHARC system was commissioned in Spring 2015, contributing to LEED® Gold certification for the facility, eliminating the need for an air conditioning cooling tower. It provided typical heat transfer of 630,000 BTU/hr for heating and 500,000 BTU/hr for cooling, with a measured peak heat transfer of 1,500,000 BTU/hr and CO_2 emission reduction of 96 tonnes per year.

Paul Nash, project coordinator for the wastewater treatment plant: *"This place is a tertiary level treatment plant that was built with the specific purpose of producing really high-quality water for reclaimed water purposes. A unique feature of this treatment plant is the greenhouse. They help the treatment process, but also in winter the greenhouse has to be heated, and we didn't want to use electricity or natural gas to heat it, but the idea of getting the heat out of the wastewater itself was a great one. So the Sharc system is able to provide the space heating for the greenhouse and all the office areas of the building. We expect our actual outside energy use of electricity for heating will be about one quarter of what it would otherwise be if we had to do this in a normal way."*

Wall Centre Central Park, Vancouver, B.C, Canada

Wall Centre Central Park is a two-phase real estate development showcases both SHARC and PIRANHA technology. Phase 1 contains 700 residential units and incorporates a Sharc 660 system, commissioned in July 2017. Phase 2 contains 350 residential units and implements two Piranha T10 units, commissioned in July 2018.

The systems save approximately $50k in energy by utilizing waste heat recovery and reduces CO_2 emissions by 260 tonnes a year. This building was built to LEED® Gold Certification standards.

Overall Financial Performance

The unaudited condensed consolidated interim statements of financial position as of June 30, 2019, indicate a cash position of $623,618 (December 31, 2018 - $1,899,657) and total current assets of $2,131,398 (December 31, 2018 - $3,575,789). Current liabilities at June 30, 2019, total $5,195,237 (December 31, 2018 - $4,565,657).

For the six months ended June 30, 2019, the Company had a working capital deficit of $3,063,839 (December 31, 2018 – working capital deficit of $989,868).

During the three and six months ended June 30, 2019, the Company reported a net loss of $1,058,227 and $2,007,224 ($0.03 and $0.05 basic and diluted loss per share) on revenue of $506,044 and $955,768 and a gross margin of $148,075 and $355,611, respectively. This compared to a net loss of $1,111,039 and $1,907,340 ($0.03 and $0.06 basic and diluted loss per share) on revenue of $39,862 and $458,109 and a gross margin of $27,659 and $246,711, respectively, for the three and six months ended June 30, 2018.

Summary of Quarterly Results

A summary of selected information for each of the eight most recent quarters is as follows:

Three Months Ended	Total Revenue ($)	Income (loss)		Total Assets ($)
		Total ($)	Per Share ($)	
June 30, 2019	506,044	(1,058,227)	(0.03)	5,792,835
March 31, 2019	449,724	(948,997)	(0.02)	5,512,908
December 31, 2018	1,441,482	(2,921,085)	(0.08)	5,878,525
September 30, 2018	236,807	(1,068,051)	(0.03)	2,725,098
June 30, 2018	39,862	(1,111,039)	(0.03)	3,806,163
March 31, 2018	418,247	(796,301)	(0.03)	1,332,184
December 31, 2017	(113,114)	(1,627,928)	(0.06)	1,704,486
September 30, 2017	174,537	(721,512)	(0.03)	2,492,570

Discussion of Operations

Three months ended June 30, 2019 compared with three months ended June 30, 2018

SHARC's loss for the period totaled $1,058,227 for the three months ended June 30, 2019, with basic and diluted loss per share of $0.03. This compares with net loss of $1,111,039 with basic and diluted loss per share of $0.03 for the three months ended June 30, 2018. The decrease of $52,812 in net loss was principally because:

- For the three months ended June 30, 2019, revenue increased by $466,182, cost of sales increased $345,766 and the gross margin increased by $120,416. The increase in revenue and cost of sales and margin is due to equipment sales of two Sharc 880's recognized on a percentage of completion basis and installation revenues. The Company realized a margin of $134,775 and $30,873 on equipment sales and service, feasibility and rental of equipment related revenue that was offset by a negative $17,573 margin on Aqualibrium. The Company has realized a loss on this contract (see – Growth Strategy – Capitalize on learnings from pilot projects). The Company has used the learnings from this to improve future installation agreements and considers this an investment into its relationship with SWH.

- For the three months ended June 30, 2019, interest and financing expense increased by $100,752. The increase is attributable to accretion expense related to convertible debt issued in the three months ended June 30, 2019, interest on credit facilities in the UK, interest on short term loans and interest expense recorded due to accounting policy change to leases as of January 1, 2019.

- For the three months ended June 30, 2019, consulting expenses decreased by $85,988. The decrease is attributable to the reduction in use of general and administrative and capital markets related consultants. This trend is expected to continue going forward.

- For the three months ended June 30, 2019, wages and benefits increased by $348,767. The increase is attributable to increased business activity in the UK and increase in salaries for the CEO, COO and the Senior VP of Finance. The increase for these three individuals also includes an accrued wage portion of $3,667 per month for the CEO and Senior VP of Finance and £1,250 per month for the COO. In the comparative 2018 period, the Company capitalized wage costs associated with the buildout of the UK energy centres.

- For the three months ended June 30, 2019, the Company had $98,744 in share-based payments versus $2,387 in the comparable period. The share-based payments were the result of the vesting of stock options granted to certain directors, officers, employees and consultants.

- For the three months ended June 30, 2019, the Company filed its 2018 UK taxes with a refundable credit of $256,502 (£148,645) owing. It is expected the Company will receive this credit towards the end of Q3 or early Q4 2019.

Six months ended June 30, 2019 compared with three months ended June 30, 2018

SHARC's loss for the period totaled $2,007,224 for the six months ended June 30, 2019, with basic and diluted loss per share of $0.05. This compares with net loss of $1,907,340 with basic and diluted loss per share of $0.06 for the six months ended June 30, 2018. The increase of $99,884 in net loss was principally because:

- For the six months ended June 30, 2019, revenue increased by $497,659, cost of sales increased $388,759 and the gross margin increased by $108,900. The increase in revenue and cost of sales and margin is due to equipment sales of two Sharc 880's recognized on a percentage of completion basis and installation revenues. The Company realized a margin of $436,924 and $53,341 on equipment sales and service, feasibility and rental of equipment related revenue, respectively, that was offset by a negative $134,654 margin on Aqualibrium. The Company has realized a loss on this contract. The Company has used the learnings from this to improve future installation agreements and considers this an investment into its relationship with SWH.

- For the six months ended June 30, 2019, interest and financing expense increased by $149,565. The increase is attributable to accretion expense related to convertible debt issued in the three months ended June 30, 2019, interest on credit facilities in the UK, interest on short term loans and interest expense recorded due to accounting policy change to leases as of January 1, 2019.

- For the six months ended June 30, 2019, consulting expenses decreased by $184,619. The decrease is attributable to the reduction in use of general and administrative and capital markets related consultants.

- For the six months ended June 30, 2019, wages and benefits increased by $432,624. The increase is attributable to increased business activity in the UK and increase in salaries for the CEO, COO and the Senior VP of Finance. The increase for these three individuals also includes an accrued wage portion of $3,667 per month for the CEO and Senior VP of Finance and £1,250 per month for the COO. In the comparative 2018 period, the Company capitalized wage costs associated with the buildout of the UK energy centres.

- For the six months ended June 30, 2019, the Company had $166,849 in share-based payments versus $105,065 in the comparable period. The share-based payments were the result of the vesting of stock options granted to certain directors, officers, employees and consultants.
- For the six months ended June 30, 2019, the Company filed its 2018 UK taxes with a refundable credit of $256,502 (£148,645) owing. It is expected the Company will receive this credit towards the end of Q3 or early Q4 2019.

Liquidity and Financial Position

As at June 30, 2019 the Company's cash balance was $623,618 (December 31, 2018 - $1,899,657) and the Company had working capital deficit of $3,063,839 (December 31, 2018 – working capital deficit of $989,868).

As of June 30, 2019, the Company had 38,720,176 common shares issued and outstanding, 19,737,472 warrants outstanding that would raise $10,855,610 if exercised in full and 3,546,858 options outstanding that would raise $1,454,212 if exercised in full. The Company does not know when or if the warrants or options will be exercised.

Cash used in operating activities was ($2,180,993) for the six months ended June 30, 2019. Operating activities were affected by the net loss of $2,007,224 partially offset by non-cash expenses of $577,424 and a change in non-cash working capital balances of ($751,194) largely because of payment of accounts payable and accrued liabilities and investment in inventory.

Related Party Transactions

Key management personnel are those persons having authority and responsibility for planning, directing and controlling the activities of the Company, directly or indirectly. Key management personnel include officers and directors.

The Company incurred the following charges with key management personnel:

	Three Months Ended June 30, 2019 $	Three Months Ended June 30, 2018 $	Six Months Ended June 30, 2019 $	Six Months Ended June 30, 2018 $
Consulting fees [i]	19,000	26,936	34,000	41,936
Wages and benefits [ii]	165,638	94,466	331,427	193,753
Share-based payments [iii]	68,578	—	96,185	—
Inventory/cost of sales/research and development [iv]	147,820	26,881	152,759	26,881
	401,036	**148,283**	**614,371**	**262,570**

(i) The Company paid consulting fees to companies controlled by the current and former Chief Financial Officer, Chief Operating Officer and a Director of Sharc UK.

(ii) The Company paid wages and benefits to the Chief Executive Officer and Director, a Director, the Chief Operating Officer and Senior Vice President of Finance.

(iii) The Company paid consulting fees to companies controlled by the Chief Operating Officer and a Director of Sharc UK that were capitalized to inventory costs and expensed to cost of sales or research and development expense.

(iv) The Company paid consulting fees to companies controlled by the Chief Operating Officer and a Director of Sharc UK that were capitalized to inventory costs and expensed to cost of sales or research and development expense.

The following table summarizes the above compensation paid to each related party.

	Three months ended June 30, 2019 ($)	Three months ended June 30, 2018 ($)	Six months ended June 30, 2019 ($)	Six months ended June 30, 2018 ($)
Lynn Mueller	50,000	39,000	100,000	78,000
Daryle Anderson	22,500	22,500	45,000	45,000
David Alexander	—	15,000	—	30,000
Russ Burton	43,138	65,493	86,427	103,280
Hanspaul Pannu	19,000	—	34,000	—
Jas Sahota	50,000	—	100,000	—
Ian Craft	147,820	6,290	152,759	6,290
Total	**332,458**	**148,283**	**518,186**	**262,570**

(i) Share-based payments of $68,578 and $96,185 (2018 – nil) for the three and six months ended June 30, 2019 was recognized in connection with the vesting of options granted to directors and officers of the Company and directors of the subsidiaries.

Other transactions with related parties included:

Included in accounts payable is $478,481 (December 31, 2018 – $252,024) due to related parties.

	June 30, 2019 ($)	December 31, 2018 ($)
Lynn Mueller	20,910	4,162
Daryle Anderson	285,000	240,000
Company controlled by Ian Craft	141,304	2,350
Jas Sahota	26,270	2,519
Russ Burton	—	2,993
Company controlled by Hanspaul Pannu	4,200	—
Sasko Despotovski	798	—
Total	**478,481**	**252,024**

During the year ended December 31, 2018, the Company entered into an installation agreement with Bandwidth whereby the Company sold a SHARC unit with associated installation services to Bandwidth. In relation to the sale, the Company recognized $100,510 during the six months ended June 30, 2019. This brings total revenue billed to date at $1,686,470. The associated costs recognized during the six months ended June 30, 2019 is $176,686 which is included in cost of sales. This brings total costs of the

project to date at $2,215,479. As the project resulted in a loss, the total revenue and cost of sale of the project have been recognized. At June 30, 2019, included in receivables is $128,386 (December 31, 2018 - $292,858) due from Bandwidth.

Share Capital

As of the date of this MD&A, the Company had 38,720,176 (June 30, 2019 – 38,720,176) issued and outstanding common shares.

Warrants outstanding for the Company at the date of this MD&A were as follows:

Warrants	Expiry Date	Exercise Price
5,964,495	May 11, 2020	$0.60
942,857	May 30, 2020	$1.05
4,180,650	June 7, 2020	$0.60
730,714	June 29, 2020	$1.05
3,714,286	November 22, 2021	$0.35
1,266,030	March 7, 2022	$0.40
2,078,790	May 3, 2022	$0.40
859,650	June 28, 2022	$0.40

Stock options outstanding for the Company at the date of this MD&A were as follows:

Options	Expiry Date	Exercise Price
800,000	December 18, 2019	$0.28
700,000	December 18, 2019	$0.26
142,858	October, 27, 2020	$1.47
100,000	July 12, 2021	$1.05
400,000	September 4, 2021	$0.47
1,304,000	October 1, 2021	$0.40
100,000	May 6, 2022	$0.26

Subsequent Events

In July 2019, the Company received a $100,000 loan from a third-party lender. The loan is guaranteed by the CEO, bears interest at 2% per month and matures three months from receipt.

Estimates, Judgments and Assumptions

The preparation of the Company's consolidated financial statements requires management to make judgments, estimates and assumptions that affect the reported amounts of assets and liabilities and disclosures of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Estimates and assumptions are continually evaluated and are based on management's experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances. Actual results could differ from these estimates.

The areas which require management to make significant judgments, estimates and assumptions in determining carrying values include, but are not limited to:

Critical Judgments

The following are critical judgments that management has made in the process of applying accounting policies and that have the most significant effect on the amounts recognized in the Financial Statements:

I. Research costs are recognized as an expense when incurred but development costs may be capitalized as intangible assets if certain conditions are met as described in IAS 38, Intangible Assets. Management has determined that development costs do not meet the conditions for capitalization under IAS 38 and all research and development costs have been expensed.

II. Management is required to assess the functional currency of the Company. The determination of functional currency often requires significant judgment where the primary economic environment in which they operate may not be clear. This can have a significant impact on the consolidated results of the Company based on the foreign currency translation method.

III. The determination of categories of financial assets and financial liabilities has been identified as an accounting policy which involves judgments or assessments made by management.

IV. Management is required to determine whether or not the going concern assumption is appropriate for the Company at the end of each reporting period. Considerations taken into account include available information about the future including the availability of financing and revenue projection, as well as current working capital balance and future commitments of the Company.

V. The Company recognizes the deferred tax benefit related to deferred income and resource tax assets to the extent recovery is probable. Assessing the recoverability of deferred tax assets requires management to make significant estimates of future taxable profit. In addition, future changes in tax laws could limit the ability of the Company to obtain tax deductions from deferred income and resource tax assets.

Estimation Uncertainty

The following are key assumptions concerning the future and other key sources of estimation uncertainty that have a significant risk of resulting in a material adjustment to the carrying amount of assets and liabilities within the next financial year:

i. Provisions for income taxes are made using the best estimate of the amount expected to be paid based on a qualitative assessment of all relevant factors. The Company reviews the adequacy of these provisions at the end of the reporting period. However, it is possible that at some future date an additional liability could result from audits by taxation authorities. Where the final outcome of these tax-related matters is different from the amounts that were originally recorded, such differences will affect the tax provisions in the period in which such determination is made.

ii. The fair value of accrued liabilities at the time of initial recognition is made using the best estimate of the amount expected to be paid based on a qualitative assessment of all relevant factors.

iii. Warranty provisions are recognized for the future obligations to provide services for the repairs and maintenance of products sold to its customers. The Company assesses its warranty provision based on experience. Actual costs incurred may differ from those amounts estimated.

iv. The Company estimates the net realizable values of inventories, taking into account the most reliable evidence available at each reporting date. The future realization of these inventories may be affected by future technology or other market drive changes that may reduce future selling prices.

v. The Company has service agreements with regards to some of its product sales which requires management to make judgments regarding the timing and allocation of revenue. Specifically, installation is generally not assumed to have standalone value and is often recognized on the same basis as the remainder of the services fees. However, the Company defers the recognition of revenue associated with fees for services agreements or warranty costs that are built in to the original sales price and recognizes the associated revenue evenly over the term of the service or warranty is provided.

vi. Revenue on development of heat supply infrastructure projects and equipment sales, predominantly based out of the UK, require the Company to make estimates of the percentage of completion of the project in order to determine the amount of revenue to recognize. Management uses costs and third-party evidence to determine estimated progress of development as of the period end dates.

Recent Accounting Pronouncements

Adoption of new accounting policy – leases

Impact of application of IFRS 16 Leases

Effective January 1, 2019, the Company adopted IFRS 16 using the modified retrospective application method, where the 2018 comparatives are not restated and the cumulative effect of initially applying IFRS

16 has been recorded on January 1, 2019 for any difference identified. The Company has determined that the adoption of IFRS 16 resulted in no adjustments to the opening balance of accumulated deficit.

IFRS 16 introduces significant changes to the lessee accounting by removing the distinction between operating and finance leases under IFRS 17 and requiring the recognition of a right-of-use asset ("ROU asset") and a lease liability at the lease commencement for all leases, except for short-term leases (lease terms of 12 months or less) and leases of low value assets.

In applying IFRS 16 for all leases, except as noted above, the Company (i) recognizes the ROU asset and lease liabilities in the statement of financial position, initially measured at the present value of future lease payments; (ii) recognizes the depreciation of ROU assets and interest on lease liabilities in the consolidated statement of comprehensive loss; and (iii) separates the total amount of cash paid into a principal portion (presented in financing activities) and interest (presented within operating activities) in the consolidated statement of cash flows. For short-term leases and leases of low value assets, the Company has opted to recognize a lease expense on a straight-line basis, and this expense is presented within office and miscellaneous in the consolidated statement of comprehensive loss.

The Company has made use of the following practical expedients available on transition to IFRS 16:

- Measure the ROU assets equal to the lease liability calculated for each lease;
- Apply the recognition exemptions for low value leases and leases that end within 12 months of the date of initial application, and account for them as low value and short-term leases, respectively; and
- Accounting for non-lease components and lease components as a single lease component.

In transitioning to IFRS 16, the Company analyzed its contract to identify whether they are or contain a lease arrangement. This analysis identified a contract containing a lease that had an equivalent increase to both the Company's ROU assets and lease liabilities, which resulted in a $91,281 adjustment. The incremental borrowing rate for lease liabilities initially recognized on adoption of IFRS 16 was 12%.

The cumulative effect of the changes made to the consolidated statement of financial position as at January 1, 2019 for the adoption of IFRS 16 is as follows:

	As previously reported	Effect of change in accounting policy	As reported under new accounting policy
	$	$	$
Property and equipment	2,241,792	91,281	2,333,073
Lease liability (current)	—	(25,209)	(25,209)
Lease liability (non-current)	—	(66,072)	(66,072)
	2,241,792	**—**	**2,241,792**

The operating lease obligations as at December 31, 2018 are reconciled as follows to the recognized lease liabilities as at January 1, 2019:

Operating lease obligations as at December 31, 2018	125,991
Short term lease	(19,514)
Effect from discounting at the incremental borrowing rate as at January 1, 2019	(15,196)
	91,281

New Accounting policy for leases under IFRS 16

The Company assesses whether a contract is or contains a lease, at the inception of a contract. The Company recognizes a ROU asset and a corresponding lease liability with respect to all lease arrangements in which it is the lessee, at the commencement of the lease, with the following exceptions: (i) the Company has elected not to recognize ROU assets and liabilities for leases where the total lease term is less than or equal to 12 months, or (ii) for leases of low value. The payments for such leases are recognized in the consolidated statement of comprehensive loss on a straight-line basis over the lease term.

The ROU asset is initially measured based on the present value of lease payments, lease payments made at or before the commencement day, and any initial direct costs. They are subsequently measured at cost less accumulated depreciation and impairment losses. The ROU asset is depreciated over the shorter of the lease term or the useful life of the underlying asset. The ROU asset is subject to testing for impairment if there is an indicator of impairment.

The lease liability is initially measured at the present value of lease payments that are not paid at the commencement date, discounted by using the rate implicit in the lease. If this rate cannot be readily determined, the Company uses its incremental borrowing rate. Lease payments include fixed payments less any lease incentives, and any variable lease payments where variability depends on an index or rate. When the lease contains an extension or purchase option that the Company considers reasonably certain to be exercised, the cost of the option is included in the lease payments.

ROU assets are included in property and equipment, and the lease liability is presented as a separate line in the consolidated statement of financial position. Variable lease payments that do not depend on an index or rate are not included in the measurement of the ROU asset and lease liability. The related payments are recognized as an expense in the period in which the triggering event occurs and are included in the consolidated statement of comprehensive loss.

Lease liabilities

The Company leases vehicles and office spaces in Canada and the United Kingdom. An office lease in the United Kingdom has less than 12 months of term remaining and as such is included in the statement of comprehensive loss and not the statement of financial position. Interest expense on the lease liabilities amounted to $5,194 for the six months ended June 30, 2019. The Company did not incur any variable lease payments and there were no leases with residual value guarantees or leases not yet commenced to which the Company is committed. The expense relating to the short term lease is $19,309 (£11,190) for the six months ended June 30, 2019.

Lease liabilities

Lease liabilities	**89,946**
Less: non-current portion	(54,780)
June 30, 2019	**35,166**

Undiscounted lease payments

Not later than one year	**44,183**
Later than one year and not later than 5 years	60,029
June 30, 2019	**104,212**

Capital Management

The Company's objective when managing capital is to safeguard the Company's ability to continue as a going concern in order to support the development of its business and maintain the necessary corporate and administration functions to facilitate these activities. The capital of the Company consists of items included in shareholders' equity.

The Company manages and adjusts its capital structure when changes to the risk characteristics of the underlying assets or changes in economic conditions occur. To maintain or adjust the capital structure, the Company may attempt to raise new funds.

There were no changes to the Company's approach to capital management during the year. The Company is not subject to externally imposed capital requirements.

Financial Instruments

Fair value

IFRS 13 establishes a fair value hierarchy for financial instruments measured at fair value that reflects the significance of inputs used in making fair value measurements as follows:

Level 1 – quoted prices in active markets for identical assets or liabilities;

Level 2 – inputs other than quoted prices included in Level 1 that are observable for the asset or liabilities, either directly (i.e. as prices) or indirectly (i.e. from derived prices); and

Level 3 – inputs for the asset or liability that are not based upon observable market data.

The fair value of cash is based on Level 1 inputs. The fair value of the Company's receivables, loans receivable, accounts payable and accrued liabilities, loans payable and convertible debentures approximate their carrying values due to the short-term to maturity. The fair value of long-term liabilities are initially recorded at fair value and subsequently carried at amortized cost using rates comparable to market interest rates.

[a] Credit risk

Credit risk is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation. The Company's cash and receivables are exposed to credit risk. The Company reduces its credit risk on cash by placing these instruments with institutions of high credit worthiness. Receivables are primarily from sales or loans. The Company believes these parties to be of sound creditworthiness, and to date, all receivables have been settled in accordance with agreed upon terms and conditions. As at June 30, 2019 and December 31, 2018, the Company is exposed to credit risk arising from receivables.

[b] Liquidity risk

Liquidity risk is the risk that the Company will encounter difficulty in meeting obligations associated with financial liabilities. The Company manages liquidity risk by maintaining sufficient cash balances to enable settlement of transactions on the due date. The Company addresses its liquidity through debt financing. While the Company has been successful in securing financings in the past, there is no assurance that it will be able to do so in the future.

[c] Market risk

[i] Interest rate risk

Interest rate risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates. As at June 30, 2019, the Company is not exposed to any significant interest rate risk.

[ii] Currency risk

Foreign exchange risk is the risk that the fair value of future cash flows will fluctuate as a result of changes in foreign exchange rates. As at June 30, 2019 the Company has exposure to the British pound that is subject to fluctuations as a result of exchange rate variations to the extent that transactions are made, and balances are held in this currency. The Company has not hedged its exposure to currency fluctuations. The sensitivity of the Company's net loss to changes in the exchange rate between the Canadian dollar and the

British pound resulting from a 10% change in the British pound exchange rate relative to the Canadian dollar would change the Company's net loss by approximately $5,000 (December 31, 2018- $6,527)

Risks and Uncertainties

Manufacturing Risks

For the successful development of the Company's manufacturing operations, the Company will require maintenance of production equipment, hiring and retaining of managerial personnel and skilled labour and maintaining of desirable levels of production. There can be no assurance that the Company will be able to achieve and sustain these goals. The Company's future success also depends on its ability to successfully achieve expected manufacturing capacity in a cost-effective and efficient manner. If the Company cannot do so, it may be unable to achieve and sustain profitability. The Company's ability to achieve expected production capacity is subject to significant risks and uncertainties, including the following: (a) delays and unexpected costs as a result of a number of factors, many of which may be beyond the Company's control, such as its ability to secure successful contracts with equipment vendors, (b) failure to effectively break in new equipment, (c) delays or denial of required approvals by relevant government authorities, (d) unavailability of manufacturing inputs; and (e) failure to execute its expansion plans effectively.

Regulatory Risks

The activities of the Company will be subject to intense regulation by governmental authorities. Achievement of the Company's business objectives are contingent, in part, upon compliance with regulatory requirements enacted by these governmental authorities and obtaining all regulatory approvals, where necessary, for the sale of its products. The Company cannot predict the time required to secure all appropriate regulatory approvals for its products, or the extent of testing and documentation that may be required by governmental authorities. Any delays in obtaining, or failure to obtain regulatory approvals would significantly delay the development of markets and products and could have a material adverse effect on the business, results of operations and financial condition of the Company.

Change in Laws, Regulations and Guidelines

The Company's operations will be subject to a variety of laws, regulations and guidelines relating to the manufacture, management, transportation, storage and disposal of untreated waste water but also including laws and regulations relating to health and safety, the conduct of operations and the protection of the environment. Changes to such laws, regulations and guidelines due to matters beyond the control of the Company may cause adverse effects to the Company's operations.

Lack of Operating History

The Company has only recently started to carry on its business. The Company is therefore subject to many of the risks common to early-stage enterprises, including under-capitalization, cash shortages, limitations with respect to personnel, financial, and other resources and lack of revenues. The failure by the Company to meet any of these conditions could have a materially adverse effect on the Company and may force it to reduce, curtail, or discontinue operations. There is no assurance that the Company will be successful in achieving a return on shareholders' investment and the likelihood of success must be considered in light of the early stage of operations. The Company may not successfully address all of the risks and uncertainties or successfully implement its existing and new products and services. If the Company fails to do so, it could materially harm its business and impair the value of its common stock, resulting in a loss to shareholders. Even if the Company accomplishes these objectives, the Company may not generate the anticipated positive cash flows or profits. No assurance can be given that the Company can or will ever be successful in its operations and operate profitably.

Reliance on Management and Key Personnel

The success of the Company is dependent upon the ability, expertise, judgment, discretion and good faith of its senior management. While employment agreements are customarily used as a primary method of retaining the services of key employees, these agreements cannot assure the continued services of such employees. The Company attempts to enhance its management and technical expertise by recruiting qualified individuals who possess desired skills and experience in certain targeted areas. The Company's inability to retain employees and attract and retain sufficient additional employees as well as information technology, engineering, and technical support resources could have a material adverse impact on the Company's financial condition and results of operation. Any loss of the services of such individuals could have a material adverse effect on the Company's business, operating results or financial condition.

Additional Financing

The Company's future capital requirements depend on many factors, including its ability to market products successfully, cash flows from operations, locating and retaining talent, and competing market developments. The Company's business model requires spending money in order to generate revenue. Based on the Company's current financial situation, the Company may have difficulty continuing operations at the current level, or at all, if it does not raise additional financing in the near future.

In order to execute the Company's business plan, the Company will require some additional equity and/or debt financing to undertake capital expenditures. There can be no assurance that additional financing will be available to the Company when needed or on terms which are acceptable. The Company's inability to raise financing to support on-going operations or to fund capital expenditures could limit the Company's operations and may have a material adverse effect upon future profitability.

The Company may require additional financing to fund its operations to the point where it is generating positive cash flows.

If additional funds are raised through further issuances of equity or convertible debt securities, existing shareholders could suffer significant dilution, and any new equity securities issued could have rights, preferences and privileges superior to those of holders of Company Shares. Any debt financing secured in the future could involve restrictive covenants relating to capital raising activities and other financial and operational matters, which may make it more difficult for the Company to obtain additional capital or to pursue business opportunities, including potential acquisitions. If adequate funds are not obtained, the Company may be required to reduce, curtail, or discontinue operations. There is no assurance that the Company's existing cash flow will be adequate to satisfy its existing operating expenses and capital requirements.

Competition

There is potential that the Company will face intense competition from numerous other companies, some of which can be expected to have longer operating histories and more financial resources and manufacturing and marketing experience than the Company. Increased competition by larger and better financed competitors could materially and adversely affect the business, financial condition and results of operations of the Company.

Because of early stage of the industry in which the Company operates, the Company expects to face additional competition from new entrants. To remain competitive, the Company will require a continued high level of investment in research and development, marketing, sales and client support. The Company may not have sufficient resources to maintain research and development, marketing, sales and client

support efforts on a competitive basis which could materially and adversely affect the business, financial condition and results of operations of the Company.

Intellectual Property Risks

The Company's ability to compete largely depends on the superiority, uniqueness, and value of its intellectual property and technology, including both internally developed technology and the ability to acquire patent protection and/or trademark protection. To protect its proprietary rights, the Company will rely on a combination of trademark, copyright, and trade secret laws, trademark and patent applications, confidentiality agreements with its employees and third parties, and protective contractual provisions. Despite these efforts, certain risks may reduce the value of the Company's intellectual property. The Company's applications for trademarks and copyrights relating to its business may not be granted, and if granted, may be challenged or invalidated. There is no guarantee that issued trademarks and registered copyrights will provide the Company with any competitive advantages. The Company's efforts to protect its intellectual property rights may not be effective in preventing misappropriation of its technology and may not prevent the development and design by others of products or technology similar to, competitive with, or superior to those the Company develops. There is a risk that another party may obtain a blocking patent and the Company would need to either obtain a license or design around the patent in order to continue to offer the contested feature or service in its products.

New Market Risks

Extracting heat from raw sewage flows is a relatively new market and its long-term growth prospects are uncertain. Should the raw sewage heat market fail to expand, it would have a materially adverse effect on our business and financial position.

Product Development Risks

The development of additional products is subject to the risks of failure inherent in the development of new, state of the art products, laboratory devices and products based on new technologies. These risks include: (i) delays in product development or manufacturing; (ii) unplanned expenditures for product development or manufacturing; (iii) failure of new products to have the desired effect or an acceptable accuracy profile; (iv) emergence of superior or equivalent products; (v) failure by any potential collaborative partners to successfully develop products; and (vi) the dependence on third parties for the manufacture, development and sale of the Company's products. Because of these risks, our research and development efforts or those of potential collaborative partners may not result in any commercially viable products. If a significant portion of these development efforts is not successfully completed, or any products are not commercially successful, we are less likely to generate significant revenues, or become profitable. The failure to perform such activities could have a material adverse effect on the Company's business, financial condition and results of its operations.

The areas in which we plan to commercialize, distribute, and/or sell products involves rapidly developing technology. There can be no assurance that we will be able to establish ourselves in such fields, or, if established, that we will be able to maintain our market position, if any. There can be no assurance that the development by others of new or improved products will not make our present and future products, if any, superfluous or obsolete.

Product Liability

The devices and products that we intend to develop may expose us to potential liability from personal injury claims by end-users of the product. We intend to carry product liability insurance to protect us against the risk that in the future a product liability claim or product recall could materially and adversely affect our business. Inability to obtain sufficient insurance coverage at an acceptable cost or otherwise

to protect against potential product liability claims could prevent or inhibit the commercialization of our intended products. We cannot assure you that if and when we commence distribution of our product that we will be able to obtain or maintain adequate coverage on acceptable terms, or that such insurance will provide adequate coverage against all potential claims. Moreover, even if we maintain adequate insurance, any successful claim could materially and adversely affect our reputation and prospects and divert management's time and attention. If we are sued for any injury allegedly caused by our future products our liability could exceed our total assets and our ability to pay the liability.

Product Defects

The Company's products are complex and, accordingly, they may contain defects or errors, particularly when first introduced or as new versions are released. We may not discover such defects or errors until after a product has been released and used by end-customers. Defects and errors could materially and adversely affect our reputation, result in significant costs to us or the termination of an agreement, delay planned release dates and impair our ability to sell our products in the future. The costs incurred in correcting any product defects or errors may be substantial and could adversely affect our operating margins. Furthermore, there can be no assurance that our efforts to monitor, develop, modify and implement appropriate test and manufacturing

processes for our products will be sufficient to permit us to avoid a rate of failure in our products that results in substantial delays, significant repair or replacement costs or potential damage to our reputation, any of which could have a material adverse effect on our business, results of operations and financial condition.

We may also be subject to claims that our products are defective or that some function or malfunction of our products caused or contributed to damages. While we attempt to minimize this risk by incorporating provisions into our standard agreements that are designed to limit our exposure to potential claims of liability, we are not always able to negotiate such protections. In addition, no assurance can be given that all claims will be barred by the contractual provisions limiting liability or that the provisions will be enforceable. We may be liable for failure regarding the use of our products or services. A significant liability claim against us could have a material adverse effect on our operating results and financial position

Reliance on Key Inputs

The Company's business will be dependent on a number of key inputs and their related costs including raw materials and supplies related to its growing operations, as well as electricity, water and other local utilities. Any significant interruption or negative change in the availability or economics of the supply chain for key inputs could materially impact the business, financial condition and operating results of the Company. Some of these inputs may only be available from a single supplier or a limited group of suppliers. If a sole source supplier was to go out of business, the Company might be unable to find a replacement for such source in a timely manner or at all. If sole source supplier were to be acquired by a competitor, that competitor may elect not to sell to the Company in the future. Any inability to secure required supplies and services or to do so on appropriate terms could have a materially adverse impact on the business, financial condition and operating results of the Company.

Dependence on Suppliers and Skilled Labour

The ability of the Company to compete and grow will be dependent on it having access, at a reasonable cost and in a timely manner, to skilled labour, equipment, parts and components. No assurances can be given that the Company will be successful in maintaining its required supply of skilled labour, equipment, parts and components.

Management of Growth

The Company has, and may in the future, experience rapid growth and development in a relatively short period of time by aggressively marketing its products and services. The Company may be subject to growth related risks including capacity constraints and pressure on its internal systems and controls. The ability of the Company to manage growth effectively will require it to continue to implement and improve its operational and financial systems and to expand, train and manage its employee base. The inability of the Company to deal with this growth may have a material adverse effect on the Company's business, financial condition, results of operations and prospects

Conflicts of Interest

Certain of the directors and officers of the Company are also directors and officers of other companies, and conflicts of interest may arise between their duties as officers and directors of the Company and as officers and directors of such other companies.

Litigation

The Company may be forced to litigate, enforce, or defend its intellectual property rights, protect its trade secrets, or determine the validity and scope of other parties' proprietary rights. Such litigation would be a drain on the financial and management resources of the Company which may affect the operations and business of the Company.

The Company may become party to litigation from time to time in the ordinary course of business which could adversely affect its business. Should any litigation in which the Company becomes involved be determined against the Company such a decision could adversely affect the Company's ability to continue operating and the market price for Company Shares and could use significant resources. Even if the Company is involved in litigation and wins, litigation can redirect significant company resources.

The Market Price of Company Shares May Be Subject to Wide Price Fluctuations

The market price of Company Shares may be subject to wide fluctuations in response to many factors, including variations in the operating results of the Company, divergence in financial results from analysts' expectations, changes in earnings estimates by stock market analysts, changes in the business prospects for the Company, general economic conditions, legislative changes, and other events and factors outside of the Company's control. In addition, stock markets have from time to time experienced extreme price and volume fluctuations, which, as well as general economic and political conditions, could adversely affect the market price for Company Shares.

Environmental and Employee Health and Safety Regulations

The Company's operations will be subject to environmental and safety laws and regulations concerning, among other things, emissions and discharges to water, air and land, the handling and disposal of hazardous and non-hazardous materials and wastes, and employee health and safety. The Company will incur ongoing costs and obligations related to compliance with environmental and employee health and safety matters. Failure to comply with environmental and safety laws and regulations may result in additional costs for corrective measures, penalties or in restrictions on our manufacturing operations. In addition, changes in environmental, employee health and safety or other laws, more vigorous enforcement thereof or other unanticipated events could require extensive changes to the Company's operations or give rise to material liabilities, which could have a material adverse effect on the business, results of operations and financial condition of the Company.

Disclosure of Internal Controls

Management has established processes to provide them sufficient knowledge to support representations that they have exercised reasonable diligence that (i) the consolidated financial statements do not contain any untrue statement of material fact or omit to state a material fact required to be stated or that is necessary to make a statement not misleading in light of the circumstances under which it is made, as of the date of and for the periods presented by the consolidated financial statements; and (ii) the consolidated financial statements fairly present in all material respects the financial condition, results of operations and cash flows of the Company, as of the date of and for the periods presented.

In contrast to the certificate required for non-venture issuers under National Instrument 52-109 Certification of Disclosure in Issuers' Annual and Interim Filings ("NI 52-109"), this Venture Issuer Basic Certificate does not include representations relating to the establishment and maintenance of disclosure controls and procedures ("DC&P") and internal control over financial reporting ("ICFR"), as defined in NI 52-109. In particular, the certifying officers filing this certificate are not making any representations relating to the establishment and maintenance of:

i) controls and other procedures designed to provide reasonable assurance that information required to be disclosed by the issuer in its annual filings, interim filings or other reports filed or submitted under securities legislation is recorded, processed, summarized and reported within the time periods specified in securities legislation; and

ii) a process to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with the issuer's GAAP (IFRS).

The issuer's certifying officers are responsible for ensuring that processes are in place to provide them with sufficient knowledge to support the representations they are making in this certificate. Investors should be aware that inherent limitations on the ability of certifying officers of a venture issuer to design and implement on a cost-effective basis DC&P and ICFR as defined in NI 52-109 may result in additional risks to the quality, reliability, transparency and timeliness of interim and annual filings and other reports provided under securities legislation.