

## EnWave Corporation (ENW)

January 12, 2019

EnWave Corporation offers industrial-scale dehydration technology for commercial applications in the food, cannabis, and pharmaceutical spaces. The Company's Radiant Energy Vacuum ("REV™") platforms are becoming the new global dehydration standard, as they are faster and cheaper than freeze drying, and have better end product quality than both air drying and spray drying.

EnWave reported revenue of \$7.35 million in the fourth quarter of fiscal year 2018, ended September 30, 2018, compared with \$3.63 million in the same period last year, an increase of 103%. A record quarter!

The Company furthermore announced a positive net income for Q4 2018 of \$75,000 compared to a net loss of \$1.06 million for Q4 2017, an improvement of \$1.13 million. Especially NutraDried's revenue skyrocketed, driven by increased sales and distribution of its Moon Cheese product.

EnWave performed extremely well in fiscal year 2018. Annual sales increased 43% and its balance is very strong. As for 2019, we expect another strong surge in NutraDried sales to at least \$25 million, a boost in total royalties to \$2.5 million, and some significant machine purchase orders.

We reiterate our buy recommendation for EnWave Corp. and increase our price target to \$3.85, which is 179% above today's stock price.



- ▣ The Company anticipates several long-term projects to convert to commercial licenses as well as additional REV machine capacity to be ordered by existing partners in 2019.

A first order on which the investment community is waiting for is the follow up order from Bonduelle for a large 300kW quantaREV machine. There may also be some further exciting developments from the US Army Natick Soldier R&D Center (NSRDEC).

More growth is also expected in the cannabis space. So far, Tilray has purchased a 10kW REV machine and two 60kW continuous REV machines for the dehydration of cannabis. With an industry that's growing very fast and EnWave aiming to become the gold standard in this area, many orders are in the pipeline.



## THE COMPANY

EnWave Corporation is a Vancouver-based applied technology Company that works in partnership with food, cannabis, and pharmaceutical companies to develop commercial applications for its proprietary Radiant Energy Vacuum (REV) dehydration technology.

The key to the technology is the vacuum environment in which the drying process takes place. Thanks to the reduced atmospheric pressure, the temperature, at which the moisture is efficiently removed, can be lowered. This reduction of heat and oxidization minimizes the damage inflicted on the REV-dried products, preserving richer flavors, brighter colors and higher nutritional content versus other drying methods.

The University of British Columbia manufactured the first prototype REV machine in 1996 for dehydrating food and nutraceuticals. Since then, EnWave has developed three commercial-scale REV platforms: **nutraREV** for the food industry to dry fruits, vegetables, meats and other products quickly and at low-cost, while maintaining high levels of nutrition, taste, texture and color; **powderREV** for the dehydration of bulk food cultures, probiotics and fine biochemicals such as enzymes; and **quantaREV** for continuous, high-volume low-temperature drying of sensitive food products in liquid or solid form.

In addition, the Company has one developmental-stage REV platform: **freezeREV** to stabilize and dehydrate biopharmaceuticals such as vaccines.

EnWave's business model is to sell REV machinery and to sign royalty-bearing commercial licenses with leading food and pharmaceutical companies for the use of its revolutionary technology. Each license agreement restricts the partner's use of the technology to specific applications and geographic areas.

So far, EnWave has signed twenty-five royalty-bearing licenses, with licensees using the REV technology for applications in the dairy, seafood, spice & herb, fruit products,

cannabis, vegetable products, and meat products verticals. Some of the Company's best-known customers include Bonduelle, Gay Lea Foods, Ultima Foods (Agropur Dairy Co-operative), Milne Fruits and Perdue Farms.

EnWave generates revenues from the following sources:

- ▣ REV machine sales and maintenance;
- ▣ Maintenance of the machines to ensure they are running properly and to replace and repair components subject to normal wear and tear from ongoing operations;
- ▣ Royalty streams from partners, which typically vary between 3% and 5% of sales (paid out quarterly), or a fee per kilogram of net production; and
- ▣ NutraDried, a 100% owned subsidiary, which sells healthy dried cheese snacks.

Annual revenue in fiscal year 2018, reached \$22.82 million, an increase of \$6.87 million, or 43%, compared with revenue of \$16.50 million last year. The net loss decreased from \$2.04 million in fiscal year 2017 to \$945,000 in 2018. Moreover, if it hadn't been for a one-time impairment charge of \$865,000 in the third quarter in regards to the Sutro agreement, EnWave would have been close to being profitable! The Company did have net cash inflows from operating activities of \$4.09 million for 2018.



**Booming sales of Moon Cheese contributed to the outstanding fourth quarter and full year results.**

Especially booming sales of Moon Cheese, the crunchy cheese snacks produced by EnWave's 100% owned subsidiary NutraDried, contributed to this outstanding performance. In fact, NutraDried recorded the highest quarterly sales ever in the fourth quarter of 2018.

**2019 looks extremely bright for EnWave thanks to growing Moon Cheese sales, growing royalty income, and a growing sales pipeline.**

### NutraDried LLP

NutraDried LLP develops, manufactures, markets and sells 100% all-natural cheese snacks under the Moon Cheese brand.

NutraDried produces Moon Cheese in cheddar, gouda, mozzarella, pepper jack, and sriracha flavors at its manufacturing facility in Ferndale, Washington, and distributes it in over 25,000 retail locations across Canada and the United States. Notable retail points of distribution include Starbucks, Costco, Target, Rite Aid, CVS, Safeway, Loblaws, and Save-On-Foods.

NutraDried's rise in revenue and profitability in 2018 was due to the fact that it significantly expanded its distribution of Moon Cheese throughout Canada and the U.S. The Company also increased marketing at the regional level in the U.S. to improve consumer awareness with the goal of creating further demand pull.

More specifically, NutraDried began selling its Moon Cheese product in a 10oz Club Pack format to Costco in the first quarter of 2018 as a product rotation in Costco's Midwest division. During the year, NutraDried expanded the product rotation to the Southeast and Northwest divisions.

Currently, the 10oz Club Pack is distributed only through Costco. However, NutraDried is targeting additional Club Pack distribution opportunities. NutraDried's strategy is to further grow revenue and profitability by leveraging its network of food brokers in the United States, as well as by further investing in marketing activities to increase consumer demand and awareness for Moon Cheese.

In order to fulfill the ever higher demand, NutraDried commissioned a second 100kW nutraREV machine in September 2018 at its Ferndale facility, doubling its production capacity for Moon Cheese. This second REV unit is currently also running at full capacity.

It also expanded its packaging and warehousing capacities through the purchase of additional manufacturing equipment to match processing capacity with the additional dehydration capacity. **We understand that the conservative guidance for total NutraDried sales in fiscal year 2019 is around \$25 million.**



**The Moon Cheese club format is doing extremely well at Costco.**

To further increase sales, NutraDried may soon launch a couple of Moon Cheese extension products coined "Moon Cheese Mixems". For example, different types of cheese will be dried and mixed with a dehydrated tomato. In addition, a Moon Cheese salad topper will be launched as an alternative to croutons. These will be distributed through the existing Moon Cheese channels.

To manage all this expected growth, Mr. Mike Pytlinski was recently hired as CEO of NutraDried. With a successful background spanning nearly 30 years in the food manufacturing industry and financial services sector, Mr. Pytlinski has direct leadership experience building sales and brand awareness for processed food products.

Most recently, Mike Pytlinski served as the Vice President of Marketing for Palermo’s Pizza. Over the course of a six year campaign the pizza line more than tripled in sales under his stewardship.

## TECHNOLOGY

Before EnWave launched its Radiant Energy Vacuum technology, food processing companies were limited to opt for either ‘freeze drying’, which provides superior product quality, but is cost prohibitive and is only used to process higher-value products; or ‘spray and air-drying’, which is cost effective but degrades the quality of the products (Also see table below).

Thanks to EnWave’s REV dryers, companies, for the first time, can combine the effectiveness of freeze drying with comparable economics of spray and air drying.

EnWave's REV technology utilizes radiant energy (microwaves) in a vacuum environment to homogeneously dehydrate a wide variety of foodstuffs and biomaterials at temperatures ranging from approximately 37.5°C to below freezing.

Four REV platforms have been developed to address specific market opportunities. Three platforms – nutraREV, powderREV and quantaREV - are at a commercial stage, while the fourth one – freezeREV - is under development. Each platform is described in more details below.

	EnWave's REV Technology	Freeze Drying	Air Drying
<b>Better Product</b>	Superior Color Superior Flavor High Nutritional Retention	High Nutritional Retention	Heat & Oxygen Damages Color, Flavor, Nutrients and Texture
<b>Faster Process</b>	Minutes or Hours (1,5 hours for Blueberries)	Hours or Days (24 - 36 hours for Blueberries)	Hours (6 hours for Blueberries)
<b>Cheaper Cost</b>	Up to 80% lower processing costs than freeze-drying (combination of lower capital, labor and energy costs)	High Capital Costs High Energy Costs	Low Capital Costs Competitive Energy Costs
<b>Comparison between EnWave's REV technology, and freeze &amp; air drying.</b>			

## Commercial Stage

**nutraREV** is designed for the dehydration of fruits, vegetables, herbs, dairy products, meats and seafood. It provides higher nutritional content, and improved appearance, flavor and texture over freeze drying, which is the industry standard for dehydrating many food applications. It is EnWave’s most popular technology.

nutraREV machines are available at varying scales: 2kW for product development, 10kW for pilot-scale production and 100kW or higher for commercial production.

A 100kW unit is capable of producing as much as 150 kg (340 lbs) of dried product (below 5% residual moisture) per hour. A 100kW

machine sells on average for \$1.5 million and generates between \$200,000 and \$400,000 in royalties per year at full utilization.

**quantaREV** is designed for high-volume, low-temperature dehydration of solids, liquids, granular or encapsulated products. It uses a continuous belt design in a controlled vacuum-microwave environment with an eventual target of dehydrating several tonnes of material per hour. This low temperature technology is designed to provide a higher-quality end product than what is currently achieved with spray drying or air drying.

**powderREV** is designed to dehydrate a wide variety of materials including enzymes, probiotics and food cultures, pharmaceuticals, non-regulated biologicals and certain dry food products.

The technology is ideally suited to replace the expensive and time-consuming process of tray freeze drying, which takes place in a high heat environment and damages sensitive organisms. Laboratory tests have shown that the potential benefits of powderREV over freeze drying include less capital cost due to faster dehydration times, smaller plant footprints, and lower energy and labor costs.

## Development Stage

**freezeREV** is designed to provide high-speed dehydration for live and active organisms in vials with the potential for significantly lowering operating costs compared with freeze drying. freezeREV is intended for products that must have a minimum moisture content in order to maximize their shelf-life. It is currently available as a multi-vial prototype for partner research and development.



**A lab-scale freezeREV designed to provide high-speed dehydration for live and active organisms in vials.**

The idea is to evaluate EnWave's REV technology as a viable replacement for lyophilization in the pharmaceutical industry. More specifically, the developmental work and testing has focused on the potential of dehydrating several vaccinations.

Unlike lyophilization, freezeREV employs a combination of microwave energy with a low-

pressure environment to achieve rapid, highly controlled dehydration of live, or active, biological materials.

Tests conducted on a lab-scale freezeREV show that processing times are far less than with lyophilization, which dramatically reduces costs. In addition, the footprint of a freezeREV machine is sizably smaller than a lyophilizer. And finally, third party tests show no key differences between freezeREV and lyophilized products.

## Expanding Patent Portfolio

EnWave holds numerous patents that protect both its REV technology and specific methods of use. The past two years, the Company received no less than 43 new patent approvals that protect its technology and processes.

Because the Company's technology continues to be developed, new innovations are made. As such, its intellectual property portfolio continually expands.

**EnWave is driven to innovate and continuously commits resources to strengthen its intellectual property portfolio. Patents are truly the cornerstone for the Company's licensing-royalty business model, because each time a new patent is granted, the royalty stream timeline extends twenty years from the patent's filing date.**

## THE MARKET

EnWave targets both the drying equipment market and dried products market, where it partners with companies that dehydrate their products.

The total market size for freeze drying equipment is estimated at \$16 billion and is expected to reach \$35 billion by 2020. Especially the food processing and pharmaceutical industries are expected to continue to drive demand for freeze drying equipment. While food processing is the largest segment with about 35% of the market, cannabis and biotechnology are expected to be the fastest growers the following years.

The worldwide market size for dried products is estimated at an astonishing \$400 billion. The largest segment, estimated at \$140 billion, is the food industry, which includes dried fruits, vegetables, meats, etc. The biopharmaceuticals segment comes in second with a \$67 billion market share, closely followed by probiotics, food cultures and enzymes, that generates \$61 billion annually. The dried beverage market, primarily made up of coffee and milk, is estimated at \$31 billion.

EnWave intends to develop the market for REV technology by selectively collaborating with strategic partners focused on reducing processing costs and creating new or improved product opportunities.

## VERSATILE APPLICATIONS FOR REV

While EnWave's dehydration technology has plenty of applications, it's clearly excelling in a number of distinct sectors.

### Rapidly Expanding Dairy Space

By far the most successful REV dried cheese snack on the market today is Moon Cheese, as it's available at every Starbucks in North America and at thousands of retail stores in Canada and the United States.

Attracted by this success, other food companies worldwide sensed an opportunity and closed commercial agreements with EnWave to produce similar snacks. Typically, EnWave receives a 5% royalty on all cheese snack sales.

The companies below have all signed a commercial agreement with EnWave to produce a REV dried cheese product. It is also stated for which country or region the companies obtained an exclusive license.

- ❑ **NutraDried LLP** for the United States;
- ❑ **Umland LLC** for high kosher products in the United States. Production and distribution of the snacks has commenced;
- ❑ **Gay Lea Foods** for Canada. It started up a 100kW nutraREV machine to expand the

production of its 'Nothing But Cheese' snack product. After a somewhat slower start, sales are starting to pick up;

- ❑ **Lake Blue Spa** for Chile. Commercial production of its INTAKT cheese snacks has recently started. The dried cheese products are available in four flavors: Original Gouda, Spicy Gouda, Oregano Gouda, and Mediterranean Mix;
- ❑ **Dominant Slice** for Portugal and Spain. It recently launched a dried cheese product, coined B!t Cheese, and is now building out commercial opportunities for the product line (also see Fruit Category below);
- ❑ **Agricola Industrial La Lydia SA (Pitalia)** for Central America. It has received two 10kW nutraREV units and has ordered a 100kW REV machine (also see Fruits Category below);
- ❑ **Ereğli Agrosan** for Turkey. The license actually grants the company the exclusive right to process a variety of fruit, vegetable and cheese products. Ereğli's dried cheese product has entered the market and is being sold B2B in central Asian markets and into Europe;
- ❑ **Kesito LLC** for Greece. A 10kW commercial REV machine was installed late 2016, which allowed Kesito to complete product development and enter the European market with a high-quality, shelf-stable dried cheese snack product under the Air Cheese brand name: and
- ❑ **Ashgrove Cheese** for Tasmania. Ashgrove purchased a 10kW commercial REV unit and launched a crunchy cheese snack under the brand name 'Amaze Balls' in January 2018.

Next to the above agreements for REV dried cheese snacks, EnWave also signed a commercial royalty-bearing license with the following dairy companies.

- ❑ **Ultima Foods (Agropur Dairy Co-operative)**, a major Canadian yogurt processor which produces more than 100 million kilos (220 million lbs) of fresh dairy products each year, announced in April 2018 a processing breakthrough to create an entirely new snack food based on yogurt.

After almost three years, Agropur has arrived at a satisfactory outcome with an

innovative product that is ready for launch in the competitive snack foods market. An intensive test regime evaluated options to produce a healthy snack food derived from yogurt that retains the flavor and health benefits, and yet has a crunchy texture.

This is a ground-breaking product that has never before been available and there is nothing else like it on the market today. The iögo Protein Crunchy Bites are available in stores since spring 2018.

- ▣ **Arla Foods**, the world's largest manufacturer of organic dairy products. Pursuant to the License, Arla submitted a purchase order to obtain a small commercial-scale Radiant Energy Vacuum machine to initiate production in 2018, with plans to quickly scale if its products are commercially successful.

The License grants Arla the exclusive right to use REV technology to process dairy products in Denmark, Sweden, Finland and Norway.

## EnWave Excels In Dried Fruits Market

A growing number of fruit processors have signed either an evaluation or commercial agreement with EnWave, indicating that this is another strong market segment for the Company's applications.

EnWave has a royalty-bearing commercial license with, among others, these fruit related companies:

- ▣ **Milne Fruit Products** entered the REV-dried fruits market a couple of years ago, positioning MicroDried products - all-natural fruit pieces and powders - as pure, healthy alternatives to sugar-infused offerings. Milne Fruit is one of EnWave's largest customers, as it ordered its third 120kW machine right before the end of 2018. In fact, more than 50 consumer products on the market today already use its ingredients;
- ▣ **Natural Nutrition Limited d.b.a. Nanuva Ingredients**, a Chilean fruit processor, that has positioned itself as a leading provider of 100% natural (with no

additives) dried fruits with colours, shapes, flavors and nutrients very similar to those of fresh fruit. These healthy ingredients are used in the snack food, functional food, nutraceutical and cosmetics industry;

- ▣ Next to dried cheese (see above), **Agricola Industrial La Lydia (Pitalia)** is also very active in the dried fruits space. In fact, La Lydia is a global leader in producing and exporting golden pineapples under the brands YAZ and SWITI. La Lydia formed a new business entity coined Pitalia specifically for the production of REV dried products. In 2018, Pitalia has started selling pineapple, apple, mango and banana snack products through its Pure Joy brand in the European and South, Central and North American markets;
- ▣ **Van Dyk Specialty Products Ltd.**, a major Canadian producer of wild blueberry products, that is best known for its highly successful blueberry juice, is focused on providing the market with high-quality REV dried blueberry products;
- ▣ **AvoLov LLC (formerly AvoChips LLC)**, a U.S. based processor that has developed an innovative new avocado snack product using REV technology. AvoChips submitted a purchase order to obtain a 10kW commercial-scale REV machine to initiate production. The license grants AvoChips the exclusive global rights to use the REV technology to process the snack product;
- ▣ **Howe Farming Group**, one of Australia's largest and most diverse farming enterprises. The license grants Howe Farming the exclusive right to use the Company's REV dehydration technology to produce dried banana products in Australia and the non-exclusive right to produce dried blueberry products in Australia; and
- ▣ **Bare Foods** is the creator of delicious Snacks Gone Simple, including bare Apple Chips, Banana Chips, Coconut Chips, and new Beet Chips, Carrot Chips, and Sweet Potato Chips. Their snacks are sold in the United States, through grocery stores like Whole Foods Market, Sprouts, Safeway, and Publix as well as national retailers such as Target and Amazon. Distribution of the Bare snacks are bound to significantly increase further as the company was acquired by food and beverage giant PepsiCo in May 2018. In

October last year, Bare purchased a third 10kW REV machine.

- ▣ **Dominant Slice**, a Portuguese snack company, signed a non-exclusive commercial royalty-bearing license with EnWave, granting Dominant Slice the right to use its existing REV machinery to produce pineapple, mango, banana, coconut and papaya fruit pieces in Portugal.



**Bare Foods has purchased three 10kW REV machines in nine months' time to keep up with demand.**

## Growing in Important Vegetable Sector

In January 2016, **Bonduelle**, the world's leading processed vegetable producer launched a new category of frozen vegetables called InFlavor. The new exclusive InFlavor dehydration and preparation process uses EnWave's vacuum-microwave drying technology, which truly separates InFlavor from all other frozen vegetables as the texture and taste of the vegetables is retained.

Bonduelle first launched InFlavor to its B2B customers in North America, and has since become a commercial success story. In addition, it also has an eye on the European market, so this could potentially be a very exciting evolution.

Late 2018, Bonduelle was recognized at the Association for the Development of Research and Innovation of Quebec (ARDRIQ) trade show with the Innovation Grande Enterprise award for its success advancing the InFlavor process. Upon accepting this prestigious award, Bonduelle representatives also acknowledged EnWave as a contributing partner in the development process.

Achieving an industry award and gaining additional recognition for the InFlavor product

line will contribute towards further sales growth for Bonduelle and may encourage this industry-leader to expand on its production capacity with a follow up order for a larger 300kW quantaREV machine, in addition to the 120kW machine currently in operation.

In 2017, **Merom Farms**, an agricultural and food production company, announced that it is going to start selling wasabi-based products in Canada and the United States.

The dried, powdered and encapsulated wasabi is specifically designed for the natural health supplement market and will soon be available under the "Your Wasabi" brand name.

Your Wasabi holds the ONLY license issued by Health Canada to produce wasabi capsules in Canada.

## Meat Snack Producers - Another Major Market for EnWave

The intention of most of these meat companies is to develop crispy meat snacks. Similar snacks are already being produced, but the texture and taste of most meat chips is poor because they are either air dried or baked.

In the meat category, EnWave has signed a royalty-bearing agreement with:

- ▣ **Perdue Farms**, a leading food and agricultural products company, ordered a 10kW REV dryer to process pet food and pet treats in the United States and Canada.

## Cannabis Application

Late August 2017, EnWave filed a new patent application for the simultaneous pasteurization and drying of cannabis using REV technology. These patent-pending methods expand the application of EnWave's REV technology to the booming medical and recreational cannabis sector.

Medicinal cannabis is often used by chronically ill or immunocompromised patients, causing several countries with medicinal cannabis programs to employ strict standards

regulating microbial contamination of herbal cannabis products in order to reduce the potential for opportunistic lung infections. Ionizing radiation is currently the only method commonly employed to meet these medicinal cannabis microbial standards.

However, EnWave's patented technology pasteurizes and uniformly dries cannabis in its natural state, without any additives, in under one hour, dramatically shortening the time from harvest to marketable products and circumvents the need to transport medical cannabis to highly-specialized and expensive off-site decontamination facilities.

Another major advantage is that EnWave's continuous high-volume REV drying process also eliminates the need for large-scale in-house drying rooms and their associated potential for product loss due to mold growth during the traditional multi-day drying process.

Finally, a common method for the extraction of cannabinoids (essential oils) from the dried plants uses pressurized CO2 as solvent. The challenge with this process however is that moisture levels in dried leaves often vary, which results in inconsistencies in the oils that are extracted. The goal with REV is to produce a much more homogenous raw material at a specific moisture level.

Two months later, the Company signed a royalty bearing agreement with **Tilray**, a major Canadian cannabis player with international presence. Tilray is an Authorized Licensed Producer as defined by Health Canada's Access to Cannabis for Medical Purposes Regulations (ACMPR).

The license grants the cannabis grower the exclusive right to use the Company's proprietary Radiant Energy Vacuum (REV) dehydration technology to dry and decontaminate cannabis in Canada.

In return for the exclusivity, the producer has purchased a small-scale 10kW commercial REV unit to enable advanced product development along with a large-scale 60kW commercial REV machine that will be used to initiate commercial production.

Furthermore, the cannabis producer is required to achieve certain minimum royalty thresholds, and to purchase additional REV machinery in order to maintain its exclusivity. It is worth noting that the producer is projected to achieve a production capacity greater than 74 metric tons in 2018. The 60kW machine however, can only process approximately 25 to 30 tons annually, which means that it will need to buy at least one additional 60kW REV machine.

Moreover, the Licensed Producer must also pay royalties based on the amount of cannabis processed with EnWave's REV equipment. Royalties in the cannabis space could be up to three times higher than what EnWave receives from companies that are active in the food sector.

In May 2018, Tilray ordered a second 60kW REV machine, which will be installed in Portugal. The unit is expected to be up and running in February 2019.

A few days ago, EnWave announced the signing of its second royalty bearing license. This time with **The Green Organic Dutchman Holdings Ltd. (TGOD)**, another well-known Canadian cannabis producer. Read all about this deal under 'Recent Events'.



**The Green Organic Dutchman bought a large-scale 60kW commercial REV machine to start processing cannabis mid-2019.**

In addition, in April 2018, EnWave signed a TELOA with **a major Canadian cannabis player**. Although EnWave didn't release the name of its new partner, it did mention that it is one of Canada's largest licensed cannabis producers (LP). When doing an online search

for the biggest cannabis companies, returning names are Canopy Growth, Aurora Cannabis, Aphria Inc., and MedReleaf Corp., all billion dollar companies!

The Licensed Producer was granted six months to evaluate EnWave's Radiant Energy Vacuum (REV) technology for cannabis decontamination and dehydration. During that period, the LP will rent a pilot-scale REV dryer, which will generate revenue for EnWave. Moreover, EnWave granted the LP an exclusive option to license the REV technology for processing cannabis in an unnamed European country.

### Pharmaceutical Dehydration Technology

A final pillar of EnWave's success is pharmaceutical applications.

In December 2011, EnWave signed a 10-year Research and Development agreement with **Merck**, one of the world's leading pharmaceutical, chemical and life science companies, in which Merck bears the costs associated with this process. Test results with a scaled-up freezeREV machine have been very encouraging.

In September 2018, EnWave announced that Factory Acceptance Testing has been completed after a thorough development phase at its own R&D facility in British Columbia, in collaboration with Merck. This has resulted in a positive approval for the technology as part of the manufacturing process for certain pharmaceutical products currently being developed by Merck.

The REV freeze drying technology for the pharmaceutical industry provides the capability for continuous processing such that individual dosage units of vaccines, enzymes, antibodies, proteins, probiotics and other small molecule therapeutics may be rapidly dried and packaged.

Testing work focused on achieving specific throughput and capacity objectives established by Merck to demonstrate the processing can deliver consistent performance with regards to production metrics such as

moisture content, homogeneity, processing time, etc.

Following this test phase, Merck has installed a 9kW REV machine at its facility in Pennsylvania to undergo Site Acceptance Testing.

Site Acceptance Testing will ensure that the equipment performs at the Merck manufacturing complex in line with the same protocol as the original parameters already achieved at EnWave's R&D test facility. This phase will use vaccines that mimic the reactions of actual vaccines in vials. Since the previous phase already surpassed the performance standards set by Merck, Site Acceptance Testing is not expected to encounter any issues.



Once the REV machine has cleared the testing phase, it can commence operations for processing of new pharmaceutical products in the pipeline for Merck. According to FDA guidelines, the REV freeze drying process will be considered part of the production protocol for pharmaceutical products. This means that drugs and therapies already approved by the FDA cannot automatically be produced using REV freeze drying without going through the FDA approval process again. Therefore it is unlikely that existing products will retrofit to REV freeze drying. Instead, the processing will be advanced along with new therapies currently under development, to incorporate REV freeze drying as part of the manufacturing protocol that can be approved by the FDA from the outset.

Merck has several new products under development that will become candidates to utilize the REV machine for the potential launch of products in the future. The development regime would involve somewhere between 2.5 to 3 years to gain FDA approval, so the actual commercial payoff for this technology is some time ahead.

However, EnWave has once again demonstrated a successful new application for

its REV technology. The potential rollout as part of the manufacturing process for established pharmaceutical companies like Merck represents yet another distinct industrial sector where the REV machines are contributing to efficient production of new products.

## GROWTH DRIVERS

### EnWave Closes Research Partnership with High Profile University

One of the more appealing aspects to the business model of EnWave is the potential for individual unit sales to evolve into more significant long term growth opportunities. The first REV machine sale to a new customer is often just the thin edge of the wedge, opening the potential for additional unit sales, new product development, and lucrative royalty agreements that may follow.



**The Center for Excellence serves as a hub to connect New York businesses with services they need by linking them with world-class Cornell researchers, farmers, processors, businesses and consumers.**

This embedded growth potential is very much a part an agreement reported by EnWave in November last year. The Company has announced that a Research and License Agreement was signed with the College of Agricultural and Life Sciences (CAL S) at Cornell University, involving the sale of a smaller 10kW REV machine. The REV unit will be installed at the Center of Excellence in Food and Agriculture facility located in Western New York near the city of Geneva.

CAL S has indicated that the purpose of purchasing the REV machine is to pursue

research and development initiatives, while exploring new uses for REV technology, and potential commercial ventures that may spin off from this program. The fact that a highly respected institution has recognized the importance of REV processing in the food industry, represents a clear endorsement for EnWave's technology.

Cornell University aspires to advance the food and agricultural sector throughout the state of New York. It should be noted that New York is ranked second in the United States, only behind California, in terms of the number of active companies in the sector. In addition, New York ranks in top -10 states for the production of 30 agricultural commodities.

CAL S has established relationships with many of the most important food processing companies operating in New York. The REV program launch at the Center of Excellence therefore has the opportunity to generate synergies between faculty researchers, students, entrepreneurs, and established businesses across the full spectrum of the food processing and distribution sector. EnWave personnel will also participate in this process and contribute expertise to showcase the capabilities of the REV technology.

The sale of a REV machine in itself is good news, as each sale generates high margin revenues for the Company. However, it is the intriguing potential to evolve into a much more significant expansion into the food services industry that makes this deal far more significant.

### EnWave Potentially Solving Major Military Issue

In June 2017, EnWave entered into a contract with the US Army Natick Soldier R&D Center (NSRDEC) to jointly develop low weight, high quality, nutritious field rations.

This opportunity for EnWave is enormous, as potentially hundreds of thousands of men and women in active duty could be served REV-dried rations.

The military is focused on reducing the footprint (weight and volume) of what fighters

have to carry in the field. It will not only increase chances of them packing more rations, it will also lessen their fatigue and improve agility and speed.

The Company's Radiant Energy Vacuum technology is uniquely suited for this purpose, because food items can be intermediately dried, and as such easily compressed. When products are dried with other drying techniques and then compressed, they typically pulverize into small pieces.

Internal focus groups of up to 200 people involved in sampling of these newly developed products have been very enthusiastic about the composition and flavor of the samples provided.

In fact, the NSRDEC was so satisfied with the progress being made that late July 2018 it ordered a 10kW REV machine for research and development purposes. The acquisition of the 10kW REV machine by NSRDEC aims to facilitate an accelerated path to improved Close Combat Assault Ration deployment.

After a successful presentation at the Pentagon in May 2018 and confirmed demand for REV dried rations, the NSRDEC has fast tracked the research and development necessary for implementation with close combat warfighters. An additional presentation to NASA will take place in September 2018. This project has been under development for the past year with trials previously being completed at EnWave's pilot plant facility located in Vancouver, Canada.

**EnWave and the NSRDEC are currently looking to collaborate with potential vendors to manufacture and supply REV-dried nutrient rich field rations moving forward.**

## RECENT EVENTS

### EnWave Signs Second Royalty-Bearing License in Cannabis Space

The rapid expansion of cannabis production in Canada and other world markets has created an exciting growth opportunity for the use of Radiant Energy Vacuum (REV) processing as a

superior method to pasteurize and dry cannabis plants.

Only a few days ago, EnWave reported another important agreement as part of its emerging relationship with Tilray. A commercial royalty-bearing sublicense agreement was arranged with The Green Organic Dutchman Holdings Ltd. (TGOD), a major Canadian cannabis producer.

The company has purchased a commercial 60kW REV machine to begin processing cannabis. The REV machine will be installed mid-2019 and will commence operations shortly thereafter generating royalties on all cannabis processed by TGOD using EnWave's technology.

This machine can process an estimated output of 20 metric tonnes of cannabis per year, assuming operations running 8 hours per day, over a five day week. Considering that TGOD is fully funded to achieve annual output of up to 170,000 kgs (170 metric tonnes) of cannabis per year, this implies that additional REV machines may be ordered in the future as production output increases.

### Global Opportunities for Dehydrofrozen Vegetables

Between Christmas and New Year of 2018, EnWave reported an additional international Technology Evaluation and License Option Agreement (TELOA) with Simplot Australia. A leading player in the Australian food processing and distribution market, Simplot was attracted to the REV technology as a means to significantly improve the quality of its frozen vegetable products. During the term of the TELOA, Simplot will have the exclusive option to license REV technology to process their product areas of interest.

Based on the deal with Simplot it's clear that the global exclusivity which Bonduelle once had for dehydrofrozen vegetables has now been reduced to a more focused market territory. This could be because Bonduelle didn't purchase the number of REV machines necessary to maintain its global exclusivity. EnWave management has made it clear that good momentum is being built in the North American market for the InFlavor brand.

Consequently, management is hopeful that a more material commitment from Bonduelle is targeted for 2019.

## FINANCIALS

EnWave generates revenue from two business segments: EnWave Canada and NutraDried. EnWave Canada sells REV machinery to royalty partners, rents REV units to prospective royalty partners, and earns royalties from customers that sell REV dried products. Note that royalties are payable to EnWave as a percentage of the value of products sold or based on the number of units produced by its royalty partners. NutraDried, on the other hand, sells Moon Cheese snacks into retail and wholesale distribution channels.

EnWave Canada had revenue of \$823,000 for the three months ended September 30, 2018 compared to \$1.63 million for the three months ended September 30, 2017, a decrease of \$803,000. The decrease in revenue for the three months ended September 30, 2018 relative to September 30, 2017 is due to lower purchase order volume for machinery in the fourth quarter of 2018 relative to 2017.

Amounts in \$000's	09/30/18	09/30/17
EnWave Canada Sales	823	1,626
NutraDried Sales	6,532	2,004
<b>Total Sales</b>	<b>7,355</b>	<b>3,630</b>
Cost of Goods Sold	4,097	2,764
<b>Gross Profit</b>	<b>3,258</b>	<b>866</b>
Expenses	2,645	1,926
<b>Net Profit (Loss)</b>	<b>75</b>	<b>(1,060)</b>
Diluted Shares Outs.	100,926	90,799
Diluted EPS	0.00	(0.01)
<b>Selected income statement data for the quarters ended September 30, 2018 and September 30, 2017. Source: Company Filings</b>		

In fiscal year 2018, EnWave received equipment orders for two 60kW REV machines from Tilray for cannabis production, and sold seven small-scale 10kW REV machines.

Also during fiscal year 2018, royalty revenue for EnWave, excluding royalties from

NutraDried, increased to \$571,000 compared to \$370,000 in 2017, an increase of 54%. NutraDried royalties increased from \$317,000 in 2017 to \$821,000 in 2018, an increase of \$504,000 or 158%.

Revenues from NutraDried reached \$6.53 million for the three months ended September 30, 2018 compared to \$2.00 million for the three months ended September 30, 2017, an increase of \$4.53 million. The increase in revenue for the fourth quarter was due to NutraDried filling repeat orders for Costco rotations, as well as increased distribution to several new retailers.

For the full year, EnWave Canada achieved revenue of \$6.32 million and NutraDried \$16.50 million, compared to \$9.40 million and \$6.56 million, respectively, in the same period of the prior year.

Furthermore, the Company achieved a gross profit of \$8.91 million for 2018 compared to \$4.30 million during 2017, an increase of \$4.61 million or 107%. Gross margin as a percentage of revenue was 39% for 2018 compared to 27% for 2017.

### Balance Sheet As Of September 30, 2018

On September 30, 2018, the Company had working capital of \$12.01 million, compared to \$6.50 million on September 30, 2017. On September 30, 2018 the cash and cash equivalents balance was \$9.10 million compared to \$1.32 million on September 30, 2017, an increase of \$7.78 million. The change in cash and cash equivalents is primarily due to the private placement that grossed \$10 million on November 15, 2017. Note that on February 22, 2018, the Company used cash of \$2.31 million (USD \$1.80 million) to acquire the 49% non-controlling interest in NutraDried.

Inventory on September 30, 2018 includes completed machines and machine components of EnWave Canada of \$1.72 million, which is a decrease of \$715,000 compared to September 30, 2017. EnWave Canada sold several small-scale machines from inventory during 2018. NutraDried's food

product and packaging supplies inventory was \$1.16 million, which is an increase of \$616,000 compared to September 30, 2017 due to the increased production.

Amounts in \$000's	09/30/18	09/30/17
Cash and Cash Eq.	9,101	1,319
Restricted Cash	250	250
Trade Receivable	3,522	2,617
Due From Customers Under Contract	727	2,378
Inventories	2,873	2,973
<b>Total Current Assets</b>	<b>16,758</b>	<b>9,723</b>
Plant and Equipment	4,452	2,675
<b>Total Assets</b>	<b>22,162</b>	<b>13,344</b>
Trade and Other Payables	3,037	2,181
<b>Total Current Liabilities</b>	<b>4,747</b>	<b>3,222</b>
Long Term Debt	493	90
<b>Total Liabilities</b>	<b>5,240</b>	<b>3,312</b>
Total Stockholder Equity	16,922	10,032
<b>Selected balance sheet data on September 30, 2018 and September 30, 2017. Source: Company Filings</b>		

## OUTLOOK & VALUATION

In the past, food processing companies had to choose between minimizing their drying costs or producing premium dried products. With EnWave’s REV technology, companies no longer have to choose, as they’re able to produce high-value dried products at a much lower cost. The main goals of using REV technology are to shorten processing times, reduce operational costs and to produce higher-value products than previously achievable via alternative processing technologies with similar economics.

An increasing number of food, cannabis, and biopharmaceutical companies are realizing that REV is the way to go if they want to maintain their competitive advantage.

The sale of REV dryers is generating millions of dollars for EnWave. Moreover, with each additional REV unit becoming operational, the minimum quarterly royalties are increased proportional to the size of the machine. A 100kW machine will typically generate between \$200,000 and \$400,000 in royalties per year at full utilization. As more and more

machines are taken into production, EnWave will benefit big time.

Several important trends continue to characterize the success of the EnWave growth model. The decision to establish partnerships with leading companies involved in strategic economic sectors has contributed to the successful expansion of REV technology in those market verticals. This was effectively demonstrated again last week through the growing relationship with Tilray.

With the deal reported involving TGOD, yet another REV machine sale was announced. And while the equipment sale component related to license deals is important to generate immediate revenue, it is the royalty leverage that contributes to the longer term objectives of the Company. The cannabis sector is particularly attractive for this growth trend, as the royalties payable from this application can be as much as three times higher than the comparable payment leverage from the food processing sector.

EnWave’s current sales pipeline comprises of 12 companies that have entered into a Technology Evaluation and License Option Agreement as well as many earlier-stage prospects that are in active discussions about using REV for applications in the dairy, fruit products, vegetable products, meat products, and cannabis verticals.

The Company anticipates several long-term projects in the pipeline to convert to commercial licenses as well as additional REV machine capacity to be ordered by existing partners in 2019.

One such order on which the investment community is waiting for is the follow up order from Bonduelle for a large 300kW quantaREV machine. As the multinational food processor's commercial success of its InFlavor products continues to increase, the production capacity of its 120kW REV machine, currently in operation, has to be near its limit.

There may also be some further exciting developments from the US Army Natick Soldier R&D Center (NSRDEC). On July 30, 2018, this organization purchased a 10kW REV machine for research and development

purposes. EnWave and the NSRDEC are conducting a collaborative R&D project for the development of nutrient rich field rations for soldiers. This opportunity for EnWave is enormous, as potentially hundreds of thousands of men and women in active duty could be served REV-dried rations. EnWave and the NSRDEC are currently looking to collaborate with potential vendors to manufacture and supply REV-dried nutrient rich field rations moving forward.

Finally, EnWave's executive management continues to look for opportunities where the REV technology can be exposed to as many royalty bearing licensees as possible via collaboration with either educational institutions or government funded R&D organizations.

The contract with Cornell, for example, is an opportunity to make new inroads with significant players in the food processing industry and achieve a faster growth rate than EnWave could accomplish independently through its own marketing activity. This collaboration enables a faster route to achieve new REV machine sales and royalty bearing agreements in the years ahead.

While 2018 was a breakthrough year in many ways for EnWave, it is clear that the pace of growth will continue to accelerate into 2019. The TGOY royalty announcement in the Canadian cannabis sector, and the continued success in many other sectors, suggest that shareholders may look forward to another strong year for the Company.

## Valuation

Given the still emerging nature of EnWave's earnings, a multiple-based valuation is challenging. Instead, we apply a Discounted Cash Flow (DCF) model.

Based on our estimate of 117 million shares outstanding, the intrinsic value of EnWave's shares derived from our model is \$3.85, up from \$3.66 in our previous report.

**We reiterate our buy recommendation for EnWave Corp. and increase our price**

**target to \$3.85, which is 179% above today's stock price.**

## SHARE DATA & OWNERSHIP

As of December 14, 2018, EnWave had approximately 100.9 million common shares outstanding. In addition, the Company had approximately 8.5 million warrants outstanding with an average exercise price of \$1.37.

Finally, EnWave has about 7.3 million stock options outstanding with a weighted average exercise price of \$1.12. Each stock option entitles its holder to purchase one common share of the Company.

The principal owners of the Company's common stock are DJE Investment (3.76%), and Manulife Asset Management (2.48%).

## MANAGEMENT

### ▣ MR. JOHN P.A. BUDRESKI, MBA - EXECUTIVE CHAIRMAN

Mr. Budreski has over 30 years of extensive capital markets and executive management experience. He was formerly a Vice Chairman of Cormark Securities Inc. from 2009 to 2012 and President and CEO of Orion Securities Inc. from 2005 to 2007, prior to its successful sale to Macquarie Bank. He has filled the roles of a Managing Director of Equity Capital Markets and Head of Investment Banking for Scotia Capital Inc. from March 1998 to February 2005 after starting out as a Managing Director of US Institutional Equity Group for Scotia Capital. He also held senior roles in investment banking and equity sales and trading for RBC Dominion Securities.

### ▣ MR. BRENT CHARLETON, CFA - PRESIDENT & CEO, DIRECTOR

Mr. Charleton has extensive experience working in competitive team-based environments in the public and private sectors. He has managed the business development, marketing and investor relations mandates for EnWave Corporation since 2010 and was recently promoted to President and Chief Executive Officer. Brent, an ex-professional athlete, is a graduate of

the Marketing Management program at the British Columbia Institute of Technology and has earned a Bachelor of Arts degree in Criminology and Communications from Simon Fraser University. Mr. Charleton has completed the Canadian Securities Course and is a holder of the right to use the Chartered Financial Analyst® designation.

**▣ MR. DANIEL HENRIQUES, CPA, CA – CFO**

Mr. Henriques is a Chartered Accountant and brings extensive experience in finance

effectiveness and financial reporting to his role at EnWave. Prior to joining EnWave, Mr. Henriques was a manager in the Assurance group at PricewaterhouseCoopers LLP, and supported numerous mid-market companies, including companies listed on the Toronto Stock Exchange, TSX Venture Exchange and the New York Stock Exchange, with financial reporting and compliance. While at PwC, Mr. Henriques provided clients in the manufacturing and technology sectors professional services in the areas of financial audits, financial reporting and tax.

## ANNUAL INCOME STATEMENT FY 2015 – FY 2018

All numbers in thousands

PERIOD ENDING	FY 2015*	FY 2016	FY 2017	9M 2018
<b>Total Revenue</b>	<b>5,868</b>	<b>14,933</b>	<b>15,954</b>	<b>22,825</b>
Cost of Revenue	4,689	10,383	11,654	13,915
	<b>1,179</b>	<b>4,550</b>	<b>4,300</b>	<b>8,910</b>
<b>Expenses</b>				
General & Administrative	2,089	1,989	2,072	2,439
Sales & Marketing	719	793	2,160	3,731
R&D	1,386	1,656	1,138	1,213
Amortization Intangible Assets	1,420	1,222	888	573
Stock-based Compensation	261	399	891	545
Total Operating Expenses	6,172	6,387	7,286	9,317
<b>Net Loss Applicable To Common Shares</b>	<b>\$4,993</b>	<b>\$1,837</b>	<b>\$2,986</b>	<b>\$407</b>

**Annual Income Statement FY 2015 – FY 2018. Source: Company Filings**

\* Note that in the Fiscal Year 2015 column all revenues and expenses generated by Hans Binder Maschinenbau – a former subsidiary of EnWave - have been excluded, due to its insolvency on September 29, 2015.



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## TSX Venture: ENW

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