

4Ry, Inc. Business Plan

Introduction

fouRy, Inc. (4Ry) is commercializing spraying and other technologies invented by Dr. Arnold Kelly, 4Ry's co-founder and Chief Technology Officer. Our Charge Injected Precision Spraying™ technology creates unlimited spray charge capability from compact, rugged, energy-efficient Spray Triode Atomizers™. An emitter punches charge into a fluid flow immediately upstream of a grounded orifice. Once voltage is applied, the flow self-organizes into a predictable charged-droplet plume, whose dimensions are only dependent on the charge imparted. The plume's well-defined dispersion is governed by the mutual electrostatic repulsion of the negatively charged droplets.

The droplets seek ground—the target being sprayed. The spray is nonlinear and wraps around the target, including indentations and irregular surfaces, with a smooth, even coat. There is very little drift, overspray, or wasted fluid. The power required is modest compared to many conventional sprayers. The economic and environmental benefits are substantial (for more about our technology and the science behind it, see 4rysprays.com).

Business Plan

Our strategy is two-fold: build profitable businesses around our technologies and build intellectual property asset values through patenting and other legal protections for those technologies as they come online. For the next three years at least, that will entail a concentration on three main areas of development: modularization of 4Ry components and incorporation across a variety of platforms, further development of distilled water spray technology, and research and development of high-conductivity fluid sprayers, with the goal of commercializing all three. Our initial emphasis will be on products for commercial and business markets, rather than consumer markets, although we will eventually enter those as well.

Our first commercial product will be a form-oil sprayer. We are working with Oldcastle Infrastructure, the largest U.S. precast concrete manufacturer and a subsidiary of Irish building products multinational CRH. Con-

crete is poured into metal forms that are sprayed with form oil to allow the form to separate from the precast object when the concrete has cured. We have demonstrated a form-oil sprayer prototype to Oldcastle officials at their Chandler, Arizona plant. After only a few minutes they concluded our sprayer was better than what they were using, and they offered to help us develop a commercial model.

The form-oil market is modest, but the same technology can be adapted to metal stamping, where oil is sprayed to separate the metal from the stamper, and machine tool applications. We recently opened discussions with a company that makes concrete additives. These markets will give us valuable experience and serve as the template for the development of other products.

Our business model is similar to Qualcomm's, which aims to put its chip sets in all brands of smart phones. We want to incorporate the components of our technology into all compatible spray platforms. Our goal is modularized components which can be adapted to a wide variety of platforms across multiple applications. The form-oil business will be an ideal first step towards implementation of this phase of our plan.

We will outsource the manufacturing of our components. The most important component is the electronic controller, which governs the flow of electric current to the emitter. Achieving the optimal flow was complex and took our contractor, HVM Technology of New Braunfels, Texas, several years, much longer than we had anticipated. Now, however, we have the controller and HVM can produce large numbers at an acceptable cost. We are also talking with HVM about the company adapting our prototypes for manufacturing commercial sprayers.

While producing a working controller was difficult, its complexity offers a measure of intellectual property protection—it will be hard to replicate by unauthorized third parties. We intend to keep production of the controller and our nozzle, the Spray Triode Atomizer™, in the U.S., but other components may be produced in lower cost foreign locations.

We have developed a prototype distilled water sprayer. A typical 50 micron droplet of distilled water will carry approximately a million charges of 54 electron volts apiece (compared to typical bacterial metabolism of 2-3 eV). We have recently received third party verification that these high-energy

droplets will kill—essentially electrocute—E. coli bacteria to 4-log (99.99 percent) efficacy.

Further testing is necessary to see if they will also kill other types of bacteria, molds, viruses, fungi, and other microorganisms. If they do so, then our sprayer can turn simple distilled water into a disinfectant and sterilizing agent. The advantages over conventional chemicals and high heat and steam are obvious. Potential markets include food and beverage container sterilization, produce and meat safety, and surface disinfection in hospitals, laboratories, and other venues. We are seeking funding and partners to develop these businesses.

One limit on our technology is the conductivity of the sprayed fluid. We cannot yet spray highly conductive fluids. Our distilled water sprayer was a breakthrough because distilled water is moderately conductive. Dr. Kelly has developed another technology, the Spraytron, which charge injects using an electron gun shooting electrons from a vacuum tube through an electron-transparent window. The technology was initially developed to charge inject solid powders for powder coating and has been used for that application. Dr. Kelly believes this technology will allow us to overcome the conductivity problem in fluids, but it requires further research and development.

Not only would this enable our technology to work with most fluids, regardless of conductivity, it could be incorporated into separation and filtration applications. The most prominent of these may be separating highly conductive salt from water, or desalination. This would be a departure from current desalination technologies and has the potential to be less expensive. In a world chronically short of fresh water the demand for cheap desalination is apparent.

The discoveries and physics that are the foundation of Dr. Kelly's inventions lead to more potential applications, both spraying and non-spraying. These include fuel injection, blue flame combustion for portable outdoor appliances, nanofiber production, drug and hormone delivery, and 3D printing. Assuming we can build a team of technicians and engineers to work with him, we will proceed along those lines as well.

We will protect, to the fullest extent possible and on a global basis, our intellectual property. Dr. Kelly is the named inventor on 20 patents and has

authored or coauthored over 100 scientific papers. We recently filed a U.S. provisional patent for our distilled water sprayer. Dr. Kelly estimates that existing intellectual property and trade secrets developed over the course of his career will yield ten to twenty additional patents, to be filed at strategically opportune times. Further research, development, and commercialization will lead to more trade secrets and patents. This protected intellectual property, the second element of our business, will be valuable as an asset in its own right and will generate licensing revenues and joint venture profits.

Use of Funds and Financials

Modularization, distilled water disinfection, and high conductivity spraying will be our focus for the next few years. To commercialize these products, we will need to hire design, marketing, and distribution expertise. While outsourcing manufacturing will save 4Ry capital expenditures, there will be costs to set up assembly and production. We intend to hire what will eventually be a team to work with Dr. Kelly. This will allow to Dr. Kelly to concentrate on cutting edge research and development. Initially we will hire one engineer and one technician. We will also need to upgrade our laboratory. Finally, patent filings and other intellectual property protection will be a significant and ongoing expense.

Estimated expenses:

Operating expenses	\$450,000/yr
Engineers (2 at \$150,000/yr)	\$300,000/yr
Technicians (2 at \$100,000/yr)	\$200,000/yr
Upgrade lab	\$200,000 (one time)
Patent filings (\$35,000/patent)	\$175,000/yr
R&D other than salaries	\$100,000/yr
Outside consultants (\$200,000/product)	\$200,000/yr
Manufacturing set up (\$75,000/product)	\$75,000/yr
Sales and distribution (\$100,000/product)	\$100,000-\$300,000 yr

These expense estimates assume one new product is introduced per year. If product launches are successful, profits will cover the launch costs and at least part of the cost of future products. At this point, precise estimates as to future revenues and the direct costs associated with those revenues cannot be made. We will not engage in businesses in which we do not

foresee substantial sales and margins. We anticipate that both product sales and licensing fees will be significant sources of revenues. However, until those revenues can be developed, 4Ry will have a continuing need for outside capital.