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LIGHTENCO: reaching the limits of bootstrapping?

R. Chandrasekhar wrote this case under the supervision of Simon Parker solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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On a late Friday evening in January 2018, the three founders of Lighting Enhancement Corporation (Lightenco), a turnkey lighting solutions enterprise, were at a brainstorming session at the company’s office in Montreal, Quebec, Canada. The session had become a regular Friday feature for the last few weeks. The trio of founders had to decide on a way forward for the seven-year-old start-up.

Lightenco was riding high. From half-year sales of CA$20,000[[1]](#footnote-1) in 2011, its opening year of operations, the company had closed the financial year 2017 with billings of $3.2 million. With three-year revenue growth of 223 per cent over 2015–2017, Lightenco was jockeying for a place in the list of the ten fastest-growing companies in Ottawa, Ontario, as ranked annually by a local business publication.

After a straight and steady run, the founders of Lightenco now faced a difficult decision: Energy subsidies from the provincial governments of Quebec and Ontario had underpinned part of Lightenco’s value proposition to customers, but these subsidy schemes were facing imminent termination in both provinces. Moreover, the financing option that Lightenco’s three founders had deployed—relying on internally generated funds and not taking external capital—no longer seemed tenable, and moving to the next level of growth seemed to necessitate new and innovative financing options. Should they persist with the bootstrapping that had now become part of their entrepreneurial mindset? Or should they scale the business by either giving up equity or subsuming their operations in a merger with a larger firm?

The founders reviewed their three alternative options once again. First, they could continue to rely on self-financing, as they had done since Lightenco’s inception. There was a comfort level associated with keeping the status quo—but this might, at best, only maintain the current level of revenue, leading to stagnation and closing off avenues of future growth. Second, they could seek an infusion of private equity. This could enable further growth but would dilute the founders’ own equity in the business and possibly also restrict their autonomy and decision-making power. Third, they could sell the business to a larger incumbent that was keen on developing lighting as a new line of business activity. Access to an incumbent’s strong balance sheet could help make Lightenco more competitive, but it would come at the price of losing the identity it had built up over the last seven years. Unsure of which route to take, the founders felt that they were at a crossroads.

the LIGHTING INDUSTRY

Ever since it was discovered by Thomas Alva Edison in 1878, the incandescent bulb had single-handedly upheld the lighting industry for decades. There was little product innovation for nearly a century until the oil crisis of 1973 led to a worldwide shift to energy-efficient compact fluorescent lamps (CFLs). The industry had long been dominated by three multinationals—General Electric Company (GE), Siemens AG, and OSRAM Sylvania Inc. (Sylvania)—which together held 65 per cent of the global market share in both categories.

The arrival of light-emitting diodes (LEDs) on a commercial scale in the mid-2000s was a turning point. While the incandescent bulb used a tungsten filament, and the fluorescent tube used gas discharge, the LED used a semiconductor to convert heat into light. The efficiency of conversion was measured in terms of lumens per watt (lm/W)—the higher the lumens per watt, the greater the conversion of heat into light. The incandescent bulb had 10 lm/W, CFLs had 60 lm/W, and LEDs had 140 lm/W. In addition, an LED lamp had a longer life of 15 years—ten times that of an incandescent bulb and four times that of a CFL tube. It was also more versatile, as it was smaller in size and provided a wider choice of colours that could be deployed in creative ways. LEDs were leading the analog-to-digital transformation of the lighting industry.

The new technology was still evolving, and its increasing hold over the market was leading to a gradual phasing out of both incandescent bulbs and fluorescent tubes. For example, the US Energy Independence Act of 2007 mandated that 100-watt incandescent bulbs would not be sold on American retail shelves by 2012. In a major strategic move, GE discontinued the production of CFLs in 2016. The ongoing divestiture of the three hitherto well-entrenched incumbents’ traditional portfolios was leading, at one level, to industry fragmentation. At another level, there was also consolidation among the small and nimble LED start-ups scattered worldwide. The old and archaic order was giving way to a new class of entrepreneurial firms reshaping the industry landscape on the strength of LED technology; the firms had become acquisition targets—both among themselves and by their larger peers.

Notwithstanding the change in its dynamics, the lighting industry was holding steady in terms of growth. The rate of growth was running parallel to global gross domestic product growth, at about three per cent on a compound annual basis. The industry had worldwide revenue of US$112 billion in 2017 and was forecast to grow at a little over three per cent to record sales of US$130 billion in 2020.[[2]](#footnote-2) The developed markets of North America and Europe generated 45 per cent of total lighting market sales. Growth was driven in those markets by economic expansion and annual increase in the number of households. In developing markets, greater access to electricity was a major growth factor.

The industry was at the cusp of the next growth phase, characterized by what was known as “connected lighting,” spearheaded, once again, by LEDs. By combining LED technology with information technology, connected lighting took lighting beyond illumination to collecting and sharing data that could be used to make lighting more efficient. There were many potential applications for which connected lights could be programmed. In offices, for example, lighting could be programmed to respond automatically to the degree of natural lighting. Smartphone apps could be used to manage lighting systems remotely, which made it accessible, in turn, to a wider range of customers. New sources of competitive advantage were emerging, and firms, both old and new, were scrambling for niche positions across the lighting value chain.

The industry comprised three major categories—general lighting, automotive lighting, and backlighting. The general lighting category consisted of four segments—lamps, electronics, consumer luminaires, and professional systems and services. Automotive lighting comprised all elements of lighting systems in automotive vehicles, especially cars. Backlighting was made up of lighting elements used in devices such as TVs, smartphones, and tablets.

LED products were about five to ten times more expensive than conventional lights. Their prices were falling, however, due to technological advances in manufacturing and increasing LED efficiency, wherein fewer LEDs were required for a similar amount of light output. The prices of LED luminaires were forecast to be just two to three times more than conventional lamps by 2020. The Boston Consulting Group reckoned that such a shift in pricing would be a tipping point for the industry because the consumer adoption rate would accelerate. LEDs were also becoming popular among users in the professional systems and services segment because of the lower total cost spread out over a longer time (see Exhibit 1).

LIGHTENCO COMPANY BACKGROUND

The company was founded in May 2011 in Montreal, Quebec, Canada, as a moonlighting project by three working professionals. The trio had come together through social connections of their spouses, and their conversations often turned toward starting a business in the broader area of clean energy, where provincial governments were subsidizing individual businesses for the costs of switching to green technologies.

Raymundo del Cojo was employed as a project development engineer with a kitchen appliances company. Eduardo Vargas was employed as senior category manager of lighting with an electrical products company. Both were qualified engineers who had migrated from Mexico and were working in Montreal. They had witnessed first-hand the impact of LEDs on energy costs at workplaces. They were joined by Steve Hubbard, who was working in sales in Ottawa, Ontario, for a company providing Microsoft solutions for the education market. Hubbard was also interested in environmental issues.

In early 2011, Vargas came across a copy of the *Commercial Lighting Survey*, commissioned by Sylvania, North America’s premier lighting company. Based on interviews with over 350 corporate decision-makers, the survey showed a strong preference for lighting systems that were less wasteful of heat during their conversion into light, consumed less energy, and, although having a high upfront cost, would cost less over their lifetime. LEDs had already debuted as an innovative offering and were making their mark as a green, sustainable, and environmentally friendly lighting product. Recognizing that LED lighting brought about energy efficiency, 73 per cent of professionals in office, retail, education, and health care who responded to the survey indicated that they were planning to use LEDs in their commercial spaces.

The trio saw the signs of a business opportunity in the survey findings. They had some exposure to early LED lighting in the late 2000s. They were also familiar, as working professionals, with clean and green technologies. As they explored various entrepreneurial opportunities, the choice of industry, product, and target customer fell quickly into place. The lighting market seemed large, including offices, hospitals, museums, convenience stores, restaurants, bars, warehouses, beauty salons, pharmacies, schools, department stores, coffee shops, food courts, theatres, hotels, spas, amusement parks, and so on. Vargas and Cojo would be based in Montreal to handle the business in Quebec, and Hubbard would continue to be based in Ottawa to handle the business in Ontario.

There had been a lot of user skepticism around LED products at the beginning. Early adopters thought that an LED lamp did not dim nicely and that the colour was too cold. There were also complaints about constant flicker and glare. By 2011, Chinese lighting factories were starting to develop LED products with warmer and dimmable light. User skepticism was on the decline by the time the founders were giving shape to their business idea. LED technology had improved and was undergoing ongoing development.

What convinced the trio to start the venture was that clean and green energy had become a policy priority for North American governments. Electricity distribution companies, which were generally owned by state or provincial governments, were keen on end-users phasing out inefficient lighting options and switching to LED. In a bid to incentivize this migration at the user level, electricity distributors in both the United States and Canada launched programs to subsidize energy costs. In Quebec, for example, Hydro-Québec launched Bâtiment du Québec in January 2011 as a five-year initiative for its commercial customers. The program was designed to reimburse commercial enterprises as much as 75 per cent of the cost of migration, tapering off to 50 per cent over a five-year period.

Given that reimbursements involved paperwork, which could deter potential customers, the Lightenco founders built a service element around their core LED product, evolving it into a package that included four components: Lightenco would (1) compute the subsidy that the customer was entitled to and make sure that the customer received it from the government, (2) take responsibility for recycling inventory rendered obsolete because of migration, (3) negotiate with a lending institution for a bridge loan for the customer, if required, to cover the cost of the project, and (4) advise the customer on the appropriate lighting mix, given that illuminating a tavern, for example, was different from illuminating an office.

As a result of these discussions, a clear customer value proposition emerged. Targeting customers for whom lighting consumption represented a considerable percentage of their electricity bill, Lightenco saved up to 85 per cent of its customers’ lighting electricity consumption while enhancing their illumination environment.

Vargas and Cojo started working on a business plan. Vargas was familiar with sourcing lighting components from low-cost economies in Asia. Cojo took a short-term course in lighting design to garner insights about incorporating software into lighting installation projects. They estimated that working capital of $20,000 would be required to purchase LED products from the low-cost suppliers. China was becoming the largest production and manufacturing base for lighting products. Large companies like Koninklijke Philips N. V. were also sourcing their raw materials from China through several layers of importers and distributors, and distribution costs made up nearly 50 per cent of their retail price. Lightenco saw a competitive advantage in bypassing the intermediaries. The partners decided to go from the factory to the client in a single step. A major limitation in importing from China was that the Chinese suppliers were asking for 100 per cent upfront payment with the purchase order. The founders negotiated the terms toward a 30 per cent deposit with the purchase order, with the remainder paid before the shipment was due to sail. The lead time for shipment from China was about eight weeks.

A reserve of $57,500 was required to cover fixed costs for the first six months, during which time sales were expected to be low. The first year of operations would be loss-making, and it was only in the fourth quarter of the second year that a return on investment could be expected. Before taking the plunge,the founders reviewed the competitive scenario: there were 230 companies in the province of Quebec affiliated with Hydro-Québec’s Energy Wise program, as the subsidized scheme was known, 97 of which were in the metropolitan area of Montreal and Laval. Forty-seven of these were lighting distributors, eight of which were undertaking lighting installation projects and competing directly with Lightenco.

LAUNCHING LIGHTENCO

The trio of founders decided to hold on to their day jobs in case the project did not take off. They pooled their collective personal savings of $30,000 as seed capital. They also obtained personal lines of credit—for a total of $30,000 at zero percent for six months—from a leading Canadian bank. The funding seemed adequate for a start, pre-empting the need for external equity capital.

The first employee they hired was for the sales function, with a mandate to generate new accounts. Taking on one or two summer students each year as co-ops, they recruited new hires from among them to handle office administration and accounting, projects, and marketing. They also took on installers to work on project sites as freelancers. After hiring a full-time employee, either directly or through the co-op route, the founders would get in touch with organizations like the YMCA and Employment Ontario, which had several ongoing grants to reimburse the costs of providing jobs to new immigrants to Canada and to the underemployed among them. The grants helped cover a major part of the company’s salary bill. By the end of 2017, Lightenco had 12 full-time employees—seven were installers, two were in sales, one was in projects, and one was in administration and accounting.

All three founders were closely involved in sales and installation activities from the start. Over time, they assumed specific roles while also being involved in all aspects of installations at customer premises. Vargas dealt with purchasing, Cojo handled administration and accounting, and Hubbard worked on marketing for the first two years. Subsequently, Vargas was managing operations and overseas purchasing; Cojo was responsible for administration, local purchasing, and some sales and business development; and Hubbard looked after sales, marketing, and business development.

A major part of the sales contract was that the customer would make a down payment of 30 per cent of the value of the project. The advance was meant to cover the cost of importing LED products. The product–service bundle ensured that the customer was fully dependent on Lightenco, which could bill the customer on a 50 per cent margin at a price that was still competitive. Delivery of the product–service bundle to the customer involved six sequential steps (see Exhibit 2).

The founders decided to start with piecemeal projects that were valued at between $2,000 and $5,000 each and could be executed outside of their working hours in no more than a week or two. They started small, with a diner or a convenience store, for example, where the project involved little more than calculating the number of lamps requiring replacement. This ranged from 30 to 50 lamps in the first few jobs. Each imported lamp had an average landed cost of $45–$50 at the time.

They also decided to roll over the revenue and reinvest the margin. They started by working on two projects at a time, collecting the receivables and using the proceeds to finance the next two projects, one step at a time. They built the business slowly and steadily, closely monitoring the cash flow and keeping expenses to a minimum. None of the founders took a salary from the business. They made do with very little infrastructure. For example, they used their garages as storerooms, saving about $400 a month on a locker rental, and used their living rooms as workspaces, saving about $600 a month in rent. Cojo even rode his electric bicycle in Montreal with a box of lights strapped on his back. The founders subsequently relocated their venture to Impact Hub, a global network of 17,000 small business owner–members in over 100 locations, including both Montreal and Ottawa. They rented a working desk for $200 a month, and access to printers, Wi-Fi, and other communication tools was included as part of the shared facility.

They decided not to spend money on traditional marketing; instead, they used their completed projects to spread the word. They picked popular spots in Ottawa and Montreal as their first clients. MacLaren’s on Elgin, a sports hall with billiard tables and a bar, was a landmark in Ottawa among the city’s residents. Pure Gelato was an ice cream parlour on Elgin Street in Ottawa, where customers would line up waiting patiently for their favourite scoop. In Montreal, Lightenco targeted popular fashion boutiques that were regularly trending on social media—Paris Pas Cher, Delano Design, Futon d’Or, and Isabelle Lehoux. The transformations that the new lighting brought at these locations, both inside and outside, caught the public eye. They also caught media attention. Local reporters of the CTV Television Network channel in both cities caught up with the founders and told them, “You are saving energy, reducing carbon footprint, putting [in] better quality lighting . . . You are doing good. It’s big for the environment.” The founders were on local news television, with sound bites that ran repeatedly during prime time.

An early investment decision involved how to obtain a truck for carrying supplies to sites. The founders thought about buying a used vehicle but decided to go for a monthly lease to reduce cash outgo. They had already been in business for two years by then.

Even when the business started picking up, the founders did not respond to requests for proposal, which were a common method of solicitation for engineering contracts. Solicited work not only involved time-consuming documentation but also allowed little or no room for price negotiation. Quite simply, unsolicited work was more lucrative. They booked $20,000 in revenues in 2011, and billings rose from $0.7 million in 2015 to $2.1 million in 2016 and $3.2 million in 2017. The business was generating a cash surplus every year.

BOOTSTRAPPING

The founders did not approach friends, family members, or outsiders for financial help with starting the business or in managing its day-to-day operations. They established an ongoing line of credit from a bank as a bridge facility to meet working capital. They relied fully on personal financial resources and reinvested all their profits into the business.

In this way, the trio used a distinctive entrepreneurial practice known as “bootstrapping.” The term originated in the rancher lexicon as a way of describing how cowboys would rise from a seated position to standing: they would reach down, grab the straps of their boots, and rock to an upright position. To “bootstrap” was “to promote or develop by initiative and effort with little or no assistance.” [[3]](#footnote-3) In the context of business, bootstrapping meant “to function independently of outside direction and carry on with minimum resources or advantages.”[[4]](#footnote-4) It meant getting ahead by using one’s own grit and determination. It also involved minimalism. *Merriam-Webster* defined minimalism as “a style or technique (as in music, literature, or design) that is characterized by extreme sparseness and simplicity.”[[5]](#footnote-5)

As self-made entrepreneurs, bootstrappers had common characteristics. In addition to working hard, they worked smart. They avoided services that were seasonal or cyclical. They chose businesses that were capital light and required relatively little product development. Their businesses were set up so that they could move into revenue-generation mode without loss of time and with short gaps between successive sales orders.

The founders grew the Lightenco business slowly, steadily, and organically, without giving up equity or incurring too much debt. They had the compulsive habit of looking for savings and bargains in their cash outgoes. They stayed lean and were averse to accumulating fat in the business. Being in the moment was second nature to them—part of their lifestyle—and their scrappiness was contagious.[[6]](#footnote-6)

Bootstrappers differed from other start-ups in another major way—failure was not a rite of passage for them on the way to becoming successful. They did not believe in failing early and failing often. They had a clear path to profitability (P2P) from day one. They would not start a business without a P2P.

Facebook Inc., Dell, Apple Inc., the Hewlett-Packard Company, and Microsoft Corporation were all examples of companies whose founders bootstrapped before they accessed external capital.[[7]](#footnote-7) Bootstrappers used several common tools of business to stay out of debt, and the founders of Lightenco implemented many of those tools.

THE LIMITS TO BOOTSTRAPPING

By the start of 2018, the company was generating annual revenues of $3–$4 million. The founders had frequent discussions about the best way forward. Having built a growth model and developed a brand that had gained some traction, the founders could either stop growing and keep the current level of revenue and remain small, or they could follow an aggressive growth strategy. The dilemma was existential, and they were not sure how to resolve it.

Sticking to Bootstrapping

By January 2018, new and enticing growth opportunities were beginning to open up. Many of these opportunities came from customer referrals. Marriott International, a hotel chain with properties in several locations and under 30 different banners, including Sheraton Hotels and Resorts and Delta Hotels, was interested in working with Lightenco on some of its Canadian properties. Another hotel client had several properties in Florida and could serve as a potential entry point into the lucrative US market. There were also openings with the Recycling Council of Ontario for lighting retrofit contracts in the province. There was a similar opportunity with federal government buildings located all over Canada. If Lightenco were to exploit any of these opportunities, it was clear that it would have to scale up its resources, raise capital, and expand its workforce.

Bootstrapping had worked thus far because the lighting projects Lightenco had worked on were relatively small in scale and were revenue accretive and cash flow positive. Three factors were noteworthy: First, the company could collect 30 per cent of the value of the order upfront. Second, 50 per cent of the project cost was being reimbursed by the provincial governments of Quebec and Ontario through their clean-energy programs. Third, the company could reinvest the earnings carried forward from the previous project because it had been working on a high 50 per cent margin. The founders could continue bootstrapping at the current level of operations at $3.2 million annual revenue, provided those three factors were in place. They could also meet the 2018 revenue target of $4 million revenue without facing a serious resource crunch. However, given the capacity limits of the current organization, it was far from obvious that they could scale up any further by bootstrapping alone.

Moreover, it was unclear whether the bootstrapping business model they were using was sustainable in the long term. With the likely imminent withdrawal of government subsidies, a key plank of Lightenco’s attractiveness to customers looked set to disappear. Lightenco would presumably need to respond by accentuating to clients the importance and value of energy efficiency as well as emphasizing other factors, such as the versatile aesthetics of modern illumination enhancement.

At their weekly Friday meetings, the founders often pondered whether they should grow further or stop where they were. They had reached a manageable and profitable scale, which they felt they could sustain if they managed to somehow compensate for the withdrawal of government subsidies. They also retained full ownership and control under the current arrangements, something they valued greatly and were reluctant to relinquish. Autonomy was important to the founders—asking someone else to conduct a lighting audit or install a lighting project on their behalf was something that the founders had difficulty coming to terms with. They preferred to do it on their own. They were hands-on to the point of being obsessed with detail, and they were not used to ceding control.

Access Funds from a Venture Capitalist

There had been inquiries from the venture capital (VC) community that the founders had not pursued because, among other reasons, they considered raising money a distraction. They recognized that it would probably take months of one-on-one meetings, legal manoeuvrings, and contract reviews that would often lead to dead ends. But they also knew that they eventually had to look at the VC option with the seriousness it deserved. In doing so, they had to deal with two issues—business valuation and equity dilution.

There were usually two sources of funding for up-and-coming enterprises in Canada: seed capital, mobilized from friends, family, and personal savings; and series A capital, raised from professional investors like VCs. The seed round was used to gain early traction in the form of customers who would be early adopters. Series A financing was used to scale up operations by building a team, diversifying offerings, expanding into new geographies, and managing scaling of the customer base and the internal organization. Lightenco had long since passed the seed stage through its effective bootstrapping strategy. But in seeking external financing for the first time, the founders would now have to deal with the important issue of business valuation.

For Lightenco, the valuation would be determined by how much equity the three founders were willing to forego in exchange for the venture capital. For example, if the founders were to give 20 per cent of the equity in exchange for a capital infusion of, say, $1 million, Lightenco would have a valuation of $5 million. The valuation of a business enterprise, as a going concern, was ultimately determined by what a buyer would be willing to pay. The company’s net worth was an important consideration here. Lightenco had an annual revenue of $3.2 million. It had physical assets—the office building in Montreal, as well as automotive vehicles—that together were valued at about $700,000. The company had no debt and ran a cash surplus. The likely valuation of the company, in the founders’ view, was $5–$6 million.

Getting the right valuation was important for bringing in the right investor. The right valuation was also an important factor in minimizing the dilution of ownership and control, which was the second piece that the founders had to contend with. VC funding would change the power dynamics at Lightenco, and being answerable to a new entity would be challenging for the founders, who were long used to dealing with just themselves. There would also be conflict-of-interest issues because the VC would be looking for opportunities to cash out, usually in three to five years, while the founders would be looking for opportunities to build a quality business that would succeed in the long term.

A VC infusion would only make sense if the next level of growth amounted to a quantum leap in revenue and profits. Piecemeal increases would not be worth the change. There was a belief in the Canadian VC community that Canadian companies did not grow as fast and did not attract as much later-stage capital as US companies. Canadian companies were also typically sold by the VCs before they could be turned into world-class companies. A study by the Impact Centre at the University of Toronto showed that 10-year internal rate of return (IRR) for Canadian VCs averaged no more than 4 per cent, compared to the IRR of American VCs, which averaged about 10 per cent.[[8]](#footnote-8) According to a study by the Business Development Bank of Canada, the IRR on VC investment was 2.9 per cent over 10 years and 2.4 per cent over five years for companies in the “cleantech” sector, to which Lightenco had close affinity.[[9]](#footnote-9)

Sell and Become Part of a Larger Company

A large, diversified incumbent firm had also recently approached Lightenco to discuss the possibility of acquiring it. This pan-Canadian enterprise had four independent business divisions built around the core purpose of improving energy efficiency in heating, air conditioning, refrigeration, and elevator maintenance. Since lighting was a gap in its product portfolio, the merger could be a good fit. For Lightenco, it would provide access to low-cost funds that came with a larger balance sheet. The tentative proposal was for a clean sale, and the price was mentioned as a one-time payment of about $10 million. There would be a provision for the founders to manage the new lighting division as before, but as employees of the company, and with their own team. Since the group would be targeting the same set of customers, the merger would provide synergies in terms of sales and marketing. The fact that each of its four existing divisions were largely independent was a plus. The lighting business could retain its niche status within the enterprise, but it would no longer be known as Lightenco. The brand identity that the founders had worked so hard to build would be gone.

The founders tried to guess how both the mechanics and dynamics of the business would change if they were managing the lighting division for a large company. The mechanics, which related to business operations, could improve because of new systems, processes, financial controls, and discipline that a large company would bring. But the dynamics—the drive, the passion, the innovation, and the relationships—would be different. There was uncertainty on that front. The creativity that went with having to save pennies while doing business for dollars would also be gone.

The founders were at a tipping point and had to decide which option to take.

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Exhibit 1: COSTS PER LIGHTING TYPE

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Lighting Type  (800 Lumens) | Life in Years | Elements of Cost | Amounts in CA$ | | | |
| Year 1 | Annual Cost | Total Cost over 10 Years | |
| Standard Incandescent | 1 | Bulb  Energy  Total | 0.50  8.02  8.52 | 0.50  8.02  8.52 | 5.00  80.15  85.15 |
| Halogen Incandescent | 1 | Bulb  Energy  Total | 1.50  5.74  7.24 | 1.50  5.74  7.24 | 15.00  57.44  72.44 |
| CFL 13W | 9 | Tube  Energy  Total | 3.00  1.74  4.74 | 0.00  1.74  1.74 | 6.00  17.37  23.37 |
| LED 10W | 23 | Diode  Energy  Total | 13.00  1.34  14.34 | 0.00  1.34  1.34 | 13.00  13.40  26.40 |

Source: Bill Millard, “It’s the End of the Bulb as We Know It (and Eisa Feels Fine),” *Architectural Lighting*, January-February 2014, accessed February 12, 2019, www.archlighting.com/industry/ reports/its-the-end-of-the-bulb-as-we-know-it-and-eisa-feels-fine\_o.

Exhibit 2: PRODUCT–SERVICE BUNDLE—FLOW CHART

1. PROMOTION

* Inform the customer of the availability of the technology and its advantages.
* Gain the opportunity to scout the customer's premises.
* Use technology and expertise to choose the proper equipment to enhance the illumination of the premises.
* Analyze electricity and economic savings.
* Analyze governmental subventions and investment financing.
* Analyze installation cost and development.
* Make the report, including all the mentioned analyses.
* Present a custom report explaining, in detail, all the advantages to the customer: illumination enhancement, investment reduction due to government participations, monthly electricity bill reductions, project's break-even point, maintenance advantages, and carbon footprint reduction impact.
* Present the government’s emerging regulations that will impose the migration to the new illumination technology.
* Contract and 30% down payment.
* LED equipment purchasing from designated suppliers, if not available in stock

1. CONSULTATION
2. PRESENTATION
3. PROJECT SALE
4. GOVERNMENT PAPERWORK & APPLICATION
5. INSTALLATION

* Complete proper documentation to apply for the governmental subventions.
* Follow the appointed process.
* Obtain the subvention for the project.
* Obtain the financing for the project investment.
* Project closure.

Source: Company documents.

1. All dollar amounts are in Canadian dollars unless otherwise indicated. [↑](#footnote-ref-1)
2. François Candelon et al., *How to Win in a Transforming Lighting Industry* (Boston, MA: The Boston Consulting Group, 2015), accessed November 10, 2018, http://image-src.bcg.com/Images/BCG-How-to-Win-in-a-Transforming-Lighting-Industry-Nov-2015\_tcm50-88535.pdf. [↑](#footnote-ref-2)
3. Merriam-Webster, s.v. “bootstrap (verb),” accessed January 29, 2019, www.merriam-webster.com/dictionary/bootstrap. [↑](#footnote-ref-3)
4. Merriam-Webster, s.v. “bootstrap (adjective),” accessed June 17, 2019, www.merriam-webster.com/dictionary/bootstrap. [↑](#footnote-ref-4)
5. Merriam-Webster, s.v. “minimalism (noun),” accessed June 11, 2019, www.merriam-webster.com/dictionary/minimalism. [↑](#footnote-ref-5)
6. Jason Fried and David Heinemeier Hansson, *Rework: Change the Way You Work Forever* (London: Ebury Digital, 2010), Kindle. [↑](#footnote-ref-6)
7. Derin Cag, “Ten Successful Companies That Started by Bootstrapping,” Richtopia, accessed February 10, 2019, https://richtopia.com/effective-leadership/10-successful-companies-started-bootstrapping-case-studies. [↑](#footnote-ref-7)
8. Charles Plant, *The Rich Get Richer: Are Canadian VCs Inadvertently Limiting Their Returns?* (Toronto: Impact Centre, 2017): 3, accessed January 26, 2019, https://tspace.library.utoronto.ca/handle/1807/87355. [↑](#footnote-ref-8)
9. *Canada’s Venture Capital Landscape: Challenges and Opportunities* (Montreal: BDC Capital, 2017), accessed January 26, 2019, www.bdc.ca/EN/Documents/analysis\_research/venture-capital-landscape-paper-en.pdf. [↑](#footnote-ref-9)