



Peak Charge: Venture Plan

GEEN 3400 - Invention and Innovation

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Executive Summary

Peak Charge was founded after several members of the team noticed students studying in some of the most unusual and inconvenient locations all over the CU Boulder campus. The concept of the PowerDesk was formed with the goal of alleviating the discomfort observed in those students. The PowerDesk provides students with a writing surface for taking notes or resting their laptops and electricity to charge their dead or dying laptop/phone/tablet batteries.

Peak Charge will provide professionals and students power; both to keep their laptops running and to keep them productive. With our PowerDesk in working in a cafe or studying on a patch of grass is not only allowed, it's supported!

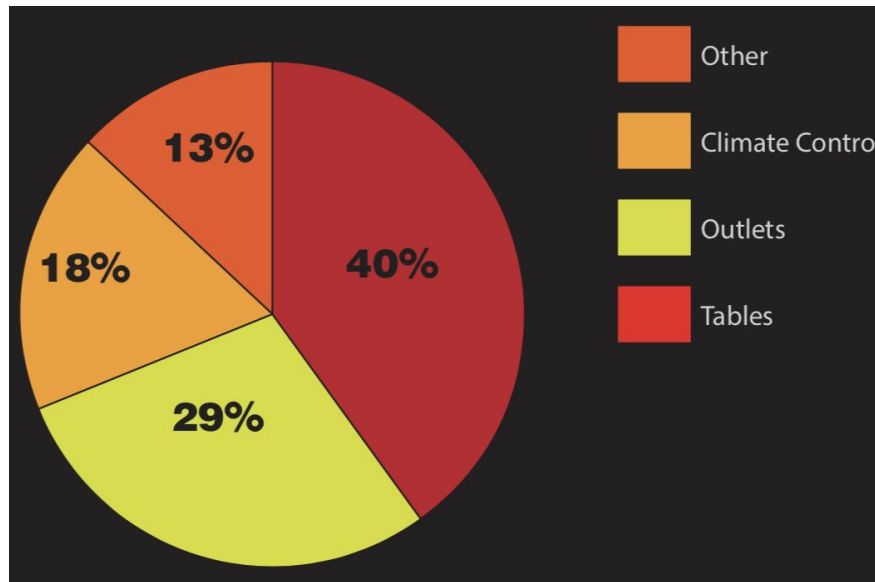
The PowerDesk is sold at familiar retailers from Staples to SkyMall, though we will hit the market in our home city of Boulder Colorado at the CU Bookstore.

Our Company is projected to become profitable in year 2. As well in year 2, we will be coming out with a Deluxe PowerDesk which we plan on having the battery capacity to charge your laptop 3x.

Our team is all CU Engineering students with diverse backgrounds and areas of interest. Parker Saltiel(CEO), Michael Mercer(CFO), Divya Bandreddi(CTO), Alex McGuirk(CEnO), Kenneth Cox(COO) all have one thing in common; they love productivity. We have two technology, arts and media majors that make our final product polished and functional, while our mechanical engineers design the guts of the PowerDesk and our complex business model.

Company Description

Peak Charge gives people freedom by allowing them to work on the go. The team took a survey of over 250 individuals which included an open-ended question on what can make you able to be productive in any environment. We found that in order to be productive in any environment, 69% of the individuals in the survey needed two main things; an outlet as well as surface to write on. This can be seen in the pie chart below:



(Necessities to be productive on the go)

We have 2 main customer segments that we are approaching; students as well as traveling professionals. We found that 94% of students use a laptop or tablet to study. The students we talked to faced major issues finding an outlet in large lecture halls as well as crowded places to study like the library. Most students need to charge their laptops during the day.

From our interviews we found that traveling professionals use their laptops 3x more than students. These business professionals found themselves looking for outlets in airports as well as coffee shops. With the increased need for power, we plan to make a PowerDesk Deluxe allowing 3 laptop charges by increased battery capacity.

Our customers will have an unlimited area to do work in which will lead them to be more productive. Another key takeaway from our interviews was that size and weight was a key driver for the interviewees to buy our product. We decided to decrease the size from our initial prototype to the size of a 13-inch laptop. The height of the PowerDesk was prohibited by the height of a three-prong outlet.

We plan on having customer reviews on our website as well as a 6-month warranty that will cover any damages incurred under intended use. Our company will be the first portable workstation with AC power and will continue to innovate after our first PowerDesk hits the market.

Market Analysis

The PowerDesk by Peak Charge is uniquely designed unlike any other form of a lap desk or power bank. These similar products either lack a patent or their patents have expired. We currently reside in an area where we have no need to patent our product. While we are entering a market space full of similar products nothing quite lines up the same as our PowerDesk.



Take the Neetto Adjustable Table for example, this desk offers restricted portability and can only charge DC powered appliances. The Peak Charge PowerDesk minimizes desk space so that it can fit easily into a backpack to take anywhere with you, while also providing a hard surface to work on. The PowerDesk also not only can charge DC powered appliances but as well as AC, so you can provide power to your laptop 1.2 times when it is fully charged.



Another product we vary from it is the RAVPower Power Bank. This power bank offers AC power to charge laptops, as well as DC. While this might be ideal for the most compact solution, it offers no portable workspace for the user.

At Peak Charge we aim to design our PowerDesk to help students like us have power and a workspace at their fingertips to be productive wherever they go. The modern education system places a heavy importance on using technology. Peak charge provides the convenience for students to have a workspace and power anywhere from a lecture hall to studying outside. We designed our device entirely from the feedback we received during our customer discovery when asking students what they need to be productive. After getting feedback from over 250 students we learned that 70% of students need a table and outlet to be productive.

As our company grows we plan to launch a deluxe version of our product for traveling business people. Much like students traveling business people are in need to be productive on the go. Peak Charge's Deluxe PowerDesk will be more compact and offer two to four additional laptop charges compared to our base model. Through customer discovery, we learned that there is a need for a workspace and power when in an airport or on the airplane because it is often crowded. By providing a more compact model, business people will be able to store their Deluxe PowerDesk without using too much of their space.

Product Description

At Peak Charge, our lead product is the PowerDesk. The design of the PowerDesk was and continues to be driven by the need of the typical student/business person. From prototyping through the current model, the two predominant driving forces have been size and the ability to charge mainstream laptop brands (i.e., conversion between AC and DC).

Iteration I (cardboard w/legs)



After extensive customer discovery, it became clear that the majority of students on the CU Boulder campus would only study in spaces with access to an outlet. Iteration I was a near replicate of some of our closest competitors. The first vision of the product was of a small portable desk, and as the name PowerDesk implies, it had legs. Our initial customer discovery was broad and we did not know if users would be comfortable having the workspace on their lap.

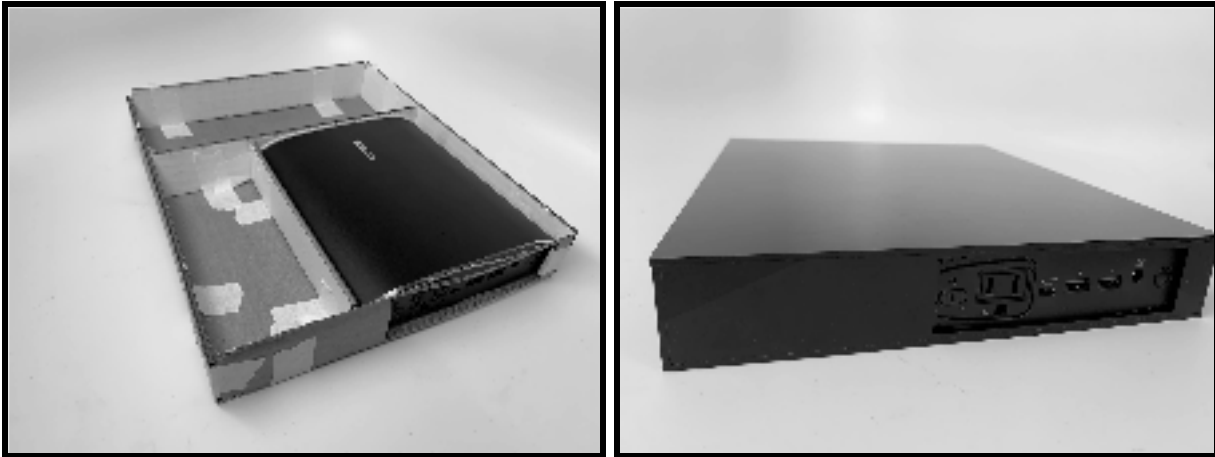
Iteration II (large angled cardboard)



In order to reduce the size and weight, we opted to remove the legs. At that point in the design process, removal of the legs allowed us to shrink the PowerDesk's thickness by nearly 50%. At the same time, we had our initial breakthrough in circuitry. We purchased a small inexpensive inverter that could be powered by a 12V source. However, in order to integrate this prefabricated equipment into our new slanted surface design, the thickness would need to be increased nearly back to its original size.

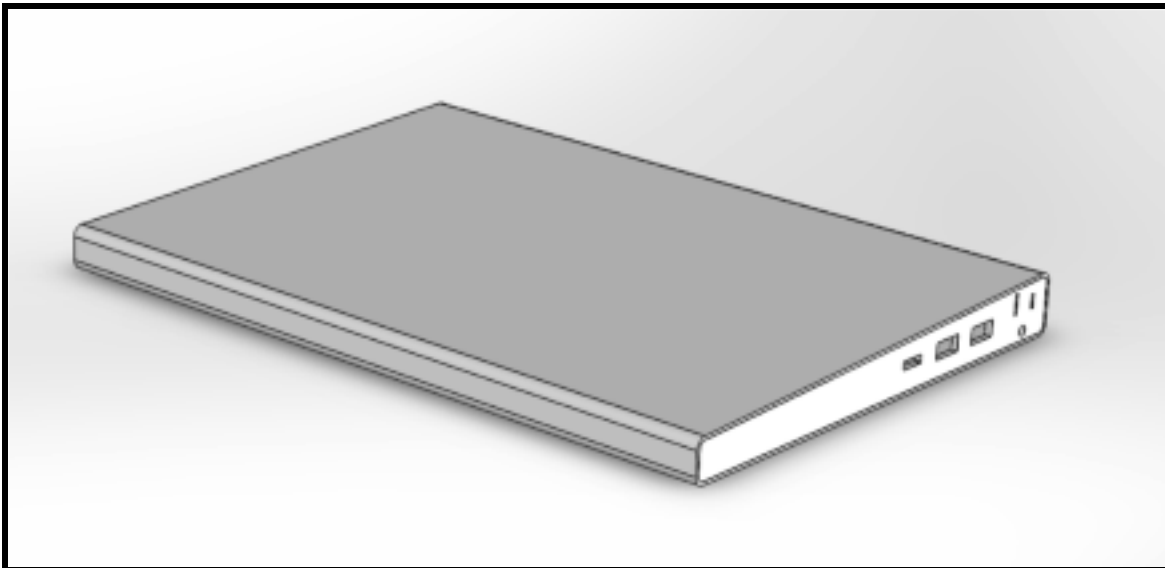
In the time between iterations I and II we performed further customer discovery and learned that customers prefer the slanted design for an improved ergonomic writing surface and lapdesk. We also had increased concerns regarding heat from the power converter and laptop exhaust which we addressed with fan holes on the back of the desk.

Iteration III (current)



After more testing, it became clear that the size was still an issue, however, we were limited by the design of the power inverter. In order to reduce the size and bulk further, we needed to change the circuitry we were working with.

Iteration IV (future)



Still feeling unsatisfied by the bulkiness of our product, we believe the most logical next step is to begin manufacturing or designing our own circuitry with a layout that will utilize all of the internal space of the PowerDesk.

Life Cycle

Development: Product is developed and funded by the founder's own personal resources and capital investment.

Introduction: Develop the market for the PowerDesk by creating product awareness.

Growth: With increased sales revenue PeakCharge can pursue line extensions and create a series of PowerDesks to meet different customer needs.

Maturity: Competition increases and the PowerDesk will require enhanced features and lower prices to stay competitive.

Decline: When revenue decreases due to market saturation, high competition or changing customer needs we will decide to discontinue the product, sell manufacturing rights, or tap into new markets.

Market and Sales

The Peak Charge PowerDesk reaches its customers through familiar retailers. We plan to start our sales at the University of Colorado, Boulder's bookstore since we are a student at the university and can easily access this outlet. The book store is also a prime location to reach one of our customer segments, students. Moving forward we hope to be in more school bookstores, office supply stores (IE. Staples or Office Depot), Amazon.com, Airports, magazines(IE. SkyMall) to help easily reach students and business people worldwide. Forming relationships with these retailers is a key activity moving for Peak Charge so we can expand our channels to customers.

We need two key partners to manufacture our PowerDesk. One is an electronics manufacturer (Omars) who will help provide us with our batteries and inverter until we hire an electrical engineer to design our own. We also will be partnering with an assembly warehouse(Frontier Metal Stamping) to create and assemble the casing with a compression fit area for the electronics. These two manufacturers will help our team mass-produce the PowerDesk and reduce the cost.

Because our market includes customers who are either students or traveling businesspeople, we expect our total market size to be 54 million people. Being that we are starting by targeting students, and will be continuing to develop our product to better suit our customers, we expect our initial addressable market to be 8.1 million people. Assuming that we can get .01% penetration into this market within the first year would mean we could sell 810 units.

Financial Projections

In order to get the Peak Charge PowerDesk up and running, we wanted a firm grasp on the cost to build the product, price we could sell the product at, initial costs to get started, as well as expected time and sales until we reach our break-even point. With this information, we will better understand the potential of our product, as well as where we might see struggles along the way.

First, it was vital that we understand the cost to build our product. The most important part to make this work is a battery. We found that batterysharks.com sells a rechargeable, 12V battery that is small enough for our product for \$8.75. Based on our team's knowledge, with no expertise in electrical engineering, we estimate that we can build a circuit for a pure sine inverter for the cost of \$10.23 per product. If we use aluminum for our material for building the desk part of our product, we can expect that both the material and the injection molding would cost \$26 per unit. This price was quoted to us from custompart.net. For our mounting hardware, we found that a pack of 320 standoff screws only costs \$13.00. We would only need 16 screws per unit. Including assembly, this brings our total direct cost to \$49.63.

Yet this is only our current value for the direct cost and we think we can decrease it by a significant amount. First, by hiring an electrical engineer, we believe we could be creating our own batteries and find more cost-efficient ways to build our inverters. We also believe that with

more research and quotes for injection molding, as well as reduced cost from mass manufacturing we will eventually be able to reduce our direct cost to approximately \$25.

With a direct cost of only \$25 we currently plan to sell the product for \$120. This is a reasonable price for a portable laptop battery considering we currently can provide 1.5 full charges and may be able to do more given our flexibility of battery space relative to our competitors. When we interviewed potential customers for the PowerDesk, we found that the average price people would pay for our product was \$98. This included the responses from both customers who were interested in the product, as well as those who were not. We think that an initial price of \$120 will be a reasonable price for those who are interested, and we may try to lower the price in the future when we try to grow to a much broader customer base.

We also plan to sell our product at retail stores so we ought to expect that 25% of our retail price of \$120 is going to go to the store. This would mean that the store gets \$30 per sale and we get \$90. However, we don't expect all of our sales to be in stores. We also expect 20% of our sales to come in via online orders. Therefore we expect our wholesale weighted revenue per unit to be \$96. Therefore we could expect \$71 of profit per unit sold.

We also expect plenty of fixed costs while designing this project. We decided as a group we would all go full time with our project if we were making a salary of \$65,000. However, we currently are all students and thought that we would be spending about 25% of our working hours on the project, so each member would currently be making a salary of \$16,250. We also expect to be hiring an electrical engineer with a salary of \$60,000 and if he's working 25% of the time we would expect to pay \$15,000. Additional fixed costs include website development, which costs \$40 per month to keep our website up and running. We are also allocating \$800 for initial marketing purposes and \$1200 for a year's worth of legal fees. We also expect to pay \$120 in accounting for TurboTax Business so that our taxes can be done in-house. This brings the total of our fixed costs to \$98,850.

After analyzing all our costs, we found that we must make a revenue of \$133,656.34 in order to break-even. This is the equivalent of selling 1,392 PowerDesks. Based on our expected penetration into our addressable market, we expect to sell 810 units in the first year, meaning we would find our break-even point halfway through year 2.

Our calculations suggest that we would need \$127,200 to get the business solidly up and running for the first year, so moving forward we would want to be working on our best ways of raising such capital. We would likely start this by looking for initial investors and possibly doing a startup accelerator in Boulder like Catalyze CU. After a year of sales, we think that our business would have enough steady sales to support itself, however the plan would still be to keep fundraising.

Appendix

	Year 1	Year 2	Year 3	Equation
Total Size of Market (in people)	54,000,000	57,240,000	60,880,464	(travellers + students) x percentage of people w/laptop brand that we're manufacturing to work with
Change in size of market per year (percentage)	6.00%	6.36%	6.76%	
Change in size of market per year (people)	3,240,000	3,640,464	4,118,257	= Total Size of Market x Percent Change per year
New customers per year (percentage)	15%	20%	25%	
Addressable Market (people)	8,100,000	11,448,000	15,220,116	"=Cumulative total size of market x Percent of new customers"
Penetration (percentage)	0.01%	0.04%	0.08%	
Potential Customers (people)	810	4579	12,176	= Addressable market x Penetration
Potential units sold (units)	810	4,579	12,176	Potential Customers x Ave number of backpacks bought(1)
Product price point (\$)	\$120	\$126	\$132	
Product price increase per year (percentage)	5%	5%	5%	
Total revenue	\$97,200	\$576,979	\$1,610,897	= Price point x Number of units sold

Direct Costs Per Unit (\$ with 15% reduction annually)	\$50	\$42	\$36	= Direct Costs x 85% cost reduction
Total Direct Costs (\$)	\$40,200	\$193,176	\$436,606	= Direct Costs x Number of Units Sold
Support and Warranty Services (\$, 5% of revenue)	\$4,860	\$28,849	\$80,545	= Total revenue x 5%
Gross Profit (\$)	\$52,140	\$354,954	\$1,093,746	= Total Revenue - Cost of Goods - Support and Warranty

Sales and Marketing (\$)	\$5,000	\$10,000	\$20,000	
General & Administrative (\$)	\$10,000	\$20,000	\$40,000	
Total Fixed Costs (\$)	\$15,000	\$30,000	\$60,000	
Net Operating Income (\$)	\$37,140	\$324,954	\$1,033,746	= Gross Profit - Operating Costs

Annual Fixed Costs (Overhead):		Unit Cost	# of Units	Amount	Description
Salaries	CEO	\$65,000	25%	\$16,250	
	CTO	\$65,000	25%	\$16,250	
	CEnO	\$65,000	25%	\$16,250	
	COO	\$65,000	25%	\$16,250	
	CFO	\$65,000	25%	\$16,250	
	Electrical Engineer	\$60,000	25%	\$15,000	
	Prototyping Space	\$0.00	0	\$0	Parker's shed
				\$0	
	Website Development	\$40	12	\$480	creating a website and paying a monthly rate to keep our website
	Marketing	\$800.00	1	\$800	ads on bus', ads on snapchat and other social media
Legal fees	\$100.00	12	\$1,200	we probably won't have this much in legal fees will we?	
Accounting fees	\$120.00	1	\$120	in house, by Michael the CFO with turbo-tax for assistance	
			\$0		
			\$0		
			\$0		
Total Fixed Costs (annually)				\$98,850	

Direct Costs Per Unit Produced:		Unit Cost	#	Amount
Power Desk				
	Injection Molding / Material	\$260,000.00	0.0001	\$26.00
	Mounting Hardware	\$13.00	0.05	\$0.65
	battery	\$8.75	1	\$8.75
	inverter 2	\$10.23	1	\$10.23
	<i>Manufacturing</i>			
	Assembly (\$/hr)	\$12.00	0.3333333333	\$4.00
	Average US shipping	\$0.00	1	\$0.00
	Total Direct Costs			\$49.63

Break-even analysis:		Definition
Fixed Costs	\$98,850	Overhead costs to run the company
Revenue/Unit	\$96.00	Average incoming dollar per unit sold
Direct Costs/Unit	\$25.00	Cost to manufacture a single unit
Gross Profit	\$71.00	Dollar of profit per unit sold
Variable Cost	\$0.00	Costs which depend on revenue created
Break-even Point	1,392	(units that must be sold to begin making money)
Break-even Revenues	\$ 133,656.34	(revenue required to begin making money)
Gross Margin Percent	74%	Percent profit per unit sold