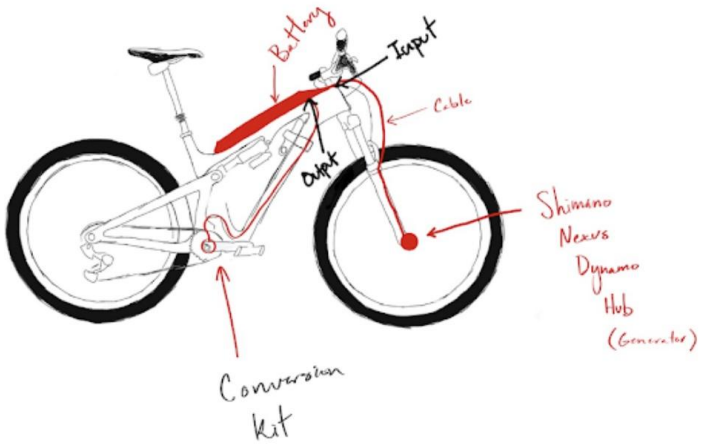
Pelokit, Overland Park, KS: **Regenerative E-Bike**

Business Summary: A power generating hub incorporated into the wheel of an E-Bike creates power supplied to the battery when the wheel turns. The Pelokit allows riders to ride further and longer than the average E-Bike rider due to the fact that the rider's efforts are indirectly resulting in the charging of the E-Bike. By using the SHIMANO Nexus Dynamo Hub, Pelokit is able to harness any of the potential energy created from the moving of the wheel and convert it into electricity used to travel longer distances as the battery will last longer on an E-Bike. This can allow people to ride longer and not have to cut a ride short due to a low battery. With Pelokit, the ride never ends.

Market Problem: The last thing a rider wants is to be stuck on the trail 5 miles from their car with a dead battery on their E-Bike. "E-bikes are predicted to grow from 3.7 million bikes sold in 2019 to 17 million in 2030. The e-bike market in 2020 is already up by 23% year on year, and on the current trajectory, there will be 10 million e-bikes sold per year as early as 2024" and with this growth in E-Bikes, now is the time to innovate and make the E-Bike the best it can be but currently, a top end E-Bike from specialized runs for only about five hours on the lowest level. Turn up the power or ride longer and you may find yourself in a position where you have to pedal without assist and the truth is that E-Bikes are not light and nimble due to the weight of all of the parts and pedaling without any electrical assist is not enjoyable.

Signature Product: E-Bike with Regenerative Braking



Milestones to Date: Working on prototyping with a Mountain bike and the SHIMANO Nexus Dynamo Generator to create the most efficient mountain bike. A name, logo, and marketing strategy have also been developed.

Target Market: Pelokit's main target market is to avid riders who enjoy riding a lot but would enjoy an E-Bike to allow them to travel further. This way, they can go up challenging hills and travel longer even though they are not as capable as professionals.

Competitive Advantage: The Pelokit is the only produced E-Bike with regenerative power and the longest lasting battery powered bike available. This bike will be one of a kind as this has never been done effectively and this will be the most efficient bike available. The bike will also be lightweight and economically conscious. There are other bikes such as the Specialized Turbo line and the Trek E-Bike series but none of these options have the regenerative capabilities.

Sales and Marketing: Pelokit has a variety of marketing materials including: Logos, Brochures, Posters, Marketing Images, and Website. Also, there is a detailed budgeting plan for an in depth marketing plan of each individual step for getting the product out.

Pelokit

Company Profile:
URL: www.pelokit.com
Employees: 1
Founded: 2021

Management:
Anthony Arquieta, 17 - CEO

Advisors:
Michael Farmer - Mentor

Financial Information:
Funding Stage: N/A
Capital Raised: $100
Monthly Burn Rate: $50
Capital Seeking: $1,500

Technology:

After narrowing down on the “energy” niche, I determined that there was a large influx of electric bicycles and scooters. After researching the market, it was confirmed that there were no regenerative capabilities available for bikes. That was when I realized the tech was out there and we created the Pelokit conversion kit.

My thoughts and ideas about the energy niche consisted of:

1. Portable Battery
2. Flywheel Generators
3. Thermo electric charging
4. Generator charging
5. Kinetic energy
6. Magnets (car seatbelt)
7. Solar Energy Solutions
8. Cell Phones
9. Wireless Charging
10. Bikes

Top 10 overall market trends or developments that make this market good:

1. E-Bikes Kits booming
2. Energy Demand will rise 40% by 2040
3. Global Electricity Demand will rise 60%
    a. Natural gas, wind, and solar will grow exponentially to compensate.
4. Global CO2 Emissions will peak
5. Federal changes focused on renewable energy technology
6. Push for no CO2 Emissions by 2050
7. Electrification of Transport
8. Electric Cars
9. New batteries are being innovated

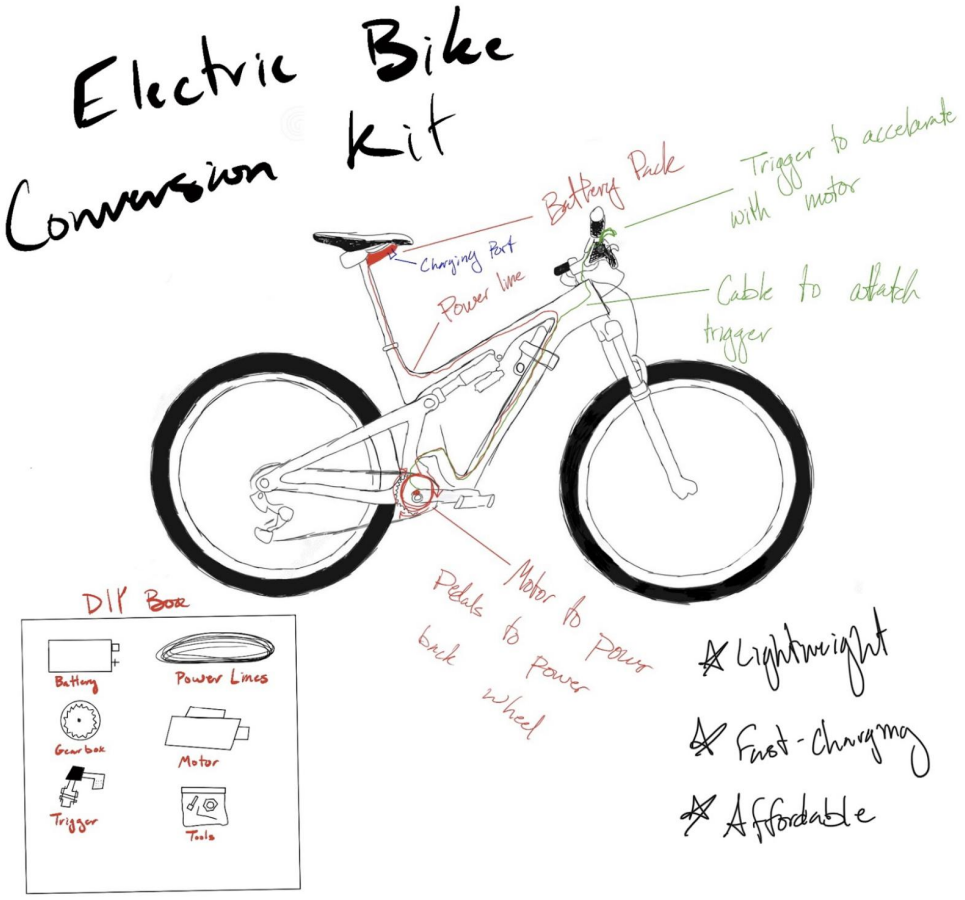
After narrowing down on the market of e-bikes, I did a lot of product ideation to determine an idea.

1. Smart E-Bike for College Students
2. AI scooter (self balancing) for young adults
3. 3-D printed power generator for ebike
4. AI E-Bike (self driving?)
5. Smart power generator
6. AI Power Generator for E-Bike
7. Backpack battery
8. Concealing bike motor in post
9. Lightweight motor
10. Self driving scooter

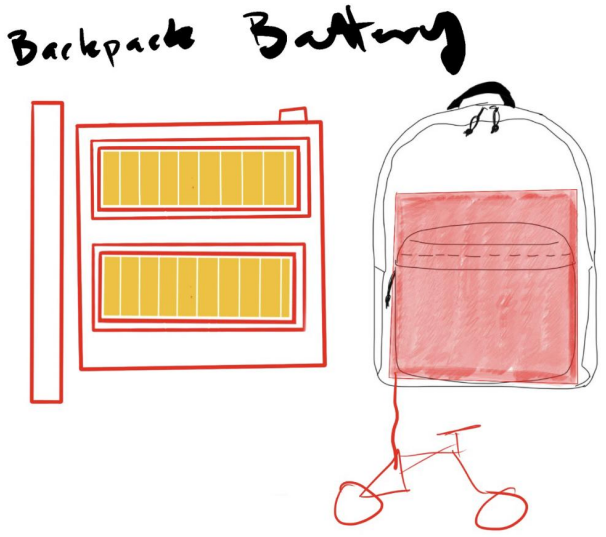
Then, I narrowed even further to decipher which ideas would be most beneficial.

1. Concealing motor in bike
2. DIY kit for ebike conversion
3. Self balancing bike/scooter

And then sketched out my main ideas:
1st was a conversion kit, 2nd was a backpack battery for powering an E-Bike, and 3rd was a regenerative system for an E-Bike



White Board Sketch or I



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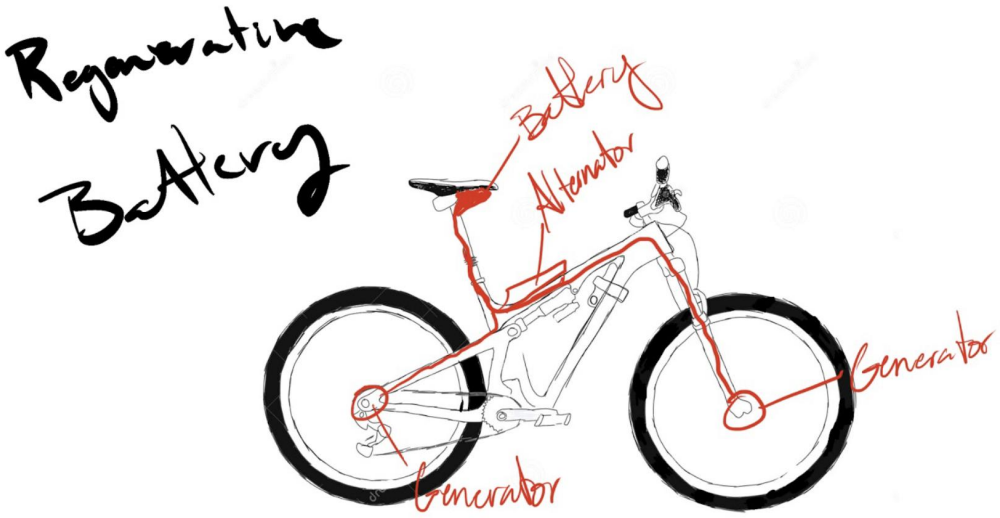
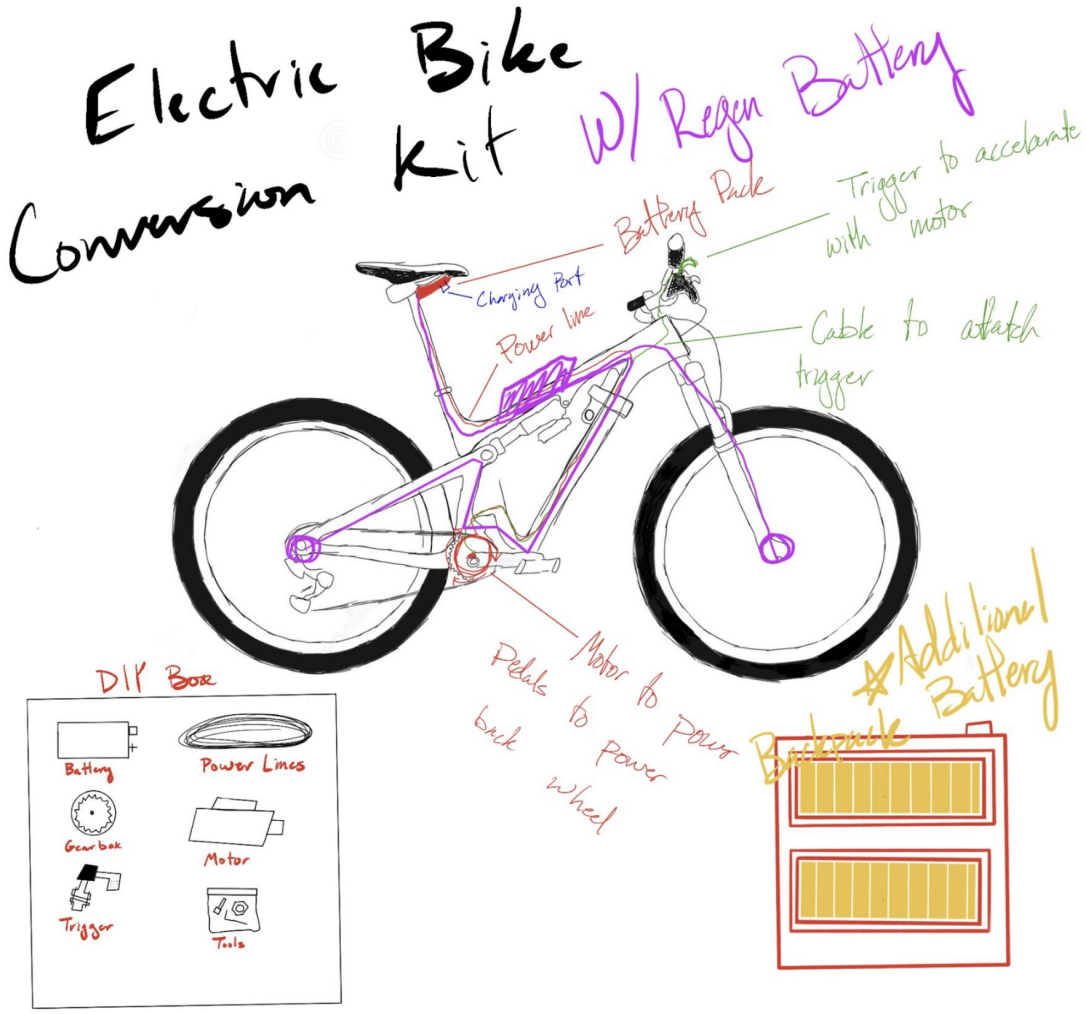


I then combined my first and third sketches to make a conversion kit with regenerative capabilities.



Ethnography Research:

After I determined a finalized idea and sketch, I looked to reach out to other people for ideas. I looked for avid bikers, bike shop employees, technical experts, and electric technicians. I went to Scheels and spoke to a bike salesman about his insights and he told me how I should buy an existing conversion kit and retrofit it with a dynamo bike hub which charges phones and powers lights. I also spoke to a professor at Kansas University who has a class in innovating bikes and he gave me some insight on how to install the components.

Then I determined a demographic POV as: Avid bikers who need to go longer distances with an ebike at an affordable cost which can attach to their own current bike.

Opportunity Statement:

I looked into the different issues of e-bikes and the opportunities for them:

A.	**need to charge battery**	**A. Recharging bike**
B.	**Too expensive to buy ebike**	**B. Make conversion kit so there is no need to buy new bike**
C.	**How to set up conversion diy?**	**C. Send a manual and videos for step by step conversion**
D.	**How to control?**	**D. Trigger next to gear shifters**

I then determined an opportunity statement as:

An affordable conversion kit to allow anyone to go faster and longer on mountain bike trails and never have to charge batteries as there is recharging.

I then began creating a mockup to accomplish features, fix issues customers had, andl determine how to create the prototype.

A. List the 3 key features the mockup will accomplish.

1. **Rechargeable battery**
2. **Motor with drivetrain**
3. **Regenerative Alternator**

B. How will the mockups 3 key features solve the top 3 consumer problems?

1. Motor will allow people to go faster and longer
2. Regenerative charging will allow people to go further without recharge
3. Battery will determine the amount

D. List materials or software systems are used to develop mockup?

1. **700Wh Specialized M2-700 battery**
2. 300 Watt bicycle generator (Alternator)
3. Wiring for both power and programming
4. 3D Printed Battery Case
5. RAD E-BIKE TRIGGER For controlling

It was determined that the bike was going to be configured in a way so that it would be regenerative, lightweight, and powerful.

I then focused in on who my target market would be and decided it would be a mix of:

Amateur who want more endurance to be able to climb hills

Avid riders who want to go further and faster

Pros who want to convert their own bike into electric

Decided that avid riders would be my primary market:

Avid riders

who go out on the trails for hours and want to have fun and be able to go further in a day with the electric motor helping them.

These are usually younger adults who enjoy the sport but don't want to have to go out and buy an ebike.

Aged 18-30.

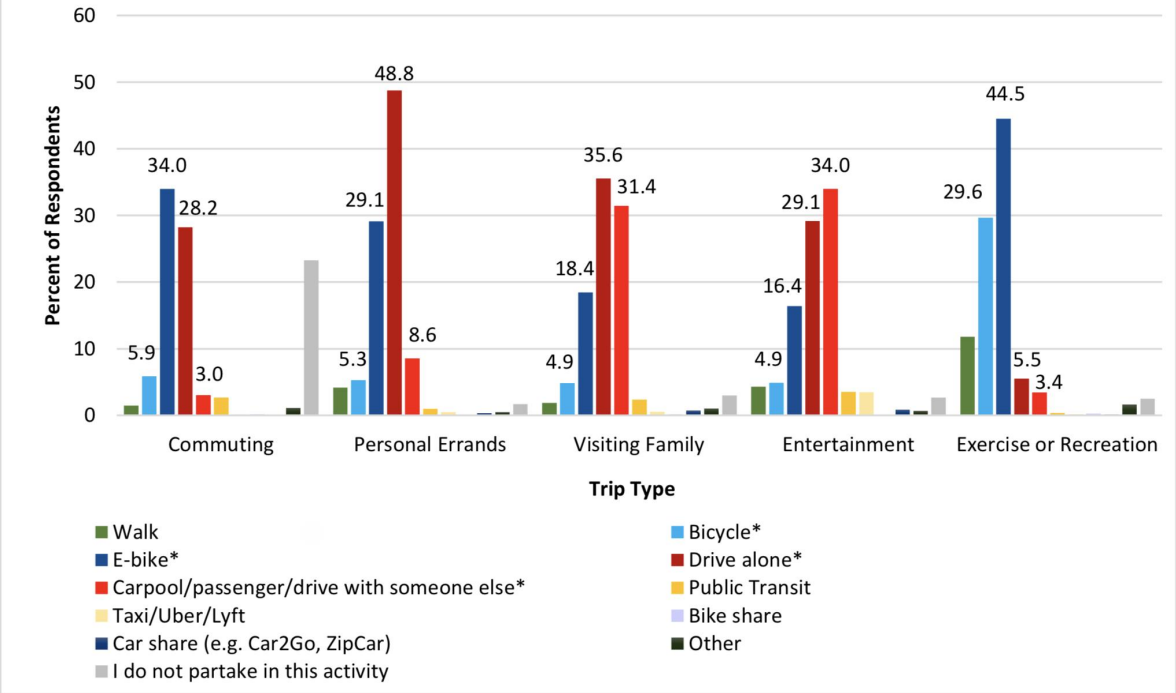


Figure 3.2: Mode Used for Various Trip Types Made by Respondents

And then the secondary market is going to be amateur and pro riders:

Amateur riders who want to ride but have issues as they are not able to have the conditioning required to make hard clubs so this product will allow them to go further and be able to enjoy biking more.

Professional riders who want an EBike

Table 3.10: E-bike Used as Primary Mode by Respondent Characteristics

	Percent of Respondents Who Selected E-bike as their Primary Mode by Group						
	All Respondents	Male	Female	<55	≥ 55	Physical Limitation	No Physical Limitation
Commute	34.0	35.3	31.5	**45.9**	**20.5**	**23.4**	**38.5**
Personal errands	29.1	**31.0**	**24.0**	**32.7**	**24.8**	27.0	29.8
Visiting friends/family	18.4	19.1	15.9	**21.0**	**14.9**	16.0	19.1
Entertainment	16.4	16.1	17.0	**19.3**	**12.9**	16.2	16.7
Recreation or exercise	44.5	45.8	41.8	**38.0**	**52.2**	**55.0**	**40.2**

Note: Bold Indicates significant differences between groups based on a chi-square test (p<.05)

Competitive Matrix:

Features	Pelokit (My Product)	Bafang Conversion Kit	Bafang Motor Kit 2	Dilenger Off-road Coversion Kit

Regenerative Battery	YES	NO	NO	NO
Faster Speed	YES	YES	YES	YES
Longer Distance	YES	YES	YES	YES
Motor on Pedals not hub	YES	NO	NO	YES
Need for new wheel	NO	NO	NO	YES

Product Roadmap:

Date	Feb 18th	April 2	April 30
Name	***Mockup***	***Alpha***	***Beta***
5 Key Features	**Bought the conversion kit** **Did research on the alternator systems** **Buy a cheap bike to prototype with** **Find a small generator which can be added to wheel hub** **Get wiring set up from the conversion kit**	**Contraption to collect power from the wheel spinning** **Alternator to take that power and convert it** **Conversion kit with components to power bike** **A box of some kind to hold all the parts on the bike** **Drivetrain which is located in center**	**The conversion kit contains both the regenerative and powered features.** **The kit is wired up from the package and preassembled.** **The kit fits on at least 50% of all mountain bikes** **The bike looks nice aesthetically** **The kit is water and dust proof**

3 Key Metrics	**start prototype with the new bike** **Bike gets wired up and has power to wheel** **Generator gets attached to the alternator**	**After 1 mile of decline, it will allow for ½ mile of flat land and ¼ mile of uphill** **Alternator part arrives by April 5th** **Conversion kit arrives by April 4th** **Alternator gets hooked up to conversion kit**	**3D printed box sealing the kit looks nice** **The kit can be packaged and weighs less than 40 lbs** **The wiring and installation is easy and has good instructions.**
Metrics Accomplish? **Adjustments**	**Broke open a USB cable and harnessed power from alternator**	**Laced in the wheel with original sized spokes. After they were too long I had to order smaller spokes.**	**Hooking up the Conversion kit with the alternator.**

Prototype Alpha:

Substitute	**Combine**	**Adapt**	**Modify**	**Eliminate**
Material or resource can you substitute to improve product? *Thicker bike spokes in order to keep them from bending due to torque from motor*	*What happens if different aspects of prototype were combined?* *If we combine the regenerative aspects where when the wheel spins the battery charges and the conversion kit which uses that battery to power the bike, a person won't need to charge their bike very often.*	*How could you adapt your prototype to serve another purpose? What other technologies or ideas could you adapt for your prototype?* *We could add this hub onto other aspects of products, not just a bike. We could adapt it to fit onto an electric motorcycle or to fit onto an electric mower.*	*What could you add to modify your prototype? What could you emphasize to create more value?* *We could add an option for a USB out and place it for people to charge their phones on the trails. We could add the option for a battery that you keep in your backpack so that you can charge it easier when you need to.*	*How could you simplify your prototype?* *Make sure it is easy to install and possibly get pre-threaded wheels to the customer with the hub in it.*