

Client Interview

3 February 2015

Technical Questions

How important is the time constraint of two minutes?

Two minutes is not fixed. Looking for something to charge quickly, in eyes of passenger of airliner. If we can justify doing it slower we can.

What should be the minimum life cycle of this device be?

Preferably at least a couple of cell phone cycles. Ultra caps have a very long life.

What size should this device be? Maximum vs. ideal.

Limiting factor that competes with ability to store energy, but should be about the size of an iPad. Idea is to make this attractive to people dashing through airports.

Does there need to be an interface of some kind?

Would like to have feedback, doesn't have to be elaborate. Can be on device or phone.

Does final product aesthetics matter?

Have potential customers all around. Can come up with ideas from anyone on campus.

Are there any limitations on what materials or components we can use?

No, but make it legal, and whatever is reasonable with cost. Parts should be about 1/6 of final cost.

What are the main components you think we will need to research?

Something to store energy, get energy from wall to device, and some way to control it. Look at Adafruit.

What are other related products that we can analyze that could benefit our research for this project?

Don't know of any; electric vehicles could be useful.

What materials are we going to be looking at for this project?

Look up ultra-caps; there are two different kinds. Can use south half of power lab (needs to be cleaned up a little). Packaging may be an issue. Would rather have it working but it should also look good.

What circuit diagrams/schematics do you recommend looking at or analyzing?

Minty boost, find some rectifier schematics online. May need thick traces in some places but not all. The sensing circuit in phone and charger.

If some phones can charge at this rate, should we focus on that type of phone only?

Target the phones that work, but it is better to sell 1 than 0. Make it so it serves the most customers.

We are going to have to research whether a USB cord can handle this.

As long as it charges the phone.
Anything in legal domain is fair game.

I'm sure Hess will help us out as far as protecting people... but are there any extra special safety precautions we need to consider with a large charged capacitor? Accidental discharge?

Charging lithium ion batteries, various ways to sense problems.

Trying to be vague, can use code or components (mosfets). Tracey Windley can help with keeping track of energy. Have the ability to put stuff on chip here.

Miscellaneous Questions

What are all the tools and utensils that will be accessible to us?

Whatever is in senior design lab and power lab, also can talk to Greg the technician. May be able to use spice for some stuff. Use the tools that are preferable.

Why was there failure last time this project was attempted?

Didn't understand USB interface or how to program phones.

How far did they get?

Had energy storage down, used larger components. How to use ultra-cap and how to protect them.

What kind of chargers currently charge at this speed?

None

These quick charges may not be good for phones or their batteries. Can we get some phones to test on?

Don't know, suspects we could. Talk to VP of region for cell providers to get phones, i.e. google. Last year's model would be cheaper and good compromise to possibly get.