

Minutes Meeting 2 30.09.2016

Present: Dominik, Loïc, Cyrill, Louai, Tamara, Mikka

Excused: -

Head: Dominik

Minutes: Mikka

Dominic will not be here on the 14th of October

Meetings could be also done on monday 17h - 19h if necessary

The following points have to be discussed:

1. Investigating in the different methods

a. Storage system

Batteries: AA batteries, etc... (some of them are rechargeable)

Lithium 110 mAh @ 3.6V

Graphite batteries → dense and powerful

Condensators (super-capacitors) → all kinds of powers

13mm diameter x 30mm = 7mAh @ 2.5V

b. Propeller

Windmill

→ miniature DC motor with propeller, spinning fast enough to create energy

Example 1: [Miniature wind turbine](#) 0.002-0.5 A @ 2-22V; rated wind speed 3 m/s

Example 2: [Wind turbine for cell phone charging](#) (no datasheet :/)

Example 3: [Another chinese wind turbine](#)

c. Shaker

For a hand cranked dynamo, there we need an inertia wheel

smallest dynamo \$3.00, 4V @ 0.9A @ 3000rpm

there is also the possibility to use magnetoinductive principle (inverse linear actuator)

d. Peltier & Membranes

→ see attachment dominic

[Piezoelectric element](#)

[Test video](#) Power supply 3.6V @ 100mA

e. LED

Loïc investigated different lighting systems → LED is the best one

SMD LED: Low: 30 lumens 65mA @ 3V -> 0.2 W

High: 150 lumens 350mA @ 3V -> 1 W

Best driver (least price) Microchip PIC12 (max current 250mA)

2. Brainstorming (activities, where is the biggest market?)

a. Mountaineering

b. Sports

- c. **Camping**
 - d. Miniaturization
 - e. Promotional gift
 - f. High end (luxury)
 - g. Stressball (gadget, gift)
3. Determine the scope of the project
 - a. Design a headlight that can be used for mountaineering, camping and sport
 - b. Problem with Peltier elements: Can we generate enough energy from body heat?
 4. Discussing the gant chart
 - a. The gant chart Louai has made is approved, but ordering the mechanical components could take longer, we have to take care about this
 5. Distribute tasks for next week
 - a. patent research (Tamara)
 - b. test peltier elements (Mikka & Dominic)
 - c. "market" research for headlights (Cyrill)
 - d. do 2 different PWS charts (Loïs + Louai)
 - e. Look at Ultra low Voltage Step-Up

Questions for assistant:

1. At which point does the lamp have to be industrializable?
2. Can it be a proof of concept?
3. Where to find mechanical components except China?
 - a. Farnell, Mouser, Digikey, Distrelec,

1. Condensators:
2. Voltage range, temperatur range (quite huge: -40 - 105°C)

Eg: 68mF at 6.3V --> 35x45mm (DxL) (traditional capa)	0.1m A h
10F at 2.5V --> 13x33.5mm (DxL) (super capa --> low voltages only!)	7mA h

3. Output not really constant over whole discharge (supercapa)
4. Really fast charging time (if enough A)
5. Higher Capacities available (size..)
- 6.
7. Li Ion batteries:
8. special charging cycle (complicated)
9. EG. 110mah at 3.8V --> 15x25x4mm
- 10.
11. Graphene battery
12. Higher power density than Li Ion
13. Eg: 1300mAh, 15V --> 75x35x36mm
- 14.
15. Coin Cell Li Ion Battery (rechargeable)
16. 110mAh at 3.6V --> 24.5x5.2mm (DxL)
- 17.
18. AA/AAA/etc batteries (Li Ion/nimH/...)

Zinc-carbon	Alkaline	2Li-Fe s	Li-ion	NiCd	NiMH
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19.

Typical capa city	540 n A h	860–1,20 0 mAh [5]	1,200 m A h	350 m A h	300–500 mAh	600–1,250 ^[6] mAh
Nominal volta ge	1.50 V	1.50 V	1.50 V	3.6-3. 7 V	1.25 V	1.25 V
	Not R C	Leaks (!)	Not R C	Charg e cy cl e	Overcharge --> cap loss Rather good choice (see wiki)	High drain devices (lot of amps)