

FireWire

Skoltech



Problem Statement

*Electrical access
in cold and
remote areas*



***We **help people** stay
connected to the **things**
that matter***



End user
No. of interviewed people = 210

82% suffer from lack of
electricity

96% make campfires



Current Solutions

Solar Panels, Fuel, Water and Wind generators

Depends on the
obstacles (fuel,
sun, wind,
running water)



Dinamo Machine

Requires
constant
physical
effort



Power Banks, Hydrogen Cells

Not reusable
in "forest"



Charging Stoves

Heavy,
unreliable



The FireWire Solution

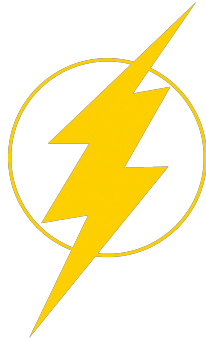
campfire/ gas stove



snow/ cold water

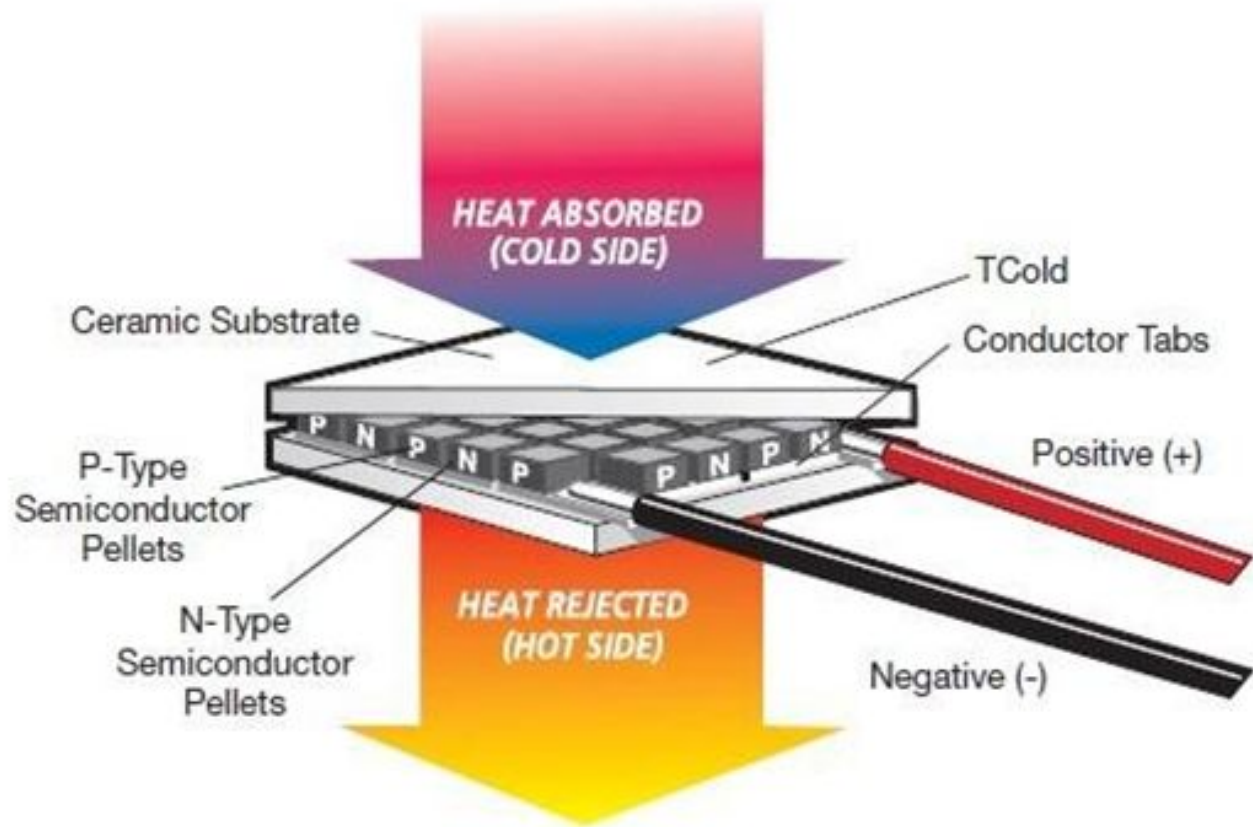


charging

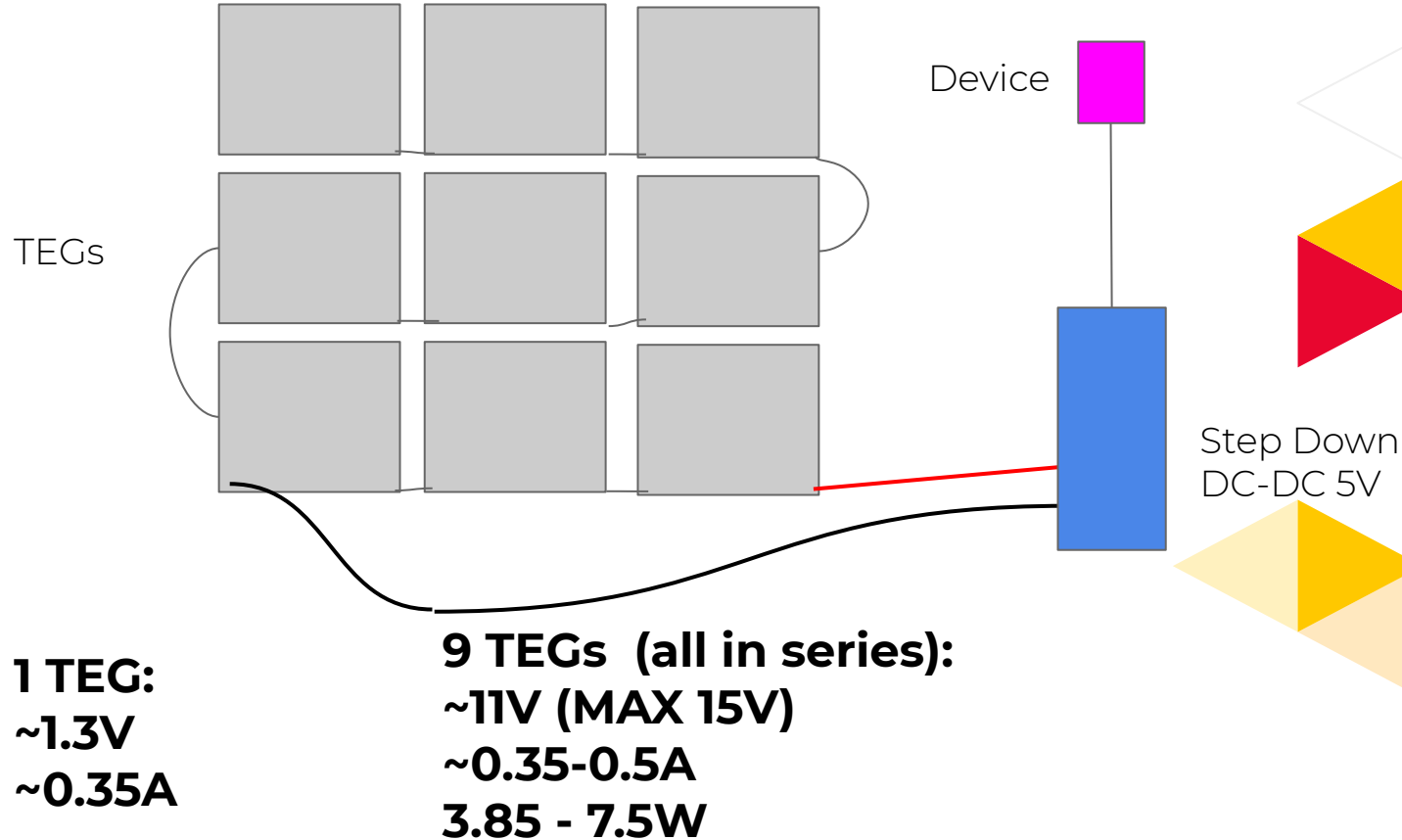


How we do it?

Thermoelectric generators (TEGs)



Configuration



The FireWire Prototype

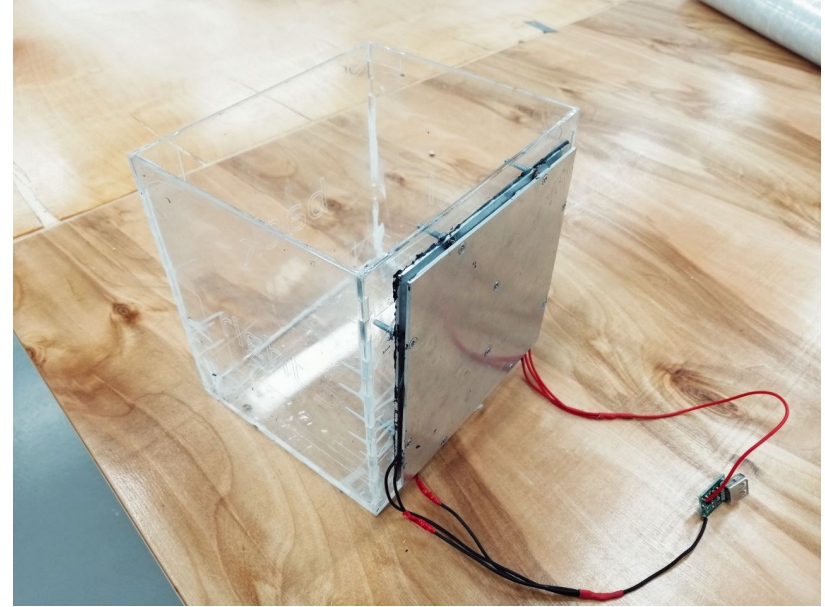
Current Weight: 880 grams

Current box is 370 grams

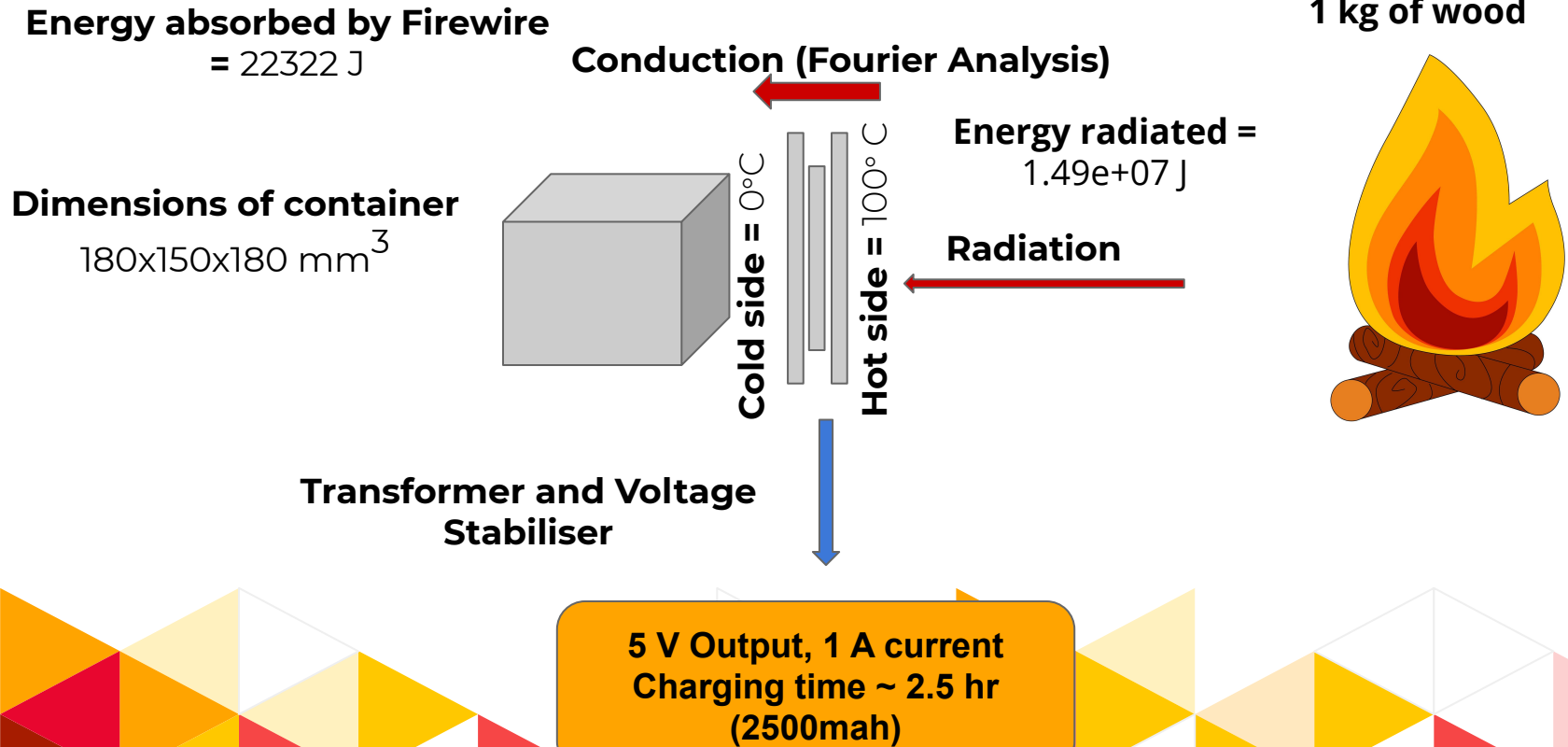
We will use silicon ~150 grams

Aluminum plate can be twice thinner

**We can achieve our goal of
<500 grams**



REALISTIC SIMPLIFIED CALCULATIONS



What makes us better?

Design

Lightweight,
easy to pack
(nice shape)

Price

(Compare to
other prices) vs
our main
competitor
Biolite Stove
\$130

Accessibility

Depends on the
person (you
create heat
source)



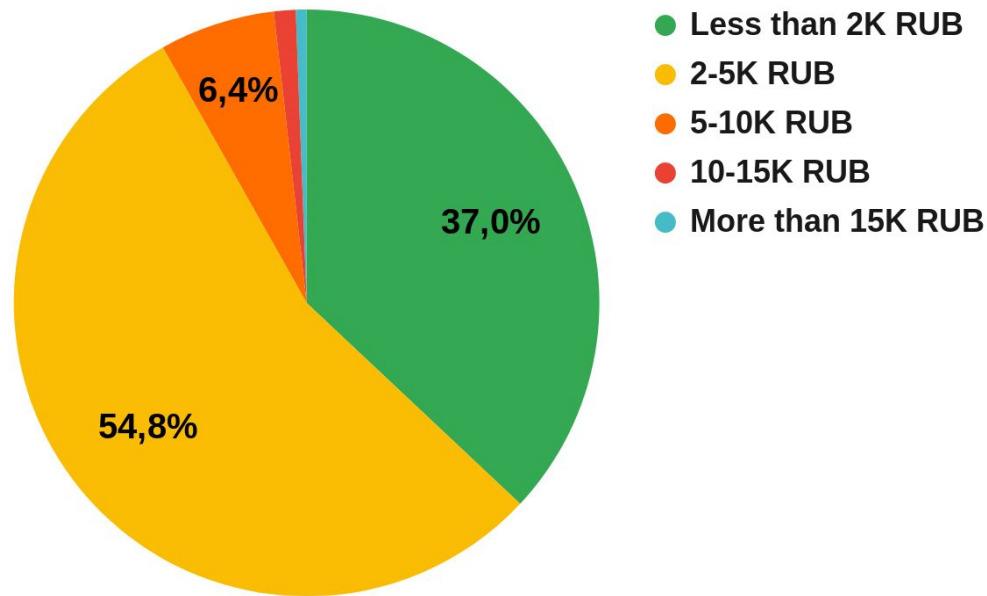


End user

No. of interviewed people = 210

70% would like to use FireWire

How much they are ready to pay?



End Users Market

Hikers

*"I really want to get
a chance to test
your device"*

Photographers

*"If you make such
a device, we will
pay you any
money"*



Wild nature photographers

- **Strong pain**
- **High budgets**
- **Experienced with competitor devices**
- **Willing to collaborate**



**СОЮЗ ФОТОГРАФОВ
ДИКОЙ ПРИРОДЫ**



*“If you make such a
device, we will pay you
any money”*

Dmitry Petenin,
Russian Union of Wildlife Photographers
representative



Hikers feedback

"If weight is less than a kilogram and efficient enough - that's very good".

"Design is not as important, most important is efficiency and reliability."

"I really want to get a chance to test your device"

"The price for a good autonomous charger is from \$75 to \$230"



MIDDLE TERM PLANS

FireWire

Testing

- Launching large-scale testing with p...
- Getting feedbacks from testers
- Analyzing statistics ('aiming')
- A/B testing of new design

Financial grants

- Industry Fair day presentation
- Karfidov lab grant
- Umnik grant
- Searching for other possible aid/inve...

Marketing

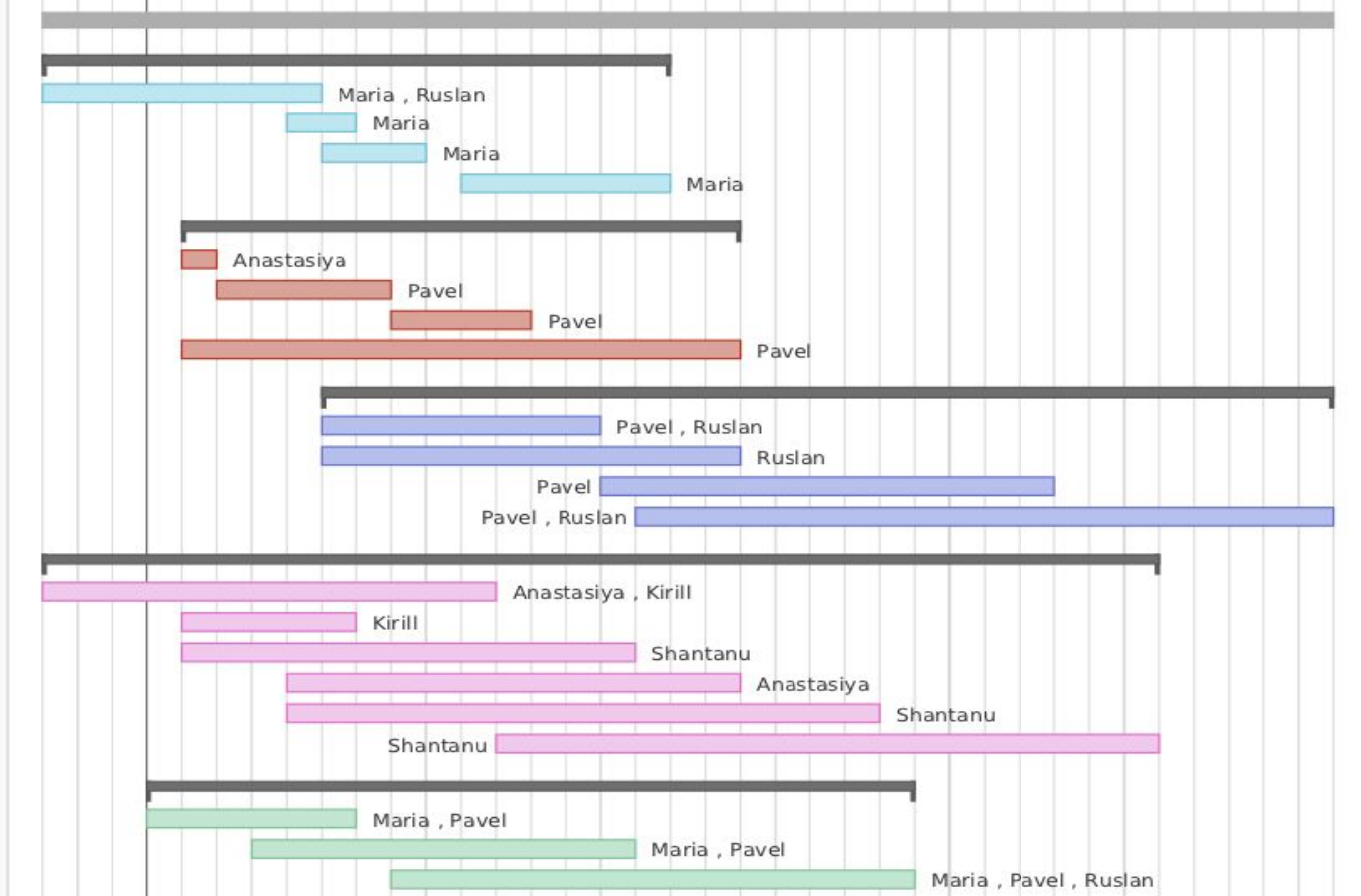
- Defining online-ads strategy
- Making web-site
- Offline events
- Marketplace agreements

Manufacturing

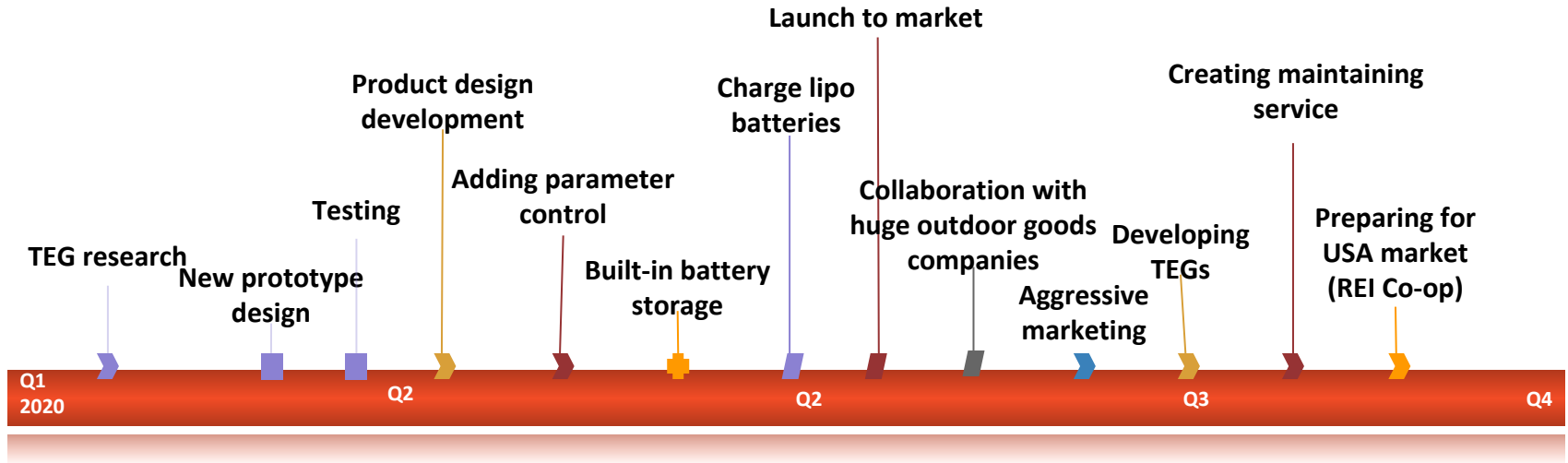
- Finding better details and materials
- Designing large-scale producing pro...
- Designing new types of devices
- Establish supply chain
- Software Development
- Establish manufacturing facility

Partnerships

- Finding key partners (Sportmaster, E...
- Meeting with partners
- Setting partnerships



Future thinking

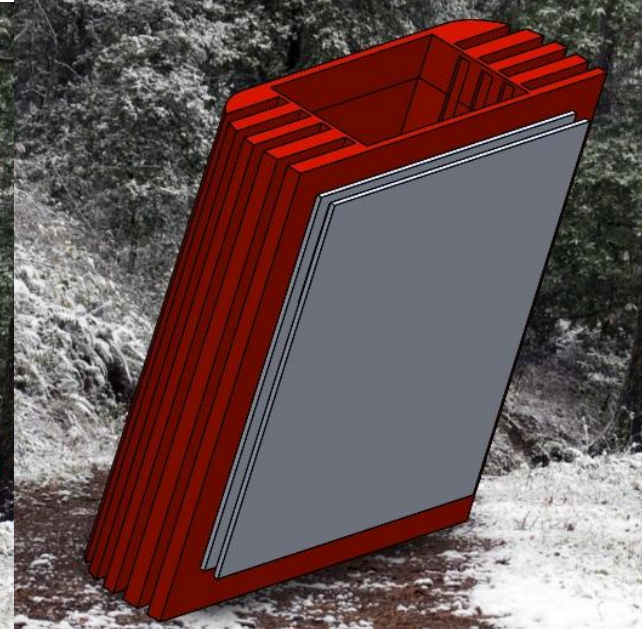


Future Device Vision

Foldable (Accordion design)

Durable (Don't be afraid to squeeze it in your bag!)

Light (<500 g)





Pricing and manufacturing

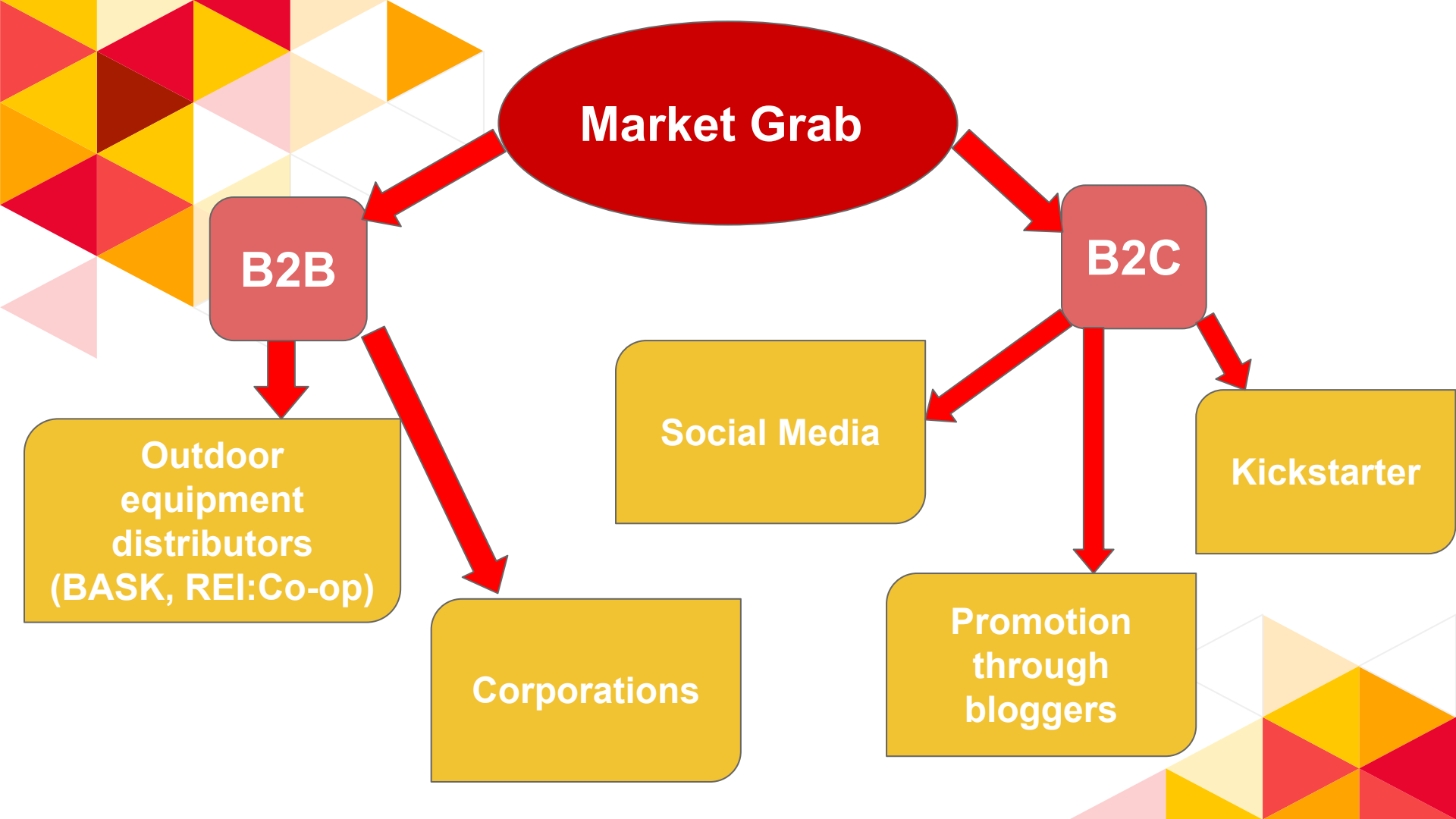
Current materials manufacturing costs ~\$40

Global markets

Extreme hikers and
photographers, further
research required to estimate

Key processes to establish

- Establish manufacturing facility and employees
 - Establish supply chain
 - Build brand and reputation
- 



Market Grab

B2B

B2C

**Outdoor
equipment
distributors
(BASK, REI:Co-op)**

Corporations

Social Media

**Promotion
through
bloggers**

Kickstarter

Thx! Questions?



OUR TEAM



Anastasija Cumika
Designing,
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Pavel Burmistrov
Business development



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Mechanical, electrical
engineering



Mariya Bakhanova
Market research



Shantanu Jain
Calculations,
scientific validation



Ruslan Aliev
Advertisement,
communication

Specifications of FIREWIRE

Dimensions of Aluminium Plate	180x150x2 mm
Absorption Coefficient of plate	0.5
Dimensions of one TEG Device	40x40x4 mm
Arrangement of TEGs	9 TEGs, 3 in Series & 3 such combinations in parallel
Seebeck Coefficient of TEG	0.053 V/K
Temperature Difference Maintained	100 Degrees
Output Current	1.05 A
Output Voltage	~ 5 V



TECHNICAL DESCRIPTION

Type of output	DC
Output current, A	~1 A
Output voltage, V	5 V
Total weight of the device, gr	< 500 gr
Estimated time of charging, hours	2.5

Technical requirements for the device are based on smartphone charger requirements.

2 days of device availability vs daily access

