









# Fresh Solutions

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### Introduction



- 20% of the children born every year are not vaccinated according to Unicef.
- In 2015, an estimated 19.4 million children worldwide failed to receive routine immunization services.

This was due to: Inability to transport the vaccines for long distances due to lack of preservation of the cold chain.





## A walk through the procedure





- Existing solutions –
- Intended users
- Product requirements









	Product	Comments	Energy supply	Costs	Existing products
Mechanical compression / steam with photovoltaic modules		26 Litres of capacity wich makes it a little heavy. It doesn't have battery.	Uses compressor, mechanical problems can occure.	710.005	Summit SPRF26 Portable medical freezer coolers.
Adsorption with biomass		Technology in the development phase, low cost, large size.	Any available local source, such as agricultural remains.	Medium-high cost, average operational cost.	Just investigation
lce		Doesn't get a battery. The ice gets melt. It's small (only 8 Litters).	Ice cubes	132.995	VCA8F – Vaccine carrier
Soft gel	atter a	Doesn't have battery. Doesn't have a temperature regulator.	Soft gel (18 h of temperature maintenance)	78.3 £	The nomad portable coolers SKU: MD8L-S
Hard gel	ate .	Doesn't have battery. Doesn't have a temperature regulator.	Hard gel (37h of temperature maintenance)	81.7£	The nomad portable coolers SKU: MD8L-H

### **Our Solution**

A portable vaccine cooler to store vaccines at low temperatures enabling transportation of cold vaccines to remote areas.







## Functionality

#### **A. Principles of operation**

1. The Thermoelectric cooling





2. Vacuum





#### 3. The nature of water







### Functionality

#### **B.** The control of temperature

• A C++ programmed ARDUINO circuit board









### Conclusions



- The principles of operation must be tested in the correct situation.
- The cooler system should be improved to reach the necessary temperatures.

### And

- Once the proposed technology is successful, a portable vaccine cooling machine will be manufactured.
- Many countries in Africa will be able to use the machine.
- This intervention will save many young lives.
- Lets make the world a better place.

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### **Thanks for your attention**

