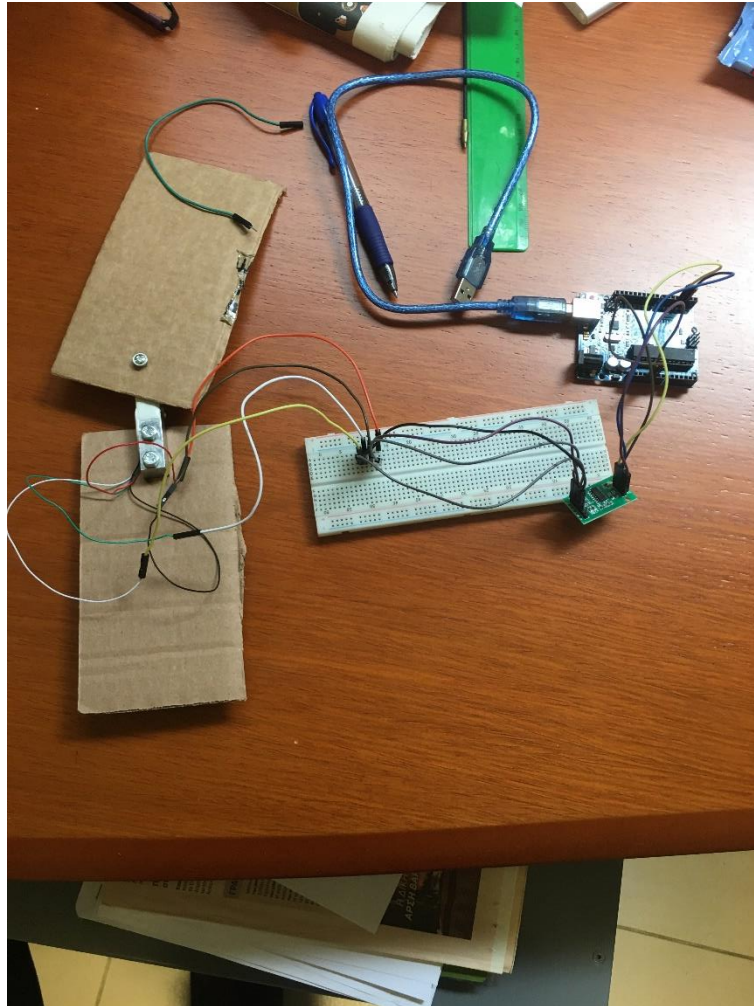


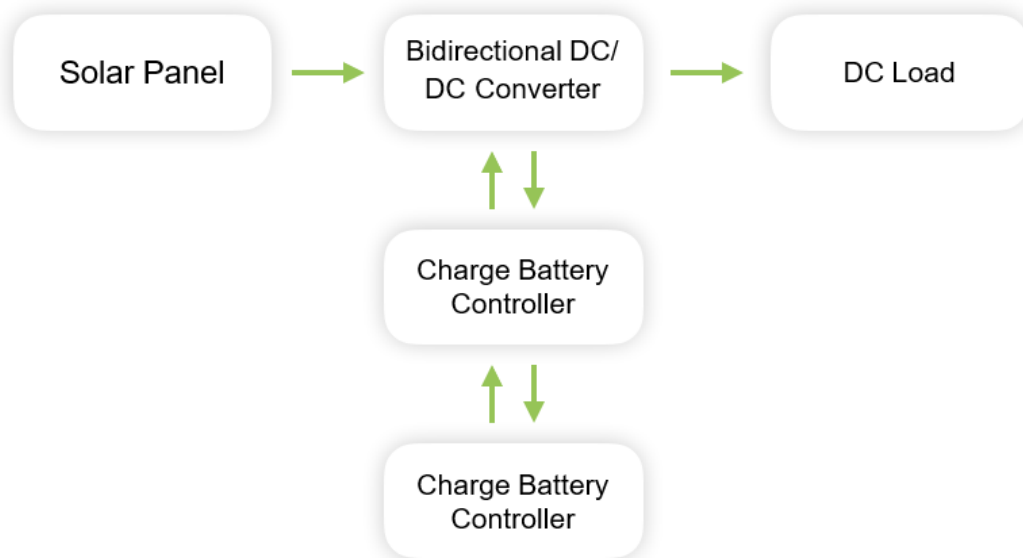
Bin Prototype:

The bin prototype was developed during the competition. Due to some problem with the wires until now we managed to connect only the weight sensor using the microcontroller Arduino Mega 2560, the load sensor Electronic Arduino Weight Sensor and the HX711 sensor to calculate the weight.



Circuit Developed

The block diagram of the operation of the bin is:



The bin will be supplied by a solar panel. The surplus of the energy will be storage for future usage to lithium batteries. A Charge Battery Controller will manage the charging and discharging of the batteries and the bidirectional DC/DC Converter will allow the flow from both of the sources

Arduino Codes:

The first code is to calibrate the sensor as it is required to have more precise calculations:

```

#include "HX711.h" //Starting the library of the sensor

#define LOADCELL_DOUT_PIN 3 //Define the pins which are used
#define LOADCELL_SCK_PIN 2 //Define the pins which are used

HX711 scale;

float calibration_factor = -7050; //-7050 max scale setup

void setup() {
  Serial.begin(9600);

  scale.begin(LOADCELL_DOUT_PIN, LOADCELL_SCK_PIN);
  scale.set_scale();
  scale.tare(); //Reset the scale to 0

  long zero_factor = scale.read_average(); //Get a baseline reading

  Serial.print("Zero factor: "); //This can be used to remove the need to tare the scale. Useful
  in permanent scale projects.

  Serial.println(zero_factor);
}

```

```

void loop() {
    scale.set_scale(calibration_factor); //Adjust to this calibration factor
    Serial.print("Reading: ");
    Serial.print(scale.get_units(), 1);
    Serial.print(" kg");
    Serial.print(" calibration_factor: ");
    Serial.print(calibration_factor);
    Serial.println();
    if(Serial.available())
    {
        char temp = Serial.read();
        if(temp == '+' || temp == 'a')
            calibration_factor += 10;
        else if(temp == '-' || temp == 'z')
            calibration_factor -= 10;
    }
}

```

The following code is to take measures depending on the weight

```

#include "HX711.h"

#define calibration_factor -7050.0
#define LOADCELL_DOUT_PIN 3
#define LOADCELL_SCK_PIN 2

HX711 scale;

void setup() {
    Serial.begin(9600);
    Serial.println("HX711 scale demo");
    scale.begin(LOADCELL_DOUT_PIN, LOADCELL_SCK_PIN);
    scale.set_scale(calibration_factor); //
    scale.tare();
}

```

```
    Serial.println("Readings:");  
}  
  
void loop() {  
    Serial.print("Reading: ");  
    Serial.print(scale.get_units(), 1); //scale.get_units() returns a float  
    Serial.print(" kg");  
    Serial.println();  
}
```

Sources Used:

- [1] <https://www.mschoeffler.de/2017/12/04/arduino-tutorial-hx711-load-cell-amplifier-weight-sensor-module-lcm1602-iic-v1-lcd/>
- [2] <https://www.instructables.com/Arduino-Scale-With-5kg-Load-Cell-and-HX711-Amplifi/>