

# C2C-NEWCAP SUPERCAPACITOR Towards a safer high performance energy storage device



# C2C - New Cap

#### 1.2V

Nickel Carbon supercapacitor

Designed and Assembled in Portugal



# **Batteries vs Supercapacitors**

Rosa Mota - Portuguese Marathon runner Seul gold medal 1988

Lus

#### HIGH SPECIFIC ENERGY SLOW DISCHARGE PERIODS

#### When to choose batteries and supercapacitors?





#### Usain Bolt - Jamaican sprinter Eight-time Olympic gold medal

#### HIGH SPECIFIC POWER FAST DISCHARGE PERIODS



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# **Supercapacitors market** 4B€ by 2020



Laptops, tablets and phones







Hybrid or **Electrical vehicles** 

#### **EXCLUSIVE BATTERY** MARKETS



Long range electrical devices



**Power tools and** electronics devices





**UPS and emergency** backup systems









#### CASE STUDY ENGINE STARTING

# Dead battery is a heavy problem...





Batteries not only have to crank/start engines, but also to run electrical loads such as lighting, lift-gates, sleepers, as well as other energy-intensive loads. Adding to this, low temperatures critically contributes to the reduction of battery performance.



Lower temperature increases viscosity in battery electrolyte and engine lubricant. This causes a decrease in battery performance and an increase of the required power to start the engine.

# ... specially in big diesel engines.

# **PAINS DUE TO START FAILURE:**

- Delays on delivery
- Loss of revenue
- Frequent battery replacements

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#### CASE STUDY ENGINE STARTING



### **Replace one Lead Acid Battery for a C2C-NewCap supercapacitor**

- Eliminate no starts from a "dead" battery under any  $\checkmark$ temperature range
- Eliminate the cost associated with jump-starting  $\checkmark$
- Eliminate the down time  $\checkmark$

# Solution



- ✓ No delayed deliveries
- ✓ No maintenance cost and longer life solution
- Easy to install  $\checkmark$
- Lower environmental impact greener solution

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# Technology - What makes us different?



#### Most supercapacitor competitors



<u>Carbon</u> Positive electrode (Electric double layer) <u>Carbon</u> Negative electrode (Electric double layer)

Separator with organic electrolyte

STRUCT IN

Unlike common (symmetric) Supercapacitors, which use two carbon electrodes embedded in a flammable and toxic electrolyte, C2C-NewCap patented hybrid technology consists in pairing Nickel and Carbon based electrodes in a safe aqueous electrolyte.



**C2C-NewCap** 



## Market



#### **Carbon-Carbon supe** (Most competi

Capacitance

Self Voltage Regulation

Instalation

Safety

**Complex instal** 

**Flammable and** 

#### **Competitors electrolyte:**





Market benchmark	
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	C2C-NewCap
rbon supercapacitors st competitors)	Nickel-Carbon Supercapacitor
$\star\star\star\star$	
plex installation	Easy to install
mable and toxic	Safer - water based electrolyte





## **Achievements**





Cap Table after conversion: 70% Founders ; 15% Caixa Capital; 15% Innoenergy

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Rui Silva Full time Co-Founder & Exec. Manager; Material Eng., 2 year in Material Science R&D; 2 years in Automotive Industry as Process Engineer



André Mão de Ferro Full time Co-Founder & Exec. Manager; Environmental Eng., 4 years R&D Inorganic Chemistry and Physical Chemistry of Ionic Liquids



Cátia Piedade Full time Product Engineer; Biomedical Eng., 2 years Material Science R&D



Xavier Delacroix Part time External Director; Aeronautical Eng., former General Manager at Saft, +20 years Energy Storage Industry



Leonor Costa Part time Business Development; Portugal, Economics, +20 years Business Management

#### **Executive Team**





Designed an

C2C

# THANK YOU







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