

**MUTLU**®

Hatice Gökdemir

# ACTIVITIES



## MUTLU Battery Plant İstanbul

Closed Area:	64.000 m <sup>2</sup>
Open Area:	142.000 m <sup>2</sup>
White Collar Employees:	F: 84 - M: 138
Operation Employees:	925 (M)
<b>TOTAL EMPLOYEES:</b>	<b>1.147</b>



## MUTLU Plastics Plant İstanbul

Closed Area:	6.000 m <sup>2</sup>
Open Area:	5.000 m <sup>2</sup>
White Collar Employees:	F: 2 - M: 4
Operation Employees:	66 (M)
<b>TOTAL EMPLOYEES:</b>	<b>72</b>



## MUTLU Recycling Plant Kütahya

Closed Area:	8.500 m <sup>2</sup>
Open Area:	43.500 m <sup>2</sup>
White Collar Employees:	M: 3
Operation Employees:	28
<b>TOTAL EMPLOYEES:</b>	<b>31</b>

## MUTLU BATTERY - Turkey - 269.000 m<sup>2</sup>

Closed Area: 78.500 m<sup>2</sup>

Open Area: 190.500 m<sup>2</sup>

Total Employees: 1.250 = Wce: 231 (F: 86, M: 145) - Op: 1.019 (M)

# STARTER BATTERIES

MULU



















Technology



# OE REFERENCES (SINCE 1945)



OE solution provider satisfying technical and performance expectations of passenger car, commercial vehicle and tractor manufacturers as well as military applications.

 Ford	 TOYOTA	 RENAULT	 Mercedes-Benz	 NISSAN	 PEUGEOT
 HONDA	 FIAT	Otokar	 HYUNDAI	 MITSUBISHI	 BMC
 KARSAN	 ISUZU	 MANI	TEM SA	 nurol	aselsan
	 SANKO	 SDF Farming Technology. Since 1927.	 BASAK		

# INDUSTRIAL BATTERIES ✓

**MUTLU**



VRLA



STATIONARY



TRACTION



# INDUSTRIAL OE REFERENCES (SINCE 1945) ✓



			 TURKISH AIRLINES		
					
					



# RESEARCH & DEVELOPMENT

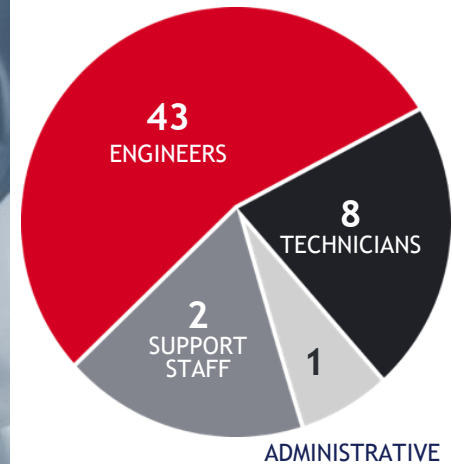


ELECTRICAL  
TEST

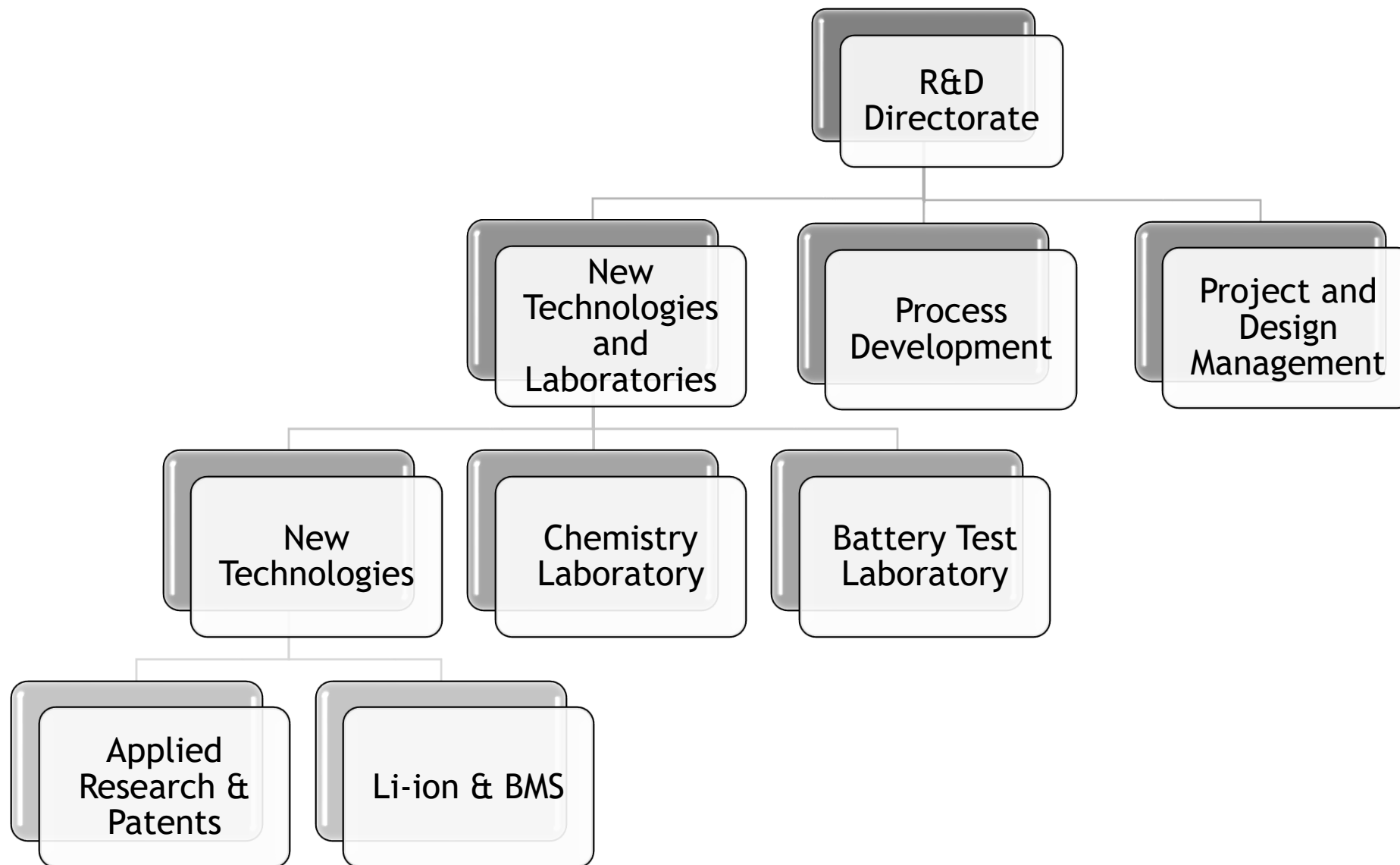
CHEMISTRY  
TEST

MECHANICAL  
TEST

2015, R&D Center Approval



# R&D CENTER - Organizational Structure





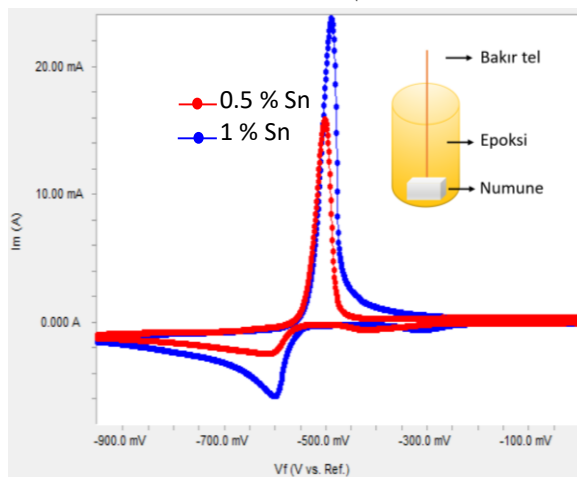
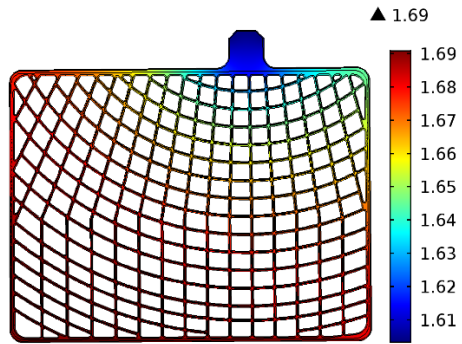
## **7 Ongoing TEYDEB Projects with total incentive rate of 3.500.000 TL (Apart from operational projects)**

- 1- New Generation Grid Design (3160706)**
- 2- Developing a method to analyze  $\alpha$ -/ $\beta$ - PbO<sub>2</sub> ratios by shortening the formation time in Lead-Acid batteries (3160708)**
- 3- Improving Charge Acceptance in S & S Batteries with Carbon Additives(3160727)**
- 4- Effect of Metals (Sn, Ba) on Corrosion Resistance of Pb-Ca-based Grid Alloys (3160833)**
- 5- Development of energy storage systems compatible with renewable energy sources(3170597)**
- 6- Development of a High Capacity Continuous Casting Technique Suitable for Positive Grid Production (3170569)**
- 7- Development of lead acid / lithium ion dual battery systems for 12V micro hybrid vehicles with BMS(3170398)**

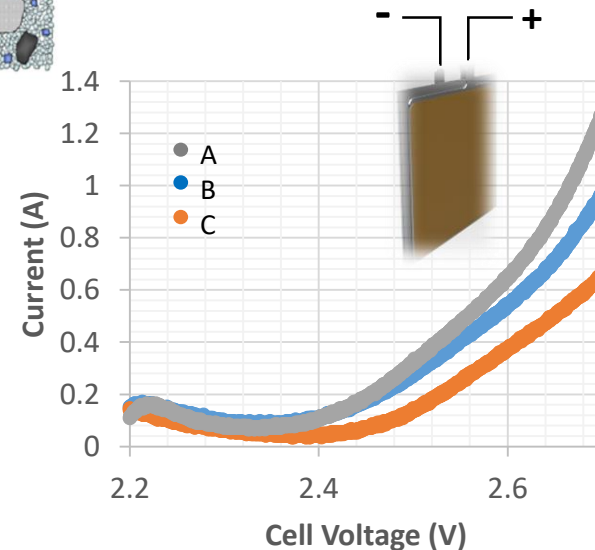
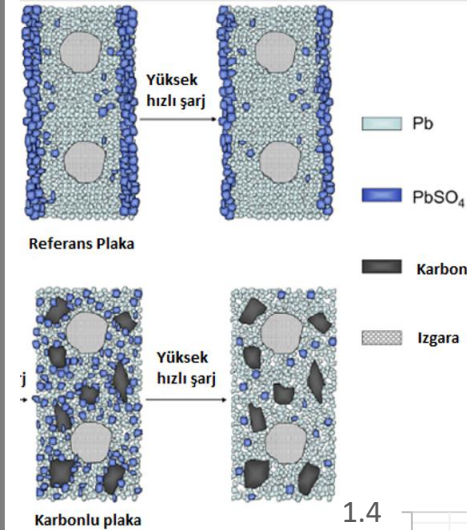
# New Technologies Group - Applied Research

- Grid Design & Simulations
- Alloying Metals
- Electrochemical Tests

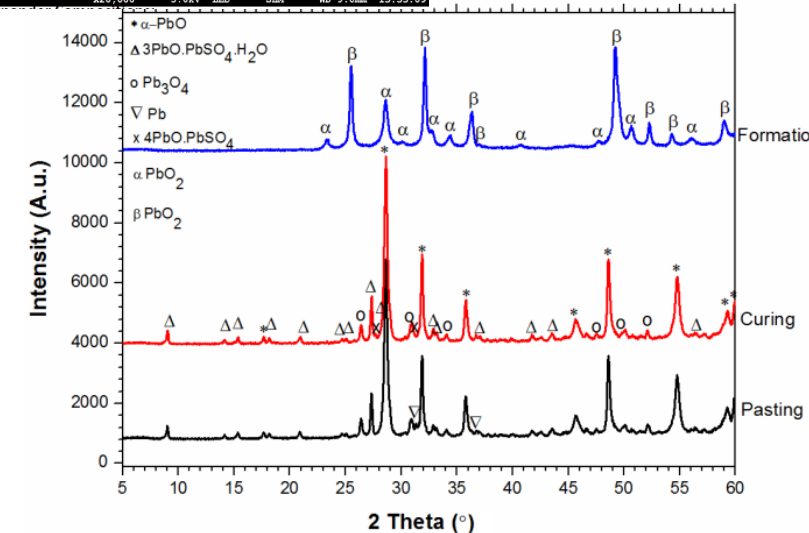
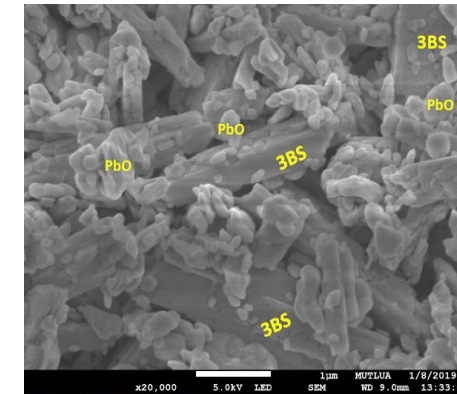
A(1)=-83 A Surface: Electric potential (V)



- High performance advance organic additive development



- Curing process optimization
- Defining the  $\alpha$ -/ $\beta$ -PbO<sub>2</sub> rate for optimum performance



# New Technologies Group - Li-ion & Battery Management System



- ❑ 12 V Micro hybrid battery
- ❑ LFP Batteries + BMS



- ❑ Electrical motor
- ❑ 360 V NMC +BMS



Remaining Capacity: 100  
Current: -36.1  
Total Voltage: 12.7

Cell 1	Cell 2	Cell 3
Voltage: 3.16 V	Voltage: 3.17 V	Voltage:
Temp. 12 °C	Temp. 13 °C	Temp.
SoC: 7.86	SoC: 7.86	SoC:

OPEN Relay CLOSE Relay Flash LEDs

Current  
Voltage



- ❑ 48 V Residential energy storage
- ❑ LFP 48 V, 50 Ah



MPPT Inventor

LFP, 48 V





# New Technologies Group - Li-ion & Battery Management System

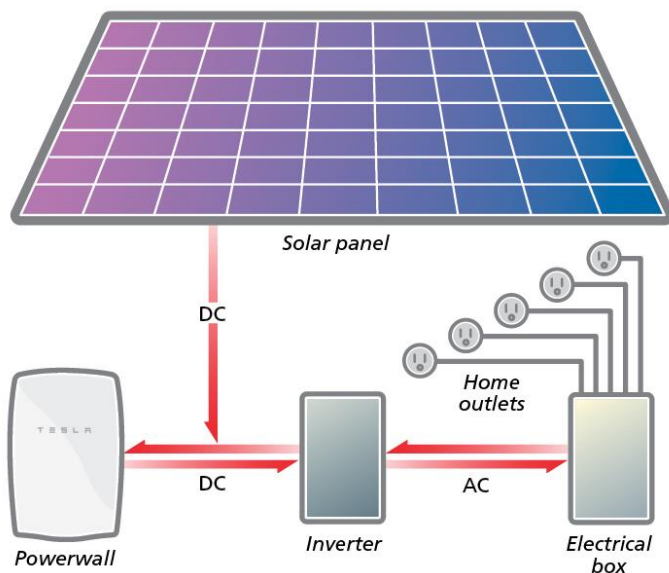


❑ Industrial storage

❑ Pb-Acid VRLA vs. Li-ion Batteries

➤ Cycle: 600 vs. 3000

➤ Cost: \$ vs. \$\$\$



# Contact

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