

# DEMOBASE

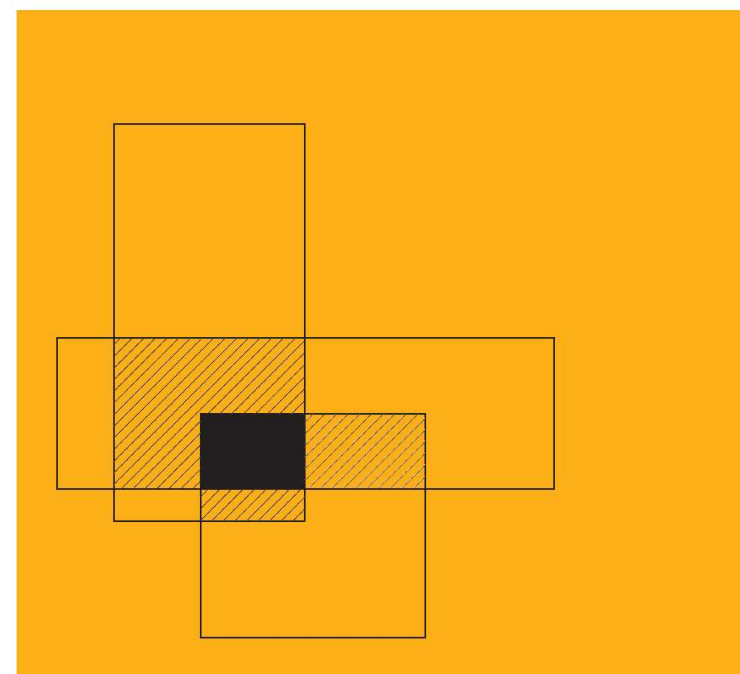
**PHILIPPE DESPREZ,  
SAFT TOTAL**

**SEPTEMBER 16<sup>TH</sup> 2020, JOINT NETWORK EVENT  
(GRAZ, REMOTELY)**



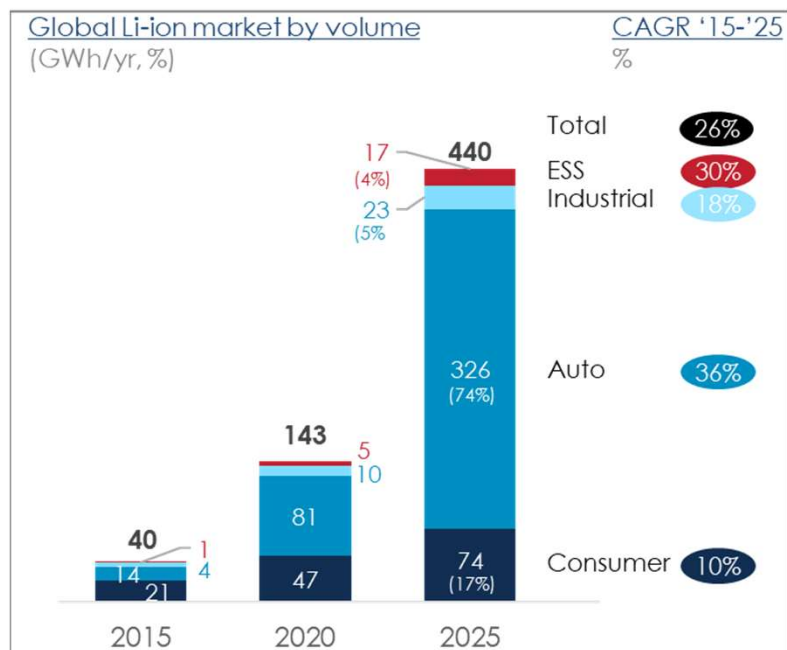
This project has received funding from  
the European Union's Horizon 2020  
research and innovation programme

## JOINT NETWORK EVENT



## Market Information

**Strong Li-ion market growth (in volume) from 2015 to 2025, driven by automotive**



SOURCE: Saft internal analysis, based upon multiple interviews & market studies

**ECA 2030**  
Electric Connected Automated Cars  
invented for the 2030 Customer

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Roadmapping Workshop for Human Centered Mobility  
at Centro Cultural Andratx, 30./31.01.2018



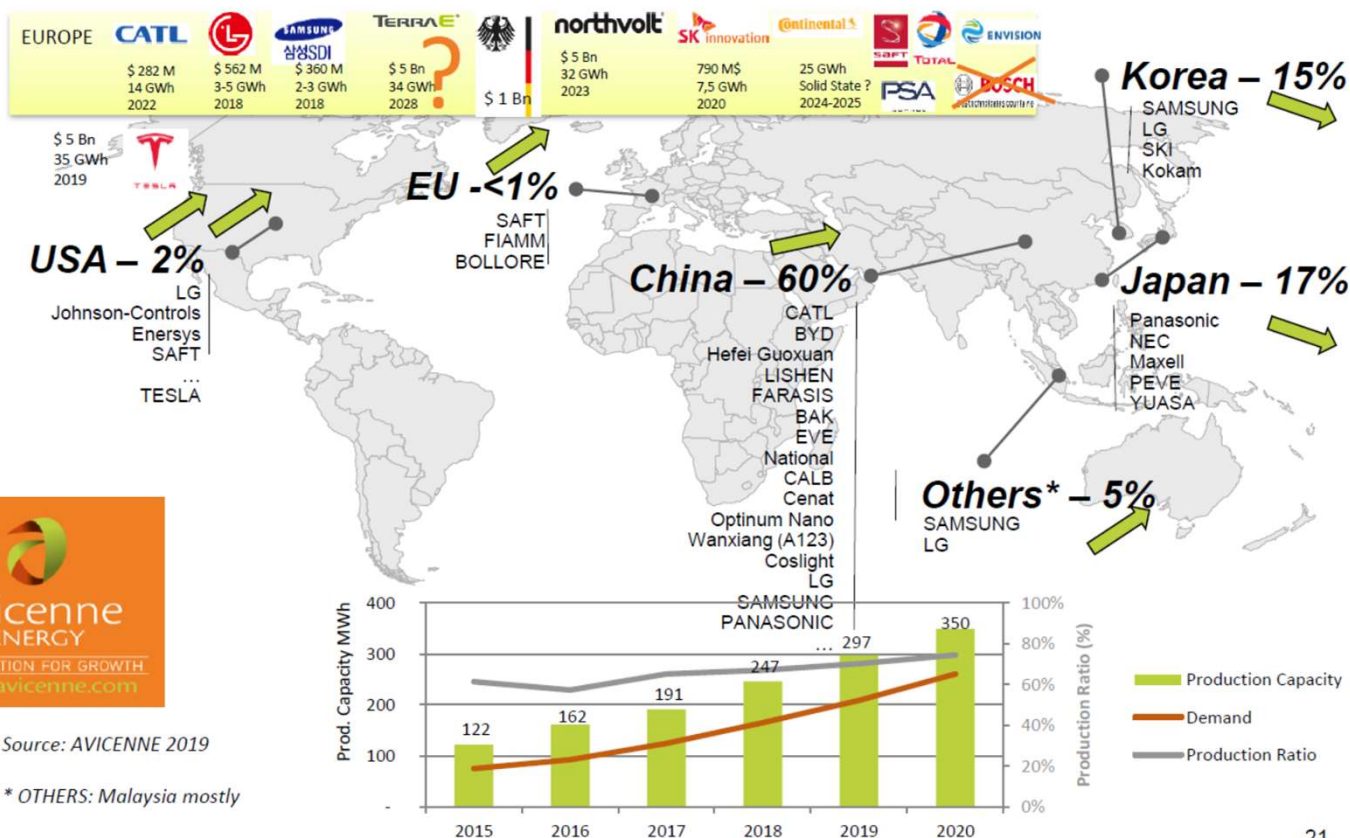
### Sensitivity

- **Uncertainty on automotive volume** from 145GWh<sup>1</sup> to >400GWh<sup>2</sup>, due to Chinese market and EV average packsize.
- **Uncertainty on ESS volume in %**, but small impact overall.

# Market Information

## LITHIUM ION CELL PRODUCTION

European market demand  
150 GWh in 2025



**LASTEST  
NEWS**

**Groupe PSA and Total create  
"Automotive Cells Company", a  
joint venture dedicated to the  
manufacture of batteries in  
Europe**

Paris, September 3, 2020



- Develop production capacity, essential to accompany the growth demand for electric vehicles in a European market estimated at **400 GWh by 2030**, i.e. 15 times the current market.
- Ensure industrial independence in Europe for the conception and manufacture of batteries, with an initial capacity of 8 GWh, reaching a cumulative capacity of 48 GWh on both sites by 2030. It will represent 1 million electric vehicles produced per year, i.e. more than 10% of the European market.



# DEMOBASE General Information



GV-07-2017 –Multi-level modelling and testing of electric vehicles and their components:

**DEMOBASE: D**ESign and **MO**delling for improved **BAT**tery **S**afety and **E**fficiency

Type of Action: RIA  
Duration: 36 month  
website:  
EC Contribution:

Grant No: 723119  
Start Date: 01 Oct 2017  
[www.demobase-project.eu](http://www.demobase-project.eu)  
7,451,520.00 €

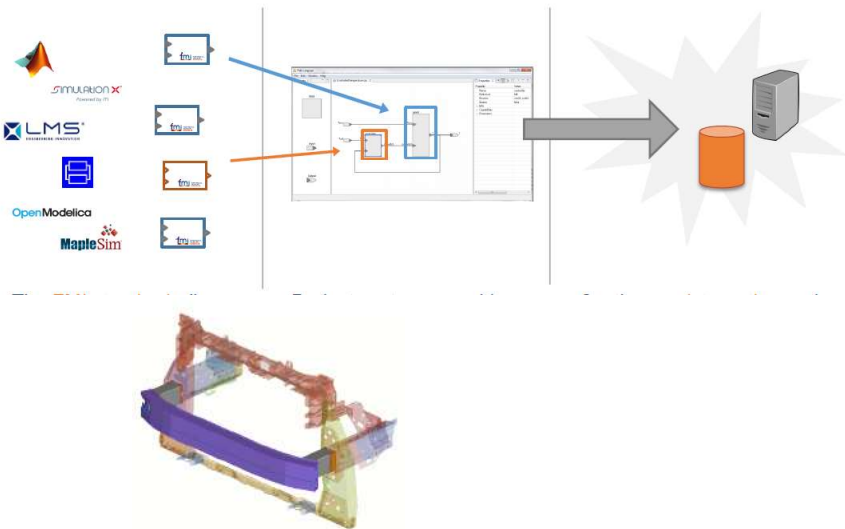


Joint Network Event : OBELIX - HIFI ELEMENT - DEMOBASE  
GRAZ remote 16th of Sept. 2020

# DEMOBASE General Information



## Massive Digitalization



## Recycling

## Hardware Counter-parts



## Measuring equipment



INERIS battery safety tests platform

## Objectives

1. COST REDUCTION:
2. SAFETY
3. EFFICIENCY

## Results : Proposals

2 pm session

### ▪ Revolutionnary vehicle:

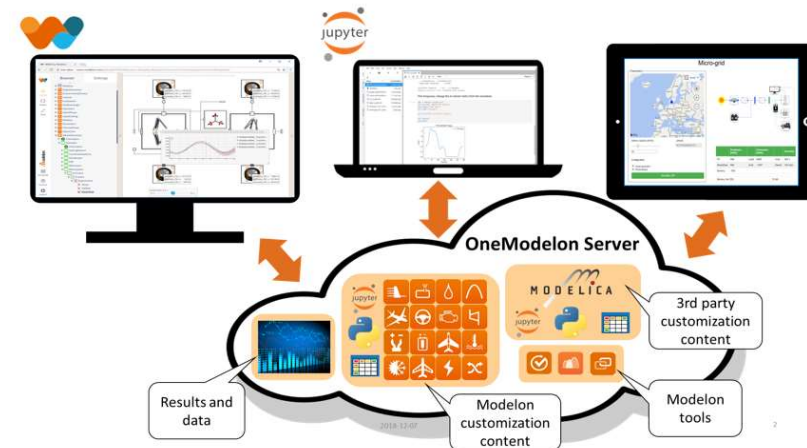
- Vehicle under development with low cost **tubular structure** : No high investment for Stamping (chassis, body case)



11h45 am  
session

### ▪ Democratisation of Simulation activities:

- Open Cloud based solution

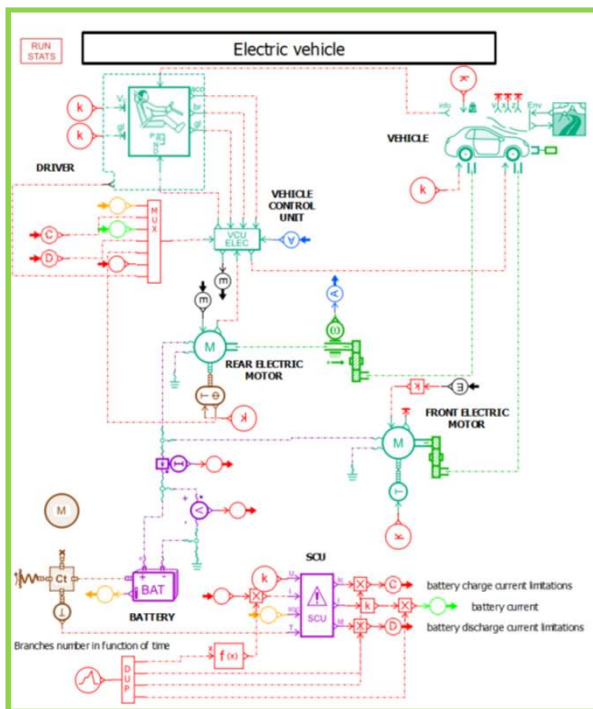


# Results

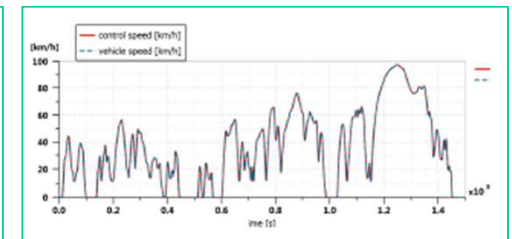
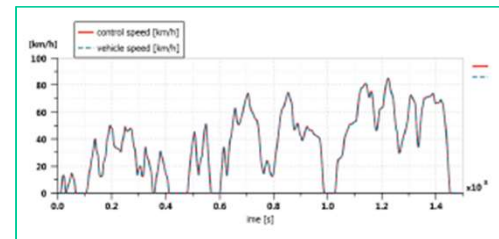
## Fail operational concept and High efficiency EV

- Demobase IFEVS **EV efficiency** by simulation (IFPEN): **80.6 Wh/km on WLTC2** and 89.5 on WLTC3.1
  - Range reduction only in case of branches failure (in all cases acceleration below 3s for 0-50 km/h)

**11h45 am  
session**



Amesim simulation test bench



1 branch  
failure

2 branches  
failure

		WLTC 2		WLTC3.1	
		Range (km)	Consumption (Wh/km)	Range (km)	Consumption (Wh/km)
V2	28s9p gen 3 cells	154	80.6	139	89.5
New pack					
V2	28s12p gen3 cells	207	80.6	186	89.5
New pack					
V2	28s6p gen3 cells	102	80.6	91	89.5
New pack					
V2	28s3p gen3 cells	49	80.6	44	89.6
New pack					

Results



# Results

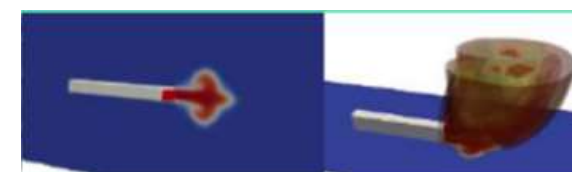
## Extensive characterisation and simulation on Safety

- Simulation of Thermal runaway propagation

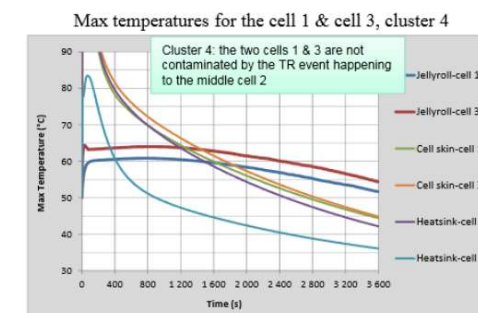
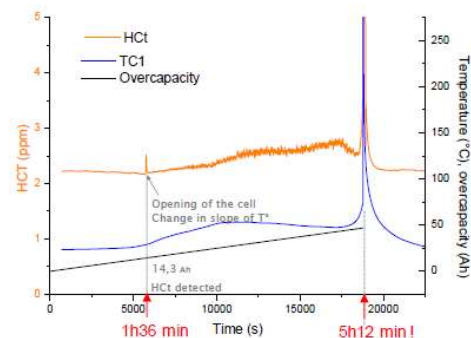
2 pm session



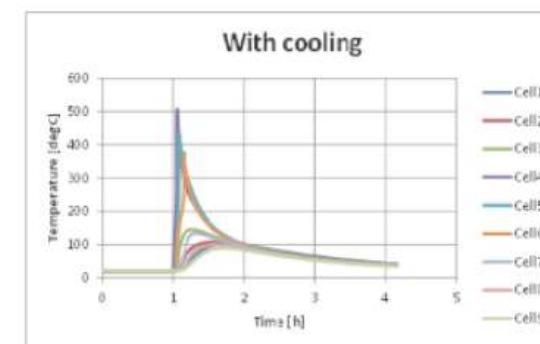
Specific cell integrating a heater for internal-short-circuit tests



Preliminary simulation  
for gas dispersion  
(Fire FOAM)



Siemens NX



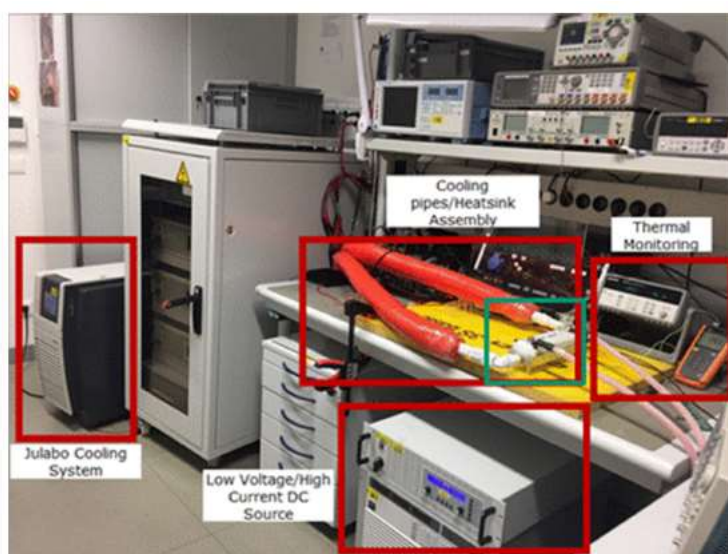
Amesim



## Results

- Advanced components for Cost reduction and safety improvement
  - semiconductor switch (technical challenge, regulation, safety, maturity)

2 pm session



First demonstrator of battery main switch under tests





## Results / And Also

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<https://www.demobase-project.eu/>

- **Cost reduction:**
  - Simulation of Recycling efficiency
  - Best practice for Dismantling
  
- **Development time / faster integration of new cells :**
  - Battery ageing characterisation and ageing model
  - Seamless process from electrochemical model to BMS
  - Neural network for battery management
  - Fox-BMS platfor

General publication coming soon 😊

# JOINT NETWORK EVENT



Promising Future...

