

# 1 COOPERATION TOTAL ET SAFT DANS L'AOLT

## 2 ACC

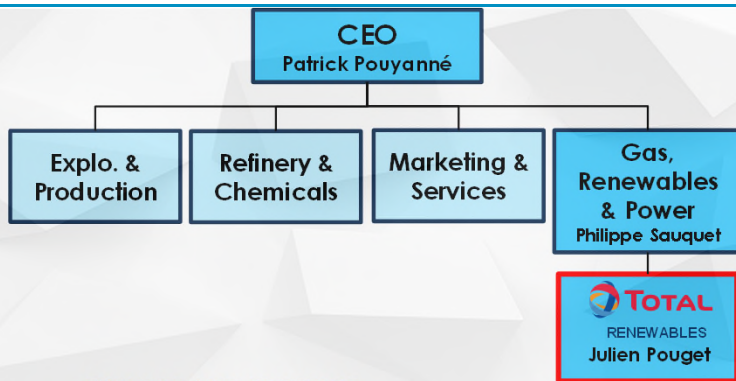


**SERVICES RESEAU PAR BATTERIES**

**COOPERATION TOTAL ET SAFT DANS L'AOLT**

Clément GUYON Total Solar International  
Michael LIPPERT Saft

# Total Integrated Business Model



## EXPLORE AND PRODUCE

- 1 OIL AND GAS
- 2 GAS, RENEWABLES AND POWER
- 3 BIOMASS

## PROCESS AND MONETIZE

- 4 SPECIALTY CHEMICALS
- 5 POLYMERS
- 6 REFINING & PETROCHEMICALS

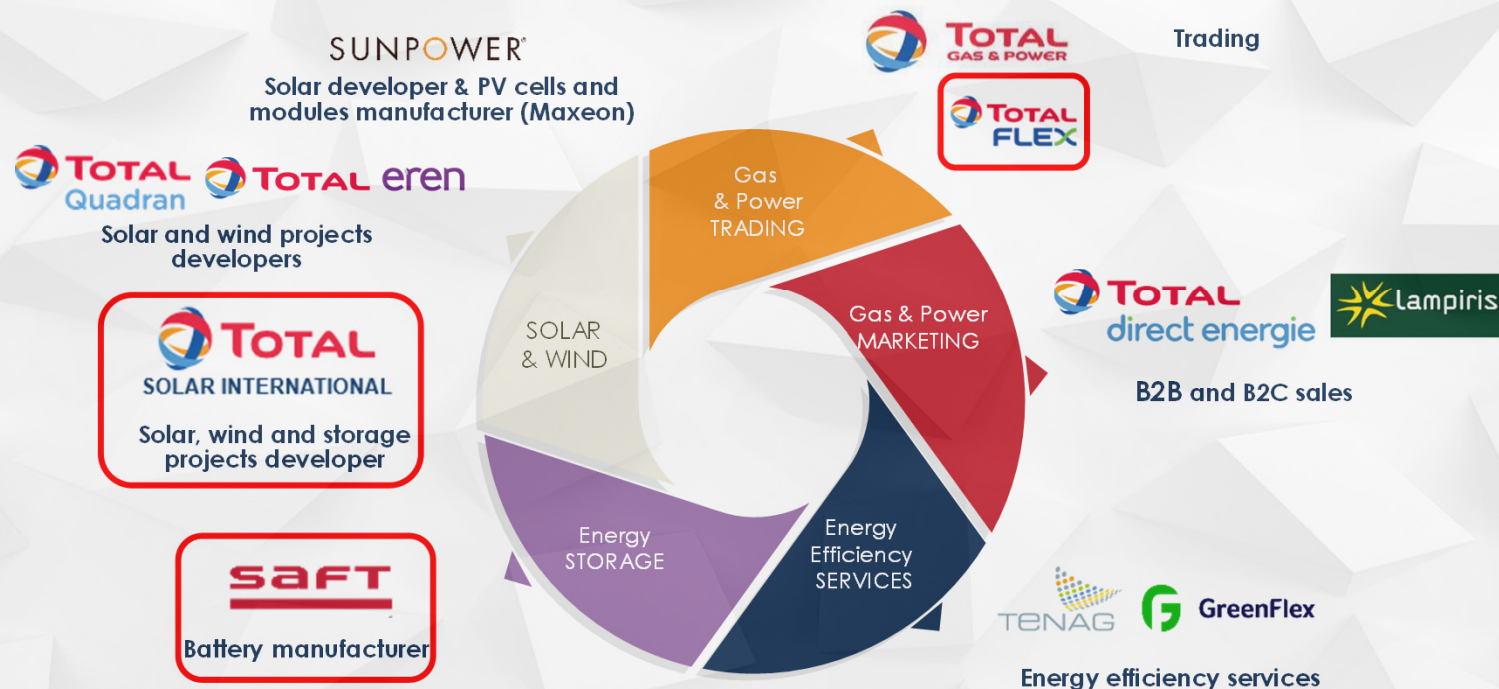
## TRANSPORT AND MARKET

- 7 TRADING & SHIPPING
- 8 PRODUCTS & SERVICES



# Total Developing a Complementary Portfolio

## GAS, RENEWABLES and POWER BRANCH Building on a base of quality assets



# Total French ESS projects in 2020 - 2021

## Targeted Services

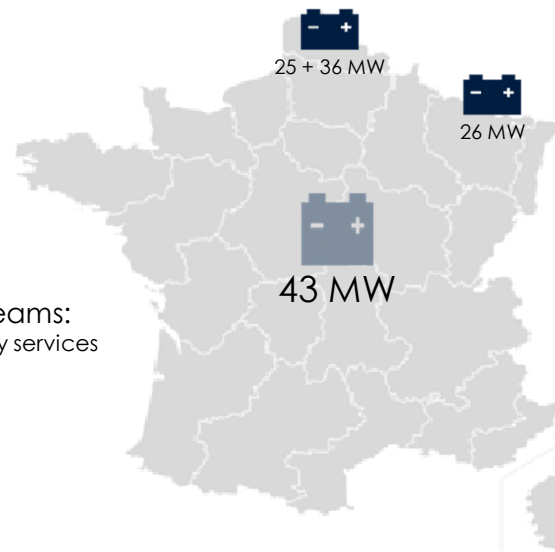
- Ancillary Services for RTE
- Complement with capacity mechanism through AOLT

\* AOLT = Appel d'Offres Long Terme (Capacity Mechanism)

## Group Synergies



130 MW pipe of stand-alone storage in France 2021/22



Revenue streams:

- 70% : Ancillary services
- 30% : AOLT\*



- 50MW of hybrid projects in operation
- +50MW of hybrid projects in 2021-2022

# Case Study: Dunkerque I

Battery storage solution to supply the French grid operator with FCR services

## Project requirements



Initial service : FCR  
at 25MW/25MWh capacity



15 year-project

Grid service to RTE  
(French TSO) at 90kV  
connection point



Follow market  
evolutions for new  
services as & when  
required

# Case Study: Dunkerque I

Battery storage solution to supply the French grid operator with FCR services

## Structure



Development  
Operation



BESS supply



Intensium® Max  
High Energy  
1000 V



Civil works + cabling +  
AC supply + PMS+ SCADA

OMEXOM

Trading



# Requirements to the Storage System Supplier

## Clients' focus



Enhanced safety



Competitiveness



Sustained capacity



Reliability of system and of revenues



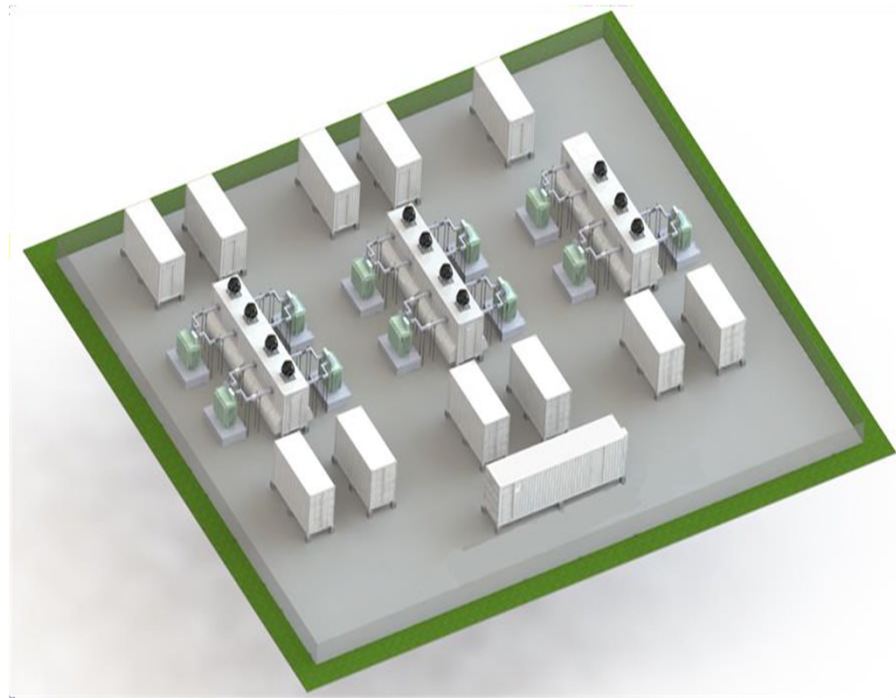
1st project Dunkirk  
Followed by repeat deals up to **130MW**

**FLEXIBLE & REPLICABLE**  
Energy Storage System



# The Solution

- **Solution for Dunkirk**
  - 25 MW - 25 MWh
  - 11 Intensium Max High Energy
  - 3 PCS containers
  - 1 LV/MV transformers
  - Perennial solution to be used for future projects



# A building block for flexible architectures

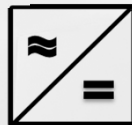
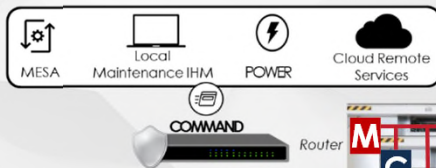


- **Intensium Max 20 High Energy**
  - 2.5 MWh
  - Up to 2.5 MW

## DIFFERENT APPLICATIONS CALL FOR... PRODUCT NOMINAL GUARANTEE...

### ✓ Flexible architectures

- different / evolving power and energy
- different system sizes



## A building block for flexible use conditions



## DIFFERENT APPLICATIONS CALL FOR PRODUCT NOMINAL GUARANTEE...

## ✓ Flexible architectures

- different / evolving power and energy
- different system sizes

- ✓ Different voltages

## ✓ Different environments



✓ **Flexibility in operation**

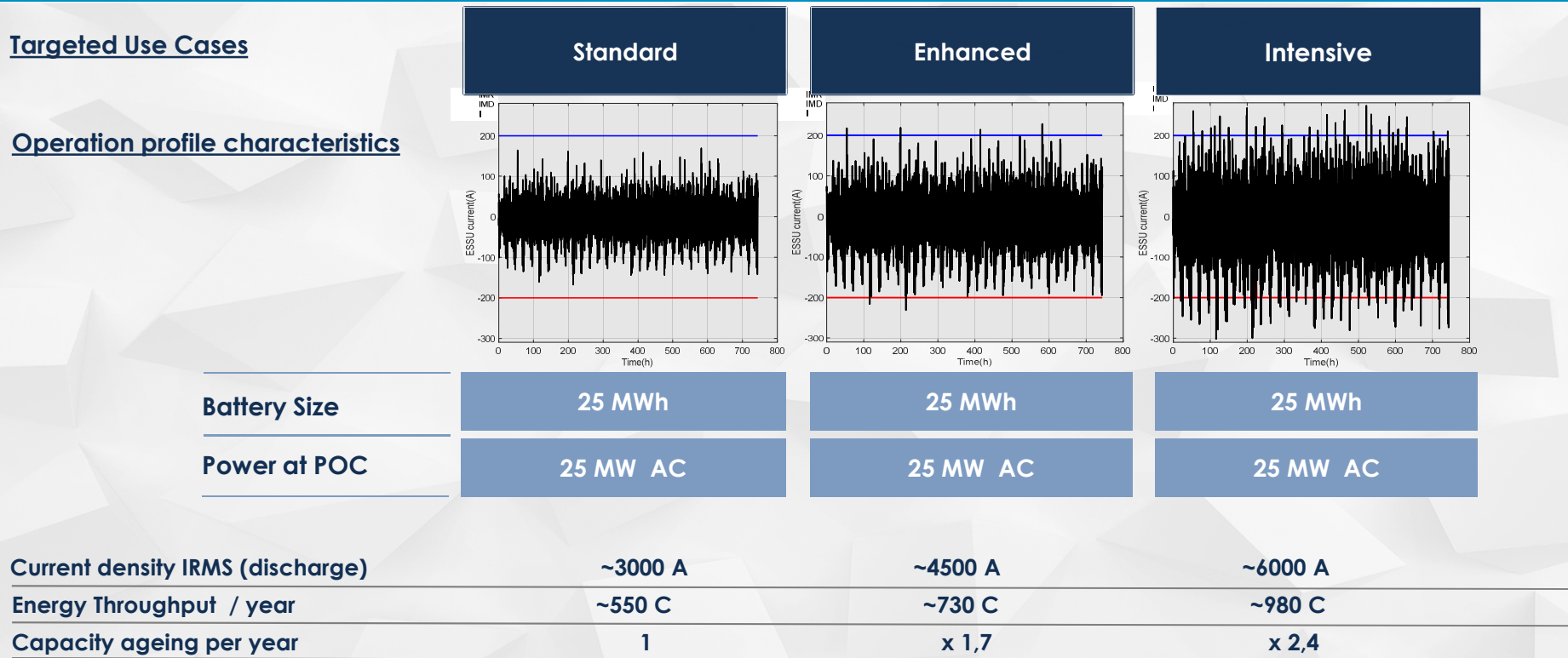
- ✓ **A consistent safety concept adaptable to local conditions**

- **Intensium Max 20 High Energy**
  - 2.5 MWh
  - Up to 2.5 MW

# ...flexibility in operation

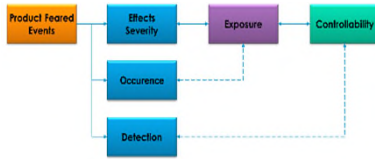
## Targeted Use Cases

### Operation profile characteristics



# ... a consistent safety concept adaptable to local conditions

## System approach to identify, minimize and mitigate product hazards



### Risk analysis at system level

- Capture electrical (U, I) electrochemical & thermal hazards, and combinations
- Effects and occurrence



### Design HW and SW safety barriers

- Detect
- Eliminate
- Mitigate
- Control effects



### Extensive component and system abuse testing

- Validate effectiveness of safety barriers
- International certifications EC, UL, ...

# ... replicable solutions

## 20-foot container concept, factory assembled and tested



### One product – 3 sites

- One single design available from 3 industrial Saft sites worldwide
- Locally optimized supply chain and services



### Assembled and tested in factory environment

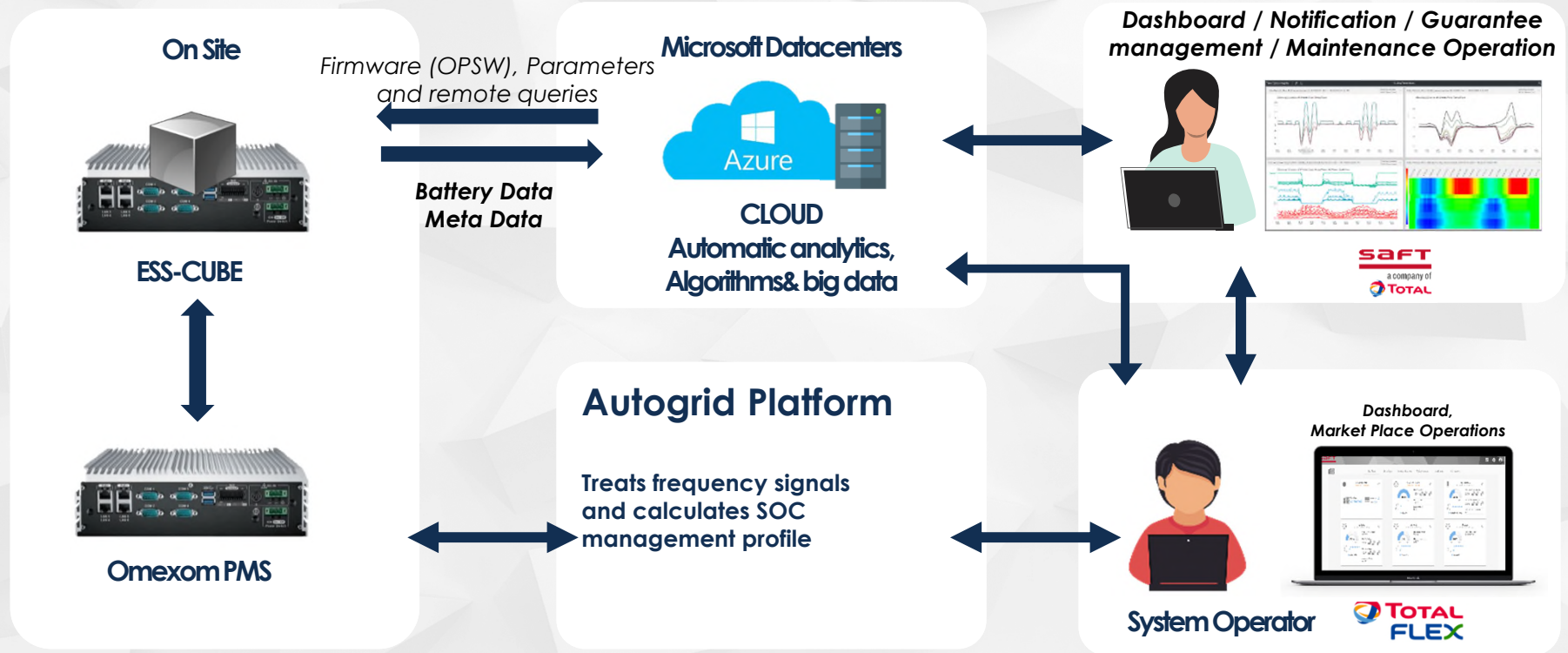
- Specialized Saft personnel
- Test benches for high power / high voltage
- Full functional testing



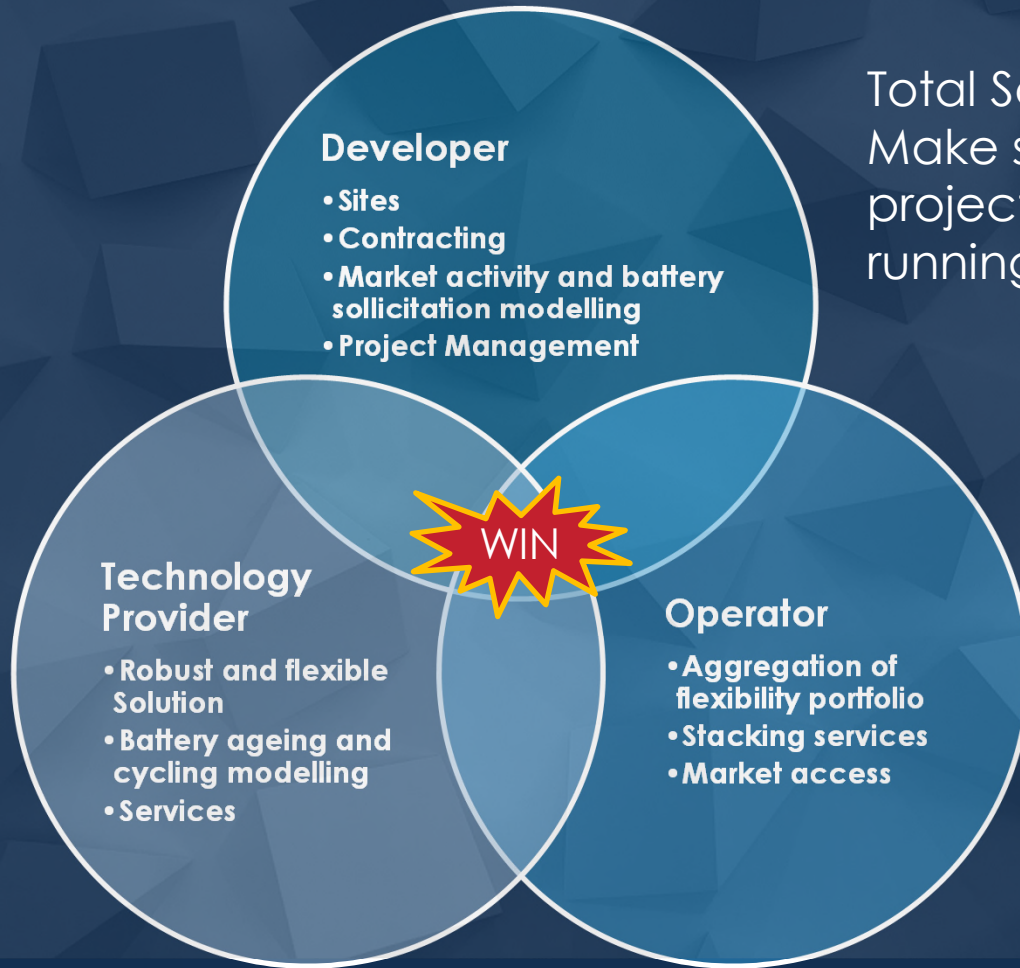
### Transportation and quick installation anywhere

- Weight < 30t
- No local assembly
- No climate constraints

# Control architecture



Saft role:  
Make sure ESS  
« does the job »



Total Solar role :  
Make sure  
project is up and  
running

Total Flex role:  
Make sure it  
earns money

# Saft's common purpose



**We energize the world.  
On land, at sea, in the air  
and in space.**



**Stay tuned!**





AUTOMOTIVE CELLS Co

# Accelerating sustainable mobility for all

October 2020

# Four commitments



1

To be competitive

2

With the best-in-class technologies

3

Fully developed and manufactured in Europe

4

Truly eco-social friendly

# Our shareholders



## Saft

Specializes in advanced technology battery solutions for industry, from design and development to production, customization and service provision.

**Total** is a major energy player that produces and markets fuels, natural gas and low-carbon electricity.



## PSA

French multinational manufacturer of automobiles and motorcycles sold under the Peugeot, Citroën, DS, Opel and Vauxhall brands.



## Opel

German automobile manufacturer, a subsidiary of French automaker Groupe PSA since August 2017.

# Footprint and ecosystem

Cells/modules 100% designed and produced in the EU

With the objective of 70+% sub-components produced in the EU



**ECO-SYSTEM OF PARTNERS – EUROPE, AMERICA, ASIA**

with the support of ACC's shareholders:

20+ universities/labs

15+ industrial companies

## **ACC GIGAFACTORY 1**

Start of operations in 2023

Capacity  $\approx$  24-32GWh

## **ACC GIGAFACTORY 2**

Start of operations in 2025

Capacity  $\approx$  24-32GWh

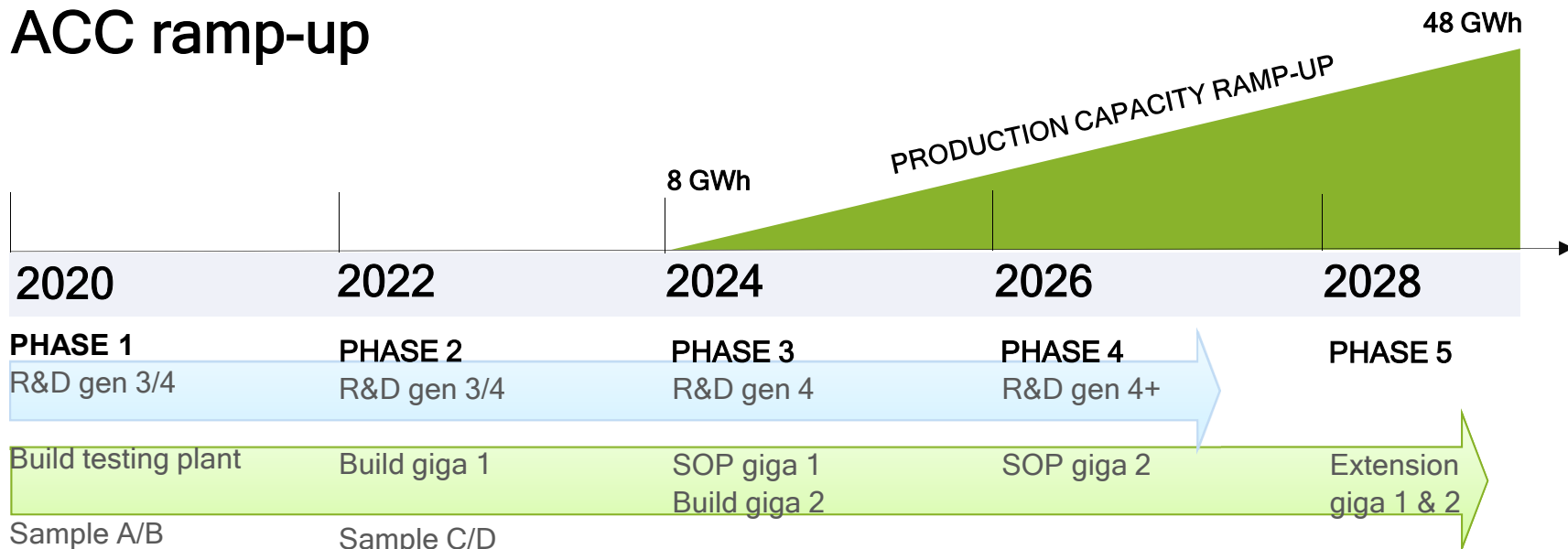
## **ACC TESTING PLANT**

Start of operations in 2021

## **ACC R&D CENTER**

Start of operations in 2020

# ACC ramp-up



# Our 4 levers to be eco-social friendly



**THE GLOBAL GOALS**  
For Sustainable Development



## LOW CO<sub>2</sub> FOOTPRINT

(from raw material to  
cell/module production)



## SUPPLY CHAIN ETHICS & SUSTAINABILITY



## DESIGN FOR RECYCLING



## GREEN FACTORIES

# Saft's common purpose



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