

How to decarbonize our back-up energy?

Hydrogen and solar energy for ATM ground equipments



SESAR 2020 SHOWCASE

SEPHER Objectives



To demonstrate possibility of supply ATM ground equipment with **photovoltaic energy** combined with **hydrogen system** (fuel cell) in order to **reduce the carbon footprint** of the back-up energy infrastructure.



G2H₂

EODev

Eneria



100/110 KVA
Electro-hydrogen
Generator systems

MobhylPower

M110

from

PowIDian
POWER IN ALL MEASURES

BOUYGUES
ENERGIES & SERVICES



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PARIS-CDG: operational tests in June 2022



RESULTS

- ▶ Location: **P+S radar**
- ▶ 1st test with EODev + ENERIA: 20th to 24th June 2022 (**G2H₂** system)
- ▶ 2nd test with Powidian + Bouygues: 31st May to 3rd June 2022 (**M110** system)

About 1,5 ton
CO₂ savings for
each test = 85%
less than a diesel
system

G2H₂ test

- ▶ 17 kW average power
- ▶ 90,5 hours in operation
- ▶ 91,1 kg H₂ consumed

M110 test

- ▶ 15,6 kW average power
- ▶ 76,6 hours in operation
- ▶ 78 kg H₂ consumed
- ▶ Supervision and H₂ rack change facilities



PARIS-CDG: recommendations for deployment



DEPLOYMENT

- ▶ Improvement of **Green hydrogen** delivery logistic
- ▶ Automatic control/supervision system to switch between H₂ racks



SARLAT: VHF station in operational use since 2021

OPERATIONAL CONCEPT

- ▶ SEPHER already deployed in “MVP1” configuration : PV + H₂ onsite system
- ▶ **Primary energy** supplied from **solar panels**
- ▶ **Back-up energy** supplied from **fuel cell and Hydrogen storage**
- ▶ Additional solar electricity used to locally produced “green hydrogen”



- ▶ Radio antenna station
- ▶ 20 kWc solar power
- ▶ Hydrogen: 20 kg @35 Bars
- ▶ 5 Kw max power



SARLAT: station monitoring



Général Configuration Exploitation A propos...

Utilisateur connecté : SebastienChabert (Utilisateur)

Station Sarlat-la-Canéda
France

ProductionMonitoring

Tension MPPT: 53.2 V
Courant MPPT: 36 A
Courant SMI: - A

LongTermStorageMonitoring

Pression platine H2: 21.87 bar
Statut EL: -
Energie produite: 133.85 kWh
Courant PAC: 0 A

Nom	Valeur	Unité
Température intérieure	21.51	°C
Température extérieure	10.27	°C

0 W 0 W

BusMonitoring

Tension Aux. 24V: 23.70 V
Tension Bus 48V: 53.79 V
Tension 24V (Voie A): 29.10 V
Tension 24V (Voie B): 29.06 V

2.25 kW 1.40 kW

851.04 W 0 W

ShortTermStorageMonitoring

Tension batterie: 53.80 V
Courant batterie: 15.80 A
Statut batterie: FLOAT (1)

ConsumptionMonitoring

Courant Bus 48V (utilisation): 25.87 A

Alarmes critiques : 0

Alarmes majeures : 0

Alarmes mineures : 0

Informations détaillées de la station

Fin de charge: 0
Irradiation: 146 W/m2
IMR batterie: 20 A
Pression Dryer: 21.91 bar





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SESAR 2020 SHOWCASE

#SESARShowcase

#EuropeForAviation