alternatives energies

INTEGRATOR SPECIALIST FOR HYBRID TECHNOLOGIES FOR MARINE APPLICATIONS

Since 1997

NOVEMBER 2024

WHO ARE WE?

Alternatives Energies is a SYSTEMS DESIGNER & INTEGRATOR FOR THE MANAGEMENT OF ON-BOARD ENERGY.
Our commitment: to actively support the nautical and naval industries as they turn the corner to green navigation.

27 years
Experience in energy - propulsion systems

Based in
La Rochelle

20
peoples

FOUNTAINE PAJOT
Owned by Fountaine Pajot group since 2022

>100
Equiped vessels >15m

20M
Carried passengers

A PIONEER IN GREEN NAVIGATION

1997-98

Creation of the company

Construction of **Europe's 1st electro-solar maritime passenger boat**

Passeur – La Rochelle

2010

Switch to **Lithium Iron Phosphate** technology

1st boat certified with LFP batteries in France

Passeur v2 – La Rochelle

2012

1st project with **serial hybrid** technology

Ecobatobus - Toulon

2017

France's **1st hydrogen-powered maritime passenger ship** (Grand Pavois 2019 Innovation Trophy)

Bus de mer H2 – La Rochelle

FROM COMMERCIAL TO RECREATIVE BOATS

2017

Production of 8 **Multi-Mission barges**: the French Navy's first battery-powered surface vessels

Barges – French Navy

2020-2021

Development of **serial hybrid technology** for yachting

Equipment of the 1st hybrid sailboat

Aura 51 – Fountaine Pajot

2022

Acquisition of Alternative Energies by Fountaine Pajot group

FOUNTAINE PAJOT

2025

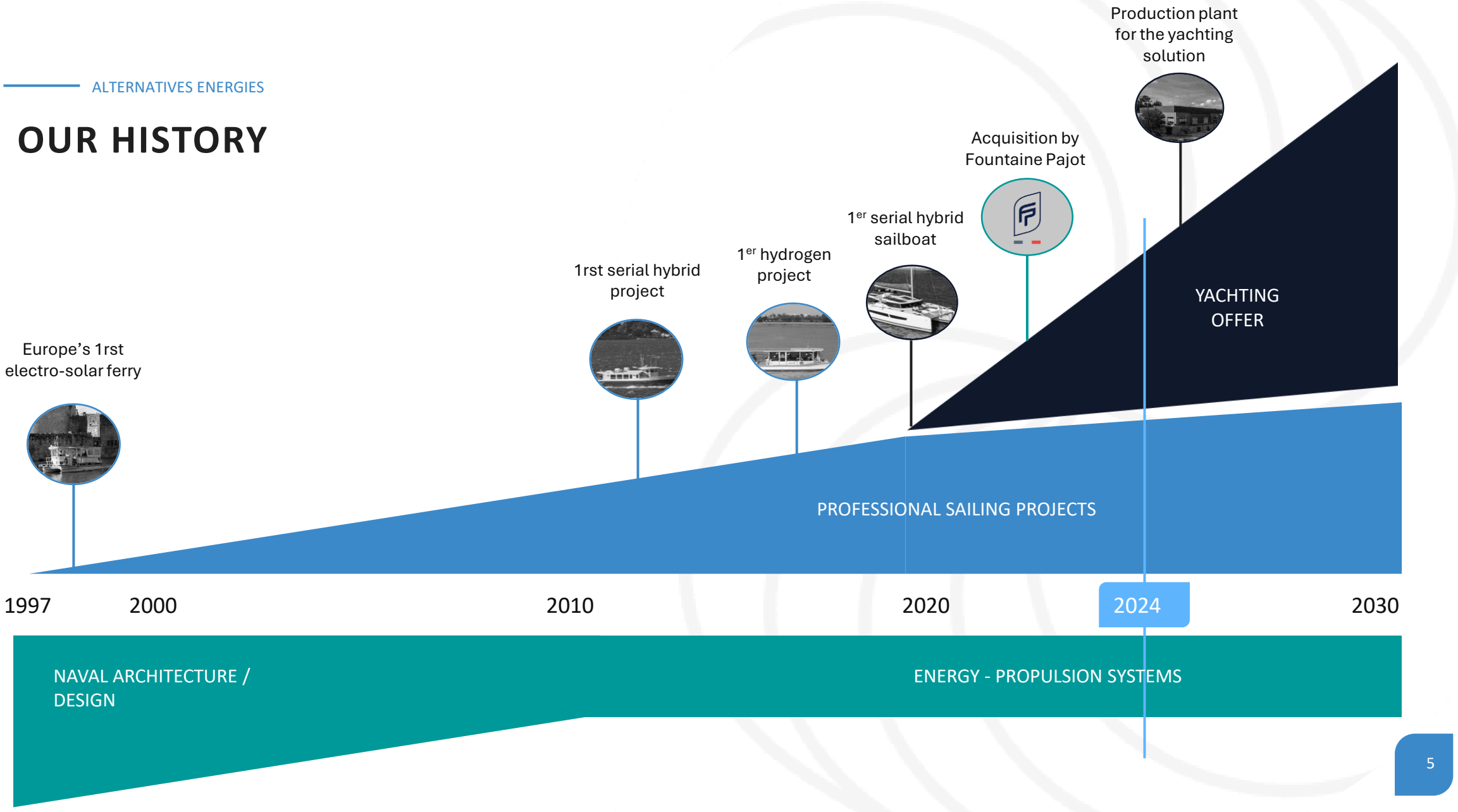
Several hundred yachting systems installed

Construction of a **1500 m²** **production plant**

Dufour 530

ALTERNATIVES ENERGIES

OUR HISTORY



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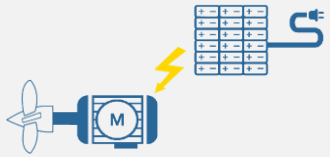
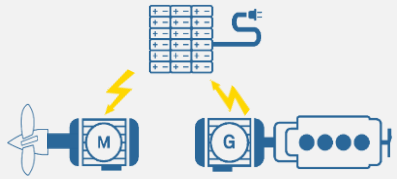
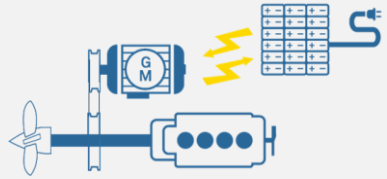
COMMERCIAL VESSELS
More than 60 ships

OUR KNOW-HOW : DIFFERENT ARCHITECTURES FOR DIFFERENT USES

	100%ELECTRIC: ZE	SERIAL HYBRID	PARALLEL HYBRID
			
PRINCIPLE	Batteries supply power directly to the electric motor(s). These batteries can be recharged on land (ZE Battery), via solar panels (ZE Super Solar) or via a hydrogen fuel cell (ZE Hydrogen).	A generator feeds the batteries to increase their power or range. The electric motor can run in full electric mode for short periods.	The electric motor and diesel engine drive the propeller directly, either individually or together to increase power. The electric motor can also act as a generator when the diesel engine is running at partial load.
USES	Small vessels Low to moderate speeds Short distances Predictable recharging times	Medium-sized ships Moderate to high speeds Long distances	Large ships High speeds Long distances
ADVANTAGES	Zero emissions, zero pollution Quiet Low maintenance	Reduced fuel consumption Lower emissions Quiet motor	Lightest system Reduced fuel consumption Lower emissions
OUR SOLUTIONS	ZE battery / ZE Hydrogen / ZE Super Solar	S Hybrid	P Hybrid

ENERGY/PROPULSION SYSTEMS INTEGRATOR FOR PROFESSIONAL NAVIGATION

Alternatives Energies works with shipowners, managers and shipyards from A to Z to make maritime and river navigation more eco-responsible.

1

CONSULTING

Definition of the optimum zero-emission or hybrid energy/propulsion system

2

DESIGN

Design of electrical architecture and drafting of certification files
Ship design

3

SUPPLY

Supply of all energy/propulsion components: batteries, electric motors, supervision system, distribution, safety devices, remote data, etc.

4

INTEGRATION

Integration of the energy/propulsion system on the production site and commissioning

5

TRAINING

Training the Captain of the boats, the technician by operators, to ensure a first level of knowledge and fast response

6

MAINTENANCE

System maintenance over its entire service life
Commitment to operation, safety and reliability
Supply of a digital supervision platform

Product Range for Commercial Applications

	Electrical Engine Range	Battery Range	Accessories and management
			 Genset integration up to 250kW AC- 380 VAC
AVAILABLE POWER	50kW – 100kW – 130 kW – 150kW – 200kW – 250kW	Battery Packs capacity : 21kWh – 27kWh – 32kWh – 38kWh – 64kWh – 86kWh	Charge DC up to 250kW Charge AC up to 44kW
USES	ZE battery / S Hybrid / P Hybrid	ZE battery / S Hybrid / P Hybrid	DC/AC inverter up to 250kW 30kW,40kW,60kW,150kW, 250kW
Types	Inboard – Water cooled - Damped		DC/DC converter in 12VDC and 24VDC 1,5kW, 3kW
Description	RPM : From 450RPm to 2000 Rpm	Up to 10 packs in parallel per engine LFP Technology BV approved ISO 62619 – ISO62620 Option : Fire Extinguishment BV approved Voltage range : 200VDC to 614VDC Forced Air cooled for eaisest maintenance	EPMS (Energy power management system) 400VAC / 230VAC / 24VDC distribution Box Solar Panel Management up to 30kW in DC

ZE Hydrogen

ZE Super Solar

OUR REFERENCES (1/2)

7 * Passeurs
La Rochelle, Concarneau, Les Sables - France
2*15 kW, 2*30 kWh, 35 pax

1 * Palissy 3
Saintes - France
2*36 kW, 2*85 kWh, 149 pax

4 * Navettes Millénaire
Paris - France
2*22 kW, 2*55 kWh, 75 pax

2 * Bus de Mer
La Rochelle - France
2*22 kW, 2*60 kWh, 75 pax

1 * Ferryboat
Marseille - France
2 x 22 kW, 110 kWh, 45 pax

1 * Henessy II
Cognac - France
15 kW, 30 kWh, 47 pax

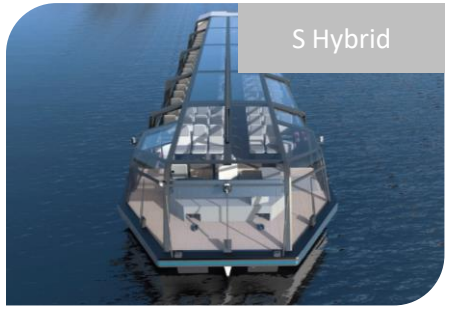
1 * Aditya
India
2*20 kW, 2*25 kWh , 140 m^2
Solar pannels

2 * EcoBatoBus
Toulon - France
2*120 kW, Genset 340 kW ,2*85 kWh, 99 pax

OUR REFERENCES (2/2)

8 * CMM
World
2*100 kW, 2*Genset 155 kW, 2*105 kWh

2 * Bateaux-Mouches
Paris - France
775 kWh, 900 pax



1 * Batorama
Strasbourg - France
700 kWh, 135 pax

4 * WaterBus 60 - 2024
Bordeaux - France
Hydrojet, 2*176 kWh, 60 pax

1 * baliseur
Saint-Nazaire - France
4*44 kWh

1 * Bus de Mer H2
La Rochelle - France
2*22 kW, 2*60 kWh, PAC 10kW, H2 7kg, 75 pax

1 * vedette ZE
Bastia (LPMAB) - France
2*REXH2 70kW, 12 pax

1 * Hynova
Marseille - France
1er Yacht à hydrogène
2*150 kW, 2*44 kWh, REXH2 80 kW, 12 pax

1 * Samana 59 H2
La Rochelle - France
1er hydrogen sailboat
44 kWh, H2 7,5 kg

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YACHTING OFFER

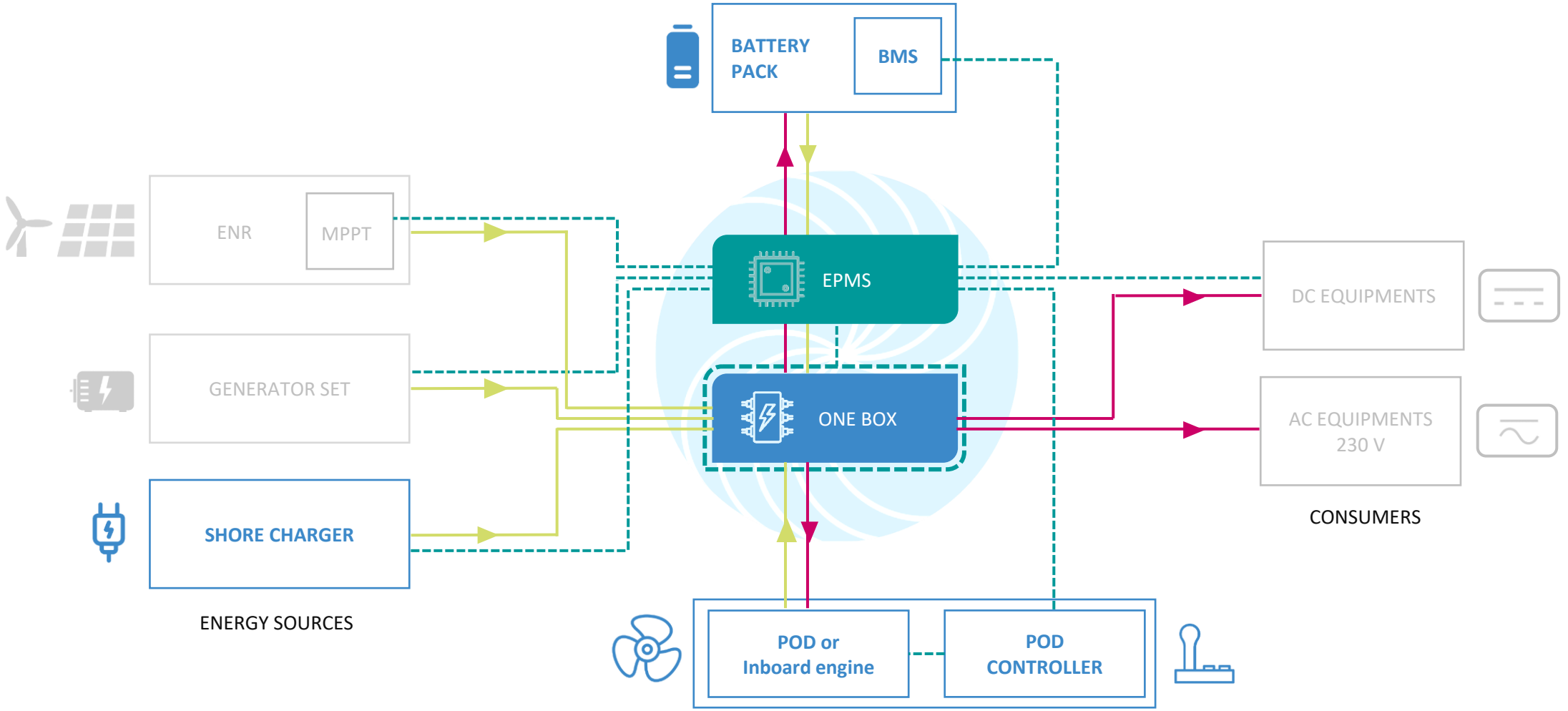
EXPERT IN HYBRID TECHNOLOGIES

Optimal propulsion technology	SERIAL HYBRID 48 V	**SERIAL HYBRID 200 – 600 V**	**PARALLEL HYBRID / Energy Box 200 – 600 V**

Alternatives Energies is an expert in hybrid solutions for cruising catamarans and monohulls > 40 ft.

- EFFICIENT PROPULSION
- REDUCED CARBON FOOTPRINT
- NOISE REDUCTION
- LOW MAINTENANCE

A SCALABLE AND MODULAR ARCHITECTURE



ENERGY SOURCES

CONSUMERS

PROPULSION / HYDROGENERATION
In case of Energy Box, possible to not connect any engine

THE ONE BOX: POWER MANAGEMENT CENTER

ALL-IN-ONE

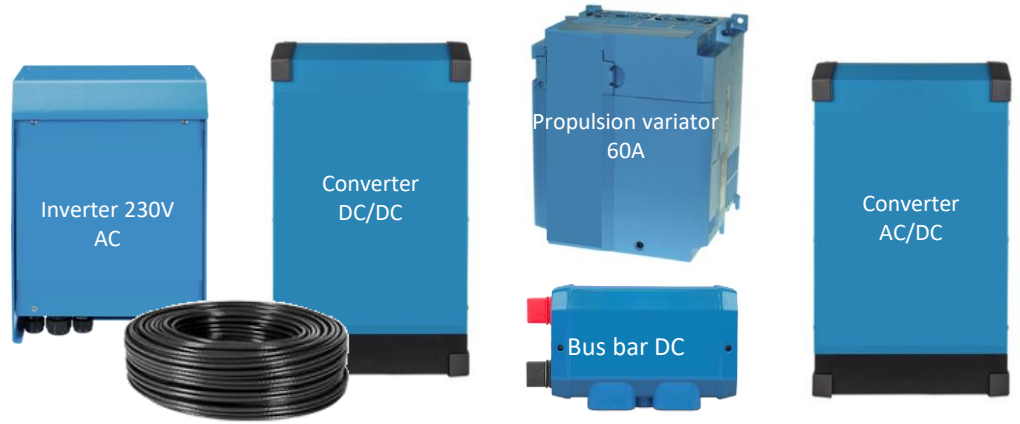
- ✓ The ONE BOX integrates all the power functions needed on board a hybrid boat, for propulsion and electrical networks production and management (12 VDC / 24VDC and 230 VAC)

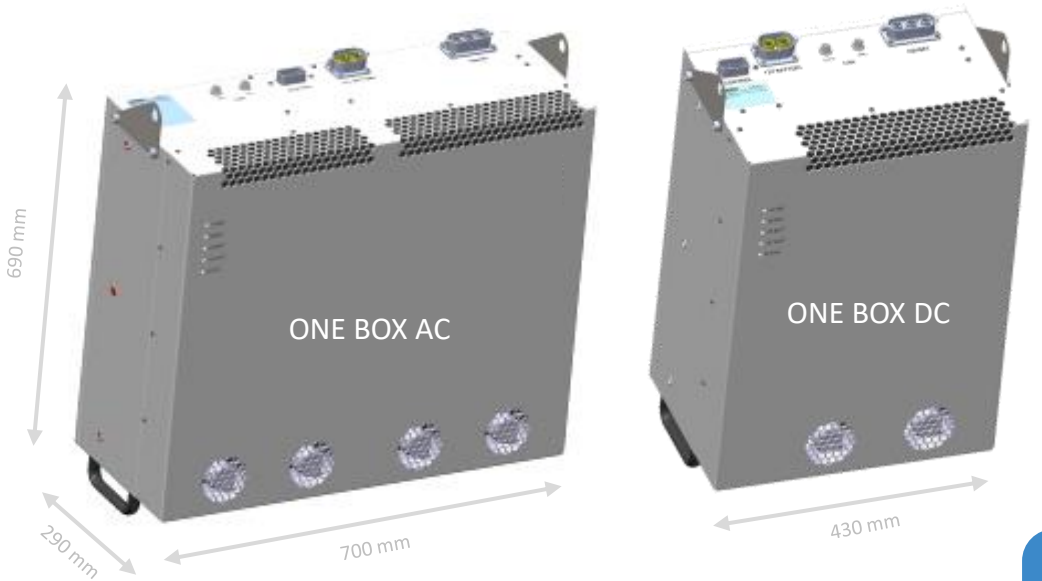
MODULAR

- ✓ Up to 4 batteries connected per One-Box
- ✓ Available in 2 versions: AC (with AC+DC conversion) or DC (only DC conv)
- ✓ DC available in 25 and 50 Kw
- ✓ 230 VAC inverter available in 50/60 Hz : 6 , 12, 15, 24 kW
- ✓ 24 VDC converter : 1,5kW or 3kW per one Box
- ✓ Up to 6 x One-box in parallel
- ✓ Up to 12kW solar panel connected per One-Box
- ✓ Genset up to 50kVA power per One-Box
- ✓ Possible to use One-Box without Engine connected as Energy management Box

ULTRA-PERFORMANCE AND EASY MAINTENANCE

- ✓ Leading-edge power electronics and conversion technologies for maximum energy efficiency
- ✓ Service life > 40000 h
- ✓ Air-cooled only





THE ONE BOX: A REVOLUTION IN ON-BOARD INTEGRATION

REDUCED WIRING TIME

- ✓ Fewer cables with the all-in-one ONE BOX
- ✓ Fast industrial connectors

CAN BE HANDLED WITHOUT ELECTRICAL CERTIFICATION

- ✓ IP2X-protected connectors
- ✓ Numerous protections: short-circuit, overcurrent, reverse polarity, CAN faults, etc.

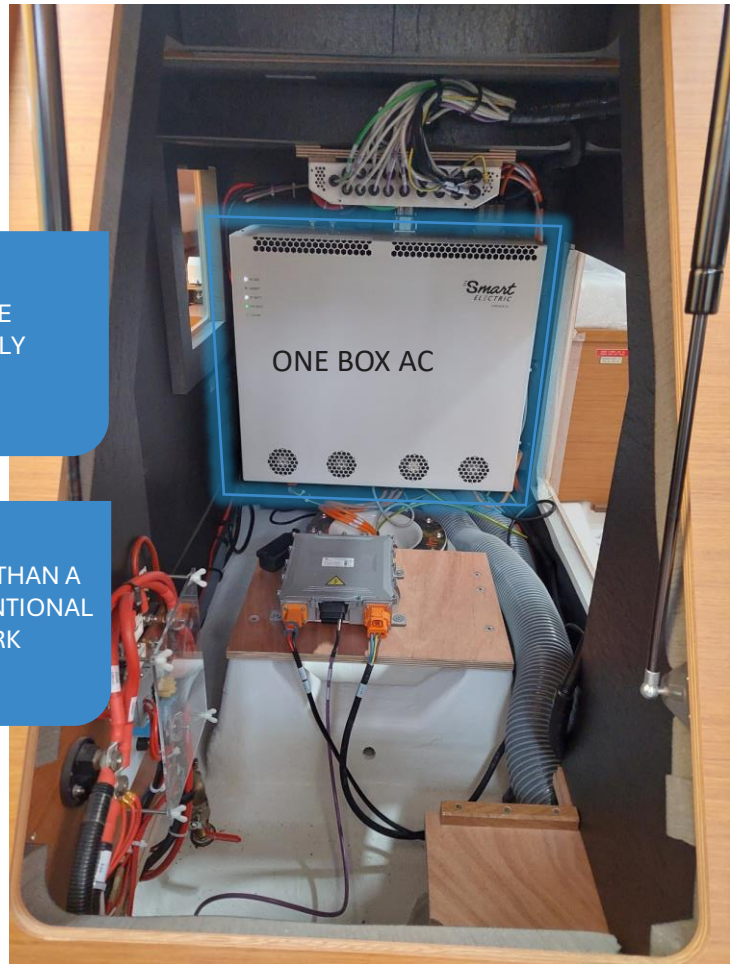
INCREASED SECURITY

- ✓ HVIL: High-Voltage Interlock Loop
- ✓ IMD: Insulation Monitoring Device

ISO 13297 | ISO 16315 | ISO 60945 | ICOMIA 49-13 | ROHAS REACH WEE

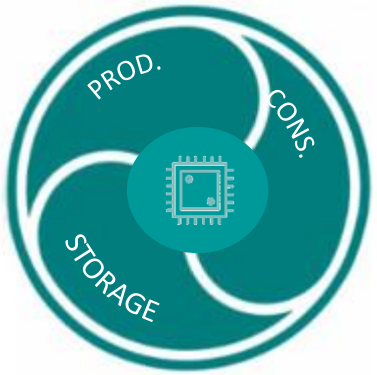
5h AVERAGE ASSEMBLY TIME

3x FASTER THAN A CONVENTIONAL NETWORK

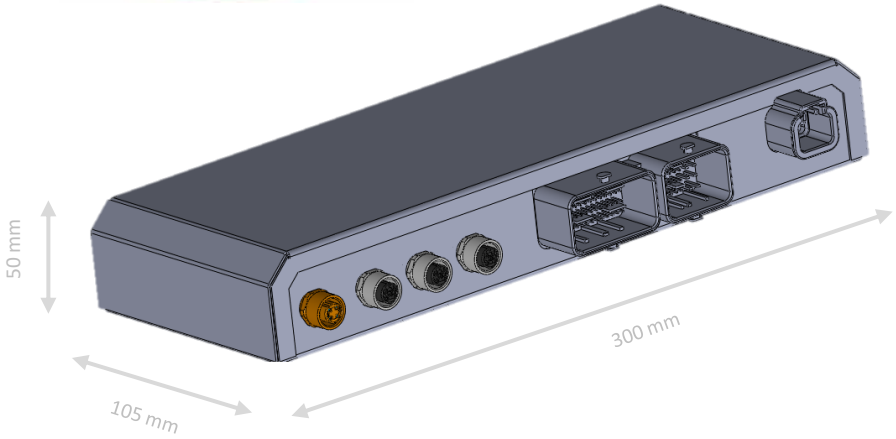


ONE BOX integrated into the engine hold of a monohull

AN INTELLIGENT ON-BOARD COMPUTER TO OPTIMIZE ENERGY MANAGEMENT



EPMS : ENERGY POWER MANAGEMENT SYSTEM



OPTIMAL AUTOMATIC MANAGEMENT

- ✓ Algorithms based on 20+ years' experience in on-board energy management
- ✓ Real-time optimization based on sailing conditions and passenger behaviors
- ✓ Algorithms always favor the use of renewable energies

AN UP-TO-DATE COMPUTER

- ✓ Automatic remote control software updates (connected EPMS option)
- ✓ Integration with commercial MFDs (Garmin / B&J)

HIGH-PERFORMANCE, SAFE BATTERY PACKS

AE-FES
Fire Extinguishing System (option)

AE-SRSEE
Electrical Energy Recovery and Storage System

IEC 62619 | IEC 62620 | IEC 60068 | IEC 61000
UN 38.3 | EN 62133 | CISPR 16 | CEM

HIGH-PERFORMANCE BATTERIES

- ✓ Lithium Iron Phosphate technology with high energy density
- ✓ Latest-generation BMS
- ✓ Service life > 65,000 kWh discharged (> ~10 years)

Complete product range:
21kWh | 27kWh | 32kWh | 38kWh
Up to 4 batteries per One-Box

HIGHLY SECURE BATTERIES

- ✓ Stable, intrinsically safe behavior
- ✓ Manual isolator and IP68 industrial connectors
- ✓ Fire safety: battery flooding system + fire extinguishing system on request

DESIGNED FOR NAVIGATION

- ✓ Resistant to temperature, humidity, vibration, EMC
- ✓ Easy-to-integrate stainless steel container
- ✓ Air cooling for simple installation

HIGH-PERFORMANCE ELECTRIC PROPULSION

POWERFUL, HIGH-EFFICIENCY MOTOR

- ✓ 25 kW propulsion power, replacing a 75 hp combustion engine
- ✓ 50kW propulsion POD replacing a 110Hp combustion engine
- ✓ 50kW In-board engine for Parallel installation on Combustion engine
- ✓ Optimized efficiency 96%
- ✓ Zero noise, zero emissions
- ✓ Natural cooling

EFFICIENT HYDROGENERATION

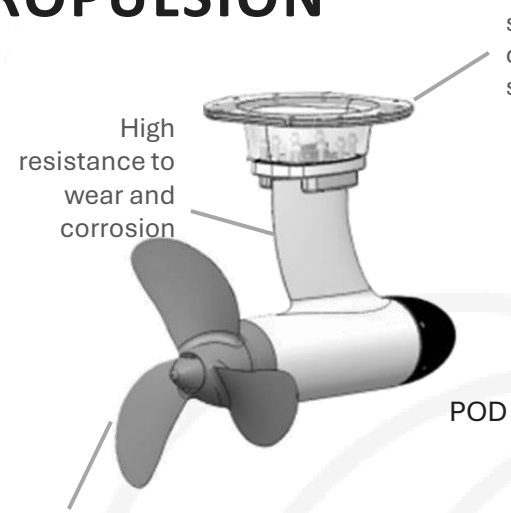
- ✓ Battery recharging from 4 knots

EASY TO USE

- ✓ Intuitive control system (automatic brightness adjustment)
- ✓ Multiple helm stations possible
- ✓ Minimal maintenance

EASY TO INTEGRATE

- ✓ Installation identical to sail drive



AE-POD
POD 25 kW, 50Kw

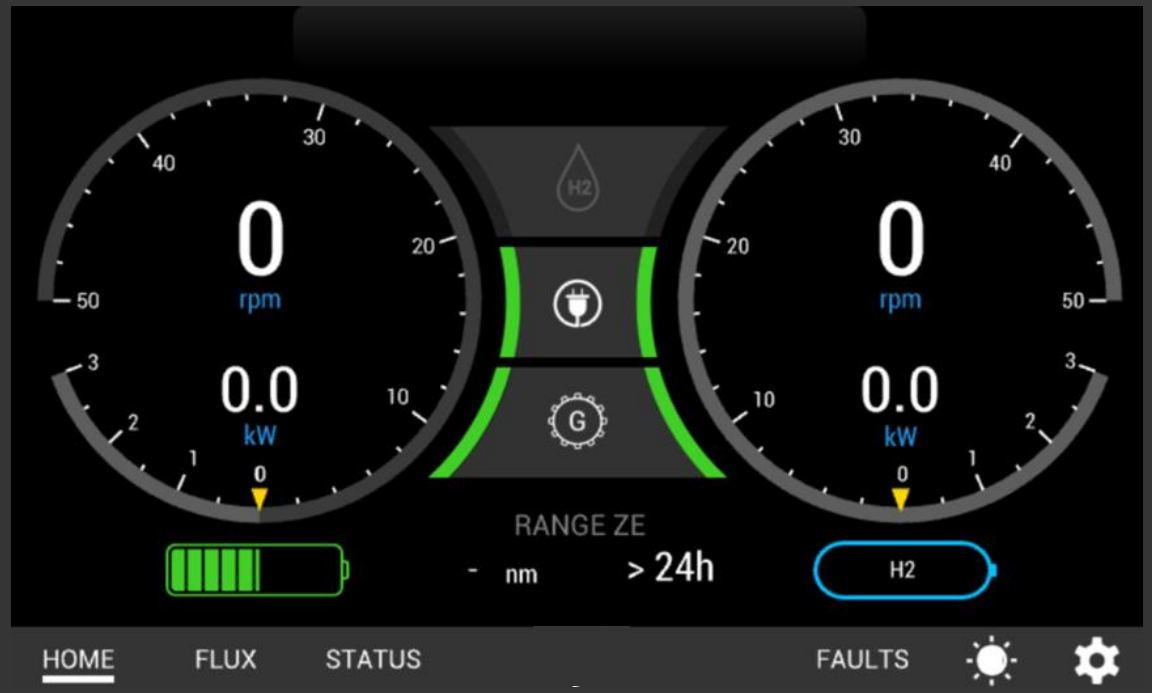
AE-PCU
Propulsion Control System

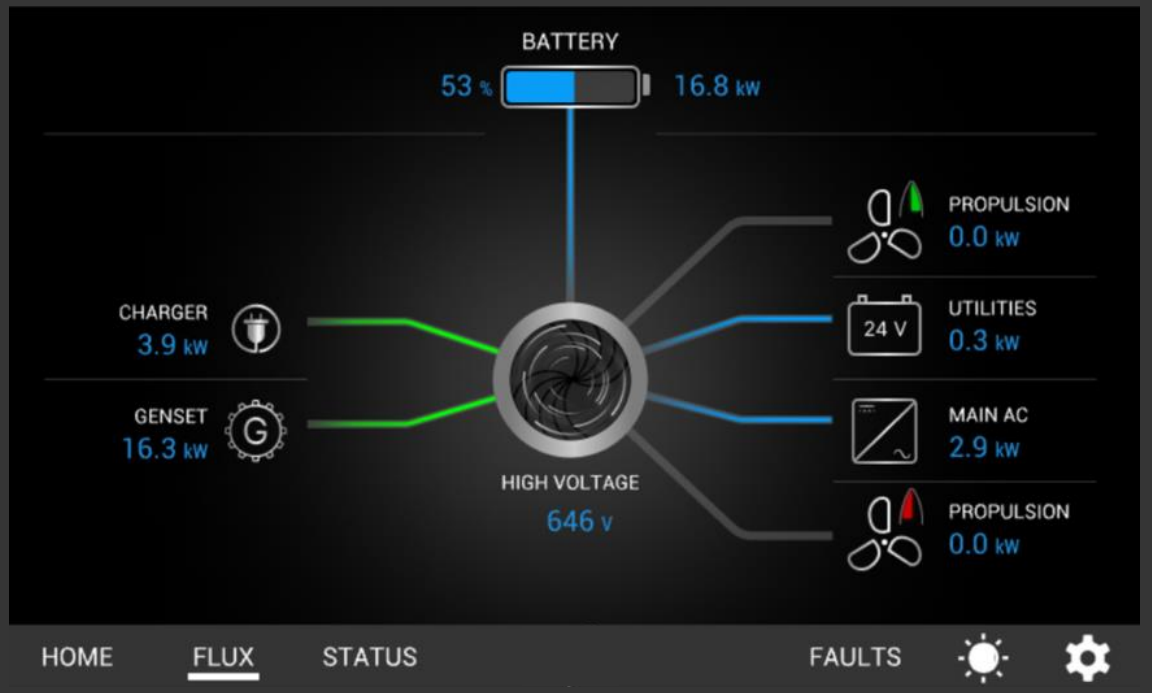
We supply Propeller adapted to the boat for optimized performance

50 kW in-board engine for Hybrid Parallel
Engine is only use for Marina handling and is used mainly as alternator in order to remove internal genset

AE-PV
Control screen

AN INTUITIVE, ERGONOMIC HMI





✓ Simple visualization of energy flows in real time

A MODULAR SOLUTION

OPTIMIZED INTEGRATION COSTS

The Alternatives Energies solution can easily adapt to the configuration of the boat:

- ✓ Batteries from 21 to 38 kWh, up to 4 per Box
- ✓ AC or DC ONE BOX
- ✓ Numerous compatible generators (multi-make and multi-frequency)
- ✓ Optional quick chargers

	Mono 45 ft	Multi 45 ft		Multi 65 ft	
		PORT	*STARBOARD*	*PORT*	*STARBOARD*
POD	25 kW	25 kW	25 kW	50 kW	50 kW
ONE BOX	ONE BOX AC	ONE BOX AC	ONE BOX DC	ONE BOX AC	ONE BOX AC
BATTERIES	27 kWh	21 kWh	21 kWh	2x32 kWh	2x32 kWh
INVERTER	-	-	6 kW	12 kW	12 kW
CHARGER	6 kW	3 kW	3 kw	6kW	6kW
GENSET	16 kW	24 kW		2x32 kW	

A MATURE AND PROVEN TECHNOLOGY

Dufour 470


Dufour 530


Leopard 45

- ✓ >50 of boats equipped since 2021
- ✓ A proven system in charter use
- ✓ Boats equipped with white label


Austréa 42


Elba 45


Aura 51


Samana 59

SUPPORT FROM A TO Z for the shipyards

1

INTEGRATION STUDY

Architecture recommendation

2

SUPPLY

One-stop supplier for Energy / Propulsion

3

COMMISSIONING

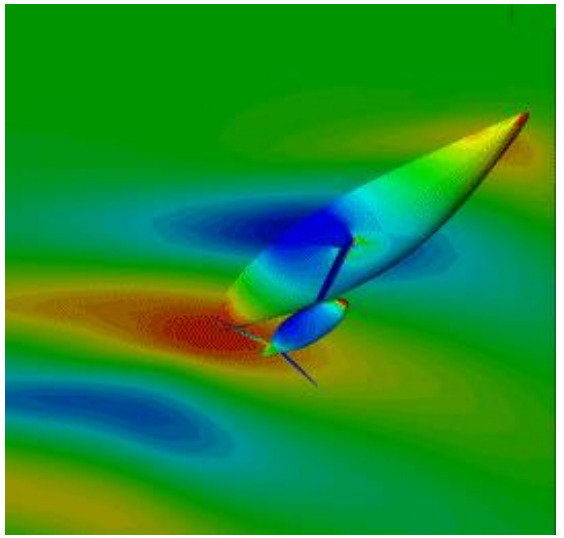
Quality guarantee

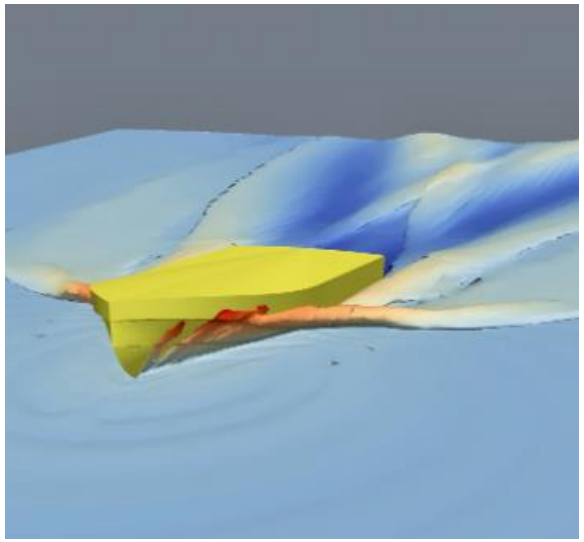
4

TECHNICAL ASSISTANCE

Worldwide network of partners

1 INTEGRATION STUDY

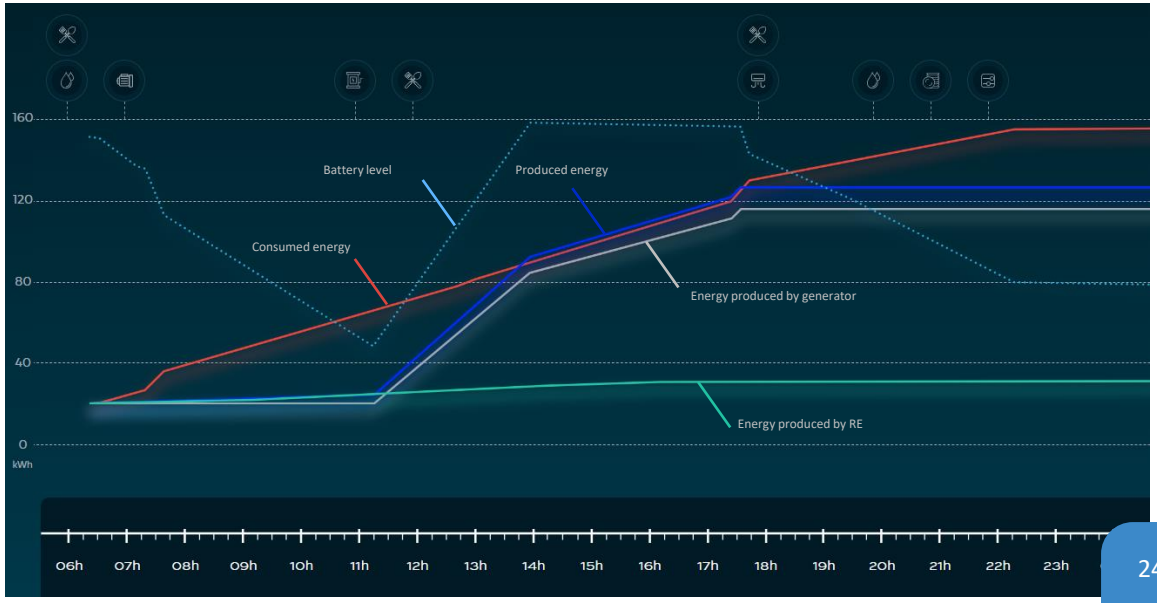




AN ENGINEERING DEPARTMENT AT YOUR SERVICE

Before any integration, our project team carries out specification studies:

- ✓ Performance prediction
- ✓ Verification of propulsion compatibility
- ✓ Consumption assessment
- ✓ System architecture recommendation
- ✓ Battery sizing
- ✓ Verification of integration capabilities



PERFORMANCE TARGETS
WITH OUR HYBRID TECHNOLOGY

1 week at anchor in 100% elec
1 weekend sailing
2-4 h of propulsion (depending on power)

2 SUPPLY

AN OPTIMIZED SUPPLY CHAIN

- ✓ A single supplier for all Energy / Propulsion needs
- ✓ Packaging for direct line-side delivery - single part number
- ✓ Lead time under 6 weeks

AN INDUSTRIALIZED SOLUTION DESIGNED FOR LARGE-SCALE PRODUCTION SITES

- ✓ Simplified integration with ONE BOX
- ✓ Robust, secure and fully under control components
- ✓ No special assembly skills required

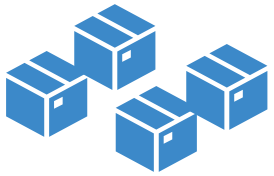
QUALITY GUARANTEES

- ✓ Fully CE-certified solution
- ✓ Designed with expert industrial partners

FLEXIBLE DELIVERY

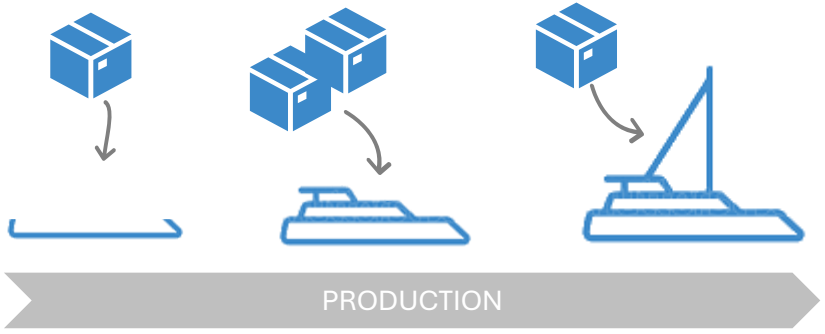
SINGLE DELIVERY

- ✓ One bundle = one cardboard
- ✓ One delivery only



FLOW DELIVERY

- ✓ A cardboard "kit" = a stage, a location
- ✓ One kit = one Alternatives Energies reference



3 COMMISSIONING

MONITORING & TRACEABILITY

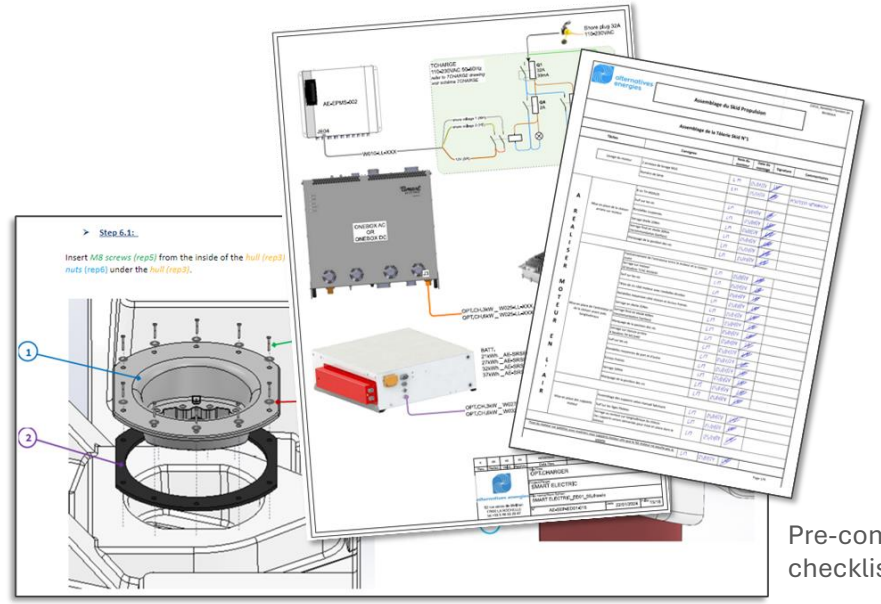
- ✓ Creation of the system's "identity card": serial number, software version, etc.

SYSTEM CONFIGURATION

- ✓ Configuration of boat-specific parameters: GenSet power, direction of propeller rotation, MPPT zero setting, etc.
- ✓ Web site tools for commissioning

QUALITY ASSURANCE

- ✓ Verification of compliance with specifications (checklists)
- ✓ System commissioning authorization



Pre-commissioning checklists

Web configuration interface

Infos sur SAV à modifier
Notion de timeline à ajouter – carte à compléter

4 TECHNICAL ASSISTANCE

TRACEABILITY & CONNECTIVITY

- ✓ Parts tracking thanks to system ID card
- ✓ Fault analysis and remote troubleshooting possible for systems with connected EPMS

LOW MAINTENANCE

- ✓ Seulement 3 composants d'usure
- ✓ Maîtrise intégrale des composants

OUR GOAL: A WORLDWIDE NETWORK OF SERVICE PARTNERS

- ✓ Partners trained in our system at our training center

The Alternatives Energies partner
2024 objective – 2025-2026 objective

alternatives energies

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www. alternativesenergies.com

LE BERNARD PALISSY 3, BATEAU DE PROMENADE FLUVIALE

CARACTÉRISTIQUES GÉNÉRALES
Dimensions : 24,8 x 6,2 m
Capacité : 149 passagers
Déplacement : 38 T
Propulsion : 2x36 kW
Stockage énergie : 2x85 kWh LiFePO4
Production d'énergie : 12 m^2 panneaux photovoltaïques
Vitesse de croisière : 6 nœuds
Autonomie : 90 km
Charge complète : 8 h

2013

NAISSANCE DU PROJET
Volonté de Croisières Charentaises de remplacer le Bernard Palissy 2 exploité depuis plus de 50 ans

2014 - 2015

AVANT-PROJET FAISABILITÉ
En tant qu'intégrateur, Alternatives Energies étudie et fournit:
- Caractéristiques générales du bateau
- Prévision de consommation du Bateau
- Caractéristiques du SEP
- Enveloppe financière du projet

Alternatives Energies accompagne Croisières Charentaises dans la recherche de financement.

2015 - 2018

RÉALISATION DU PROJET
Création d'un équipe Armateur | Architecte | Chantier | Intégrateur
Alternatives Energies accompagne le projet dans ces différentes phases de conception, réglementation, réalisation, mise en service, formation.

2018

MISE EN SERVICE
15 000 PAX / an

MAINTENANCE
Alternatives Energies s'engage contractuellement sur le respect des performances et du service du bateau.

LES NAVETTES DU MILLÉNAIRE, UN SERVICE DE TRANSPORT EXIGEANT

CARACTÉRISTIQUES GÉNÉRALES X 4

Dimensions : 15 x 5 m
Déplacement en charge : 19 T
Capacité : 75 passagers
Vitesse de service : 6 nœuds (max 9 nœuds)
Propulsion : 2x22 kW
Stockage énergie : 2x55 kWh LiFePO4
Production d'énergie : 21 m^2 panneaux photovoltaïques
Charge complète : 5 h
Utilisation moyenne : 4000 h / an

UNE NOUVELLE FAÇON DE SE DÉPLACER DANS PARIS DEPUIS 2006

Les navettes du Millénaire assurent la liaison entre la station de métro du nord de Paris, Corentin Cariou (ligne 5), et les 110 000 m² de bureaux du Parc du Millénaire. Pendant toute la semaine avec une fréquence de passage de dix minutes, les deux navettes peuvent transporter 75 passagers en empruntant le canal Saint Denis

PRINCIPAUX AVANTAGES :

- ✓ Silence et confort
- ✓ Consommation très faible : < 1,5 € / jour
- ✓ Zéro émission CO2 ou NOx
- ✓ Temps d'accostage réduit (ouvertures automatiques des portes)
- ✓ Excellente manœuvrabilité

LE YÉLO H2, PIONNIER DES BATEAUX DE TRANSPORT À HYDROGÈNE

Réservoirs H2 dans les bancs

Pile à combustible

CARACTÉRISTIQUES GÉNÉRALES
Capacité : 75 passagers
Vitesse de croisière : 6 nœuds
Service maritime : 22 miles nautiques / jour
Propulsion : 2x22 kW
Batteries : 2x60 kWh
Stockage H2 : 4 réservoirs 350 bars, 7 kg au total
Pile à combustible : 100 kWh
Remplissage : 5 minutes

2015

NAISSANCE DU PROJET
Souhait de l'Agglomération de La Rochelle, pionnière dans les nouvelles mobilités, de lancer la 1ère expérimentation nationale de bus de mer propulsé à l'hydrogène en installant une pile à combustible H2 sur un bateau électrique ZE Batterie existant

2015 - 2017

RÉALISATION DU PROJET
Interventions Alternatives Energies :
- Définition du besoin (puissance, énergie)
- Analyse de risques Utilisation / Intégration
- Intégration mécanique et électrique du système (système de 250 kg intégré dans un banc)
- Gestion de la récupération de chaleur produite par la pile (pour le chauffage)
- Gestion de la sécurité et de la réglementation, relations avec la CRS
- Gestion de l'acceptabilité du système (Marins, Usagers et Armateur)
- Suivi du fonctionnement / Analyse et Retour d'Expérience

2017 - 2018

EXPERIMENTATION RÉELLE
Expérimentation d'un an à La Rochelle
Installation d'une station de compression d'hydrogène sur le port