

HIMOINSA

A YANMAR COMPANY



Miguel Ángel Ruiz | Global Head of Engineering and Development

 mrui@himoinsa.com

 <https://www.linkedin.com/in/miguelangelruiz/>



Engineer



43 years



2 daughters



Business & Innovation



Massachusetts Institute of Technology

Innovation Program, MIT Sloan Executive Education.



Duke University

Leadership Explorer Program.



Zaragoza University

Industrial Engineering | Electrical and Electronic Engineering.

He is Industrial Engineer with a large experience over 10 year on power generation market. Currently, is in charge of the **HIMOINSA product managers team** and is also leading the **R+D team** developing new products for the global market.


Working together with the sales and marketing departments to **identify the market needs** and define a **comprehensive product development plan** including the cost definition, design, prototyping and pilot batch among others.



YES YANMAR ENERGY SYSTEM

FOUNDED, MARCH 2003



 **TURNOVER** (CONSOLIDATED)
1,035 \$ MILLION

 **EMPLOYEES**
2,278

 **BUSINESS ACTIVITIES**
Development, Manufacturing, Sales, Installation,
Maintenance, Application Engineering and Customer
Support of Energy System Products

Company Introduction

YES | YANMAR ENERGY SYSTEM

DIVISIONS

ENERGY SOLUTION:

CHP
COMBINED HEAT AND POWER



GHP
GAS HEATING PUMP



POWER GENERATION:

GENERATOR SETS
HIMOINSA

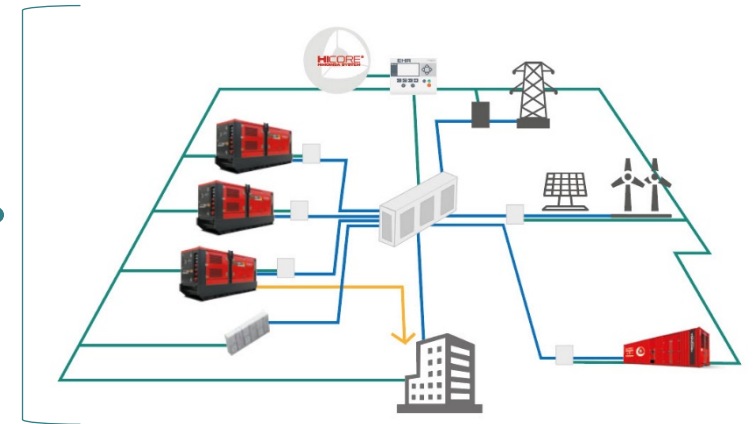


- COMPLETE ENERGY SOLUTION
- GLOBAL R+D TEAM
- SUSTAINABLE & SMART ENERGY

HIMOINSA 'At a Glance'

HIMOINSA

Sustainable & Smart energy



Diesel Generator

REDUCE CARBON FOOTPRINT

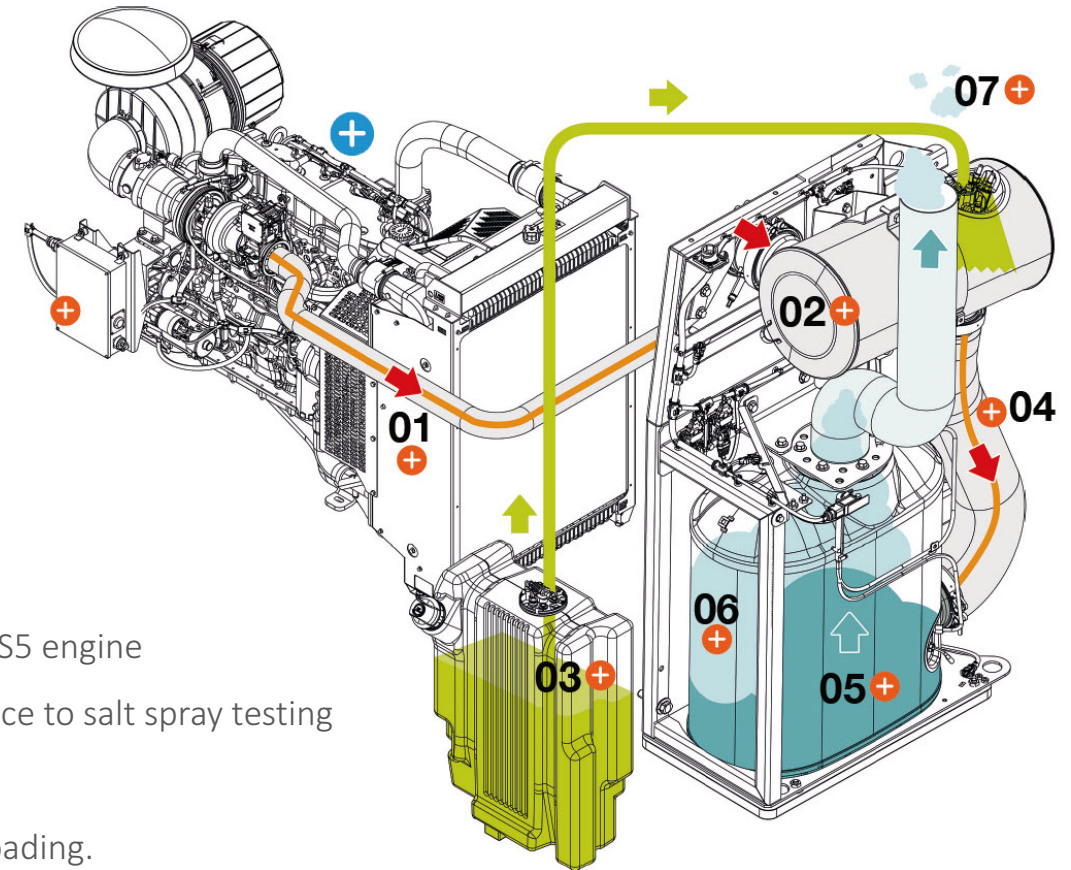


STAGE V / TIER IV ENGINES
AFTER-TREATMENT SYSTEMS
RoHS 2 COMPLIANT



Reduction of up to 90% of emissions of harmful components

- Lower Noise Level | Special rock wool insulation
- Smart Control | Reliable and efficient coordination with the control units of the S5 engine
- Best-in-class canopy | Highest levels of impermeability | 1,500 hours of resistance to salt spray testing
- Accessibility and Transportability
- Internal fuel filling tank to prevent theft and accidental spillage of fuel during loading.



STAGE V: EU Regulation 2016/1628, which regulates the emission limits for gaseous and particulate pollutants for internal combustion engines installed in non-road mobile machinery (NRMM).

RoHS2: Directive 2011/65/EU, which establishes restrictions on the use of hazardous substances in electrical and electronic equipment (EEE); designed for use with a rated voltage not exceeding 1000 volts for alternating current, and 1500 volts for direct current.

Gas Generator

NG | LPG | BIOGAS | BIOPROPANE | BIOMETHANE

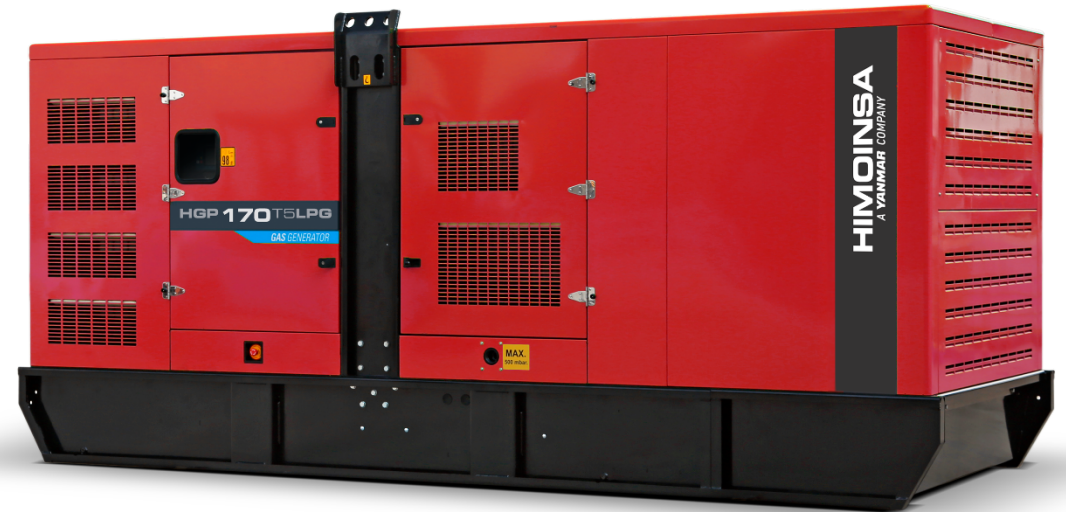


BIOFUEL
BIOGAS | BIOPROPANE | BIOMETHANE



FOSSIL GASES
NG | LPG

- HIMOINSA offers a complete gas range (12-2500 kVA)
- Specialized Gas Division & Gas Product Manager
- Project follow up and advice from the beginning
- Reducing the carbon footprint
- Low noise level
- Lower OPEX – Competitive operational expenses
- Extended services interval (up to 10,000 hrs in some models)



What are the challenges of gas generator?

Gas Generator

NG | LPG | BIOGAS | BIOPROPANE | BIOMETHANE



In terms of Development

- **Fuel Availability:**
NG and LPG have a restricted distribution worldwide. NG accessibility is improving thanks to the expansion of LNG. Biofuels like biogas, biopropane and biomethane are increasing its presence although still very concentrated in countries that supported their implementation
- **Composition of fuel:**
Gaseous fuels application are heavily dependant on their composition and this is different on each country, sometimes even on each site, like oil&gas.
- **Emissions:**
Depending on the country different emissions certificates are needed. And it means again different engine selection.
- **Application:**
Island application or parallel with mains, variable or constant load have an impact on engine selection too. It is critical to select always the most suitable engine: stoichiometric? Lean burn? High LT temperature? Low?

In terms of Managing

- **Continuous power**
A support network is a must for gas gensets, stronger and specialized than in diesel due to its continuous running in 95% of the cases. Training | Technical Support | Spare part stock.
- **Control of security.**
From design stage to operation, security must be an absolute priority. To our customers, safety must be taken for granted.

ESS - Storage



RENTAL (Continuous)

Battery Power Generator

10 – 45 kVA



- ✓ LOW NOISE LEVEL
- ✓ ENERGY EFFICIENCY
 - PEAK SAVING
 - Peak Saving
 - LOW LOAD
 - Stage V Low Loads
 - LOAD SHARING
 - Best Efficiency Point

MICROGRIDS (Flexibility Solution)

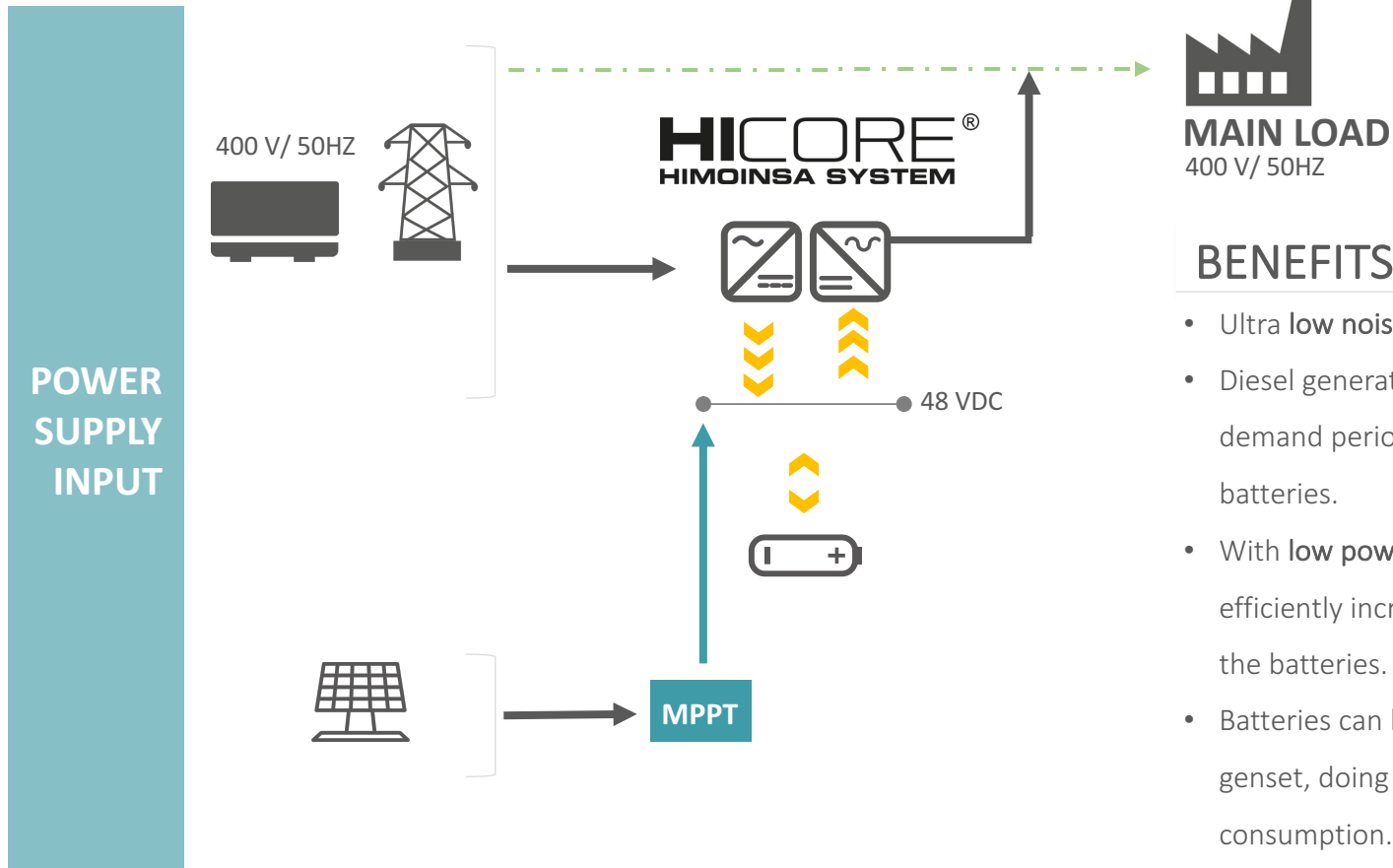
Battery Power Solutions



- ✓ Reliable Energy Supply in Real Time
 - ✓ Smooth Integration of Renewable Energy
 - ✓ Balanced Energy supply and demand
 - ✓ Uninterrupted Power
 - ✓ Operational Cost
-
- 1500 KVA
- 1500KVA 400KWp WIND ENERGY
- P=3000 KVA
E=1000 Kw/h

ESS – Storage

BATTERY POWER GENERATOR



BENEFITS

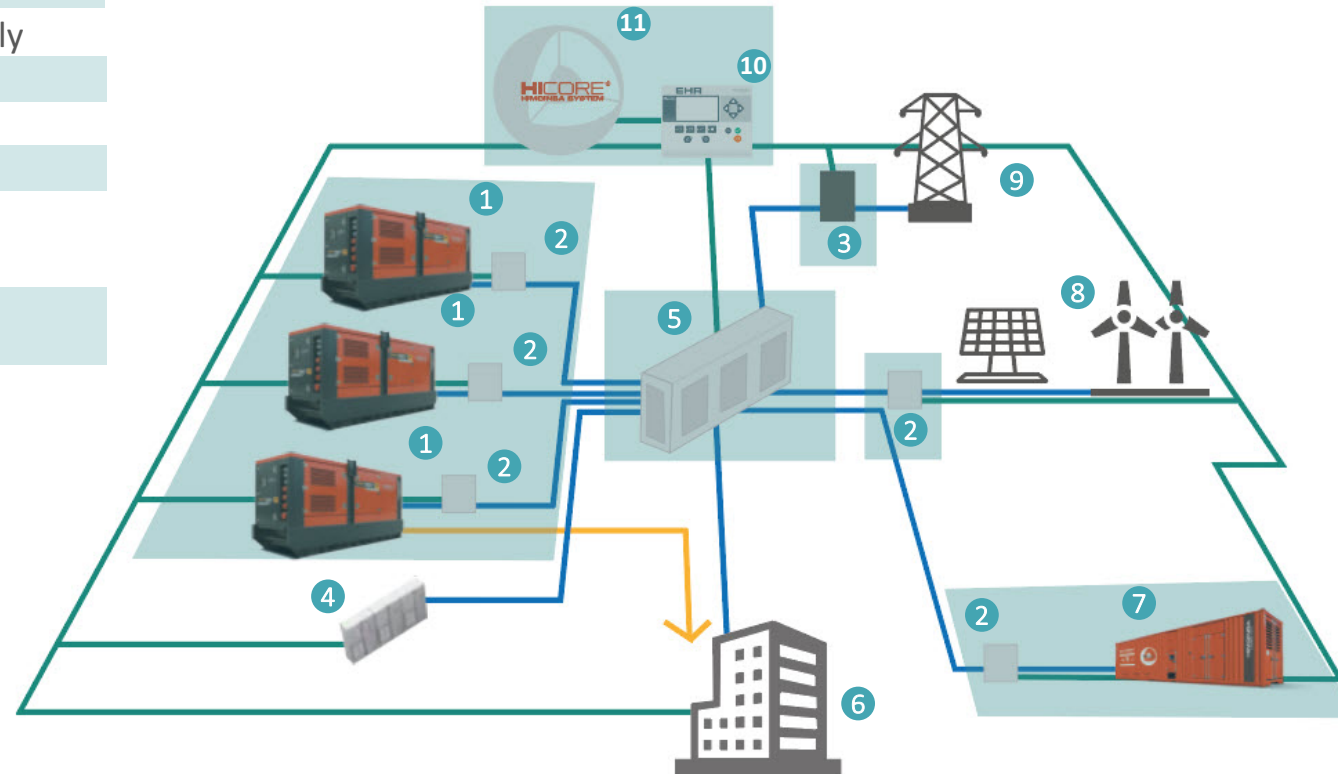
- Ultra **low noise** level
- Diesel generators (gensets) are less efficient with **low power demand**. During low demand periods generating sets are switched off and all energy is supplied from batteries.
- With **low power demand**, the **Stage V** aftertreatment has not the conditions to operate efficiently increasing the OPEX massively. In this case, all the energy will be supplied by the batteries.
- Batteries can be recharged (up to 80%) within the efficient charge profile zone of the genset, doing the genset operate in the **best efficiency point** optimizing the fuel consumption.
- **Peak saving**. Genset can be downsized due to EHR can works in parallel with genset and take care of the eventual peak power needs.
- Reduced operating time extend the genset service needs, **reducing OPEX**.

ESS – Storage

BATTERY POWER SOLUTION
SMART GRID

- 1. Genset
- 2. Circuit Breaker
- 3. Main Breaker
- 4. Uninterrupted Power Supply
- 5. Switch Gear
- 6. Load
- 7. Energy Storage
- 8. Renewables
- 9. Main Supply
- 10. Microgrid Controller
- 11. Intelligent System

📶 Wireless Communication



— Power
— Data
→ Heat

ADDING

Flexibility, speed, grid support and reliability by our diesel and gas generators to the renewable energy and storages

RESULTS INTO

Full energy integration providing a low-carbon, autonomous and distributed energy systems

CASE STUDY

Reference Projects

YANMAR ENERGY SYSTEM | Ikitelli City Hospital, Istanbul



- TRIGENERATION
- DIESEL GENERATORS
50MW
- GAS GENERATORS
12MW

Trigeneration System with a 12MW electricity capacity, producing electricity, heating and cooling, works with diesel generators that are activated when there is an interruption in the grid, synchronously.

24/7 efficient operation of the devices.

 <https://www.youtube.com/watch?v=XXVYh8NLGnc&t=2s>

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Q&A