



SOLUTION POWER PARTNER



COMPANY PRESENTATION

DESIGNING & ERECTING POWER STATIONS

2023



ABOUT THE COMPANY

ACTIVITIES

A **POWER PLANT EPC** and Renewable Energy contracting company, dealing mainly with **RECIPROCATING ENGINE** based power plants and **HYBRID ENERGY SYSTEMS** in Africa and the Middle East.



VISION

The **LEADING EPC CONTRACTOR AND O&M SERVICE PROVIDER** in Africa and the Middle East of Engine-based and Renewable Energy Power Plants and Solutions.



SERVICES

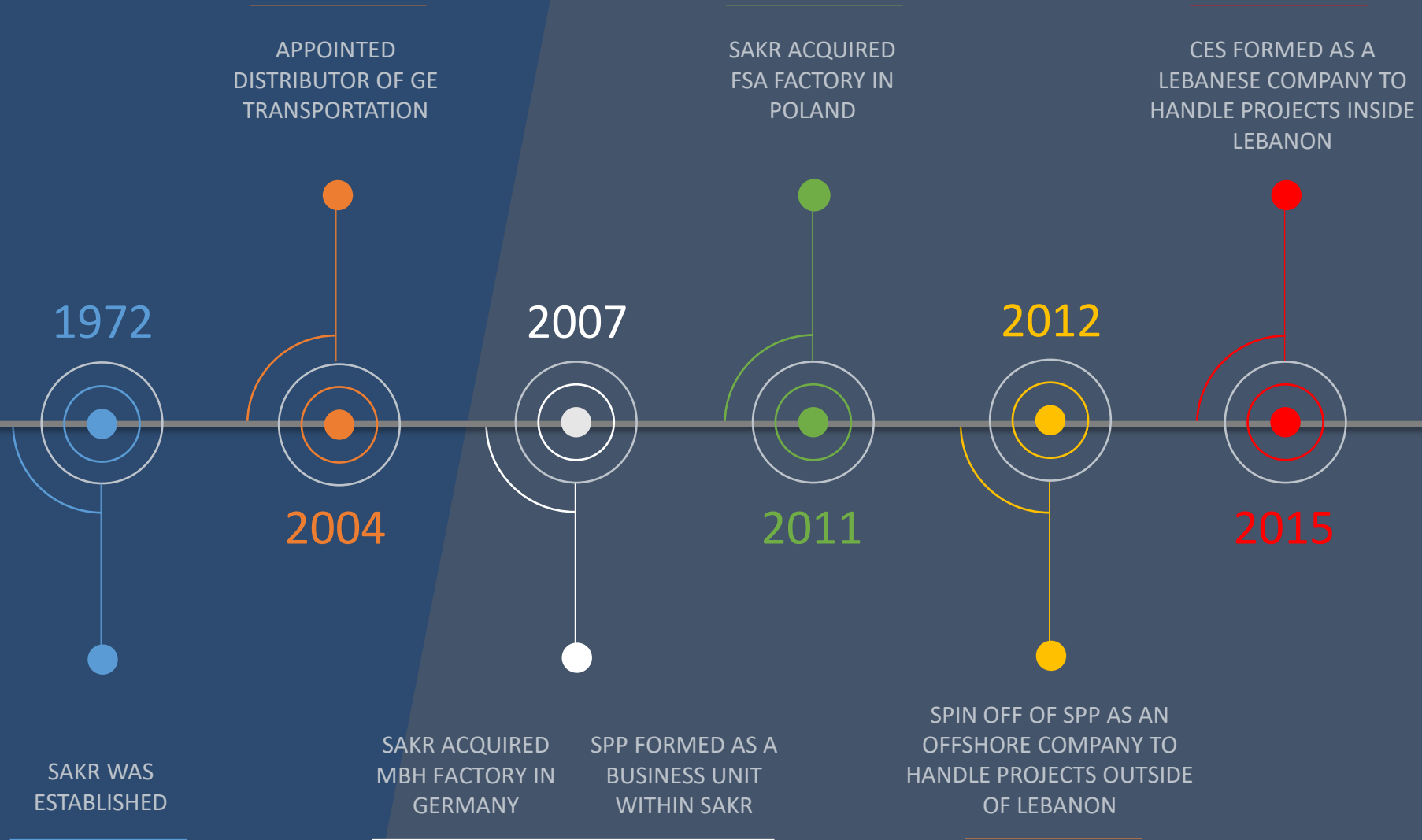
SPP offers **DESIGN-BUILD-COMMISSION, OPERATION & MAINTENANCE** and **MATERIAL SUPPLY** services.

MISSION

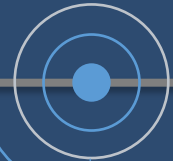
Provide **HIGH QUALITY & EFFICIENT** Power Plant Solutions to meet clients' requirements and expectations for a wide variety of **LIQUID FUEL, GAS, and RENEWABLE SOURCE APPLICATIONS.**



TIMELINE



1972



SAKR WAS ESTABLISHED

APPOINTED DISTRIBUTOR OF GE TRANSPORTATION



2004

SAKR ACQUIRED MBH FACTORY IN GERMANY

2007



SPP FORMED AS A BUSINESS UNIT WITHIN SAKR

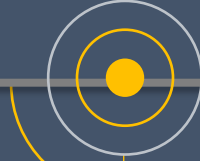
SAKR ACQUIRED FSA FACTORY IN POLAND



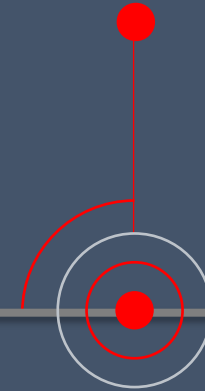
2011

SPIN OFF OF SPP AS AN OFFSHORE COMPANY TO HANDLE PROJECTS OUTSIDE OF LEBANON

2012



CES FORMED AS A LEBANESE COMPANY TO HANDLE PROJECTS INSIDE LEBANON



2015



SAKR ENERGY GROUP

SPP



- Regional power plant EPC and renewable energy contracting company, dealing mainly with reciprocating engine based plants and renewable energy systems
- Executed and operated many small and medium speed power plants based on diesel, gas and HFO reciprocating engines in the Middle East and Africa
- Distributor of GE Transportation medium speed diesel engines in Lebanon and Iraq
- Partner for INNIO Jenbacher (Gas Engines) in Lebanon, Jordan and Iraq
- Utilizes mostly for its projects MBH and FSA engines and generating sets

MBH



- Factory founded in 1951 and located in Halberstadt, Germany
- Assembles medium speed and high speed diesel and gas generating sets
- Holds the ISO 9001 certificate
- Follows German and international standards and regulations
- Qualified specialist Work Force for 4-Stroke engines
- “Made in Germany” advantage
- Large assembly and testing facilities
- Generating Sets designed for proven power reliability and efficiency

FSA



- Factory founded in 1846 and located in Poznan, Poland
- Licensee of MAN for the production of their HFO engines up to 4,000 kW
- Holds the ISO 9001 and ISO 14001 certificates
- High degree of specialization in the production of engines and associated machinery
- Made in Europe advantage for many countries like Latin America, the Middle East and African countries
- Flexibility in offering fast delivery for most of its engines

CES



- Lebanese Onshore Company
- Power Plant EPC and Renewable Energy contracting company, dealing mainly with reciprocating engine based plants and solar PV systems
- Executed and operated the 7MW Naameh landfill power plant in Lebanon
- Partners with international companies in providing Resource Characterization and Project Design & Engineering for Solar PV projects
- In-house design that meets international quality standards and specifications



DEPARTMENTS



BUSINESS DEVELOPMENT

PROJECTS SALES
PROPOSALS
AGREEMENTS WITH COUNTRY PARTNERS



PROJECT MANAGEMENT

EXECUTION
PLANNING
COST CONTROL
PROCUREMENT



CONSTRUCTION & OPERATION

COMMISSIONING
ELECTROMECHANICAL INSTALLATIONS
OPERATION & MAINTENANCE



GENERAL MANAGEMENT

CORPORATE STRATEGY FORMULATION



FINANCE

PROJECT CASHFLOW
ACCOUNTING
BUDGETING
FINANCIAL REPORTING



ENGINEERING

PROJECT DESIGN
PRODUCT DESIGN
ELECTRICAL, MECHANICAL AND CIVIL ENGINEERING



MARKETING

MARKETING STRATEGY FORMULATION
MARKET RESEARCH
CREATIVE SERVICES
CAMPAIGN MANAGEMENT

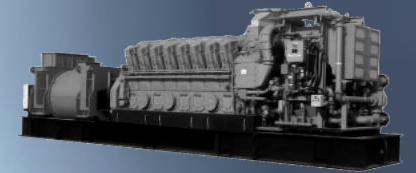


POWER PLANT SOLUTIONS

RECIPROCATING ENGINES

FUELS: DIESEL, HFO, GAS

BRANDS: GE TRANSPORTATION, BERGEN, MAN, MITSUBISHI, HYUNDAI, JENBACHER, LIEBHERR, WAUKESHA, CUMMINS, MTU



FIRST
CLASS
BRANDS

SOLAR PV SYSTEMS

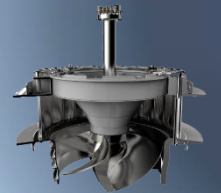
MAIN INVERTER BRAND: SolaX



HYDROELECTRIC TURBINES

BRAND: GE

SOLUTIONS: STANDARD STARTING FROM 5MW UNIT OUTPUT





PROJECT DELIVERABLES

OPERATION | MAINTENANCE

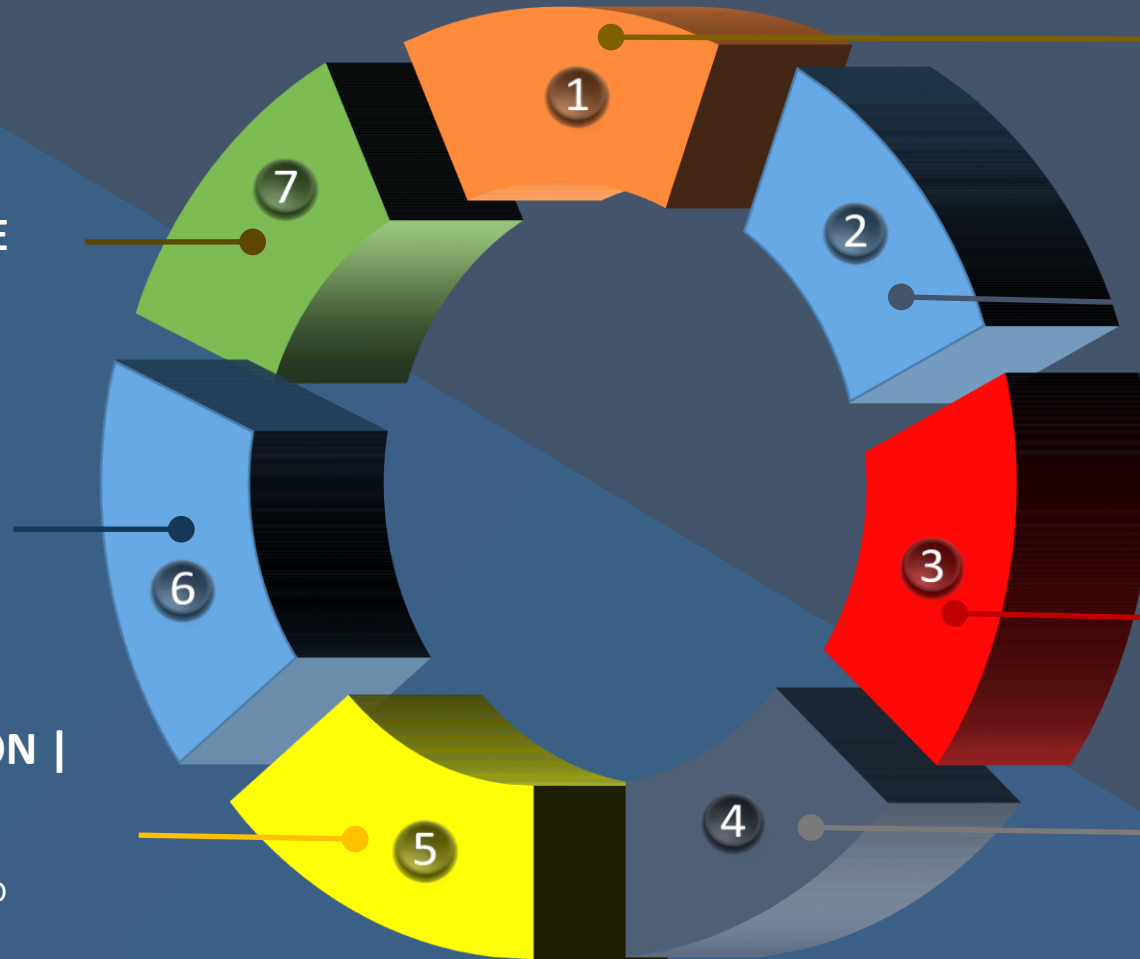
24 HOUR OPERATION, CORRECTIVE AND PREVENTIVE MAINTENANCE

TRAINING

SITE AND CLASSROOM TRAININGS

INSTALLATION | SUPERVISION | COMMISSIONING

SUPERVISION OF ELECTROMECHANICAL INSTALLATION, SAFETY OF PERSONNEL AND EQUIPMENT



FEASIBILITY | OFFER | CONTRACT

CAPEX, OPEX, ROI, IRR, PAYBACK, COMMERCIAL PROPOSALS, TECHNICAL PROPOSALS, SLDs, LAYOUTS, CONTRACT DRAFTS

PLANT CONFIGURATION | DESIGN

DESIGNS, DRAWINGS, CALCULATIONS

PROJECT MANAGEMENT | PROCUREMENT | DELIVERY

PLANNING, COST CONTROL, PROCUREMENT OF PROJECT MATERIAL

MAIN EQUIPMENT MANUFACTURING

PROCUREMENT OF GENSET COMPONENTS, TESTING, FAT, PACKING



CORE COMPETENCIES

Multi-Disciplinary Engineering
team (mechanical, electrical, civil engineers)

Extensive experience in power plants and ability to deliver

Customized Power Plant Solutions

Capacity of executing **Multi-Megawatt Projects**

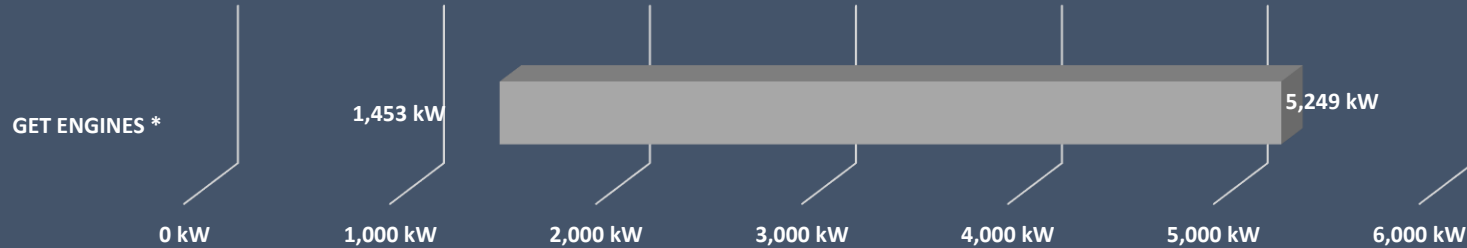
In-House Designs that meet international quality standards and specifications

Commissioning Know-How and 24/7 after sales services

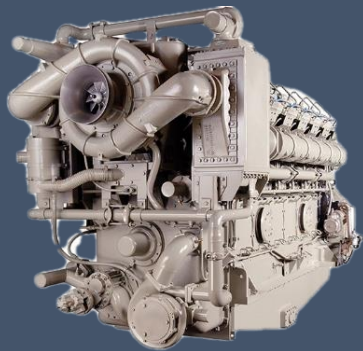
One of few companies that construct turnkey projects based on **Own Products and Designs**



DIESEL MEDIUM SPEED GENERATING SETS



* Assembled at MBH Factory in Germany



GE TRANSPORTATION

- Diesel Engines that meet Tier 4 standards, reducing emissions by around 70%
- Speed: 1000rpm @ 50Hz (900rpm @ 60Hz)
- Fuel Consumption: 189g/kWeh

MBH

- Medium speed gensets normally powered by a GE Transportation GE16V250 (4MW) diesel engine
- Ideal for continuous operation in harsh environments with high efficiency
- Can start large motors



OPEN GENSET CONFIGURATION



CONTAINERIZED GENSET CONFIGURATION

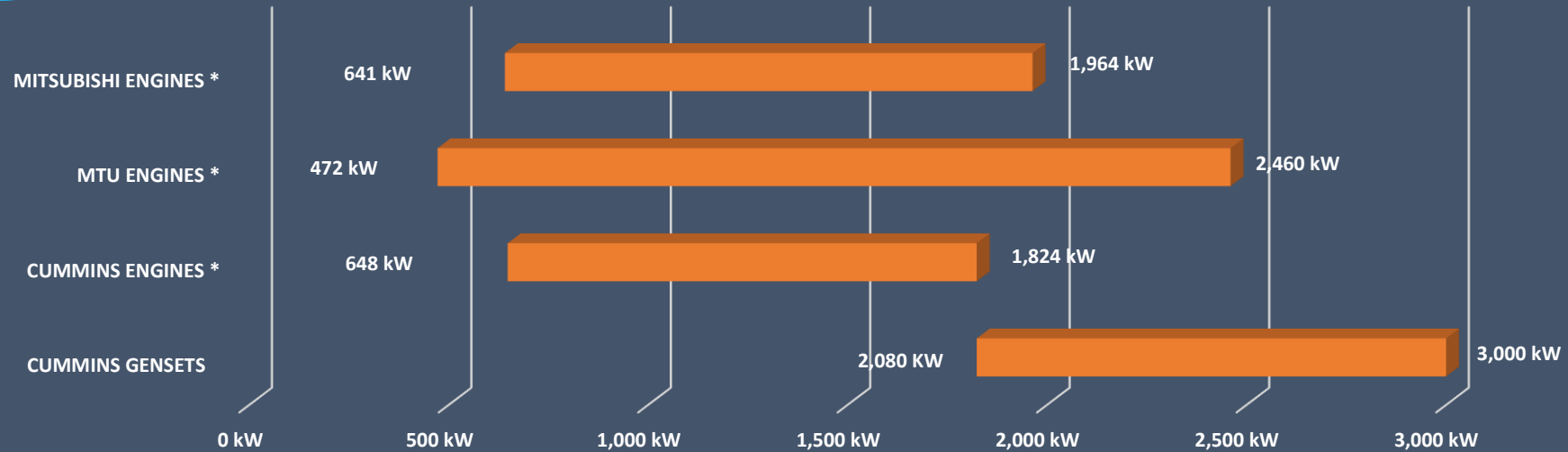


Rolls-Royce®





DIESEL HIGH SPEED GENERATING SETS



* Assembled at MBH Factory in Germany

MBH'S HIGH SPEED DIESEL GENSETS SPECIFICATIONS AND BENEFITS

- Optimized performance
- Proven reliability
- Optimized fuel efficiency
- Optimized life-cycle costs
- Easy to install and operate
- Easy to service
- Serviced worldwide, around the clock
- Available in open and enclosed versions

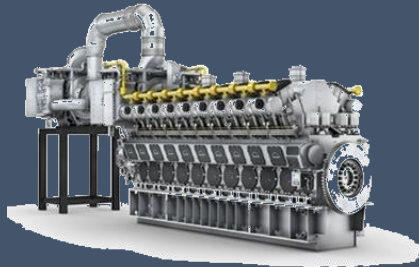
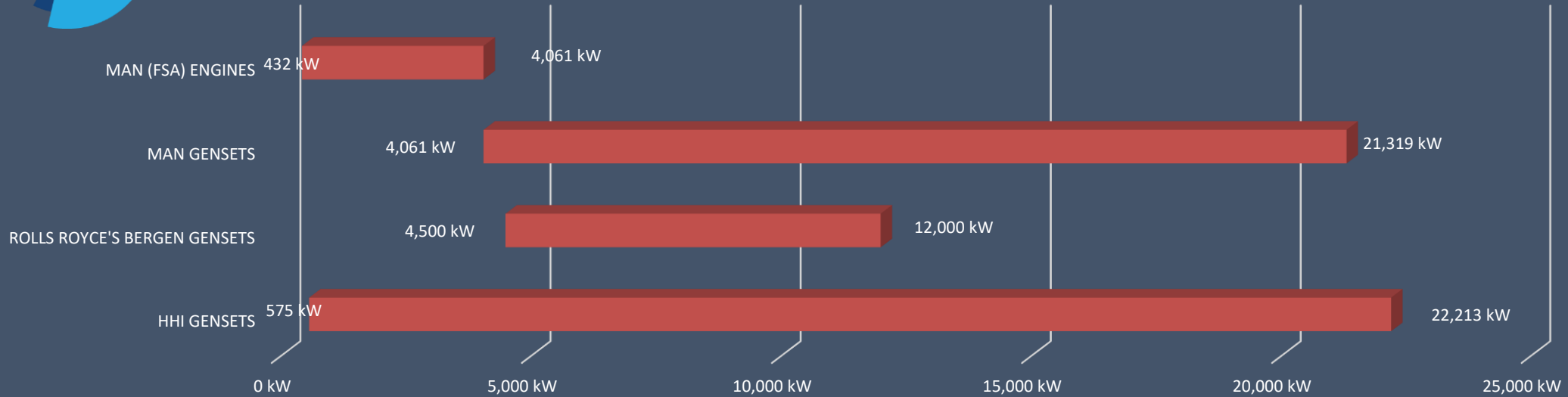


Rolls-Royce®



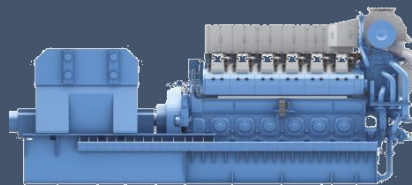


HFO GENERATING SETS



MAN

- HFO Gensets that meet world bank emissions standards
- Fuel Consumption: Down to 183g/kWeh



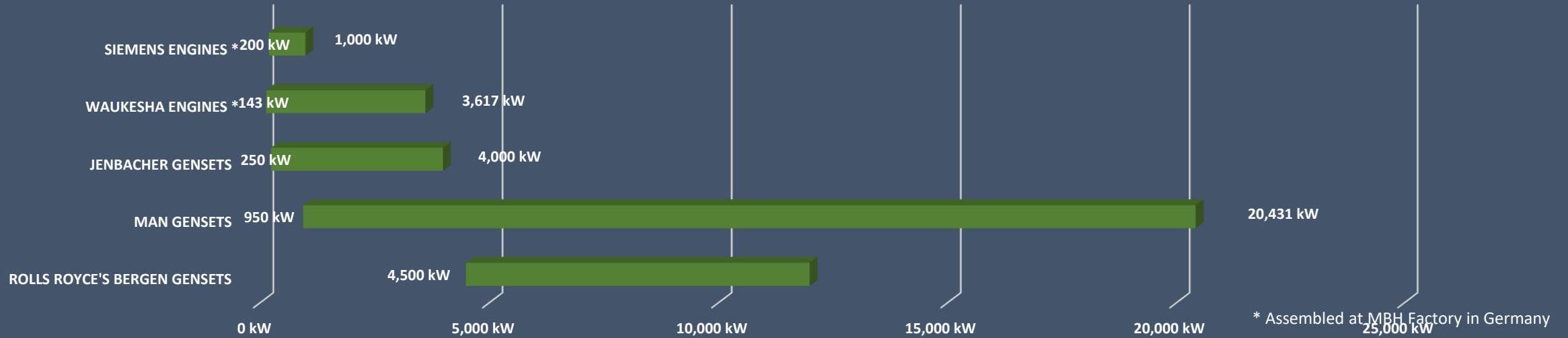
ROLLS ROYCE'S BERGEN

- Unique engine competence based on more than 160 years of experience
- High efficiency (beyond 90% with CHP)





GAS GENERATING SETS



WAUKESHA



- Robust technology for extreme environments and oil & gas applications
- Fuel Consumption: 0.26 Nm³/kWh based on 93% methane

JENBACHER



- Highly developed gas engines for commercial, industrial and municipal applications

SIEMENS

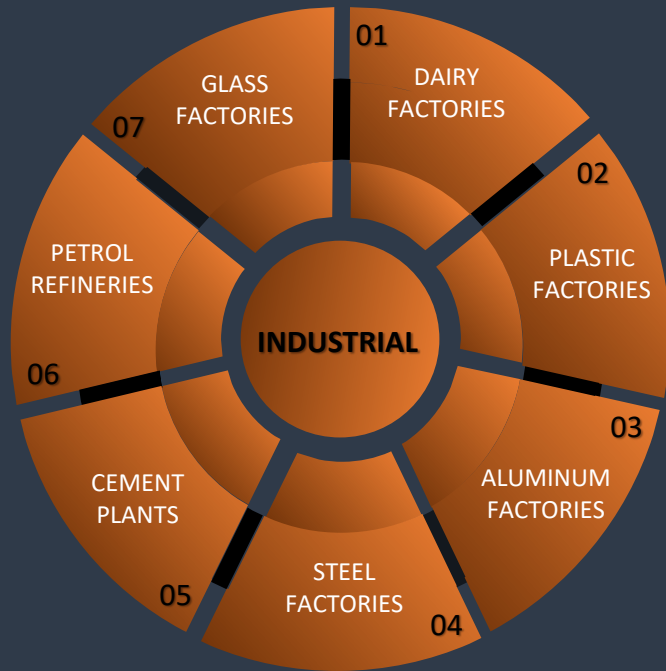


- Optimized for operation with natural gas, biogas and special gases
- High mechanical efficiency of more than 41%





TYPICAL SERVED SECTORS





REFERENCE PROJECTS: 2014-2023

Country	Project Name	Client Name	Year	Capacity	Fuel	Engine Type
Republic of the Congo	Marine VII Congo LNG Pre-Treatment	Expro / Eni	2022	18MW	Gas	MTU 20V4000L32ER
Iraq	HKN Sarsang Block	Influit	2020	4MW	Diesel and Gas	Mitsubishi S16R2PTAW / MTU 20V4000L32 ER
Lebanon	Josons Tower	Josons	2020	1MW	Diesel	Cummins VTA28G5
Lebanon	Banque Du Liban Data center and branches	Banque Du Liban	2019	1.2MW	Diesel	Cummins QSK23G3
Liberia	Conex refinery Liberia	Vfuels	2019	2MW	Diesel	Cummins KTA50G3
Australia	Zenith Energy Power Plant	Zenith Energy	2018	3MW	Diesel	GE12V250
Angola	Spare Parts for power plants across the country	AEnergia	2018	N/APP	Diesel	Various medium speed engines
Kuwait	Az-Zour South CCGT	Sepco III	2017	2MW	Diesel	Mitsubishi S16R2PTAWE
UAE	Abu Dhabi Airports – MTC	Abu Dhabi Airports	2017	3MW	Diesel	MBH1700 / MBH1600 / MBH470
Iraq	US Embassy	US Embassy	2017	6.4MW	Diesel	Mitsubishi S16RPTAA2
Sierra Leone	Sierra Leone Power Plants	Ministry of Energy	2017	6MW	Diesel	Cummins VTA28G5
Algeria	In Salah Power Plant	Mechanical Electrical Services GmbH	2016	6.7MW	Diesel	Mitsubishi S16U-PTK
UAE	Audi Showroom	Audi	2016	1MW	Diesel	MBH1250
UAE	Al Raha Beach	Al Raha	2016	1.6MW	Diesel	MBH1740 / MBH350
Lebanon	Naameh Landfill Power Plant	Sukomi International	2015	7MW	Landfill Gas	Jenbacher J320 GS
Iraq	Basrah Water Supply Improvement Project (Pack 3)	Hitachi Ltd.	2014-2015	17.4MW	Diesel	MAN 18V32:40
Iraq	Temporary Power Supply	Lukoil Mid East	2013-2014	44MW	Diesel	Cummins K50 G3
Iraq - Kurdistan	Sulaimaniyah CCPP - Emergency Diesel	Enka	2014	2.6MW	Diesel	Mitsubishi S16R-PTA
Iraq - Kurdistan	Bazyan - Black Start	Enka Insaat	2014	4MW	Diesel	Mitsubishi S16R2-PTAW
Iraq	Temporary Load Bank Services	Lukoil Mid East	2014	66MVA	N/APP	N/APP



REFERENCE PROJECTS: 2010-2013

Country	Project Name	Client Name	Year	Capacity	Fuel	Engine Type
Iraq	Najybia Power Plant- Black Start/Emergency Diesel	Enka Teknik	2013	5.5MW	Diesel	GE16V250 / Mitsubishi S16R PTA / MBH 1900
Iraq - Kurdistan	Erbil CCPP – Emergency Diesel	Enka	2013	2.6MW	Diesel	Mitsubishi S16R-PTA
Iraq	FAO Depot – Black Start Diesel	Penspen	2013	5.6MW	Diesel	GE16V228
Iraq	Diwaniya - Black Start/Emergency Diesel	El Sewedy Electric	2013	5.6MW	Diesel	GE16V250/Cummins QSK60G4
Iraq	Akaz Power Plant - Black Start/Emergency Diesel	Lanco	2012	4MW	Diesel	GE16V250 /Mitsubishi S16R-PTA2
Iraq	Khairat Power Plant - Black Start	Calik Enerji	2012	4MW	Diesel	GE16V250
Iraq	Nainawa Power Plant - Black Start	Calik Enerji	2012	4MW	Diesel	GE16V250
Nigeria	Leoplast Gas LP1	Leoplast	2012	2.6MW	Gas	Jenbacher 320 / Jenbacher 312
Iraq	Shat Al Basra 10XGT 9E Open Cycle Power Plant - Black Start/Emergency Diesel	Metka	2012	13.3MW	Diesel	GE16V250 / Mitsubishi S16R PTA / MBH 12VTADM
Iraq	Quds Power Plant - Black Start/Emergency Diesel	HDEC (HYUNDAI)	2011	4MW	Diesel	GE16V250 / KTA 50-G8
Iraq	Hilla Power Plant - Black Start/Emergency Diesel	IFC (International Free Co.)	2011	4MW	Diesel	GE16V228 /Cummins KTA50-G3
Iraq	Karbala Power Plant - Black Start/Emergency Diesel	IFC (International Free Co.)	2011	4MW	Diesel	GE16V228 /Cummins KTA50-G3
Iraq - Kurdistan	Sulaimaniyah Power Plant - Black Start	MGI (Mass Global Investment)	2010	5.3MW	Diesel	GE16V250
Iraq - Kurdistan	Dhook Power Plant - Black Start	MGI (Mass Global Investment)	2010	5.3MW	Diesel	GE16V250

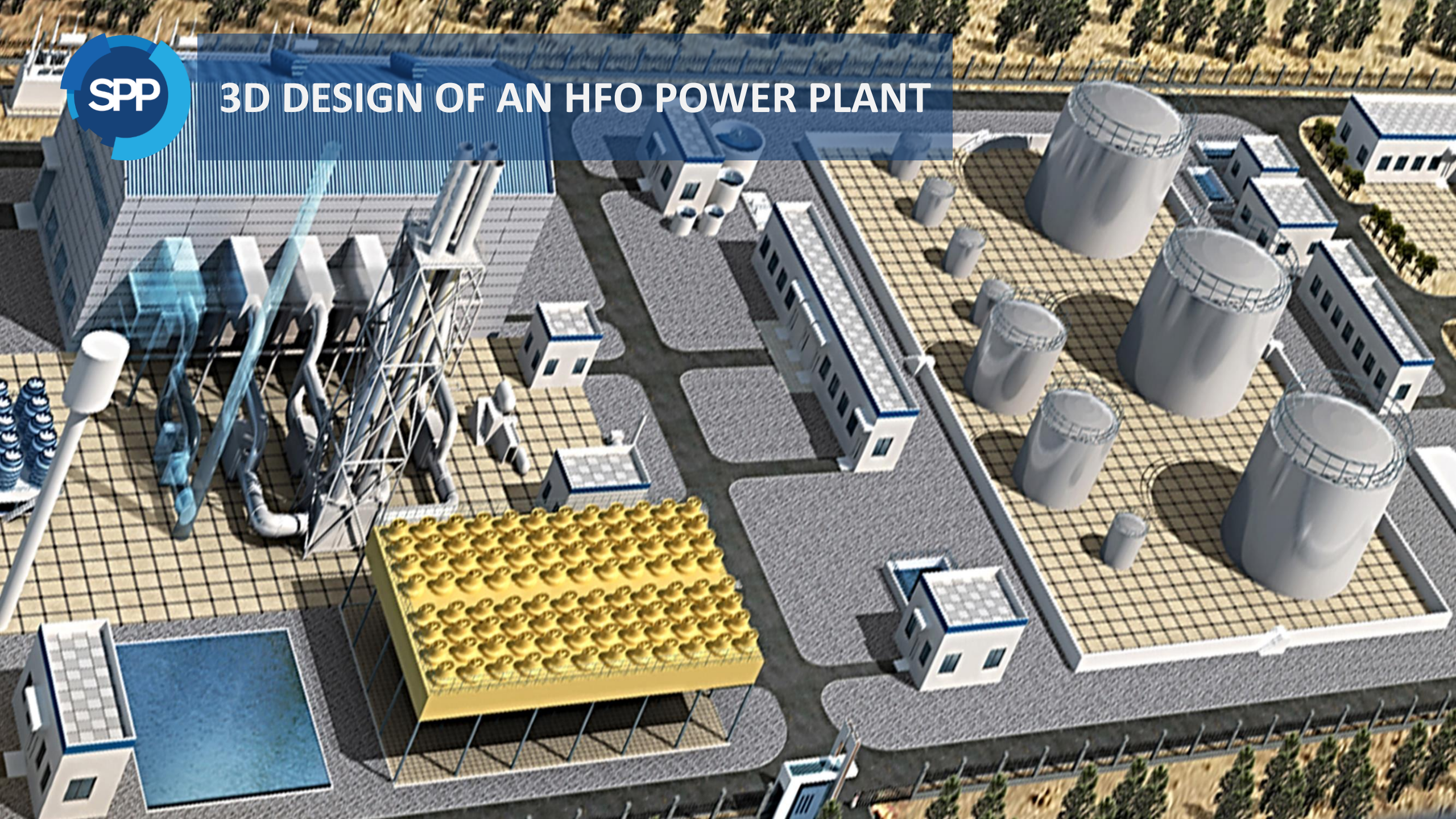


REFERENCE PROJECTS: 2005-2009

Country	Project Name	Client Name	Year	Capacity	Fuel	Engine Type
Ivory Coast	Moulin Moderne de Cote d'Ivoire	MMCI	2009	4MW	Diesel	Cummins KTA50-G3
Nigeria	Palm Spring Estate	Artee Industries	2009	2.05MW	Diesel	MBH 12VTAD-M
Nigeria	Rockson Engineering - Black Start/Emergency Diesel - Alaoji, Egbema, Gbarain, Omoku Power Plants	Rockson Engineering	2009	26MW	Diesel	GE16V228 / MBH 12VTAD-S
Iraq	Hurriah Plant Phase 1 (PP1)	Ministry of Electricity (Baghdad)	2008	62MW	HFO	Wartsila 8L46
Algeria	Amimer Energie Groupes Electrogenes - Moto-soudeuses for Sonatrak	GE Transportation	2008	33.6MW	Diesel	GE16V228
Iraq	Al Ramad Power Station	Al Bareh	2008	12MW	Diesel	Mitsubishi S16R-PTA2
Nigeria	Nestle gas power plant	Negris	2008	3MW	Gas	Jenbacher J320
South Africa	Debeers - Venetia mine	Sheltam Grindrod	2008	11.2MW	Diesel	GE16V228
South Africa	Nestle 7.5MW	Lubri-Tech Marketing	2008	7.5MW	Diesel	Mitsubishi S16R-PTA2
Sudan	Atbarah - Shamal Cement	MGI (Mass Global Investment)	2008	6MW	Diesel	Mitsubishi S16R-PTA2
Iraq	MOEK – Kurdistan	Ministry of Electricity (Kurdistan)	2007	90MW	Diesel	Cummins QSK 60/ K50, GET
Qatar	Qatalum	SATCO	2007	12.5MW	Diesel	GE16V250/Cummins
Qatar	Al-Udeid Air Base	QIT	2007	11.2MW	Diesel	GE16V250
Iraq	P35 – 168MW	Ministry of Electricity (Baghdad)	2005	168MW	Diesel	Cummins QSK 60



3D DESIGN OF AN HFO POWER PLANT





EXAMPLE OF AN HFO POWER PLANT

HURRIAH FIRST PHASE IRAQ



ELECTRICAL OUTPUT: 62MW



CLIENT: IRAQI MINISTRY OF ELECTRICITY



PLANT FEEDING NETWORK



8 x WÄRTSILÄ 8L46B / 6L46B GENSETS



EXAMPLE OF AN OPEN DIESEL GENSET USED TO BLACK START A POWER PLANT

KHAIRAT BSDG
IRAQ



ENGINE

1 X GE16V250



SIZE

5.5MVA



CUSTOMER

CALIK ENERJI



EXAMPLE OF A CONTAINERIZED DIESEL GENSET USED TO BLACK START A POWER PLANT

SULAIMANIYAH BSDG
IRAQ KURDISTAN



ELECTRICAL OUTPUT: 5.3MW
VOLTAGE OUTPUT: 6.6KV



CLIENT: MGI
ENGINE: GE16V250



EXAMPLE OF A LANDFILL POWER PLANT

NAAMEH LANDFILL GAS POWER PLANT LEBANON



7 CONTAINERIZED GEN-SETS POWERED BY JENBACHER GAS ENGINES AND ASSEMBLED AT MBH FACTORY IN GERMANY



HANDLED SCOPE: EPC AND O&M OF THE LANDFILL POWER PLANT



TOTAL POWER PLANT CAPACITY OF 6.4 MW



PRODUCED ELECTRICITY STARTED BEING EXPORTED TO THE NATIONAL GRID IN 2015 FOR AN ESTIMATED PERIOD OF 15 YEARS



SUMMARY

