

drive & energy systems for oil & gas industry

CAT[®] FLARE GAS SOLUTIONS BY ZEPPELIN

YOU CAN COUNT ON.



63,000 MW

OF FLARE GAS ACCUMULATED
WORLDWIDE TO USE

ZEPPELIN[®]
Power Systems



ANALYSIS, INSTALLATION & CERTIFICATION.

WHEREVER OIL IS PRODUCED, FLARE GAS IS ACCUMULATED. WHY SHOULDN'T YOU USE IT FOR YOUR BENEFIT?

The amount of gas flared corresponds to:

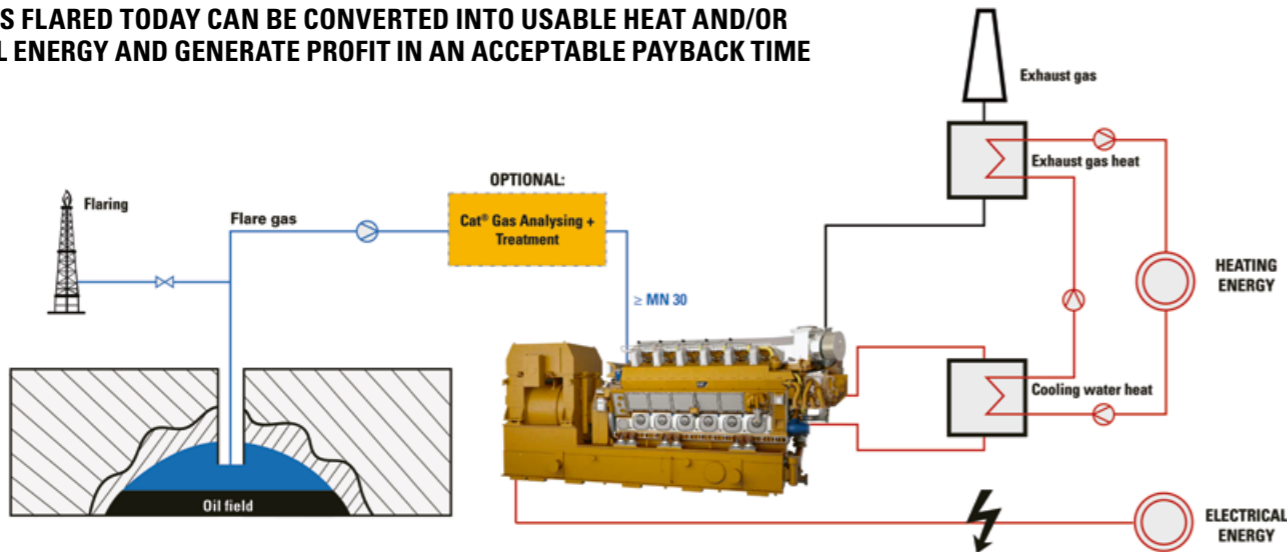
- approx. 5% of worldwide gas demand
- a market value of approx. 40 billion US\$
- approx. 2.4 million barrels of oil per day
- create 400 million tons of CO₂ emissions
- similar to a yearly exhaust gas quantity equating to 77 million cars or 252 gas power plants, 250 MW each

HOW TO USE FLARE GAS FOR YOUR BENEFIT.

USING FLARE GAS, YOU CAN:

- provide extra power at no cost to electrical consumer/grid and/or heat customers
- reduce air pollution and minimize your CO₂ footprint – “Zero Flaring” becomes mandatory from 2030
- heating crude oil from engine coolant or exhaust
- be independent of fuel prices, transportation availability, weather and economic & political boundary conditions
- generate profit in an acceptable payback time

GAS THAT IS FLARED TODAY CAN BE CONVERTED INTO USABLE HEAT AND/OR ELECTRICAL ENERGY AND GENERATE PROFIT IN AN ACCEPTABLE PAYBACK TIME



OUR SOLUTION

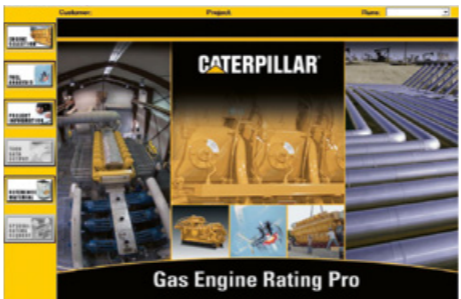
Zeppelin Power Systems created a flare gas solution based on durable and robust Caterpillar ATEX approved engines.

G3406/G3412 160/305 ekW gross, 140/275 ekW at MN30, 50°C, 500m	G3516A 975 ekW gross, 850 ekW at MN30, 50°C, 500m
G3508/G3512 480/725 ekW gross, 400/610 ekW at MN30, 50°C, 500m	G3520E 1,995 ekW gross, 1,500 ekW at MN55, 50°C, 500m
	G3600-A4 1,330 ekW to 3,500 ekW gross, 1,330 ekW to 3,500 at MN30, 50°C, 500m

100% GAS ANALYSIS – WITH THE CATERPILLAR “GAS ENGINE RATING PRO” (GERP) SOFTWARE

Zeppelin Power Systems provides you with Gas Engine Rating Pro software (GERP) from Caterpillar, which analyses the gas/fuel status. The software:

- is specially designed for your solution
- allows optimal configuration of the engines
- delivers 100% analysis of your gas composition



Constituent	Abbrev	Mole Percent	Wt%	Wt%
Water Vapor	H2O	0.0000	0.0000	0.0000
Methane	CH4	0.0000	0.0000	0.0000
Ethane	C2H6	0.0000	0.0000	0.0000
Propane	C3H8	0.0000	0.0000	0.0000
Isobutane	iso-C4H10	0.0000	0.0000	0.0000
Normalbutane	nor-C4H10	0.0000	0.0000	0.0000
Isopentane	iso-C5H12	0.0000	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000	0.0000
Hexane	C6H14	0.0000	0.0000	0.0000
Heptane	C7H16	0.0000	0.0000	0.0000
Octane	C8H18	0.0000	0.0000	0.0000
Carbon Dioxide	CO2	0.0000	0.0000	0.0000
Hydrogen Sulfide	H2S	0.0000	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000	0.0000
Oxygen	O2	0.0000	0.0000	0.0000
Nitrogen	N2	0.0000	0.0000	0.0000
Helium	He	0.0000	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000	0.0000
Octane	C8H18	0.0000	0.0000	0.0000
Nonane	C9H20	0.0000	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000	0.0000

Calculated Fuel Properties:

- Caterpillar Methane Number: 0.00
- Lower Heating Value (MJ/Net3): 0.00
- Higher Heating Value (MJ/Net3): 0.00
- WOBBS Index (MJ/Net3): 0.00
- THC Free Inert Ratio: 0.00
- Total % Inerts (H2, CO2, He): 0.00%
- HPC (%) (To 35.64 MJ/Net3 Fuel): 0%
- Compressibility Factor: 0.00
- Stoich A/F Ratio (M/A): 0.00
- Stoich A/F Ratio (Mass/Mass): 0.00
- Specific Gravity (Relative to Air): 0.00
- Fuel Specific Heat Ratio (K): 0.00

After a detailed gas analysis our engines can use untreated gas with a Methane No. (MN) of up to 30 – we set up the individual configuration according to your requirements.

INSTALLATION & CERTIFICATION



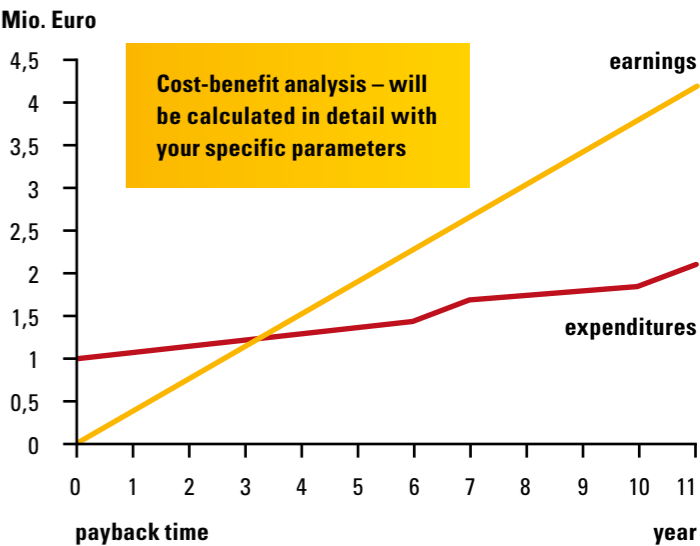
Whether onshore or offshore, the set can be installed independently as a stand-alone set in an already existing or scheduled plant, depending on your specific requirements. Certifications in accordance with API, ASME, U-stamp or international classification societies such as DNV-GL are available. Of course, ATEX and IECX compliant engines are also available for use in hazardous areas.

DETAILED COST-BENEFIT ANALYSIS

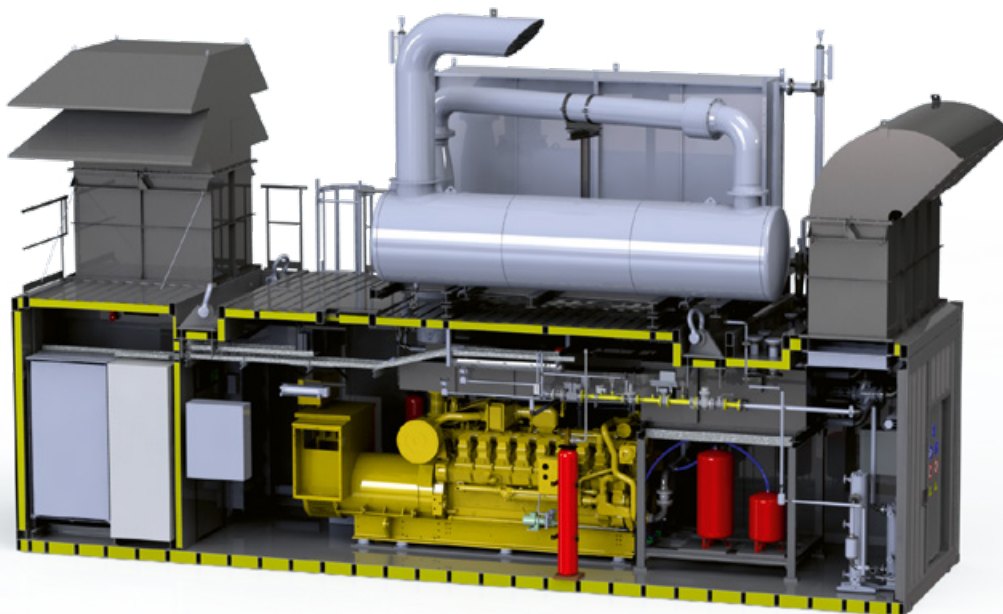
Resulting in a design of your application, we parallel provide a detailed cost-benefit analysis to show your cash flow break even and payback time in case the flare gas generator set provides the electrical power instead of the diesel oil generator set.

We take into consideration the installation, operating, service and maintenance costs of the plant on one hand and the produced electrical energy (and optional heating energy) and the estimated savings of diesel fuel on the other, over the years.

With our CAT® CONNECT solution we provide online access to your equipment and ensure high uptime and condition-based maintenance.



CAT® FLARE GAS SOLUTIONS BY ZEPPELIN POWER SYSTEMS.



Electr. power: 1200 kVA
Voltage: 400 V
Heat recovery: 50–55 m³/h
crude oil/ Δt = 30 grd
Methane no.: 44

Suitable for Hazardous Area ATEX Zone II



BUILT FOR IT.™

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