

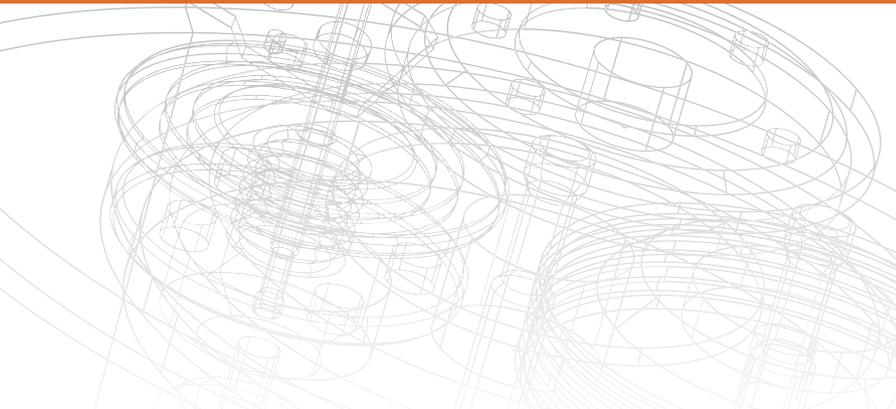
New challenges call for  
new solutions with  
efficient energy technologies

**meco** plan – three syllables synonymous with innovative engineering services that blend economic efficiency with a sense of responsibility for the environment in a revolutionary fashion. mecoplan, based in Cologne (Germany), offers extensive technical and commercial know-how on every aspect of energy optimization in combined heat and power systems. **meco**plan develops, executes and supports projects in the field of innovative process gas recovery based on efficient CHP technology.



Thanks to a pioneering concept, **meco**plan helps customers meet their own process gas needs at virtually neutral costs. Moreover, users of combined heat and power (CHP) units benefit from economic and ecological advantages for a variety of use concepts.

**meco**plan provides advice and support from the initial planning phase through the engineering design to an optional demand analysis tailored to the requirements of your individual application.





## Experience a new dimension in energy efficiency

### Gas engine for the production of process gas

Process gas, or inert gas in its pure form, plays a central role in the operation of gas-tight autoclaves, e.g. for the manufacture of high-quality fiber composites.

**mecoplan** has the know-how it takes to produce process gas or O<sub>2</sub>-free inert gas in a sustainable way using a gas engine and an innovative exhaust gas treatment technique.

There is no longer any need to buy in cost-intensive nitrogen or if so, it is only required for the purpose of system redundancy.

This method for recovering process gas with a gas engine has been tried and tested since 2007 and is already employed with considerable success in the aerospace industry.

The reduction of contaminant input to a minimum, the engine-specific regulation system and the exhaust gas treatment concept all have a decisive influence on the quality of the process gas. Individual customer requirements, for instance regarding the concentration of O<sub>2</sub>, can be taken into account very accurately.

This revolutionary technique for process gas recovery improves both the energy and the economic efficiency of your production facility, leading to a significantly accelerated return on investment (see model calculation).

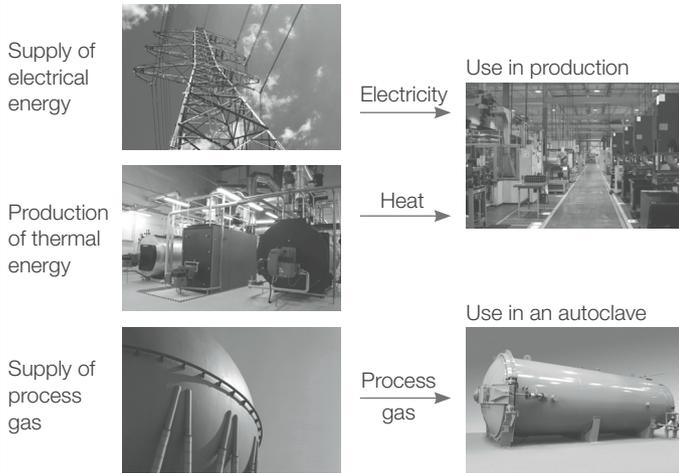
If it is possible to utilize the entire electrical and thermal energy generated by a CHP unit, process gas can be produced at virtually neutral costs.

**mecoplan** also provides comprehensive advice in support of applications for the attractive subsidies linked to the use of CHP units.



The following model calculation clearly illustrates the economic benefits of process gas recovery using a gas engine compared to conventional technology.

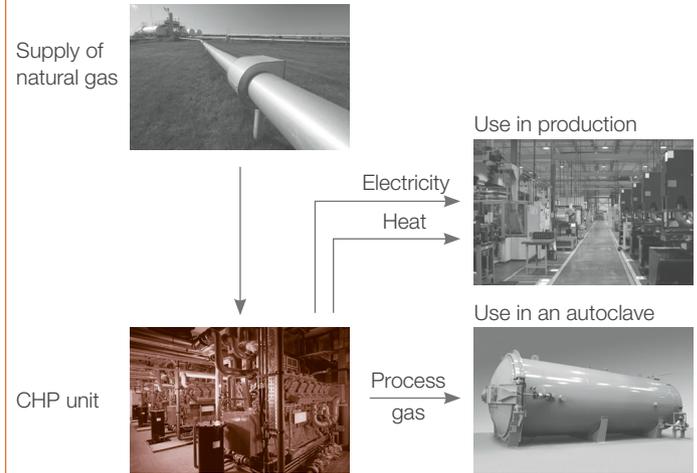
## CONVENTIONAL TECHNOLOGY



The model calculation shows the annual energy costs for electricity, heat and process gas (e.g. nitrogen) procured in the conventional way:

<b>Electrical energy</b>			
0.72 MW x 8000 op. hrs./year	100 €/MWh	€ 0.58 mill.	
<b>Thermal energy (&gt; 90° C)</b>			
2.2 MW x 8000 op. hrs./year	36 €/MWh	€ 0.63 mill.	
<b>Thermal energy (&gt; 50° C)</b>			
1.3 MW x 8000 op. hrs./year	36 €/MWh	€ 0.37 mill.	
<b>Process gas</b>			
5050 m <sup>3</sup> /h x 8000 op. hrs./year	0.06 €/m <sup>3</sup>	€ 2.42 mill.	
<b>Total costs per year</b>			<b>€ 4.00 mill.</b>

## mecoplan PROCESS GAS RECOVERY



The model calculation shows the huge reduction in energy costs achieved with process gas recovery according to the **mecoplan** principle:

<b>Supply of natural gas</b>			
4.45 MW x 8000 op. hrs./year	35 €/MWh	€ 1.25 mill.	
<b>Maintenance costs/year</b>			€ 0.50 mill.
<b>Total costs per year</b>			<b>€ 1.75 mill.</b>



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**mecoplan** – a plan that pays off:

- Consulting and support based on the **mecoplan** demand principle
- Significantly accelerated return on investment for the plant as a whole
- (Exhaust) gas treatment concept tailored to each customer's individual requirements
- Process gas production at virtually neutral costs
- Eco-friendly energy production thanks to high efficiency values
- Innovation lead through the use of high technology
- Lower costs by profiting from government subsidies

Our cooperation partner  
and gas engine supplier



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