

Combined Heat and Power – An insight into a current project at the IndustrieparkHöchst

Dr. Paul Michael Falk, Infracore Höchst

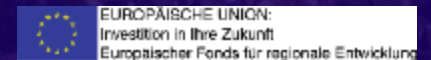
13.05.2022



**Process⁴
Sustainability**

**Cluster for climate-neutral
process industries in Hesse**

Supported by:



4TH INTERNATIONAL WORKSHOP ON INNOVATION AND PRODUCTION MANAGEMENT IN THE PROCESS INDUSTRIES



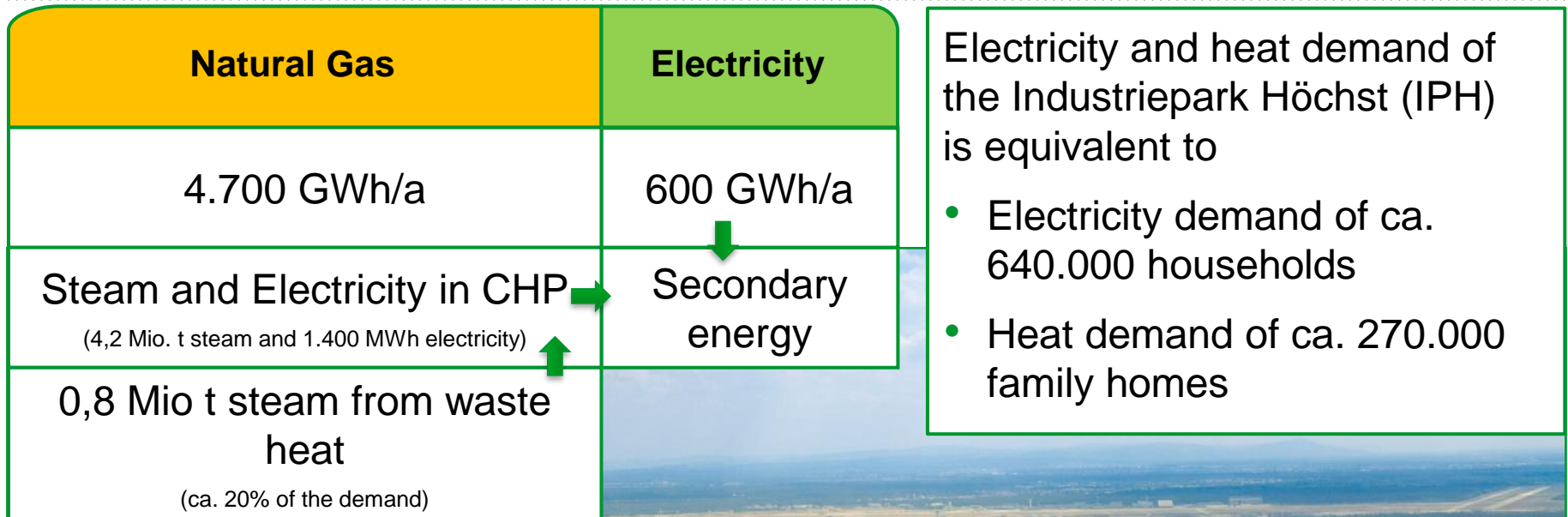
>> **Combined Heat and Power – An insight into a current project at the Industriepark Höchst**

DR. PAUL MICHAEL FALK, INFRASERV GMBH & CO. HÖCHST KG

Industriepark Höchst is one of the biggest industrial sites in germany



Industriepark Höchst (IPH) has an energy demand of ca. 5.300 GWh/a



The energy is supplied by several plants



Cogeneration plant



Sewage
sludge
incineration



Residue
incineration



Exothermic processes



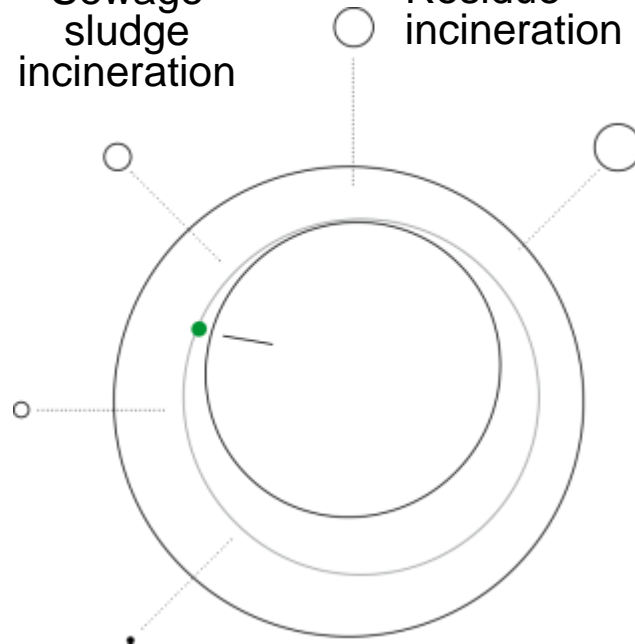
Biogas
generation



3 Gasturbines



Waste-to-energy plant

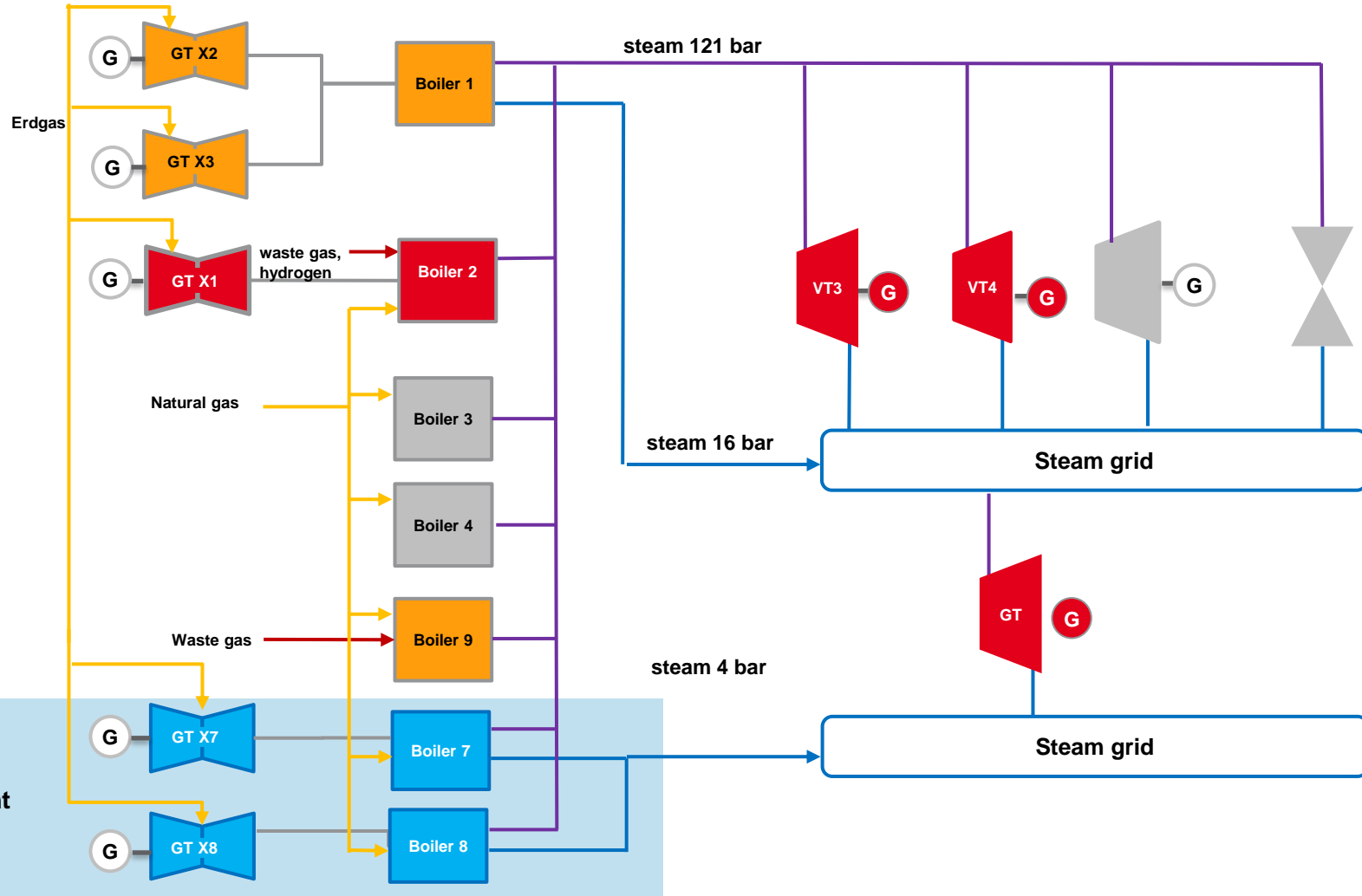


Heat-operated site

Steam collecting track

steam grid

The cogeneration plant is the main supplier of electricity and heat in the IPH



The sewage sludge incineration plant uses sewage sludge to produce heat

- Sewage sludge is a waste product of the waste water treatment plant
- Incineration in a stationary fluidized bed
- Two incineration lines with a flow capacity of 225.000 t/a of sewage sludge



The residue incineration plant is used for the safe disposal of hazardous waste products while using the generated heat

Incineration of residues in every form

- Rotary furnace
- Capacity of 55.000 t/a
- Up to 48 t/h of steam
- Complex flue gas cleaning

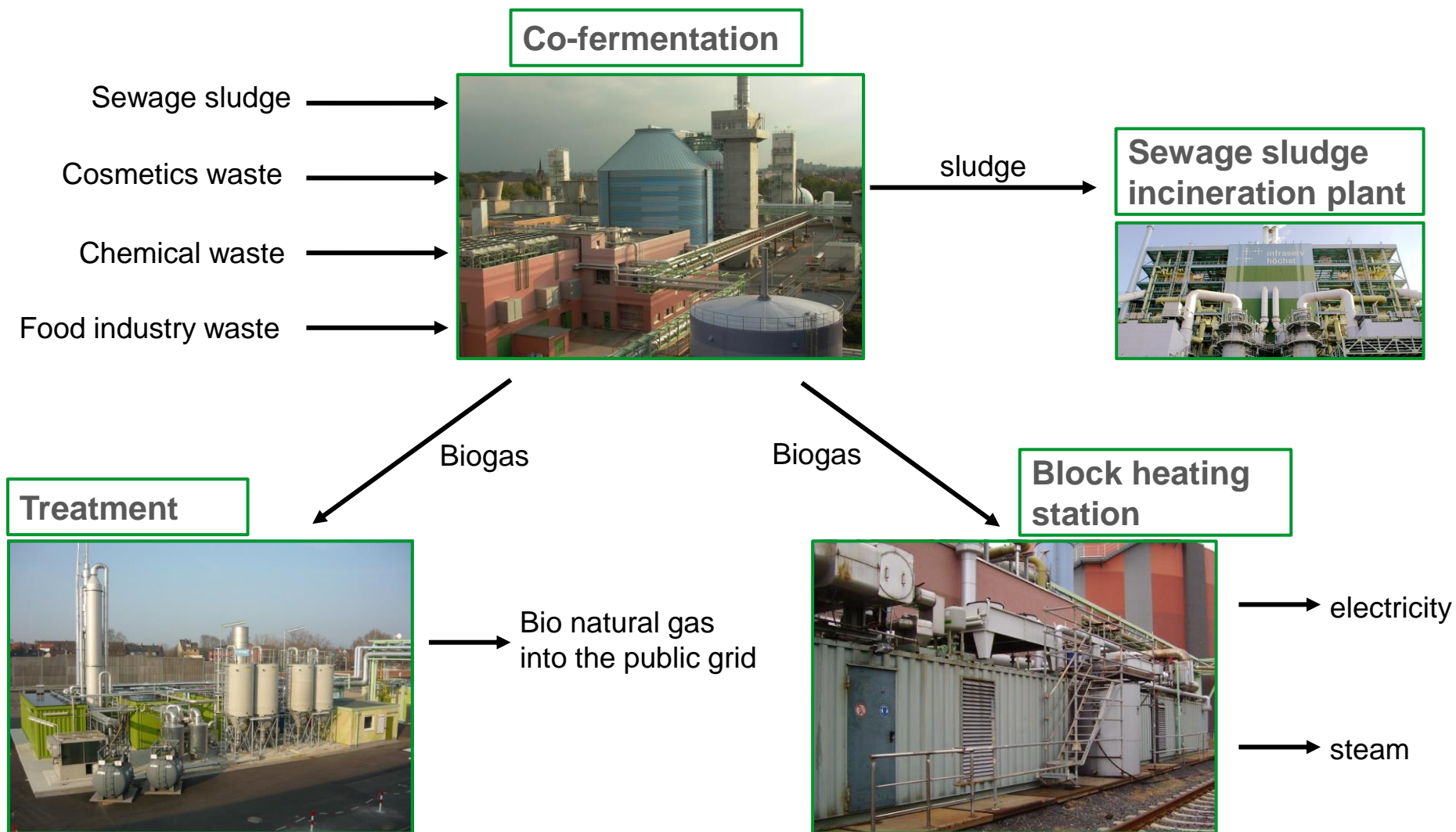


The waste to energy plant is a cogeneration plant

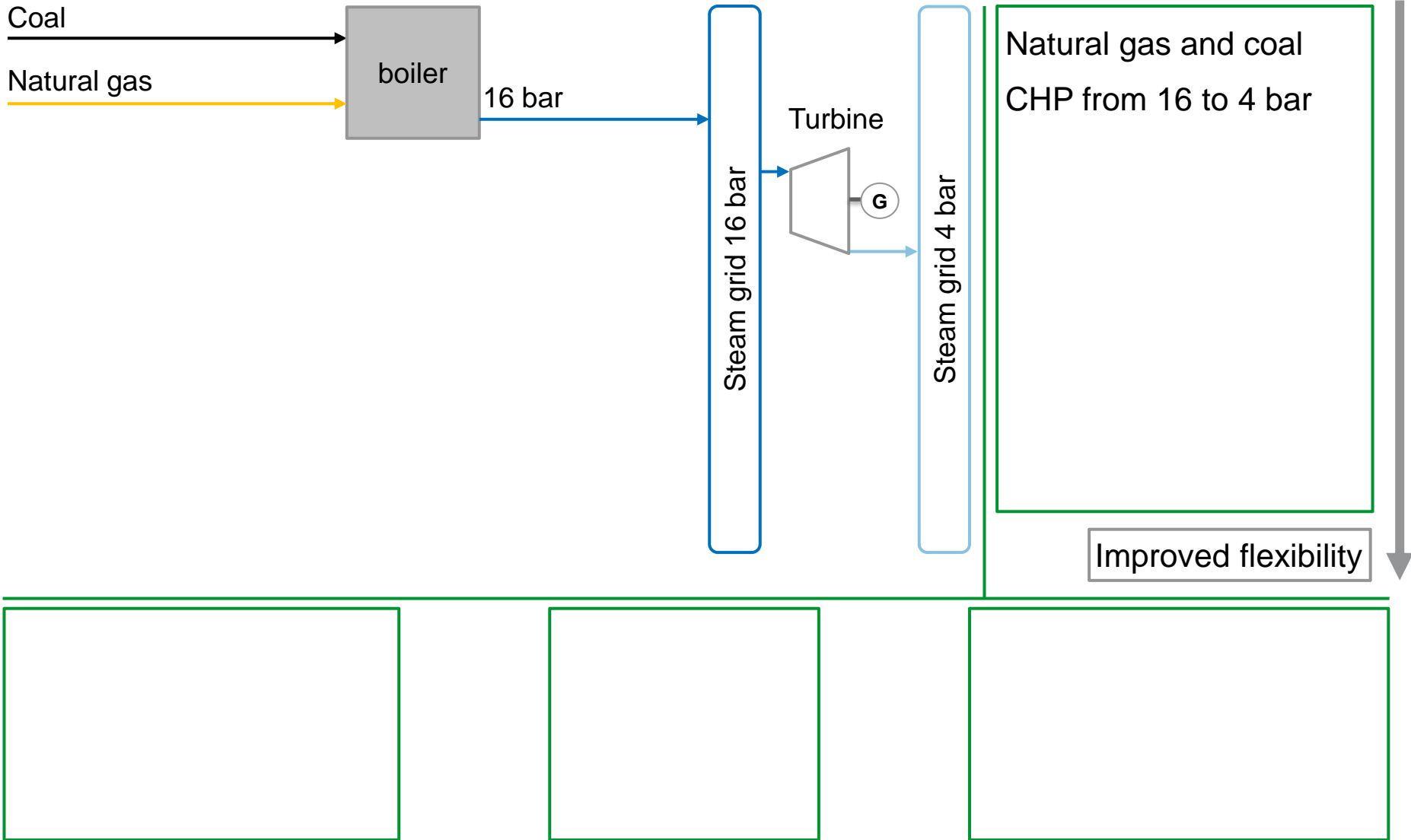
- Three incineration lines
- Annual capacity 700.000 t/a of waste
- Main steam output power ca. 265 t/h
- Codensing steam turbine with bleeding
- Turbine output power 70 MW_{el}



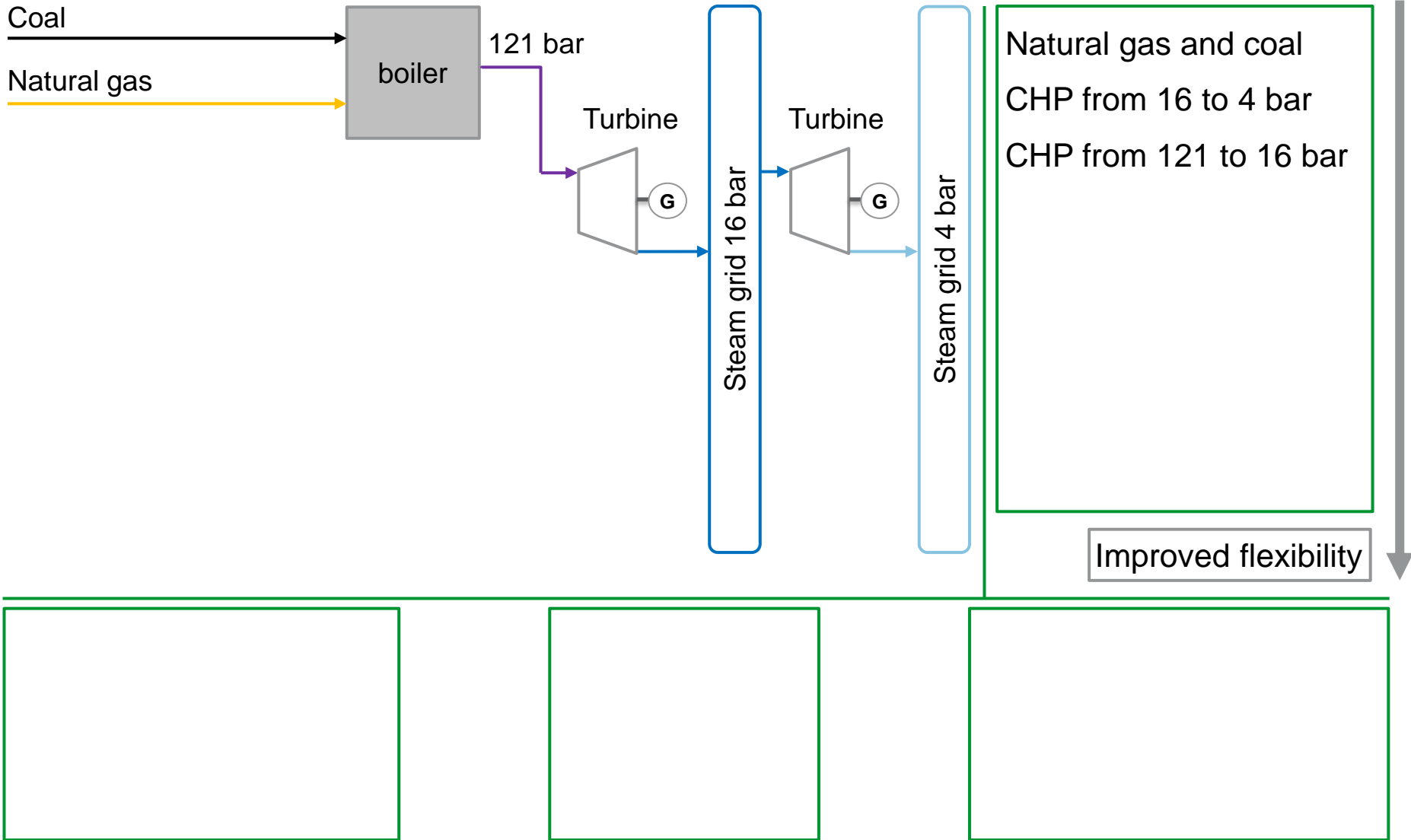
Biogas production uses cross-company synergies



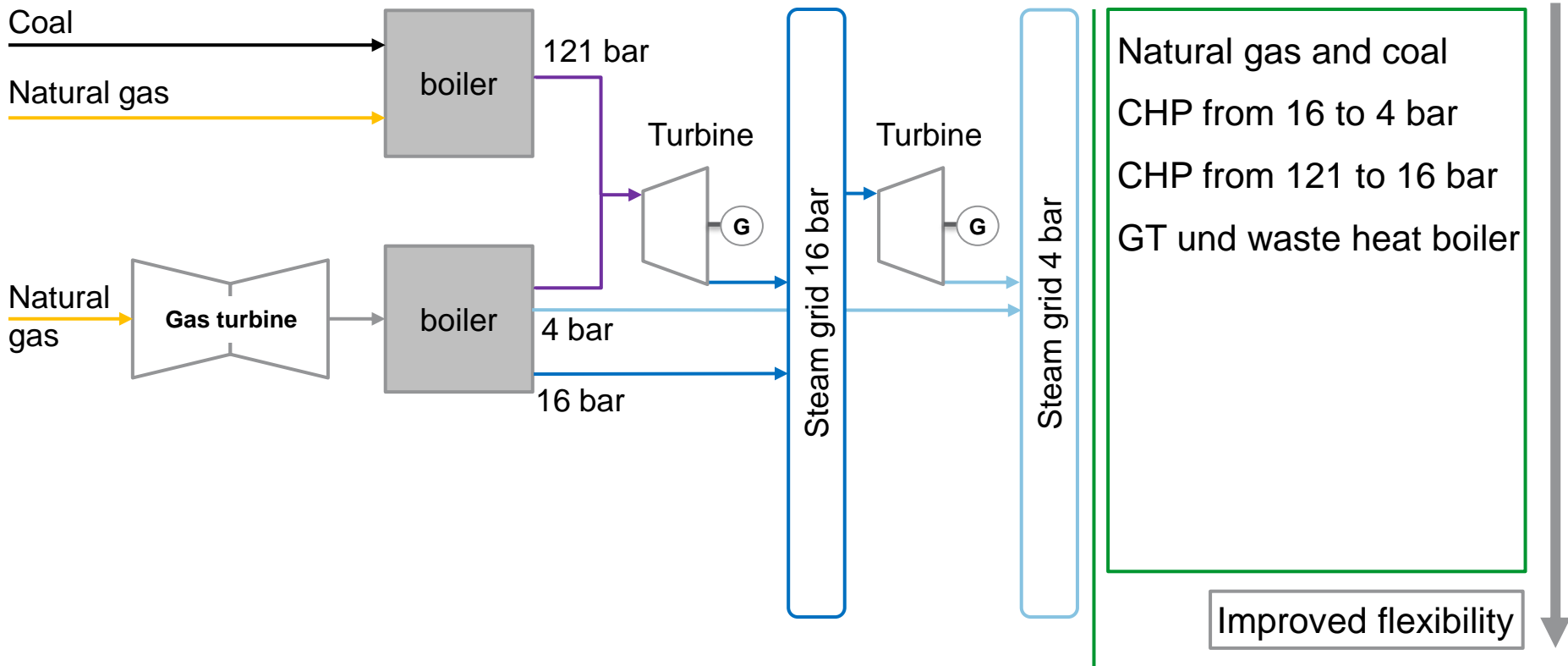
CHP has been used for a long time in the IPH



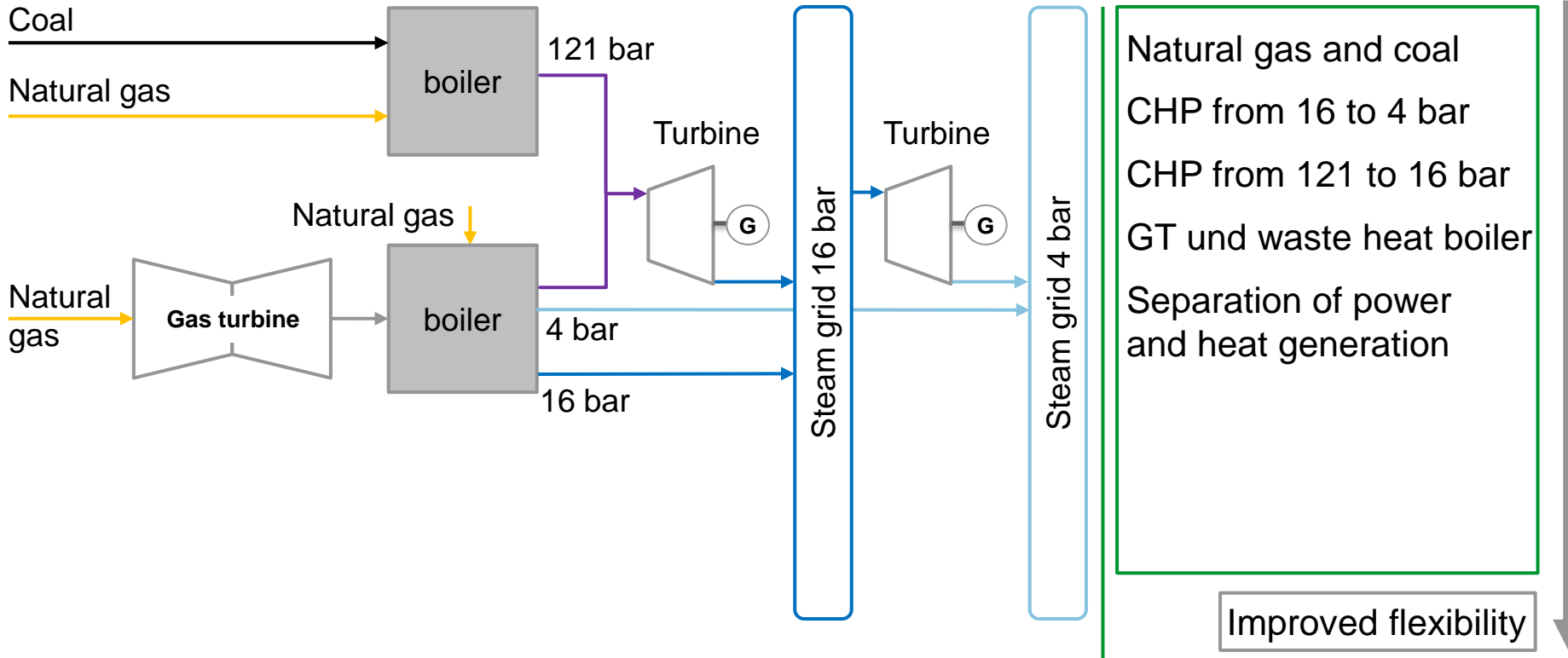
The introduction of HP turbines increases the power-to-heat ratio



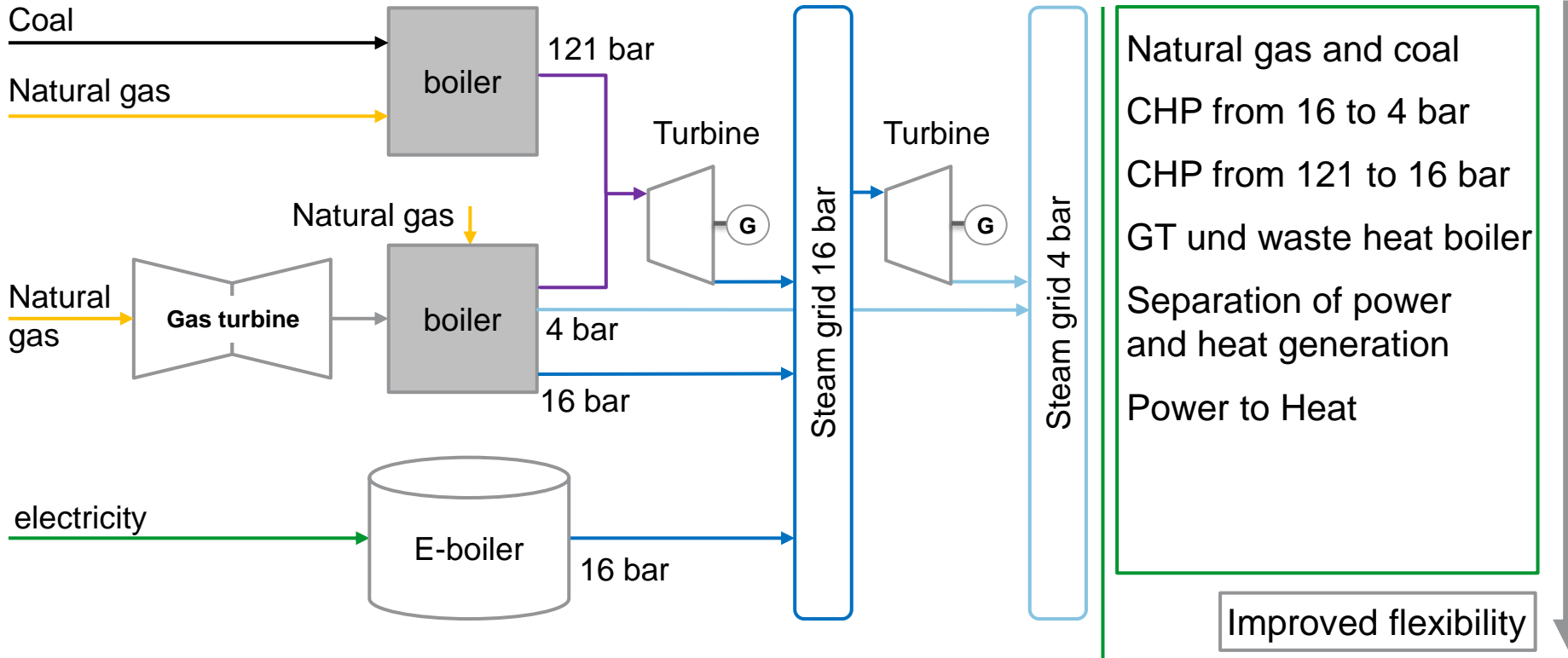
The commissioning of gas turbines introduces the combined cycle power plant



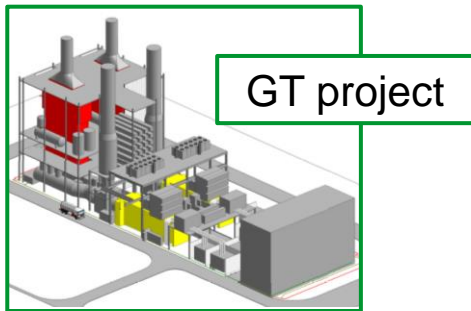
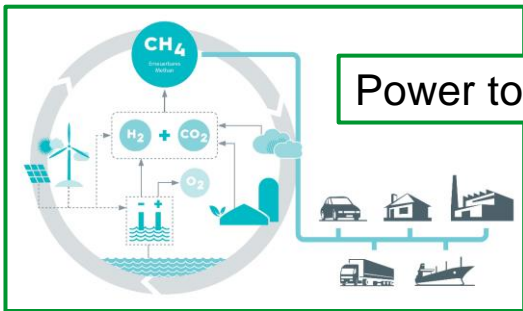
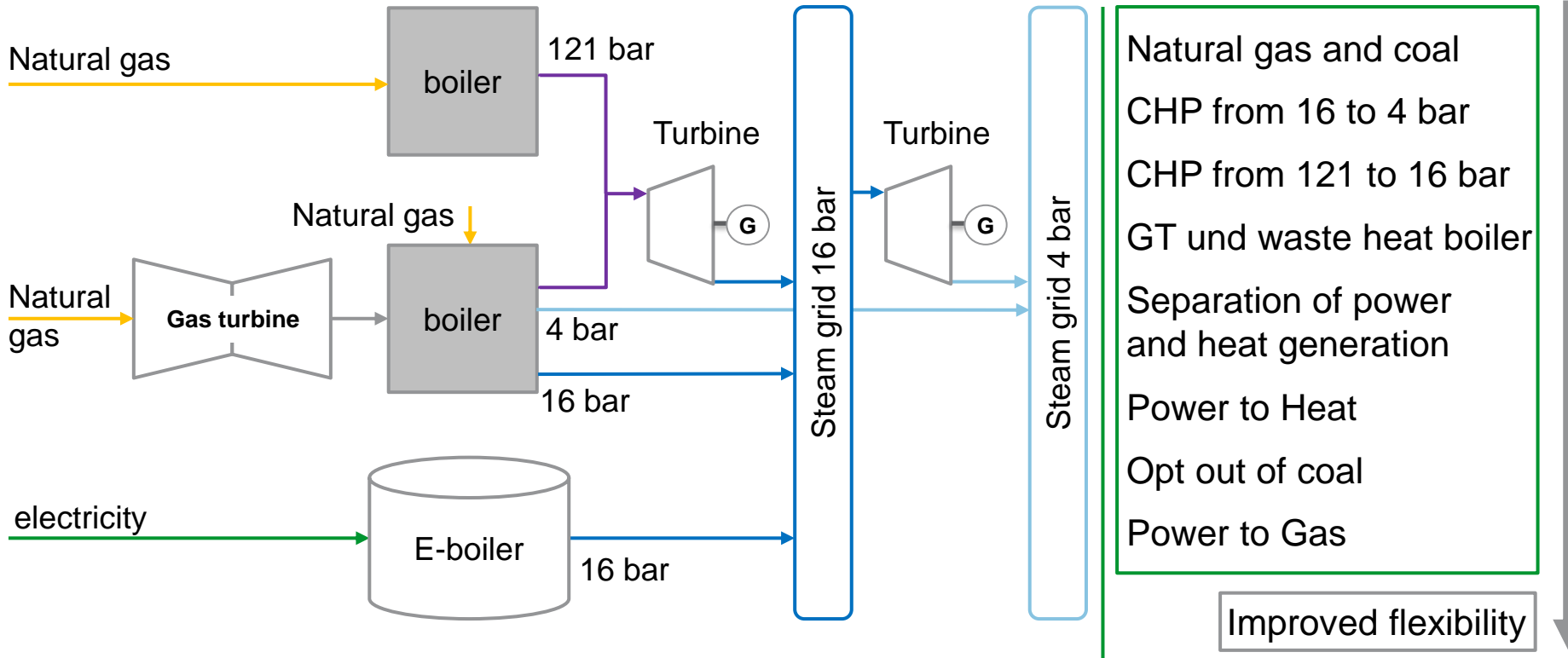
Waste heat boiler with auxiliary firing make the electricity production independent from the heat generation



Electrical boiler improve the flexibility by having a variable electricity demand



With Power to Gas and the gas turbine plants the flexibility of the power generation can be improved



Flexible electricity generation:

- Controlling power range
- Optimization

The new development replaces the coal boiler and improves the flexibility

Project scope

- Two gas turbines 90 MW_{el}
- Two boiler with auxiliary firing 200 t/h
- Opt out of coal after commissioning
- The power generation capacity in the IPH is increased by 60% to ca. 480 MW_{el}



Regulatory constraints:

- High efficiency
- Network operator specifications

Technical constraints:

- Noise emissions
- Pollutant emissions

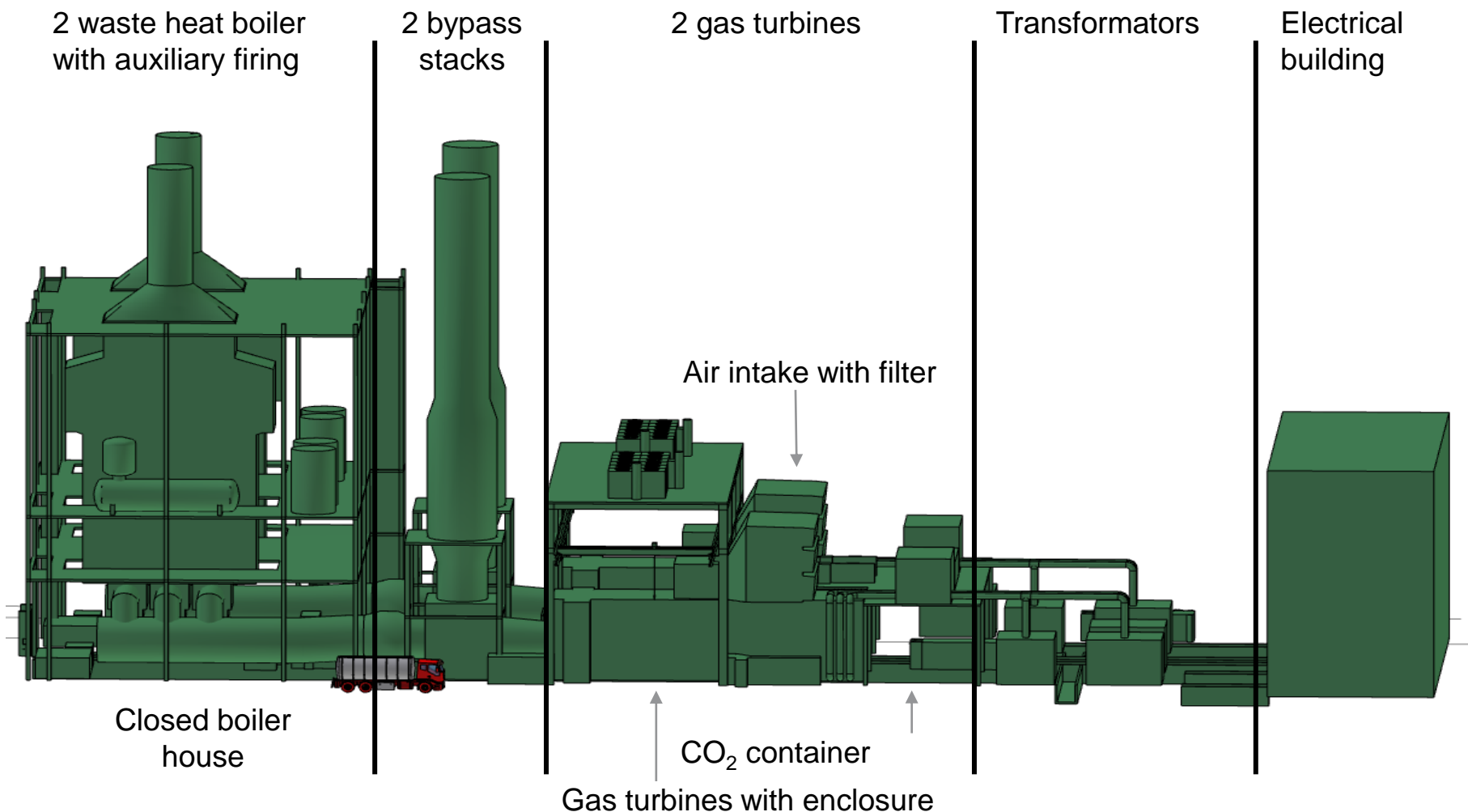
Independent electricity and heating power:

- Compliance with the HP steam temperature
- Provision of controlling power range

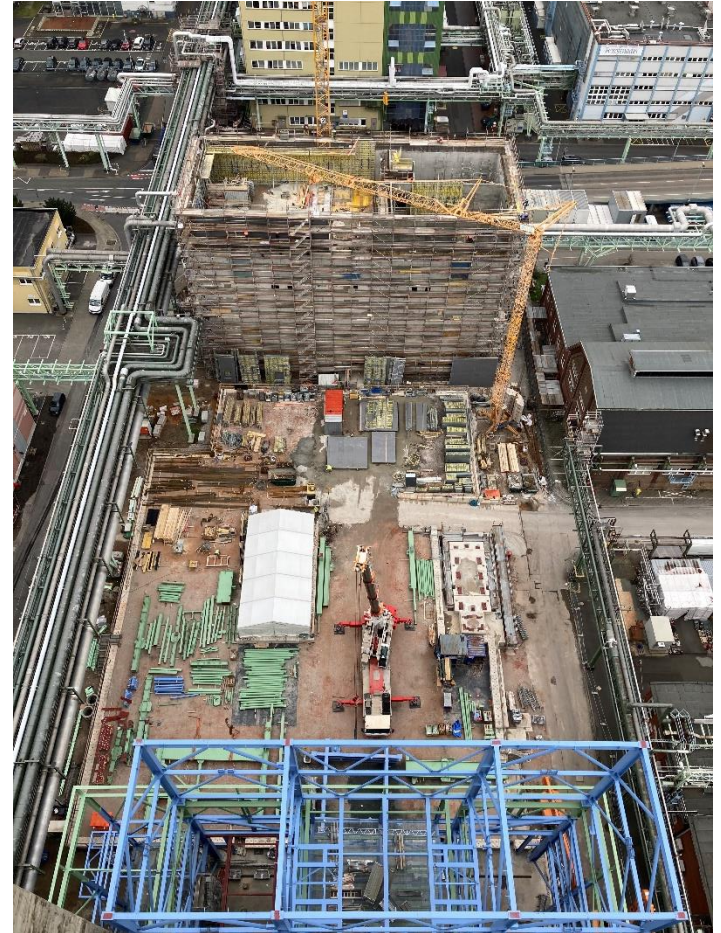
Functions:

- Steam availability n-1
- Controllability

The new power plant will have two independent incineration lines



Challenges during the project



Construction progress



Impressions of the building site



Bypass stack erection



Boiler house base plate

4TH INTERNATIONAL WORKSHOP ON INNOVATION AND PRODUCTION MANAGEMENT IN THE PROCESS INDUSTRIES



>> Combined Heat and Power – An insight into a current project at the Industriepark Höchst
