

**BOSCH**

Invented for life

Bosch hydrogen boilers

www.bosch-industrial.com



be ready for the
future use or use it
already today

Is your plant ready for H₂ yet?

H₂ is one of the alternative fuels for a sustainable future but often it is not available in the required amount today. Therefore we recommend to take a possible future use already into account when building a new plant or modernising an existing one. Several scenarios are possible for this options.

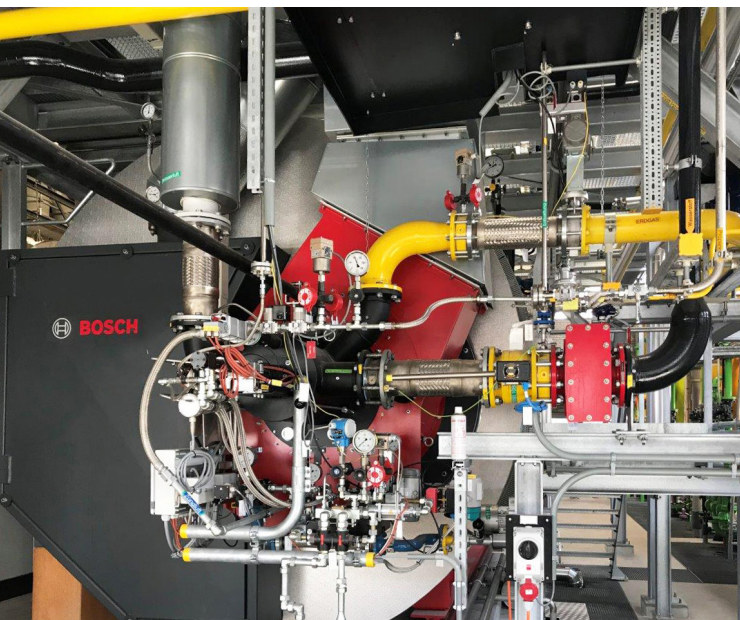
Scenario 1	Scenario 2	Scenario 3	Scenario 4
new plant	new plant	new plant	existing plant
H ₂ is available in the future	H ₂ is already available	H ₂ is already available	H ₂ is available in the near future
	low amount	up to 100%	
Natural gas with a certain amount of H ₂ addition	Natural gas supply + additional separate hydrogen supply with a share of 10–100%	Pure hydrogen firing (Very rare, since natural gas is usually also burned for availability reasons)	Modernisation of existing plant for multi-fuel firing with H ₂ and existing fuel
H ₂ -ready boiler with multi-fuel firing	H ₂ boiler with multi-fuel firing	H ₂ boiler with single fuel-firing	H ₂ boiler with multi-fuel firing

Options for hydrogen firing

Hydrogen firing		Hydrogen ready	
Boiler and Burner fully equipped to burn H ₂ . The main criteria to have 100% hydrogen firing in a project, is the availability of H ₂ .		Boiler ready to burn 100% hydrogen. Burner, gas supply, controls, etc. has to be modified/replaced in the future to burn hydrogen	
	Oversize boiler body +10%*		Oversize boiler body +10%*
	Special gas supply components		Advantages: ► Boiler has not to be replaced when using H ₂ ► Bosch supports a CO ₂ free future
	External recirculation installed		
	Fully equipped H ₂ burner (+100% or more*)		

*cost increase compared to fossil fuel application

Worldwide experience in numerous application areas



Pharma company Switzerland 20 t/h steam 13 bar

- Three fuels for maximum reliability.
 - Priority on 100% H₂ when available
 - Natural gas as secondary fuel
 - In worst case light oil as backup on site
- Small exhaust gas recirculation from the reversing chamber for NO_x optimisation

Chemical company Poland 15 t/h superheated steam

- Dual-fuel burner with flue gas recirculation
- Up to 100% hydrogen from production processes possible, natural gas as back-up fuel
- Very low NO_x emissions below 60 mg/Nm³.
- Economizer and condensing heat exchanger
- Efficiency over 100% based on calorific value

District heating Germany 5 MW up to 100% H₂

- Up to 100% hydrogen operation
- Natural gas as backup
- Use for district heating and for commercial purposes (wood drying)

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