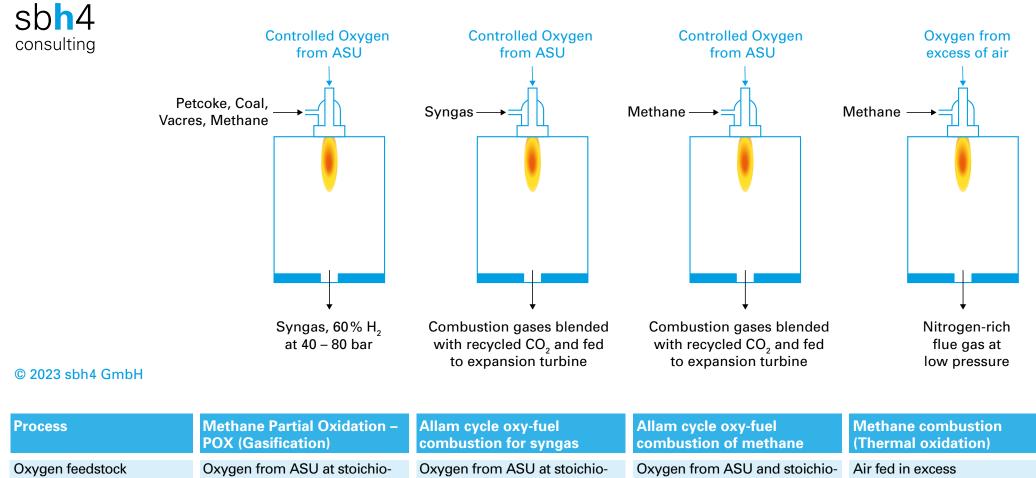
Gasification and oxy-fuel combustion in the Allam cycle



	POX (Gasification)	combustion for syngas	combustion of methane	(Thermal oxidation)
Oxygen feedstock	Oxygen from ASU at stoichio-	Oxygen from ASU at stoichio-	Oxygen from ASU and stoichio-	Air fed in excess
	metric flow for partial oxidation	metric flow for complete syngas	metric flow for complete	
		combustion	methane combustion	
Energy required/released	Exothermic, steam generation,	Exothermic, working fluid	Exothermic, working fluid	Exothermic, steam generation
	hot syngas	temperature is increased	temperature is increased	
Chemical reaction	$2CH_4 + O_2 \rightarrow 2CO + 4H_2$ (ideal case)	$2\text{CO} + 4\text{H}_2 + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 4\text{H}_2\text{O}$	$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$	$CH_4+2O_2 \rightarrow CO_2+2H_2O$ (ideal case)
Carbon product	CO (and CO_2 from side reactions)	CO ₂	CO ₂	CO ₂
Product gas pressure	40 to 80 bar	300 bar in the Allam cycle	300 bar in the Allam cycle	Atmospheric pressure
Product gas temperature	~1,400 °C	1,700 °C in the Allam cycle at the	1,700 °C in the Allam cycle at the	~1,400 °C
		burner exit and 1,150 °C after	burner exit and 1,150 °C after	
		dilution with recirculated CO ₂	dilution with recirculated CO ₂	