



Aspen Plus® by AspenTech is a Process modeling tool for conceptual design, optimization, and performance monitoring of chemical processes

Aspen Plus® predicts process behavior using engineering relationships such as mass and energy balances, phase and chemical equilibrium, and reaction kinetics.

With reliable thermodynamic data, realistic operating conditions, and the rigorous equipment models, engineers are able to simulate actual plant behavior.

World's largest database of pure component and phase equilibrium data for conventional chemicals, electrolytes, solids, and polymers

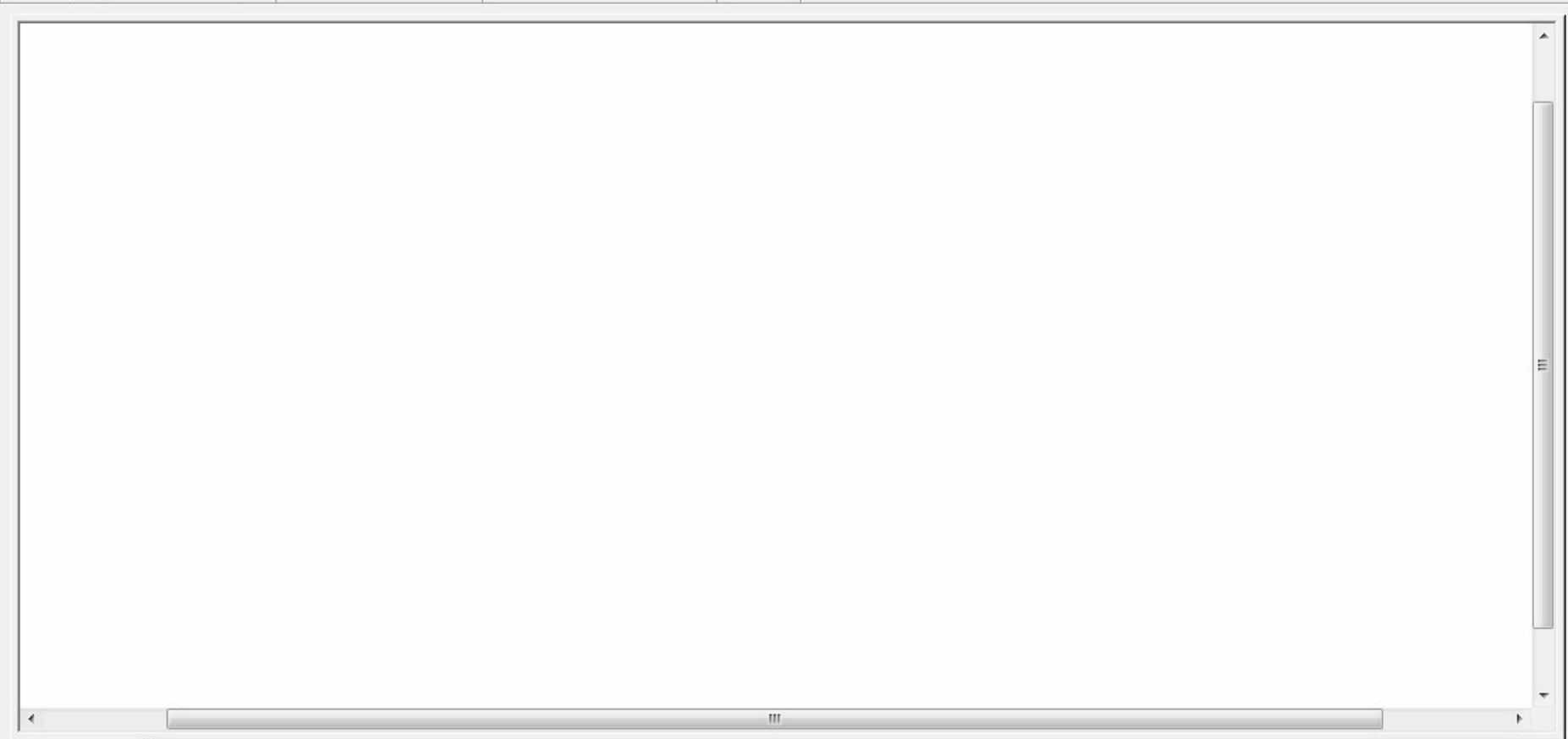
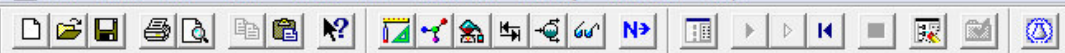
Comprehensive Library of Unit Operation Models

Addresses a wide range of solid, liquid, and gas processing equipment

Models a wide range of industrial processes including power, chemicals, polymers, metals and minerals, etc

Aspen Plus - Simulation 1 - [Process Flowsheet Window]

File Edit View Data Tools Run Flowsheet Library Window Help



Process Flo...

Mixers/Splitters Separators Heat Exchangers Columns Reactors Pressure Changers Manipulators Solids User Models



For Help, press F1 C:\...g Folders\Aspen Plus 11.1 Flowsheet Not Complete

Process Flo...

Mixers/Splitters | Separators | Heat Exchangers | Columns | Reactors | Pressure Changers | Manipulators | Solids | User Models

Material STREAMS

Mixer FSplit SSplit

Process Flo...

Mixers/Splitters | **Separators** | Heat Exchangers | Columns | Reactors | Pressure Changers | Manipulators | Solids | User Models

Material STREAMS

Flash2 Flash3 Decanter Sep Sep2

Process Flo...

Mixers/Splitters | Separators | **Heat Exchangers** | Columns | Reactors | Pressure Changers | Manipulators | Solids | User Models

Material STREAMS

Heater HeatX MHeatX Hetran Aerotran HXFlux HTRIXIST

Process Flo...

Mixers/Splitters | Separators | Heat Exchangers | **Columns** | Reactors | Pressure Changers | Manipulators | Solids | User Models

Material STREAMS

DSTWU Distl RadFrac Extract MultiFrac SCFrac PetroFrac RateFrac BatchFrac

Process Flo...

Mixers/Splitters | Separators | Heat Exchangers | Columns | **Reactors** | Pressure Changers | Manipulators | Solids | User Models

Material STREAMS

RStoic RYield REquil RGibbs RCSTR RPlug RBatch

+ Setup
 - Components
 - Specifications
 - Assay/Blend
 - Light-End Properties
 + Petro Characterization
 - Pseudocomponents
 - Attr-Comps
 - Henry Comps
 - UNIFAC Groups
 - Comp-Groups
 + Comp-Lists
 + Properties
 - Streams
 - Blocks
 - Reactions
 - Chemistry
 - Reactions
 + Convergence
 + Flowsheeting Options
 + Model Analysis Tools
 + EO Configuration
 + Results Summary

Process Flo... Data Browser

+ Setup
 + Components
 - Properties
 - Specifications
 - Property Methods
 + Estimation
 - Molecular Structure
 + Parameters
 - Data
 - Analysis
 + Prop-Sets
 + Advanced
 - Streams
 - Blocks
 + Reactions
 + **Convergence**
 - Flowsheeting Options
 - Design Spec
 - Calculator
 - Transfer
 - Stream Library
 - Balance
 - Measurement
 - Pres Relief
 - Add Input

Results Not Available

Process Flo... Convergenc...

Esempio di definizione corrente di input

File Edit View Data Tools Run Plot Library Window Help

METCBAR Input

Specifications Flash Options PSD Component Attr. EO Options

Substream name: **MIXED** Ref Temperature

State variables:

Temperature: 40 C

Pressure: 31 bar

Total flow: 4100 kg/hr

Solvent:

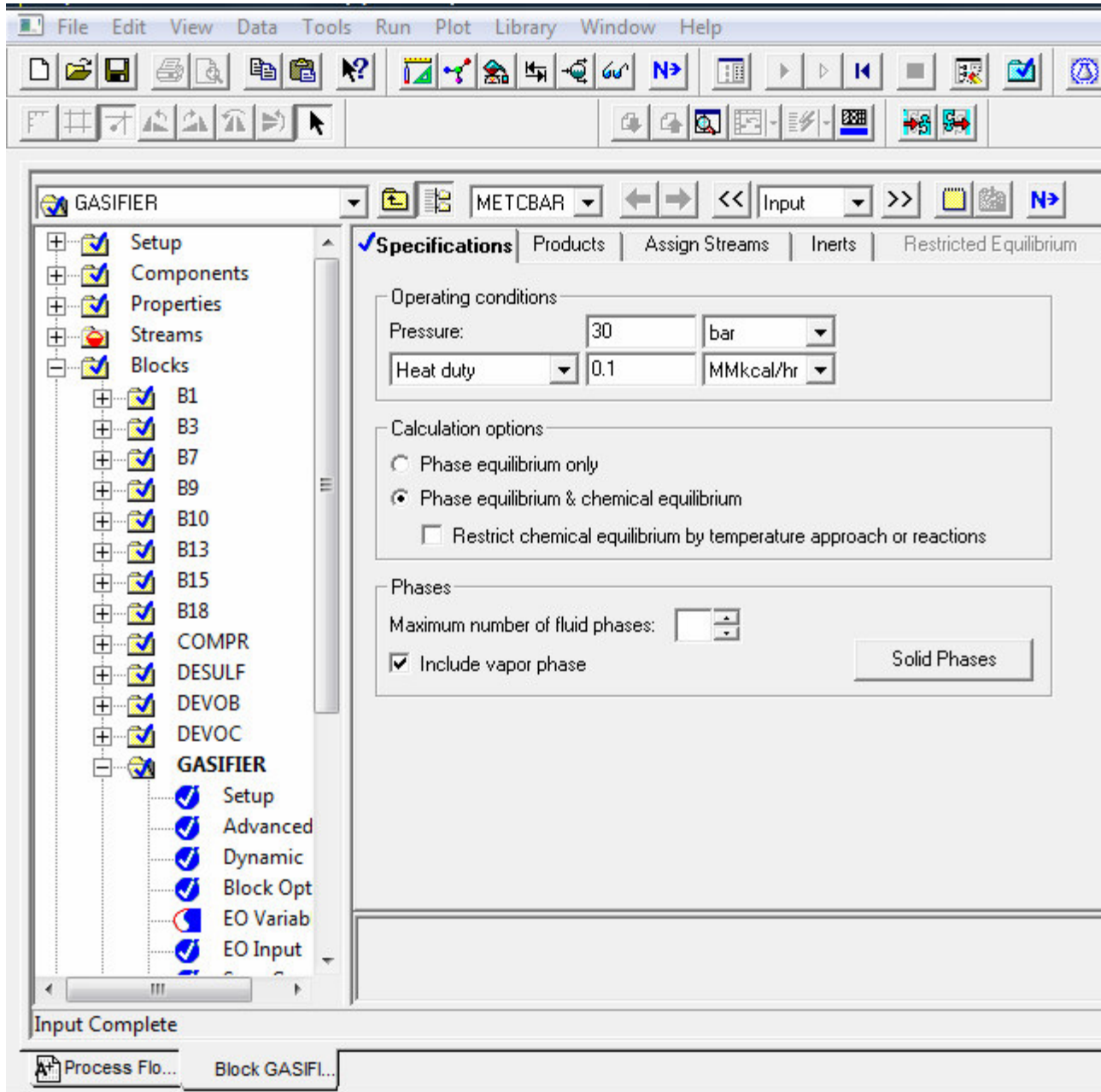
Composition:

Mole-Frac

Component	Value
N2	0.03105437
O2	0.94809178
AR	0.02085385
H2	
CO	
CO2	
H2O	
CH4	
NH3	
HCN	
COS	
H2S	
C2H2	
Total:	1

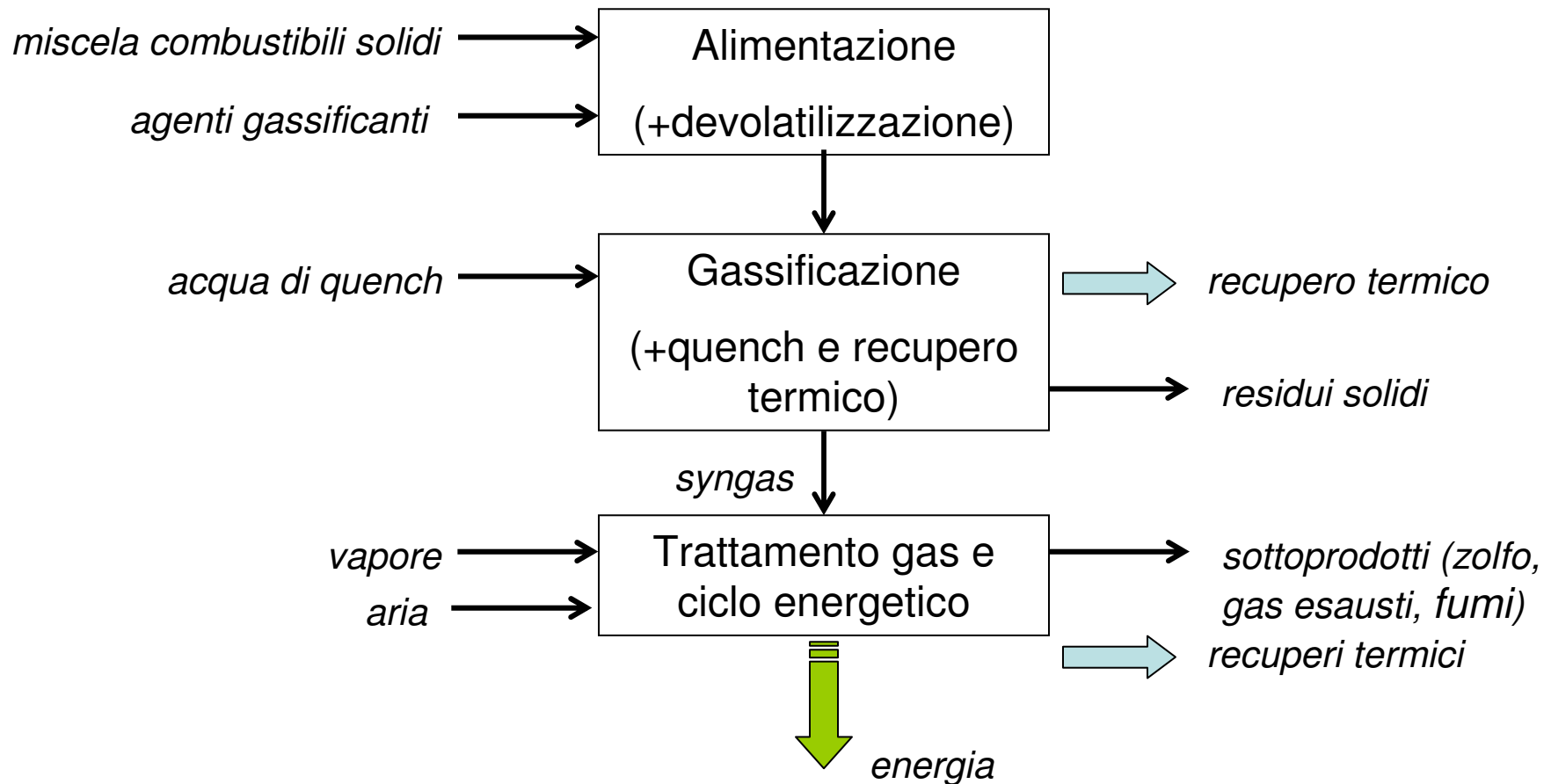
Input Complete

Esempio di definizione blocco di reazione (reattore di Gibbs)



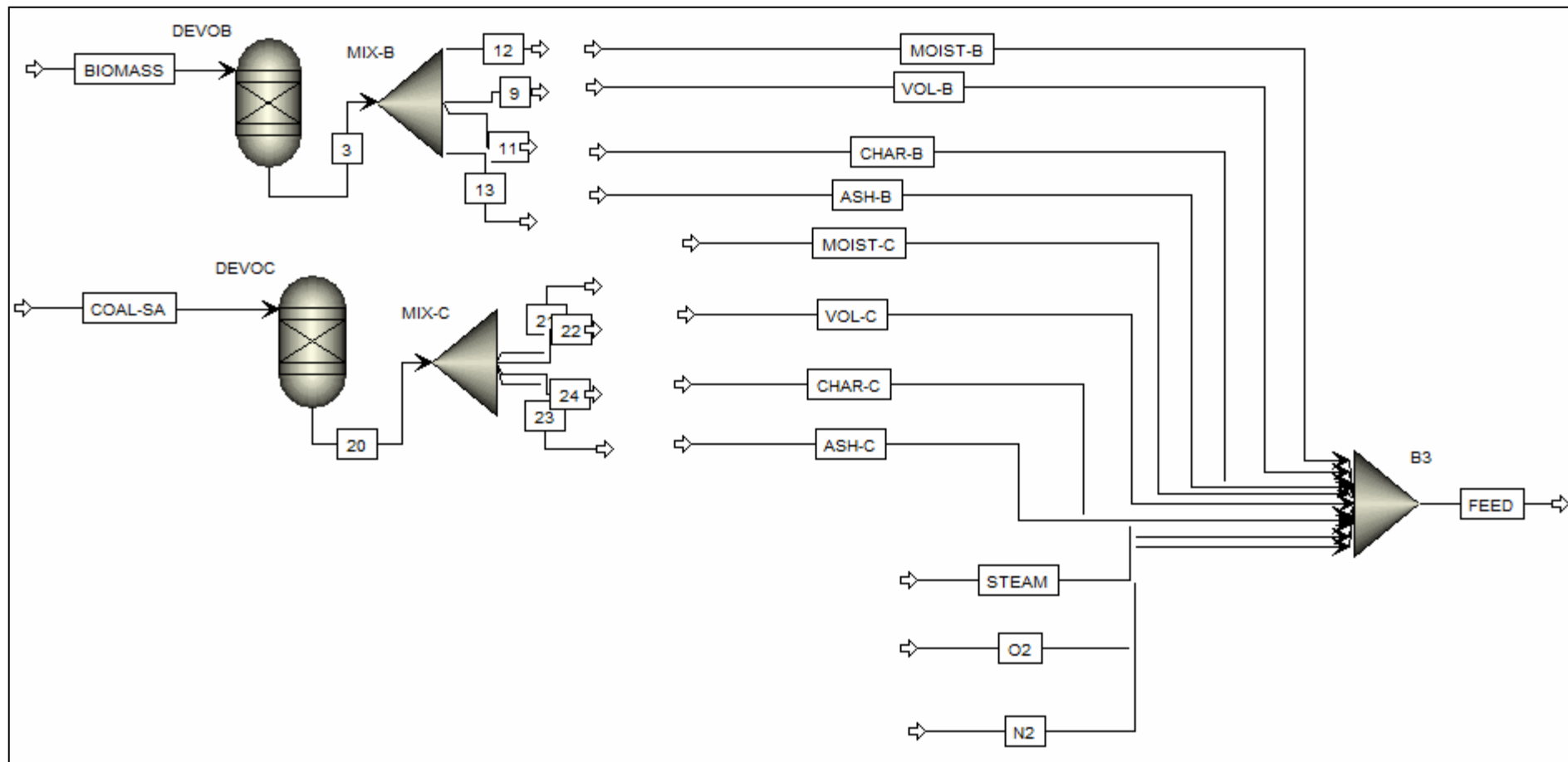
Schema di processo: Impianto di gassificazione per la produzione di idrogeno
Schema a blocchi (alimentazione, gassificazione, trattamento gas)

Combustibili di partenza: carbone e biomassa in diversi rapporti massivi
Agenti gassificanti: ossigeno (puro al 95%) e vapor acqueo

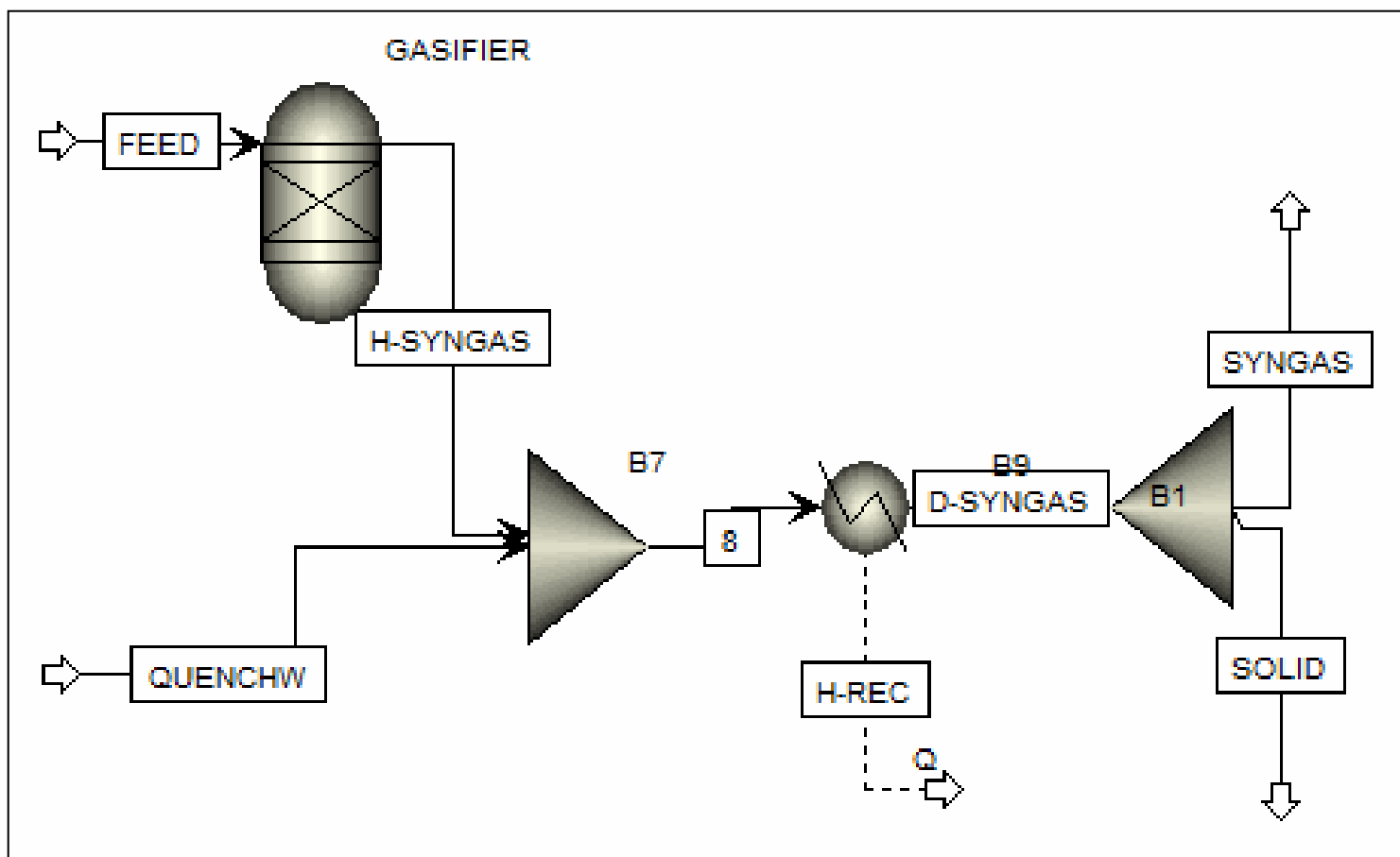


Schema di processo: Impianto di gassificazione per la produzione di idrogeno

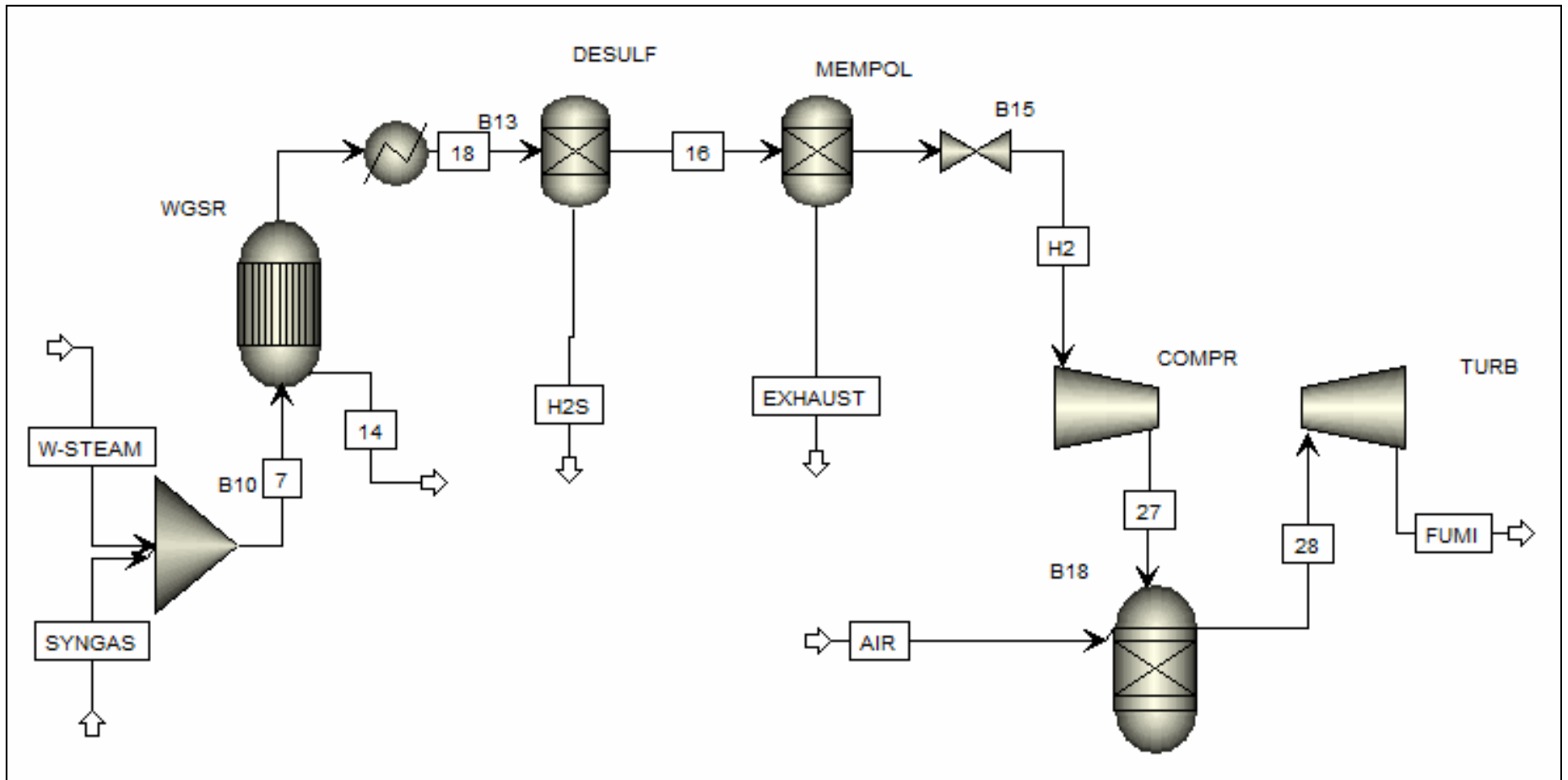
Blocco di alimentazione (Carbone, Biomassa e Gas)



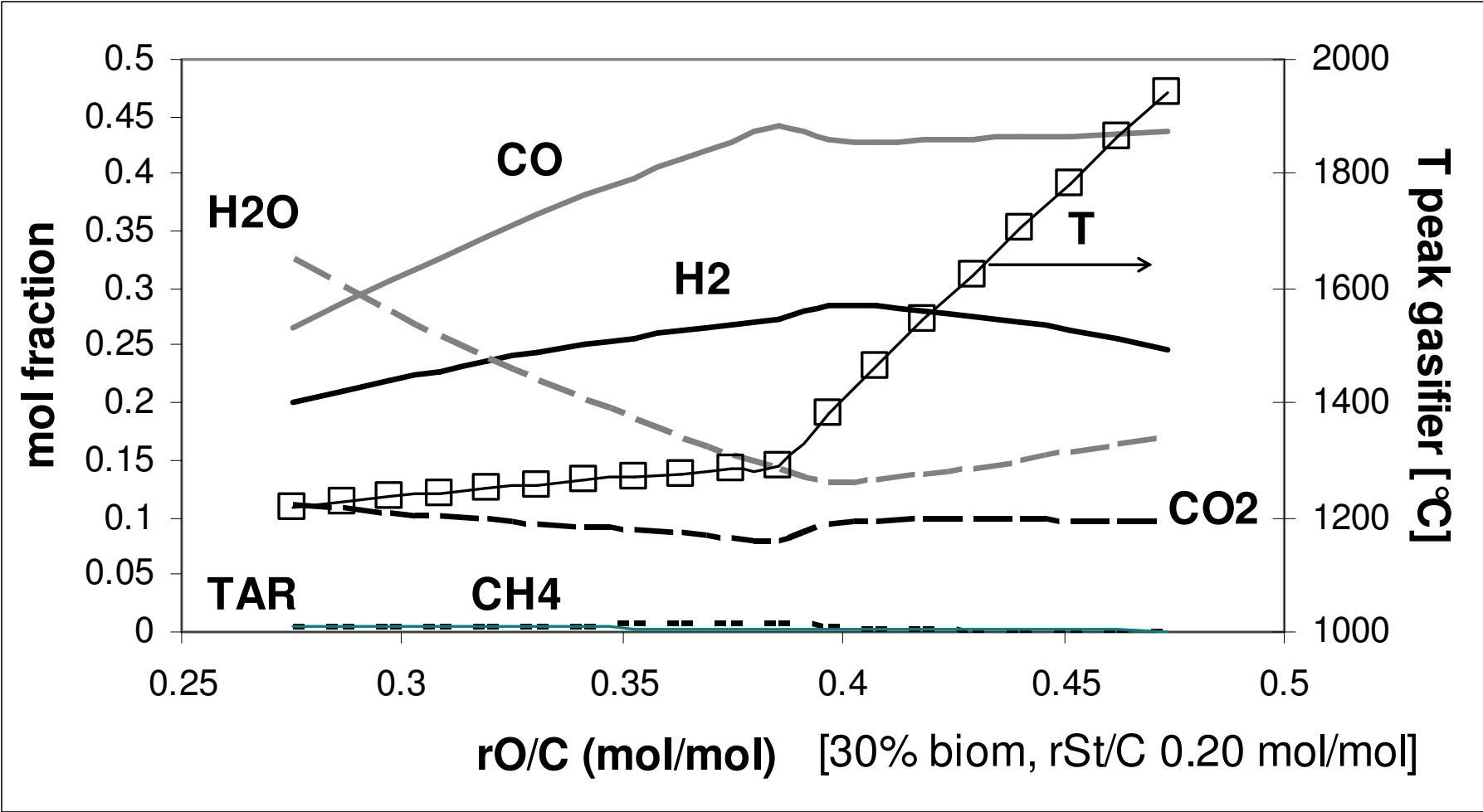
Schema di processo: Impianto di gassificazione per la produzione di idrogeno
Blocco di gassificazione (reattore, quench e separazione fanghi)



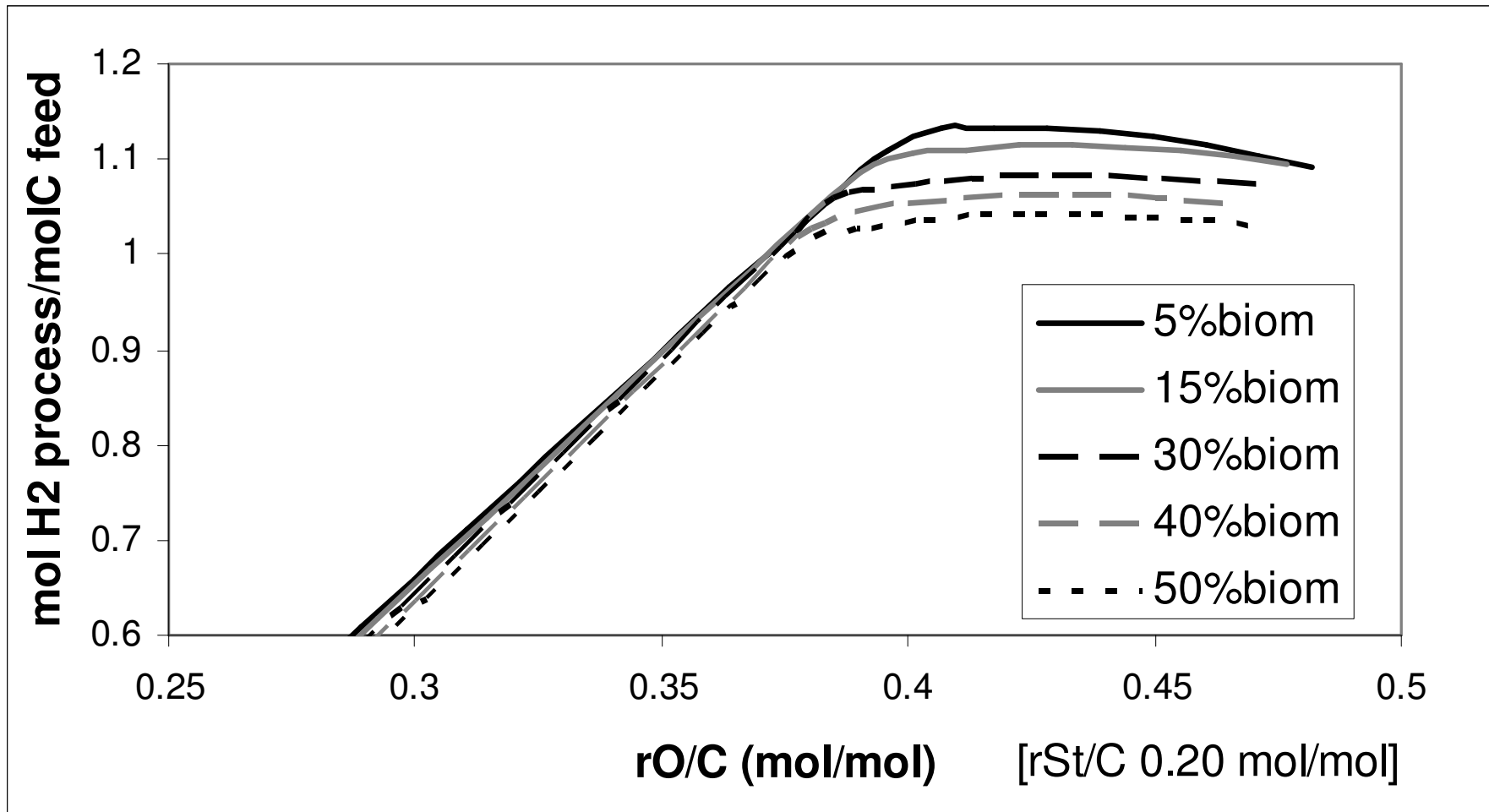
Schema di processo: Impianto di gassificazione per la produzione di idrogeno
Blocco di trattamento gas (reattore di water shift, desolforazione, membrane di separazione e ciclo di combustione dell'idrogeno)



Risultati analisi di sensitività:
composizione del syngas al variare del rapporto ossigeno / combustibile



Risultati analisi di sensitività:
effetto del rapporto biomassa/carbone sull'idrogeno prodotto
(carbone sudafricano, pioppo)

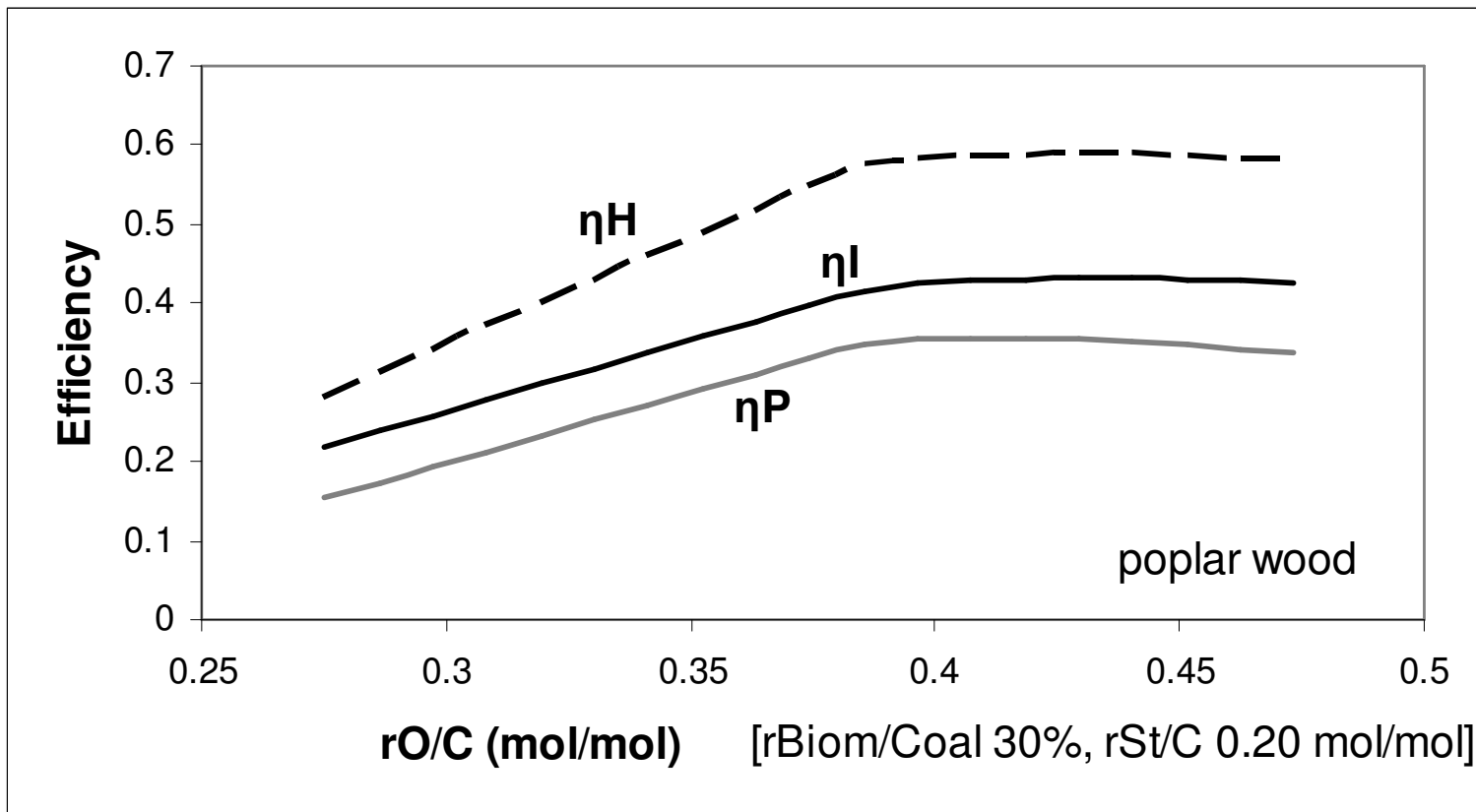


Risultati analisi di sensitività:
confronto delle efficienze di processo

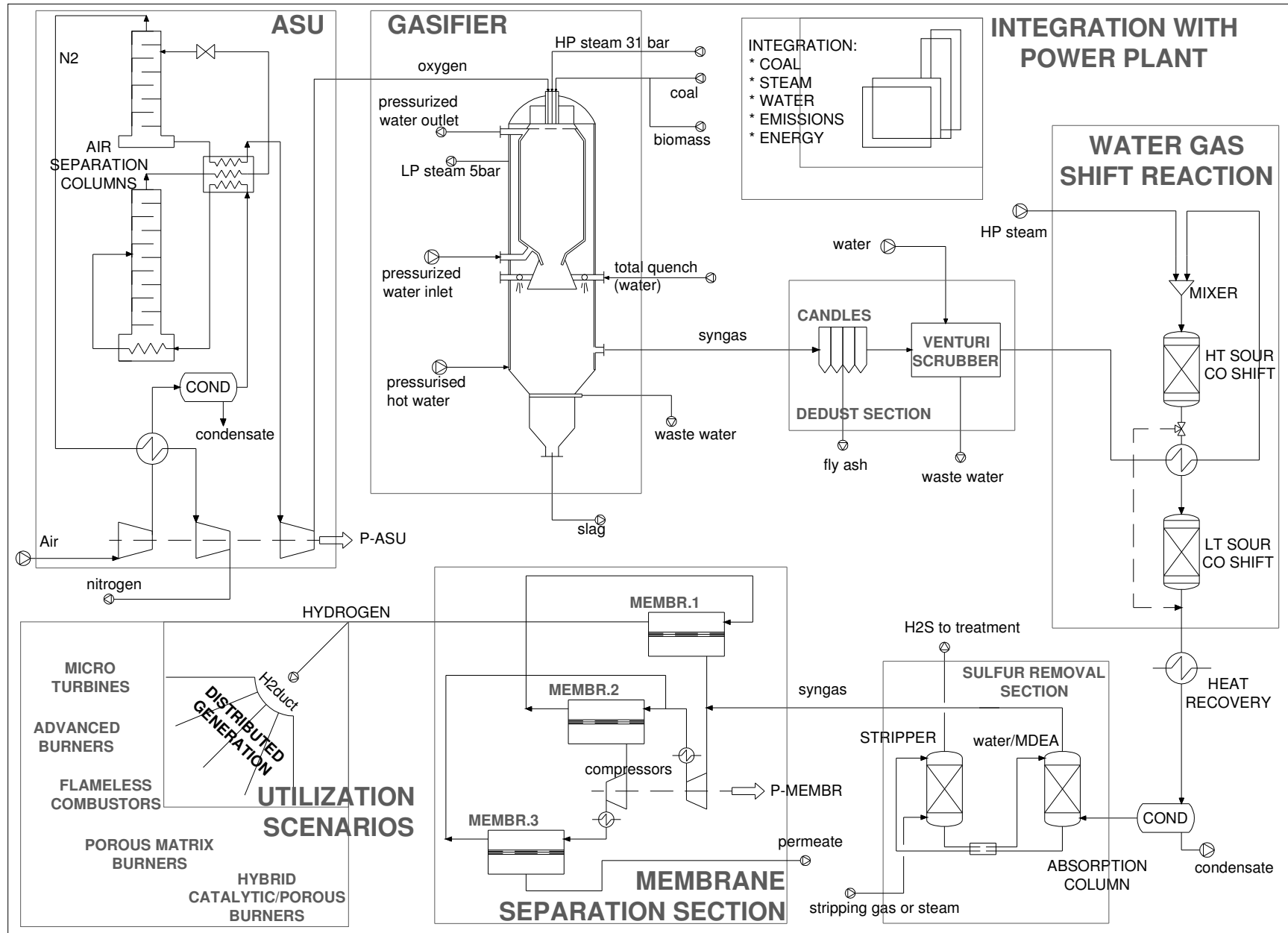
$$\eta_H = \frac{HV_{H_2} \cdot M_{H_2}}{HV_{Coal} \cdot M_{Coal} + HV_{Biomass} \cdot M_{Biomass}}$$

$$\eta_P = \frac{HV_{H_2} \cdot M_{H_2} - \sum P_U - \sum E_{HD}}{HV_{Coal} \cdot M_{Coal} + HV_{Biomass} \cdot M_{Biomass}}$$

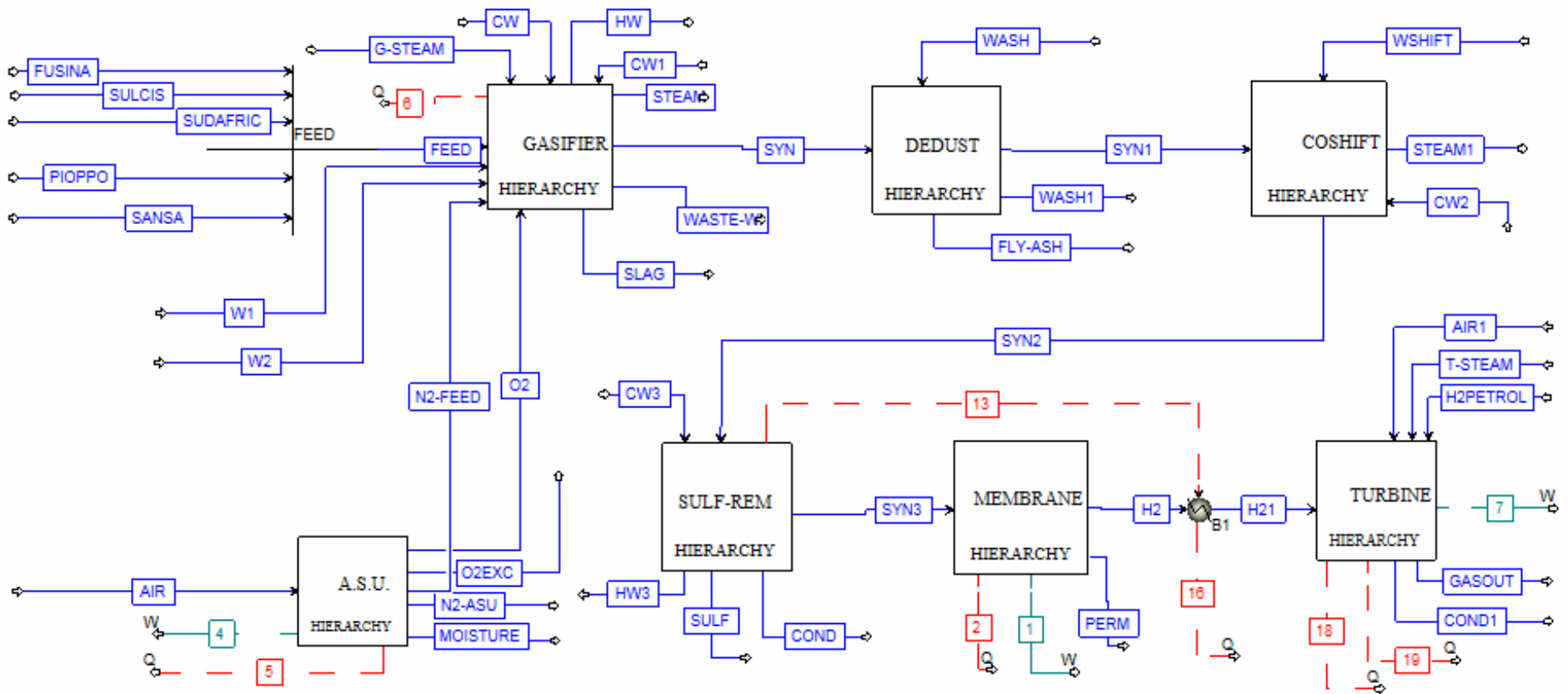
$$\eta_I = \frac{HV_{H_2} \cdot M_{H_2} - \sum P_U - \sum E_{HD} + \sum E_I}{HV_{Coal} \cdot M_{Coal} + HV_{Biomass} \cdot M_{Biomass}}$$



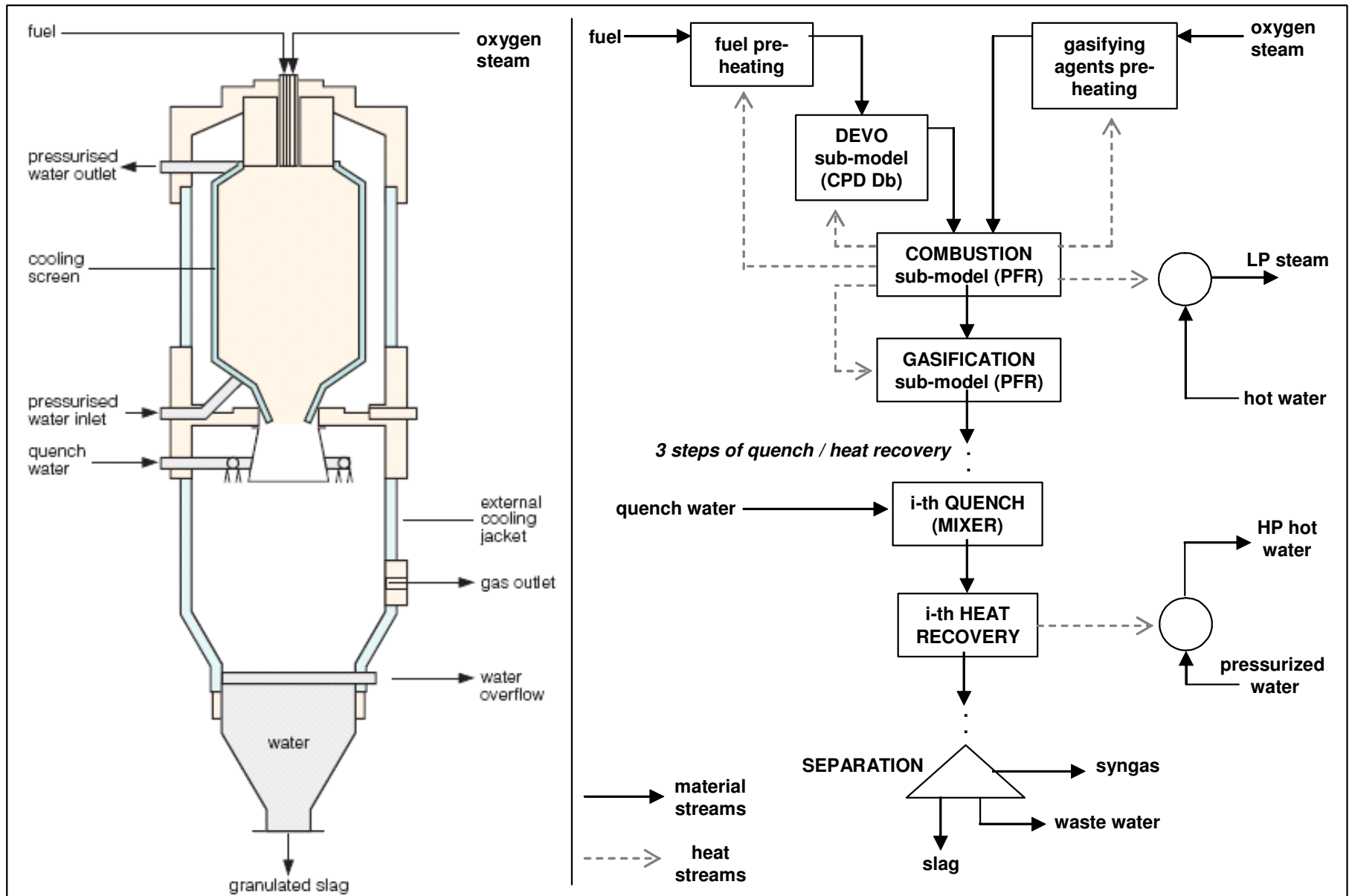
Schema (complesso) di gassificazione per la produzione di idrogeno



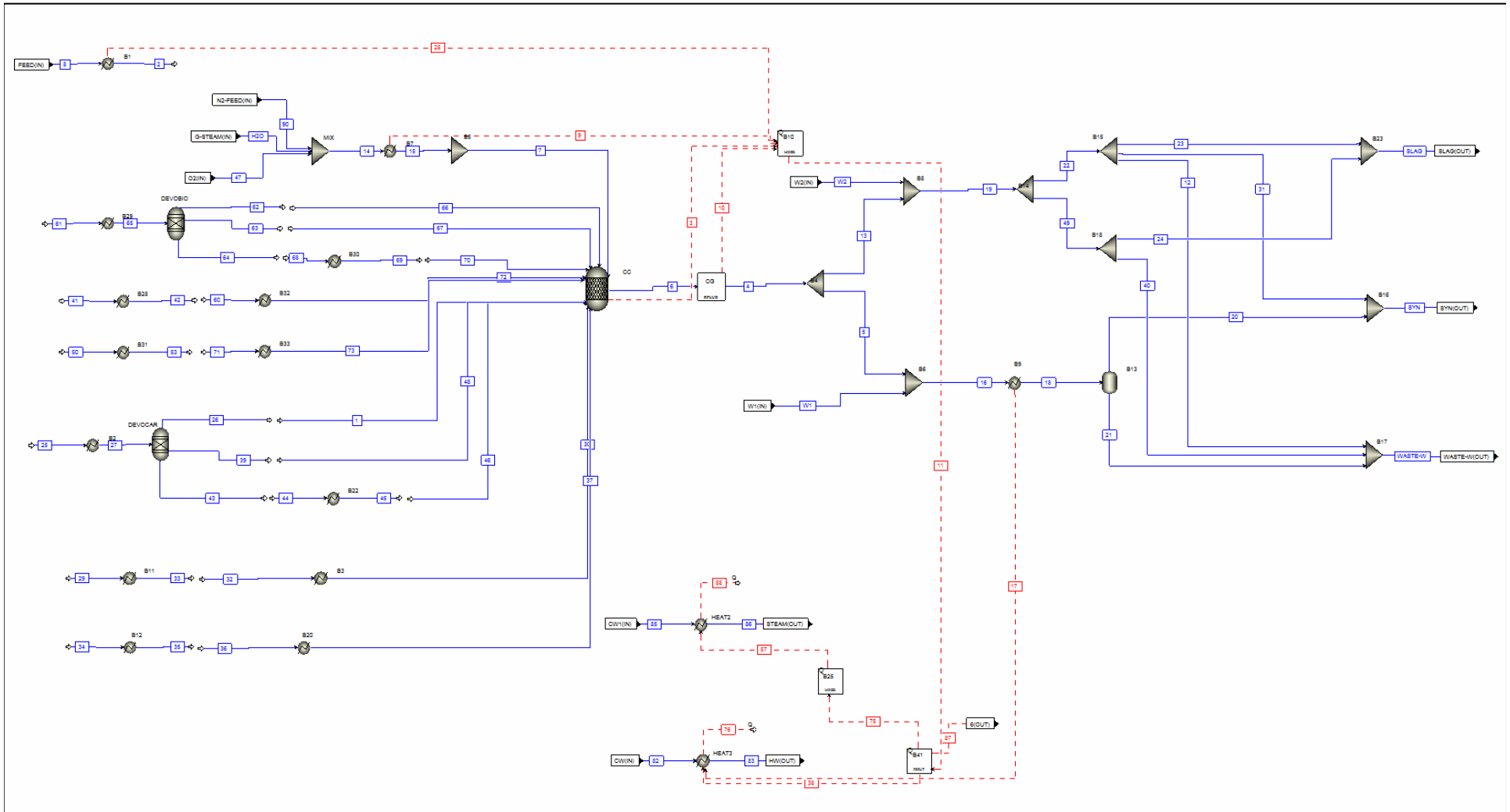
Process Flow Diagram (AspenPlus Hierarchy): processo di gassificazione



Schema di un gassificatore a letto trascinato



Process Flow Diagram (AspenPlus Hierarchy): gassificatore



Process Flow Diagram (AspenPlus Hierarchy): Air Separation Unit

