CO2NET East
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Zagreb

CACHET: Development of pre-combustion capture technologies

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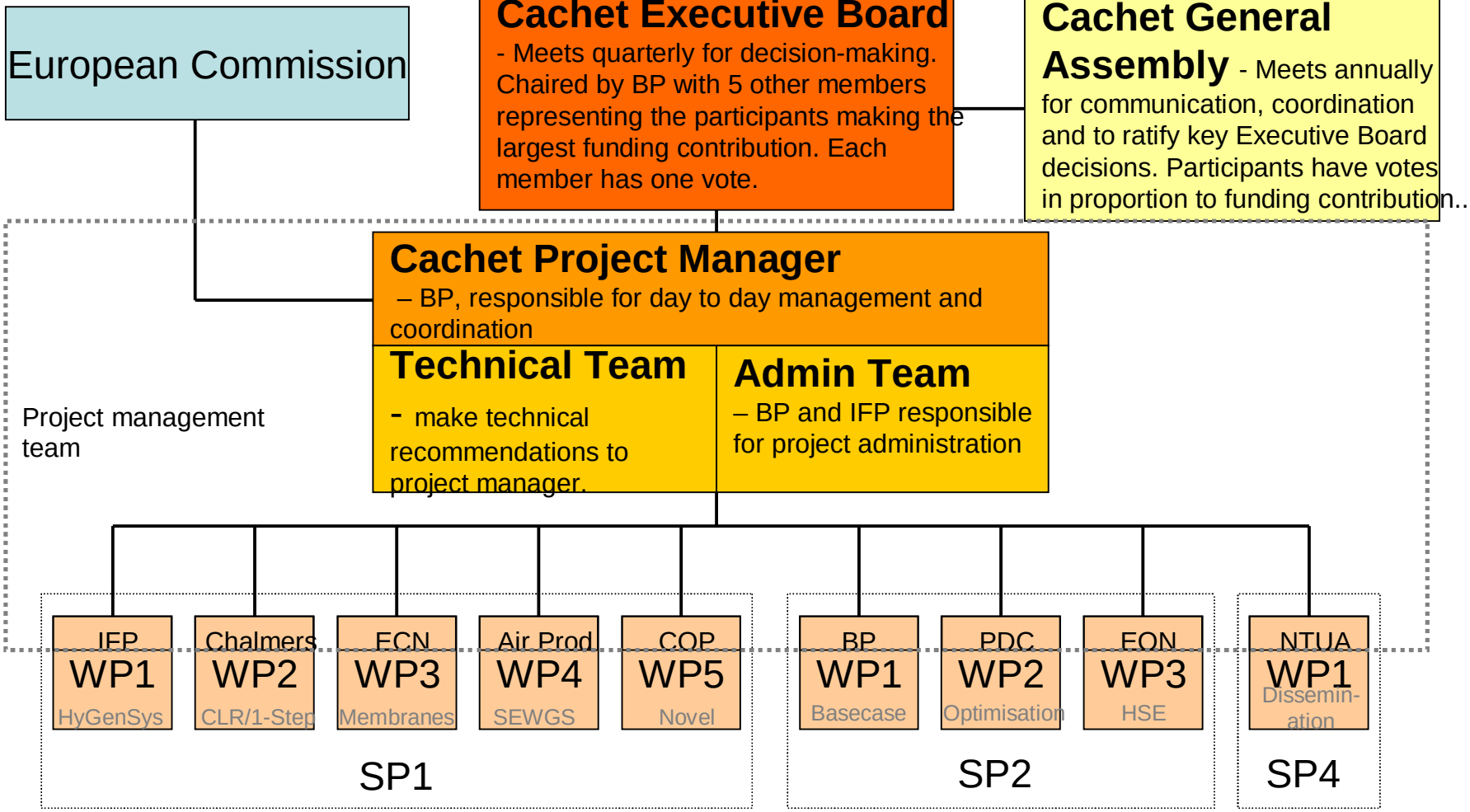
Sixth Framework Programme

cachet summary

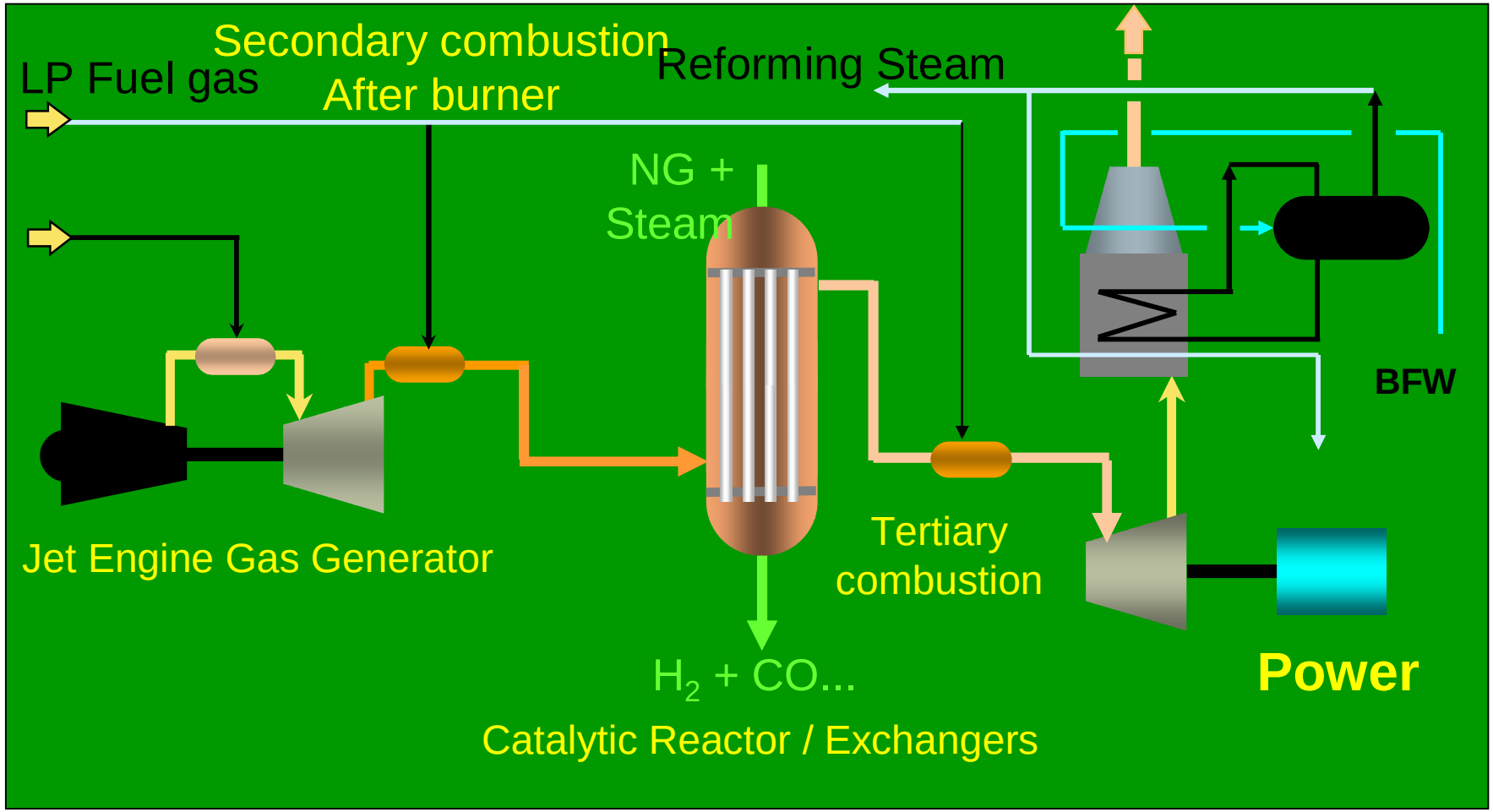
- Objective: Develop technology to reduce cost of CO_2 capture to EU target of 20 to 30 €/tonne at 90% capture rate
- Industrial application to natural gas fired 400 MWe CCGT with (H_2 side-stream)
- 4 main technology areas:
  - Advanced SMR
  - Chemical looping and One-step
  - Membranes
  - SEWGS
- Technical optimisation and economics (including state of the art base case)
- Novel technology evaluation, HSE and dissemination
- 3 year project duration, commencing 1st April 2006
- 29 participating organisations (from 18 countries) – oil and gas companies, electricity utilities, equipment manufacturers, engineering contractors, research institutes and universities

project participants

project organisation

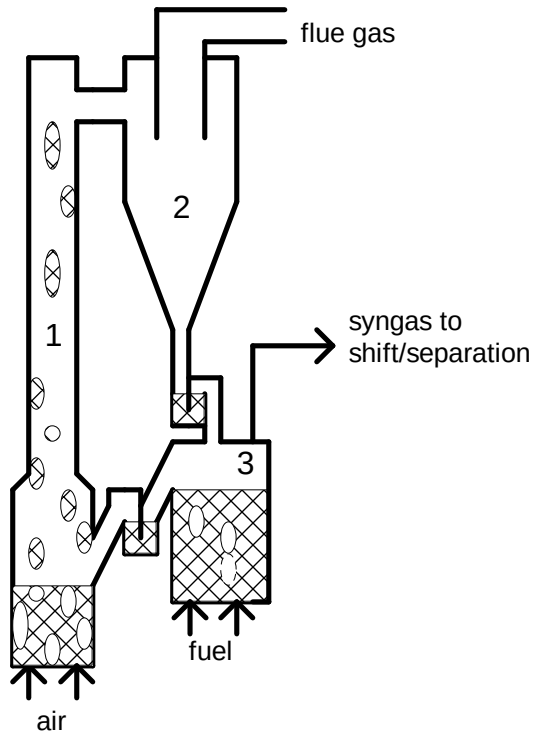


hygensys process flow



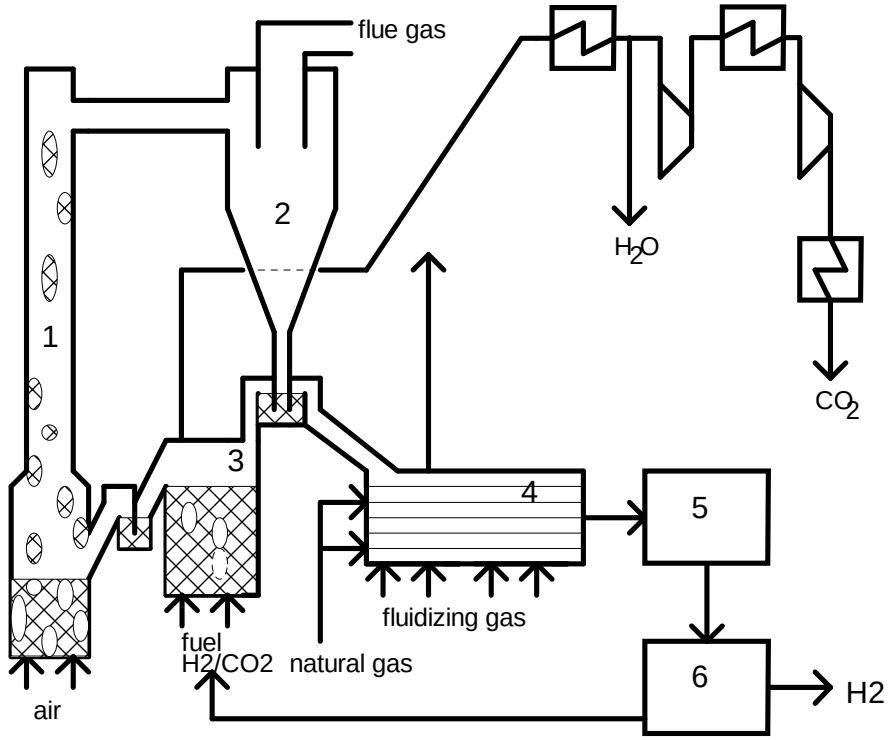
chemical looping reforming

autothermal



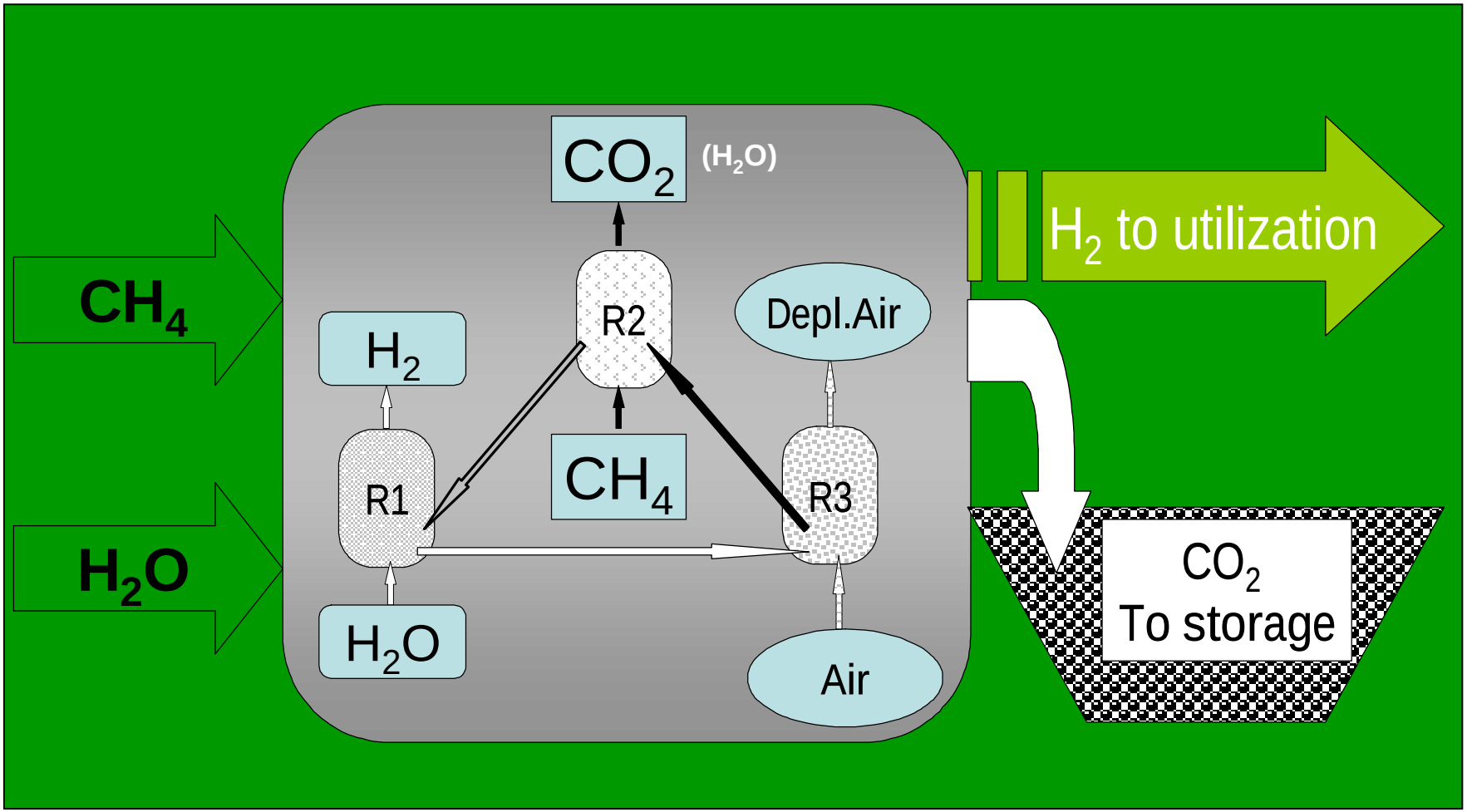
1 Air reactor/riser
2 Cyclone
3 Fuel reactor

smr



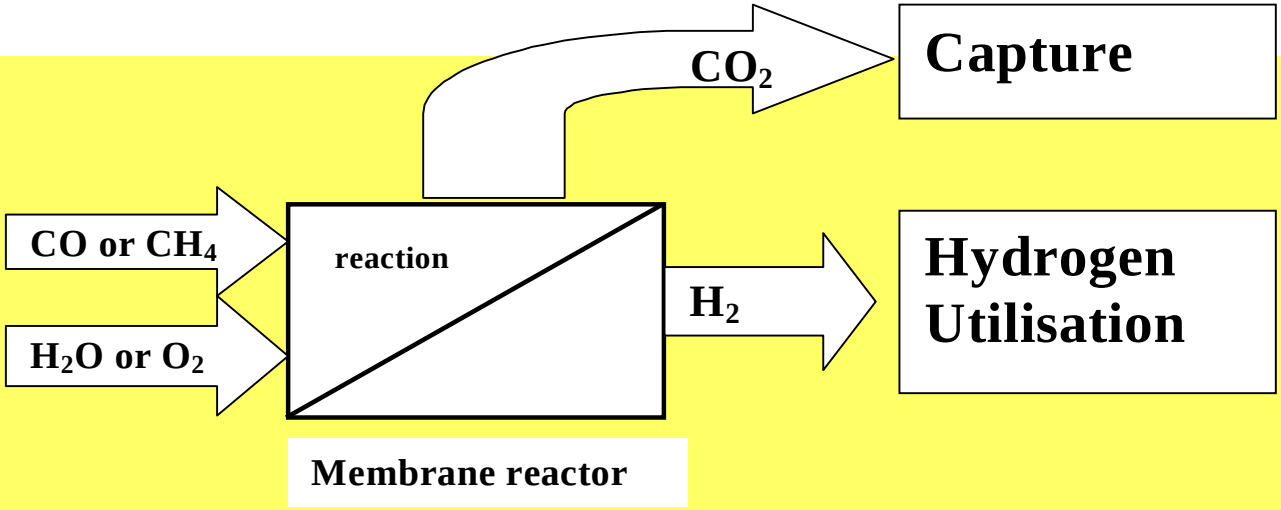
1) air reactor/riser, 2) cyclone, 3) fuel reactor,
4) fluidized bed heat exchanger/reformer (FBHE/R), 5) shift reactor
6) hydrogen separation (one pure hydrogen flow, one CO_2/H_2 flow)
NOTE: return of particles from 4 to 1 not shown because of 2 D view, Fluidizing gas for FBHE/R can be gas recycled from outlet of fuel or air reactor or air.

one-step decarbonisation



metal membranes

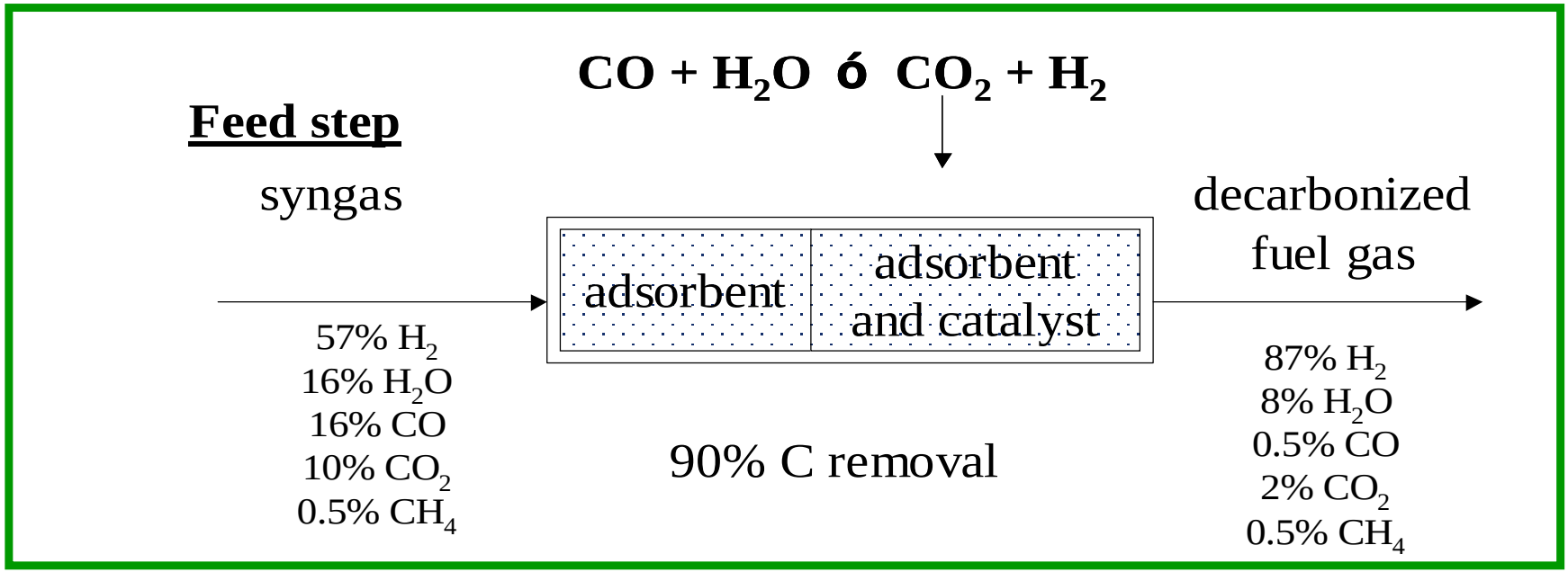
combined reaction and separation



Operating temperature	Type of reaction	Active membrane
300-400°C	Water gas shift	Metal membrane
400-600°C	Low temperature reforming of methane	Metal membrane

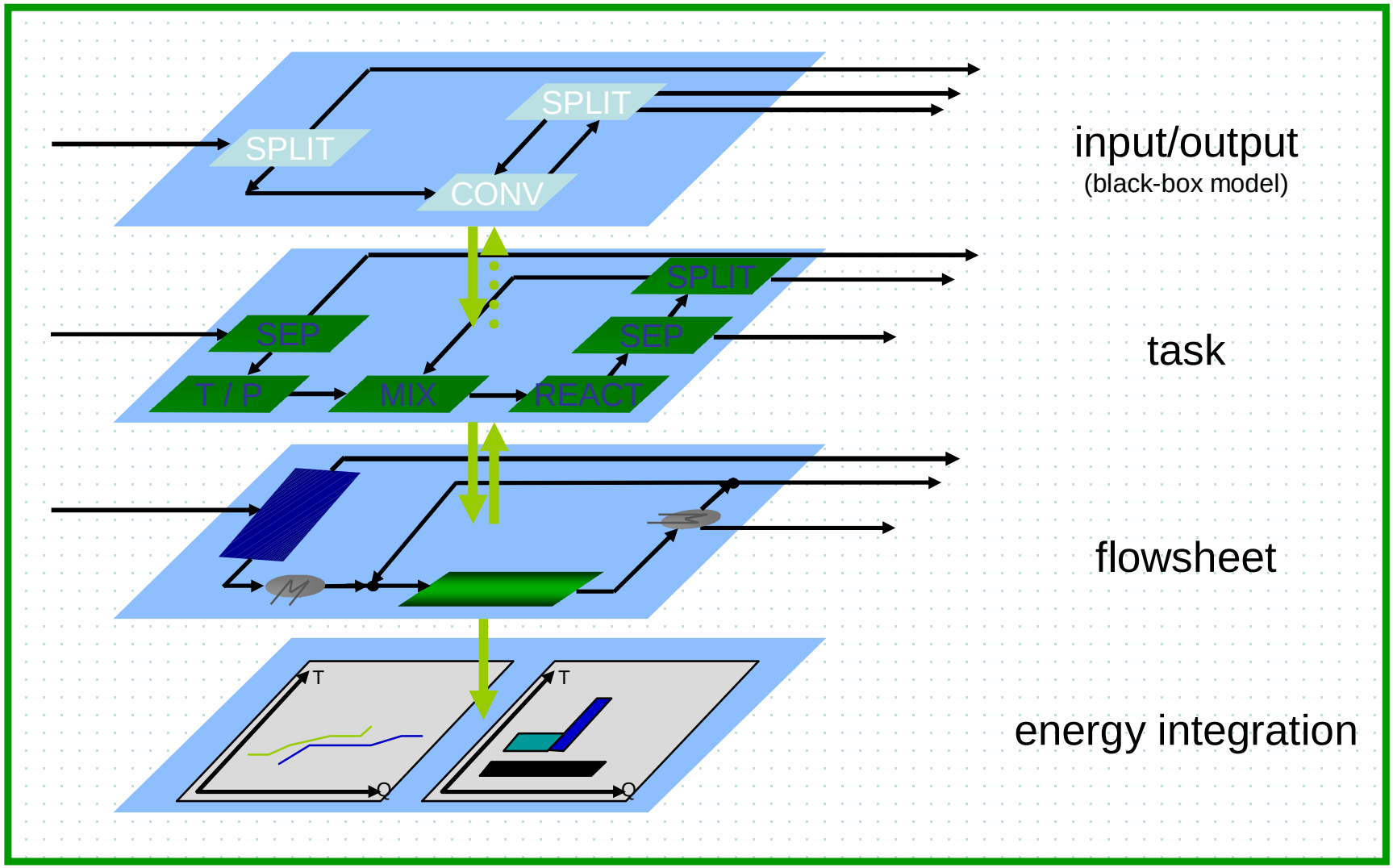
thin palladium supported membranes

sewgs process concept



- Water gas shift catalyst + high temperature CO_2 adsorbent
- Removes CO_2 from hot syngas (400-500^{o}C), drives CO towards extinction
- Multiple beds undergo cyclic process steps (reaction/adsorption and regeneration

process synthesis



knowledge management and dissemination

- management of ip created co-ordinated by the technical team
- dissemination of results through a structured programme of international activity
- Newsletter due for publishing early April 2007

Public Workshop Tuesday 24th April, National Technical University of Athens – please register on line

thank you for your attention

www.cachetco2.eu