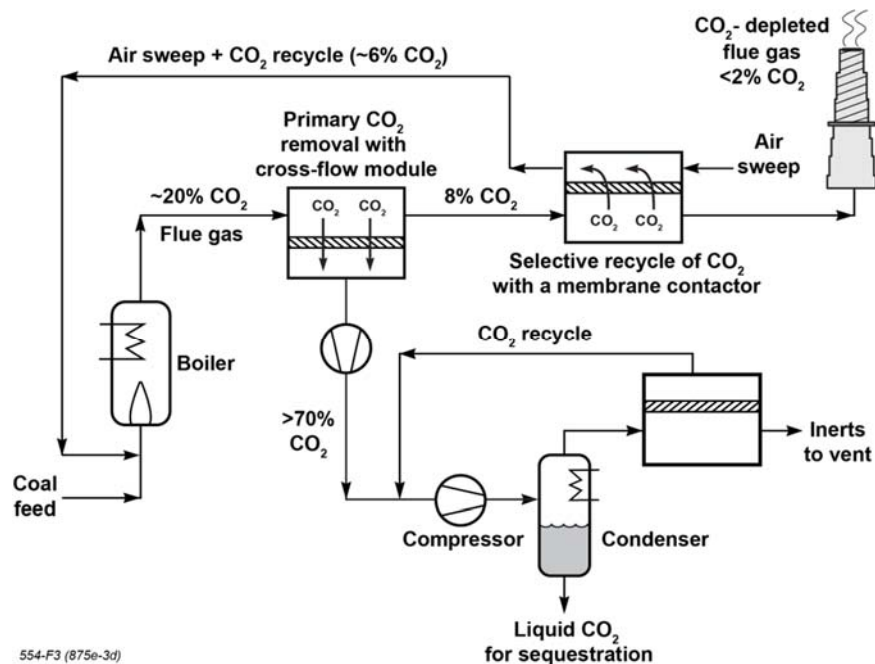


A Membrane Approach to CO₂ Capture

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I first met Don Paul more than 40 years ago and “it don’t seem a day too much.” For the last 30 of those years, we have both been interested in the use of gas separation membranes. In my talk, I will describe the use of these membranes to separate and sequester carbon dioxide from power plant flue gas. The company I work for has been working on this technology for some time. A 20 tonne/day test system has been built and operated at two field sites. The technology is moving to the 200 tonne/day (10 MW_e) demonstration scale.

One innovation of this process is the use of a two-step membrane design where the second step uses a membrane operating with air sweep to selectively recycle CO₂ to the boiler. The use of combustion air to provide driving force for CO₂ separation significantly reduces the energy cost. Because the air sent to the boiler already contains CO₂, the CO₂ concentration in the flue gas leaving the boiler increases from 13% CO₂ to as much as 20% CO₂. The removal rate required by the first step membrane is then reduced and the concentration of CO₂ in the membrane permeate is increase to the 70 to 80% range.



In this talk, the current status of this technology will be reviewed, the project process economics, best applications and a route to commercial use outlined.