

HTRI experiences with COBIA

David Gibbons

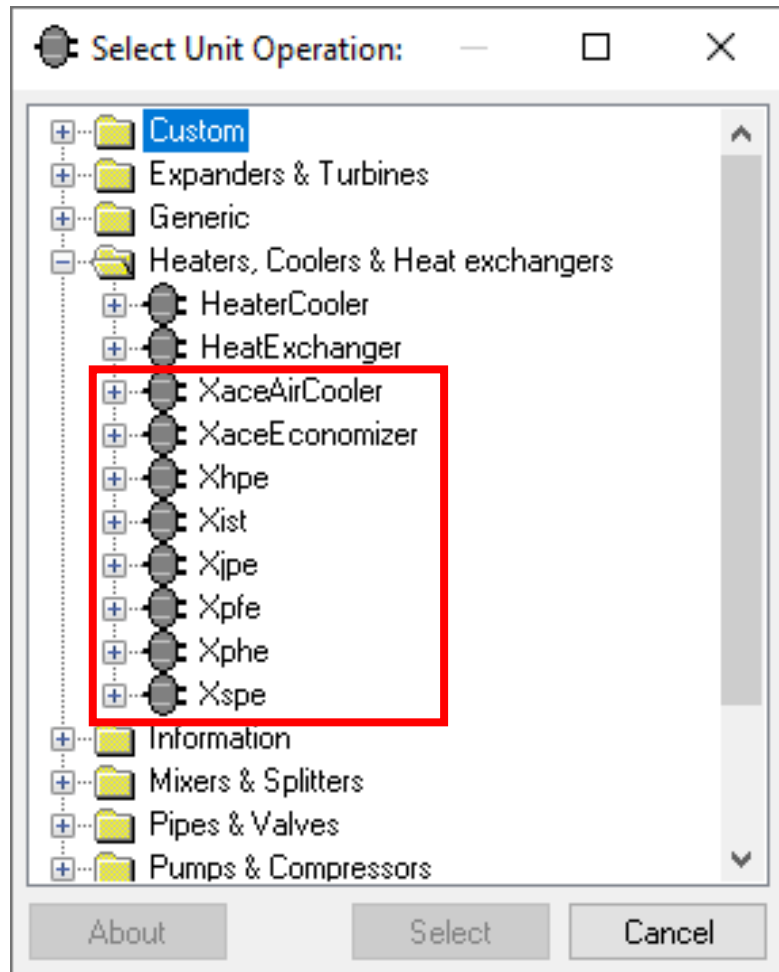
CAPE-OPEN Annual Meeting / October 2023



A brief history

- HTRI
 - CAPE-OPEN 2005 Award
- Use of CAPE-OPEN
 - *Xchanger Suite*[®] modules since 2005
 - Added *Xpfe*[®] (plate-fin) to the list of modules supported in 2013
- Use of COBIA
 - *Xfh*[®] *Ultra* released in 2021

Heat exchanger modules in *Xchanger Suite*



- Air-cooled heat exchangers
- Hairpin heat exchangers
- Shell-and-tube heat exchangers
- Jacketed pipes/double pipes
- Plate-fin heat exchangers
- Plate heat exchangers
- Spiral heat exchangers

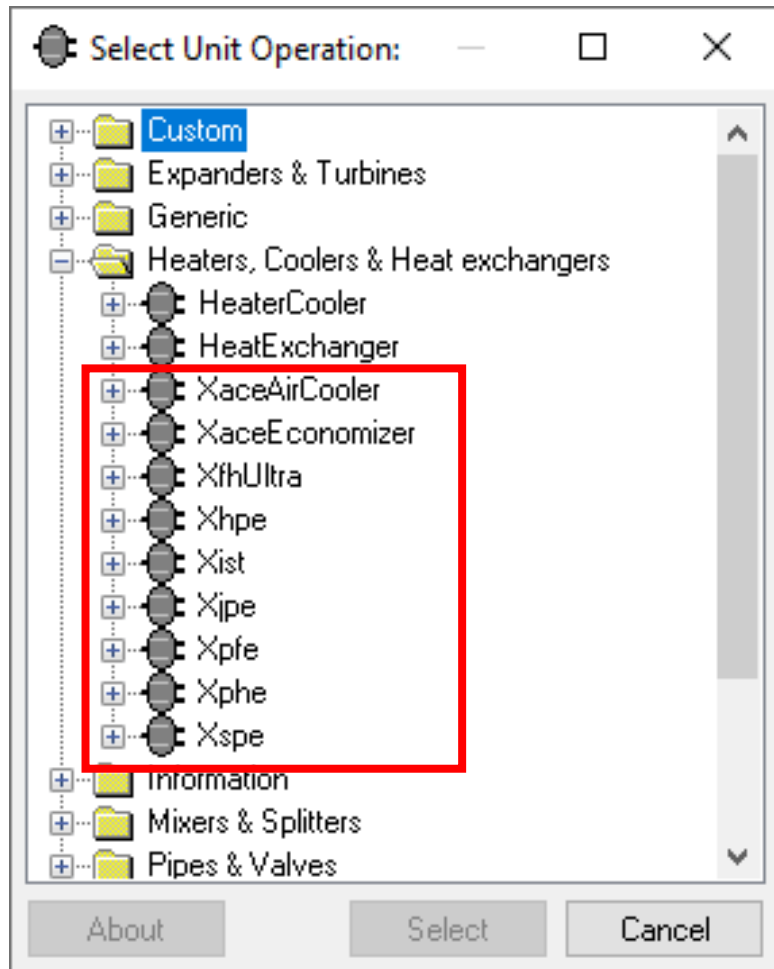
Working with COBIA at HTRI

- First expressed interest in COBIA for any new development at 2017 Annual Meeting
- HTRI could not attend the 2018 Annual Meeting where there was a training session on implementing COBIA-based software
However, material gave enough to start experimenting
- In 2019 HTRI were approved for support via the Consultancy Service
- With training material, a skeleton unit operation was quickly created

Development challenges

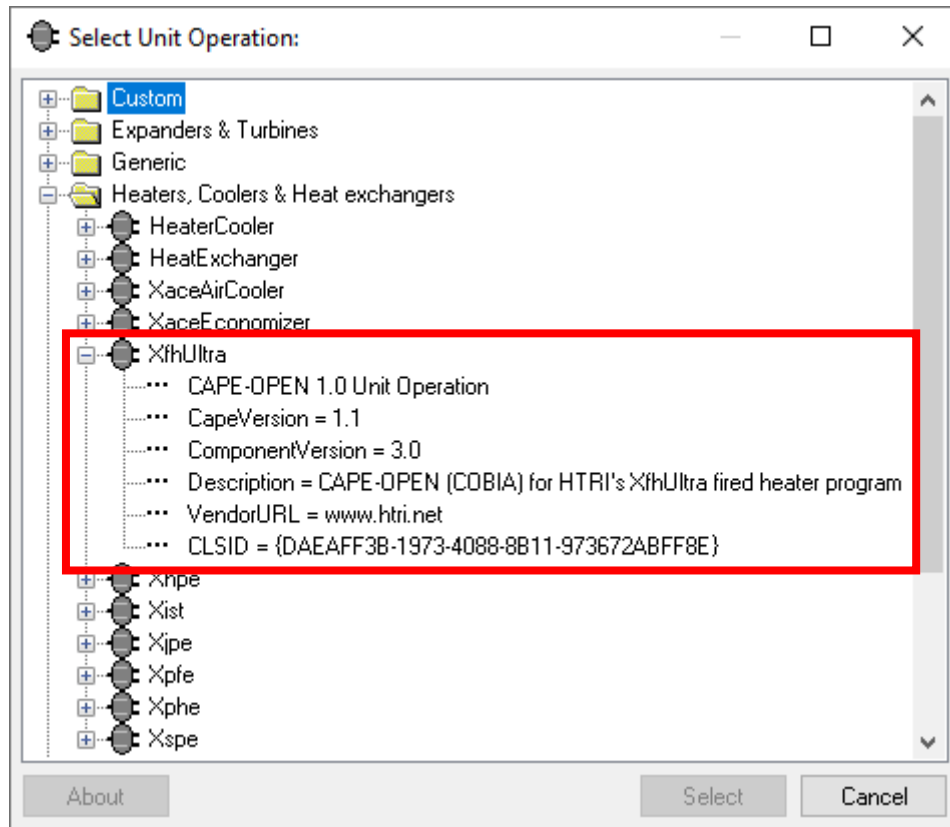
- However, as early adopters (ie before a public release of COBIA), many issues were uncovered which did require assistance
 - Built up the ability to handle multiple ports
 - Display and interaction with the *Xfh Ultra* user interface
 - Dealing with registration issues
- Added COBIA ×64 and Win32 components to *Xfh Ultra* (×64) and *Xfh Ultra* (×86) installers, respectively
- Added COBIA common runtime components to both *Xfh Ultra* installers
- Little time was needed for consultancy

Xchanger Suite and *Xfh Ultra* unit operations



- *Xfh Ultra* 3.0 was released in September 2021
 - 32 bit
 - 64 bit
- *Xfh Ultra* included necessary implementation for CAPE-OPEN with everything based on the COBIA 1.2.0.7 release

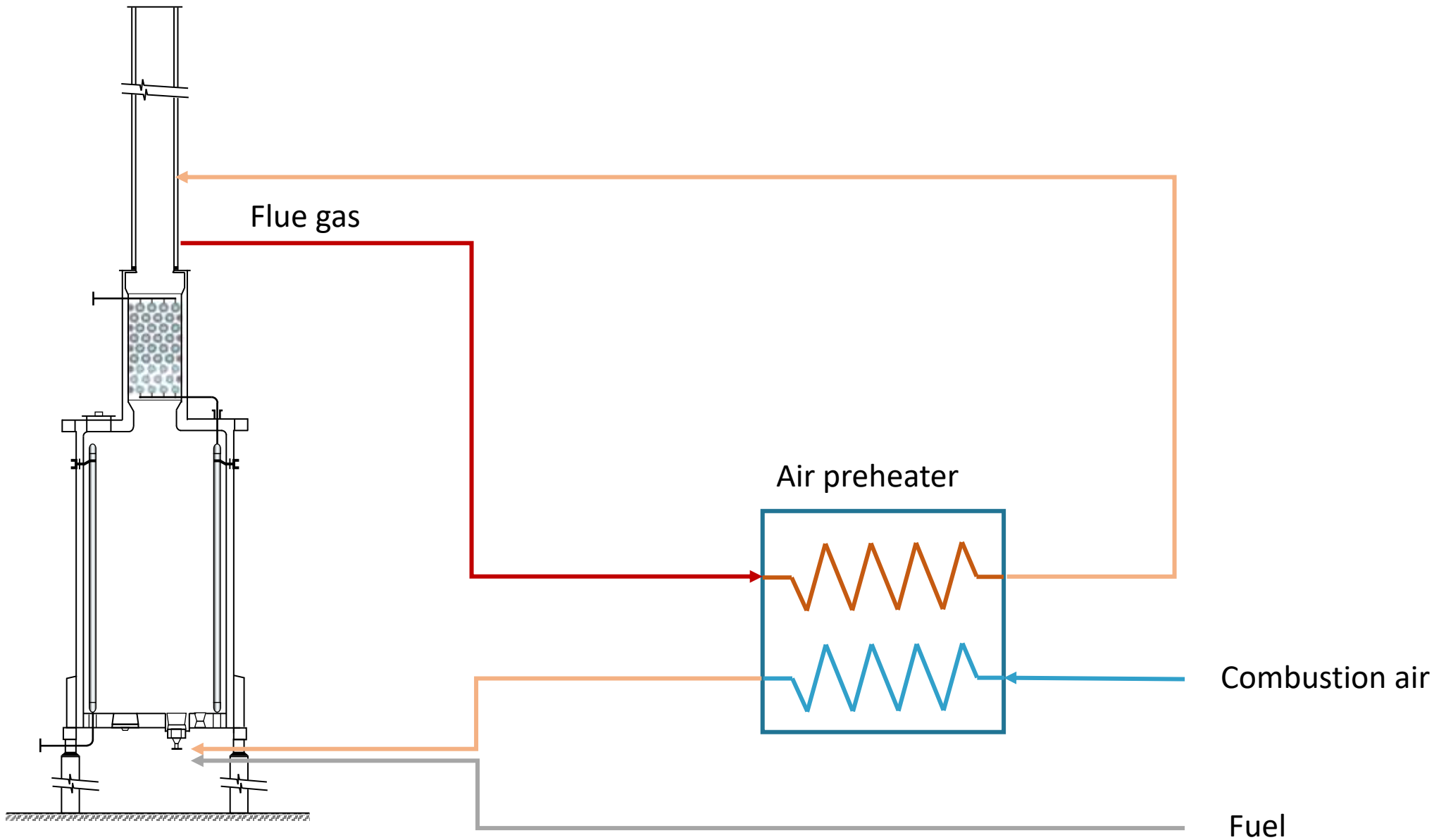
Details for *Xfh Ultra*

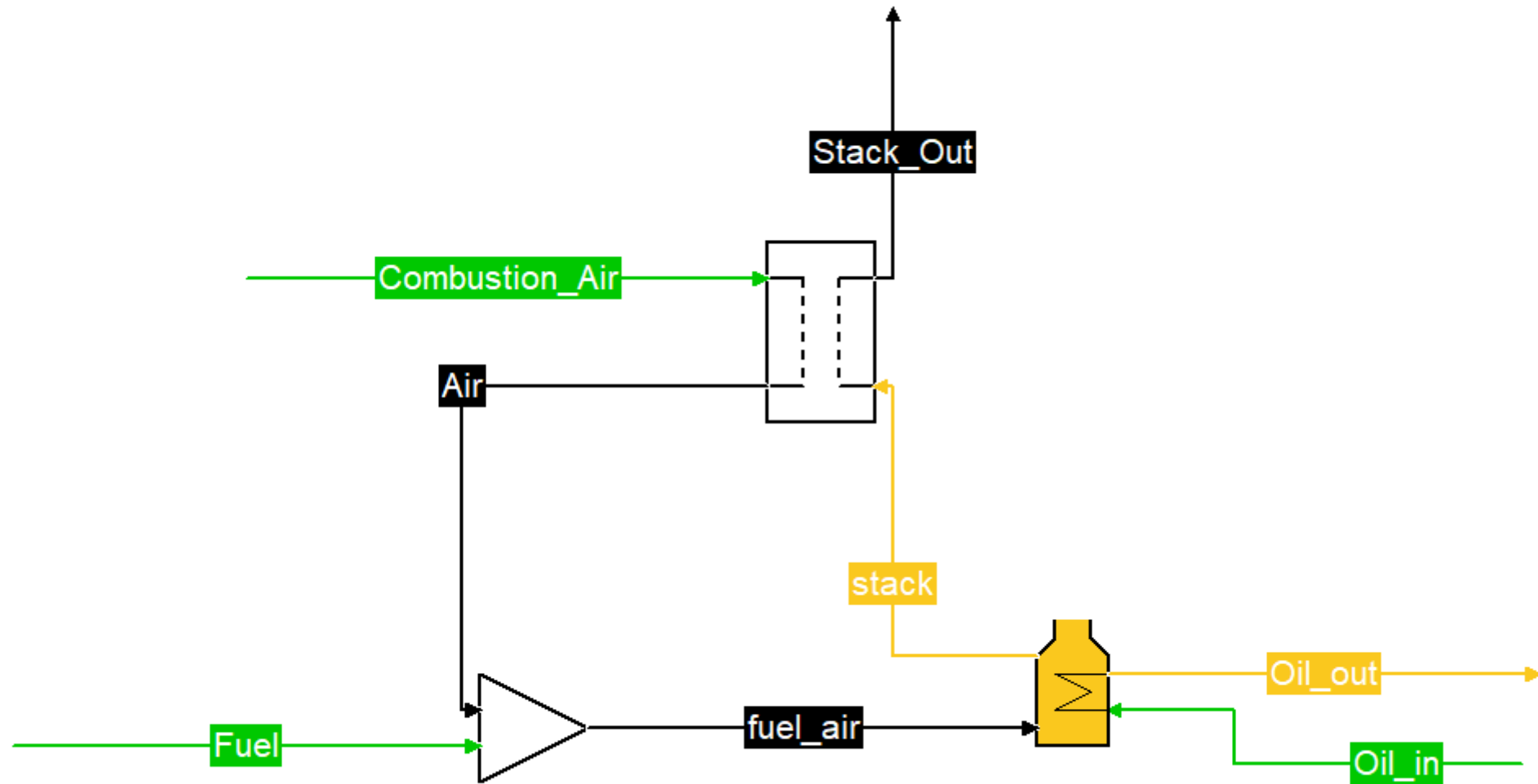


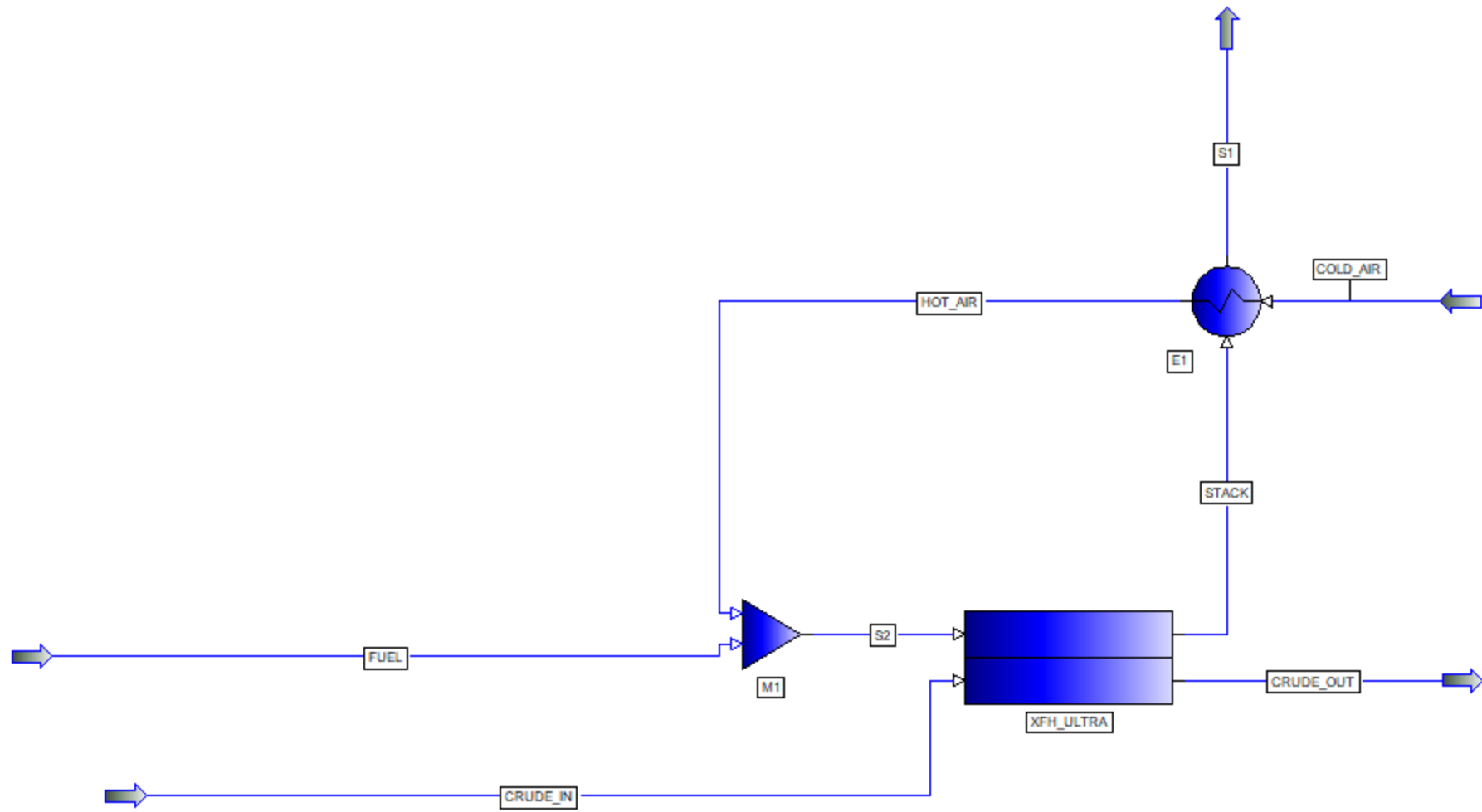
- Benefits?
- Steam injection
- Air pre-heater
- Example case

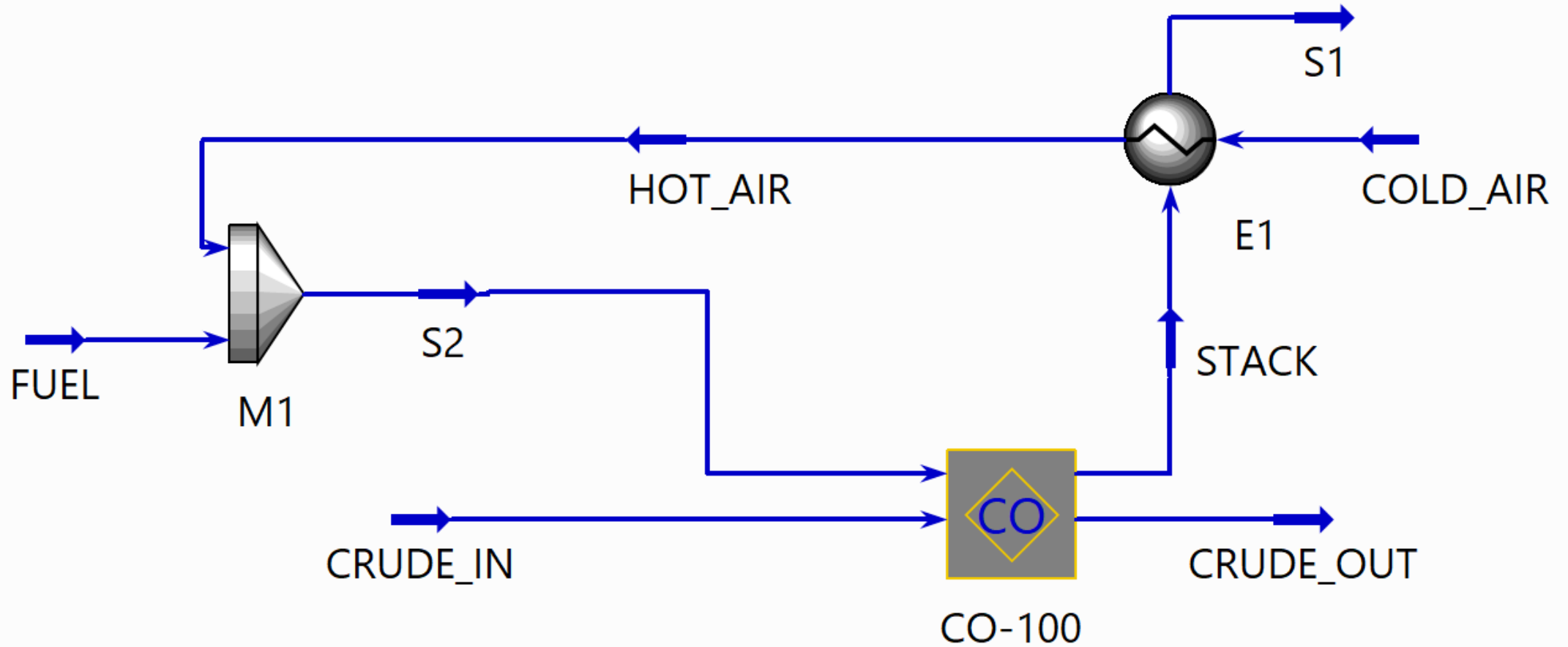


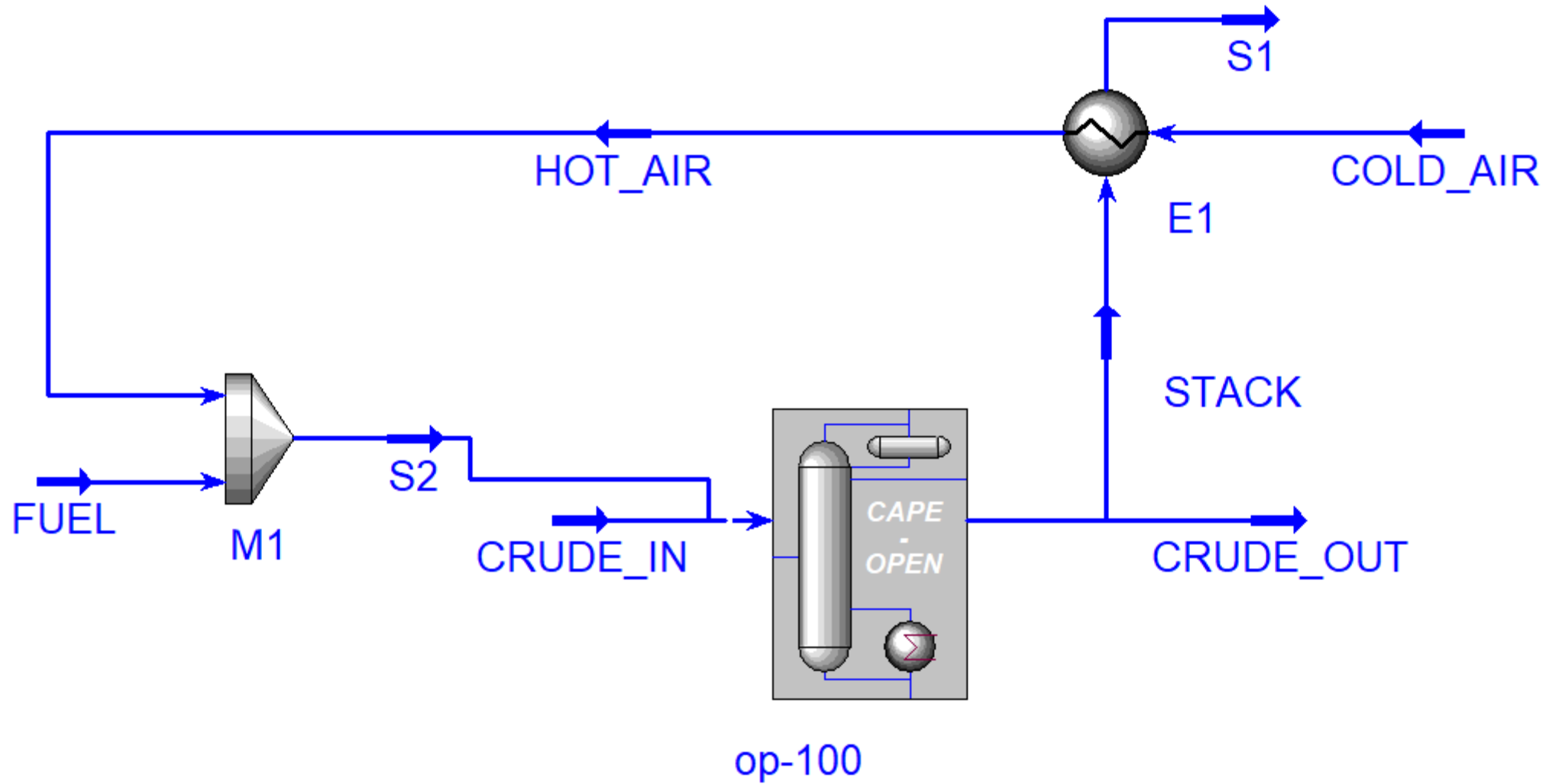
Source: Shutterstock











Recap on implementation

- *Xfh Ultra*: Rigorous fired heater calculations in PMEs
Several process simulators tested
- COBIA: Good ease of coding
Benefited from Co-LaN consultancy
In reality, little requirement
As early adopters, issues found but...
With advice from Jasper, easily correct
- COBIA: Good backward compatibility
(i.e., with current process simulators)

Final thoughts on COBIA

- It works well
- Much more straightforward than COM based implementation
- New release of *Xfh Ultra* (coming soon) will include COBIA 1.2.0.13





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