ENHANCING MULTI-FIELD GAS PRODUCTION VIA NETWORK OPTIMIZATION

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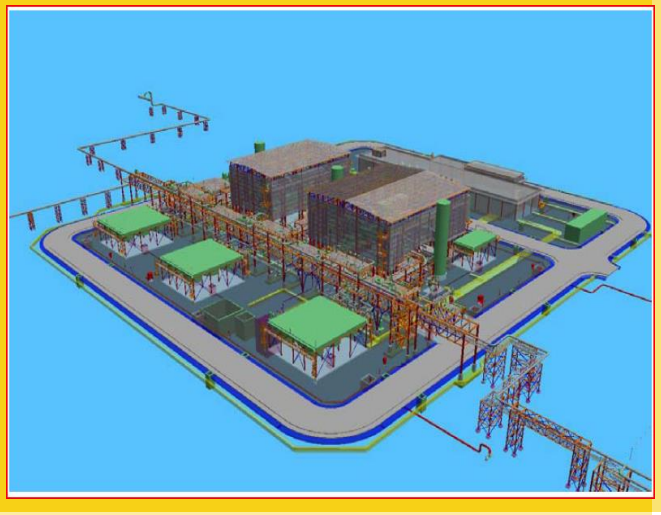
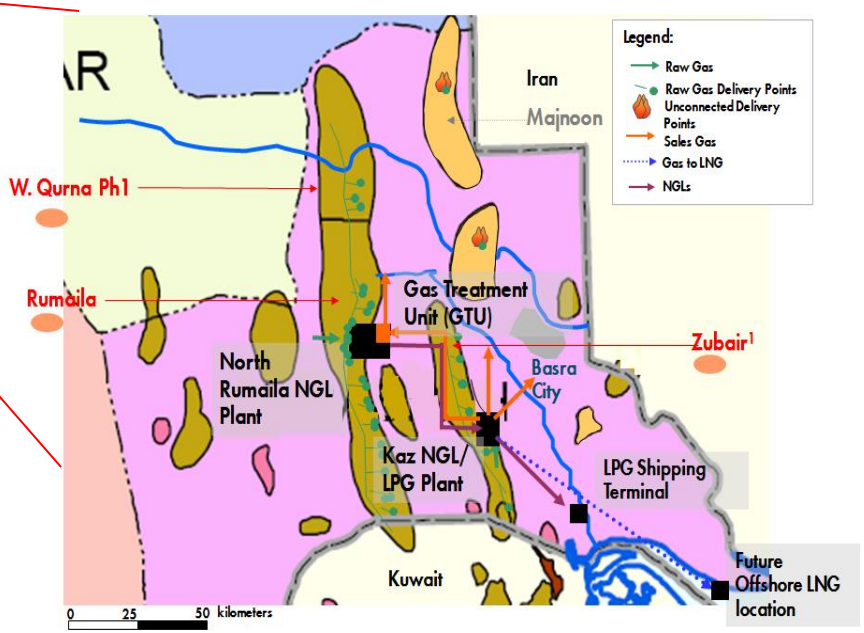


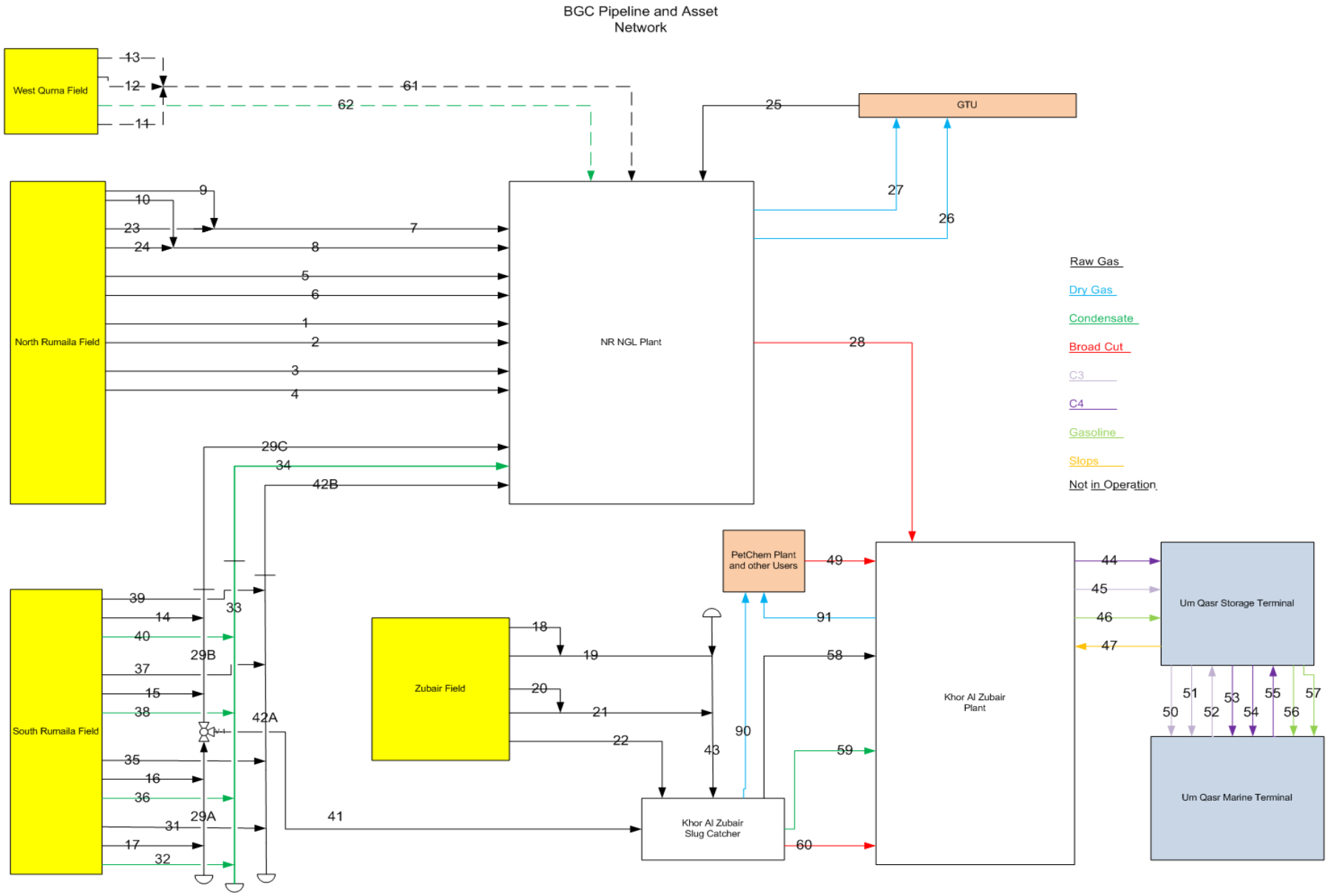
IRAQ: THE POTENTIAL

- 140 billion bbl of proven oil reserves
- 110 tcf of gas (mostly associated)
- Opened up in 2010 to IOCs.
- 3 mmbbl/d current oil production
- 9 mmbbl/d ; projection for 2020

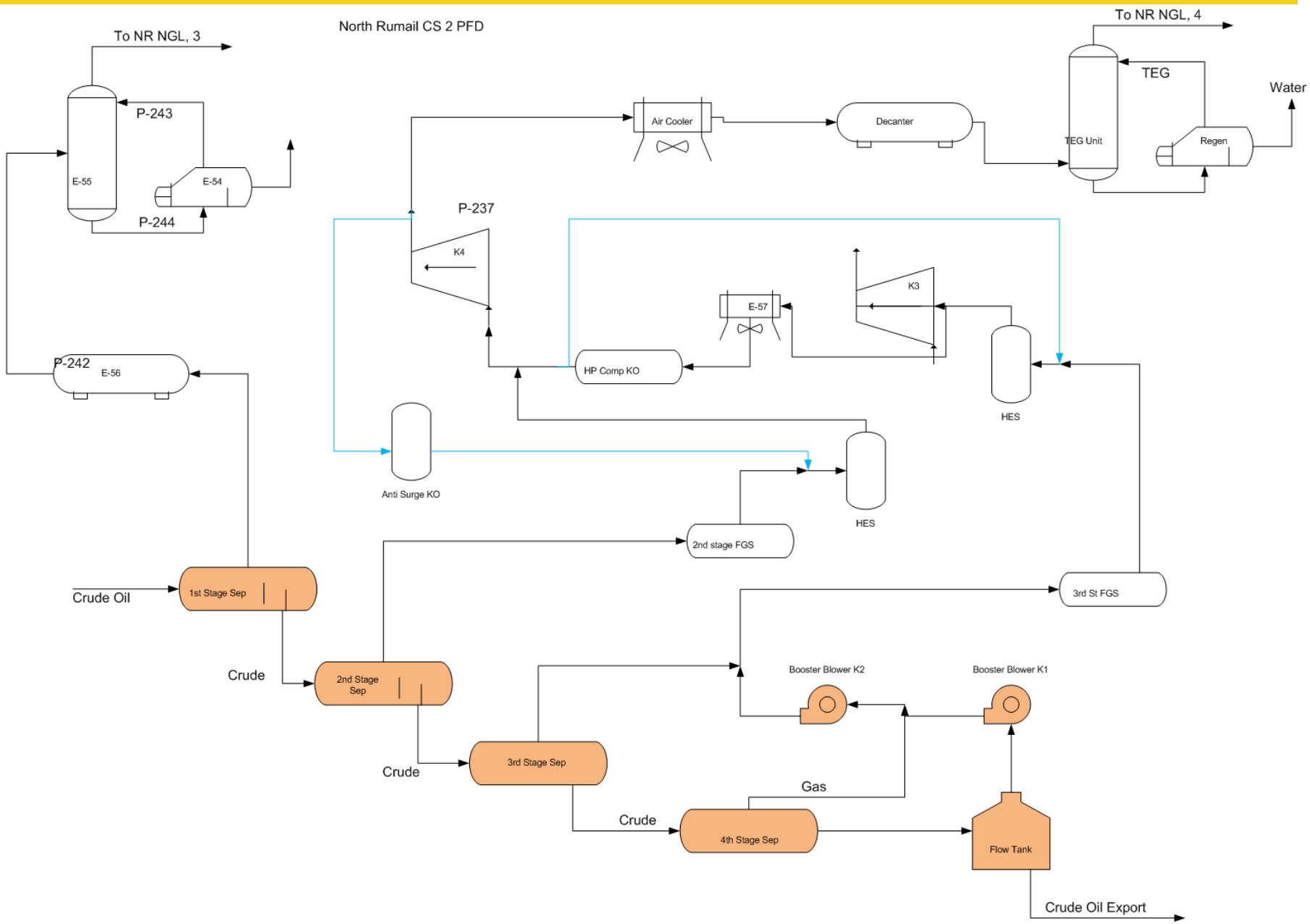


IRAQ: THE CHALLENGE

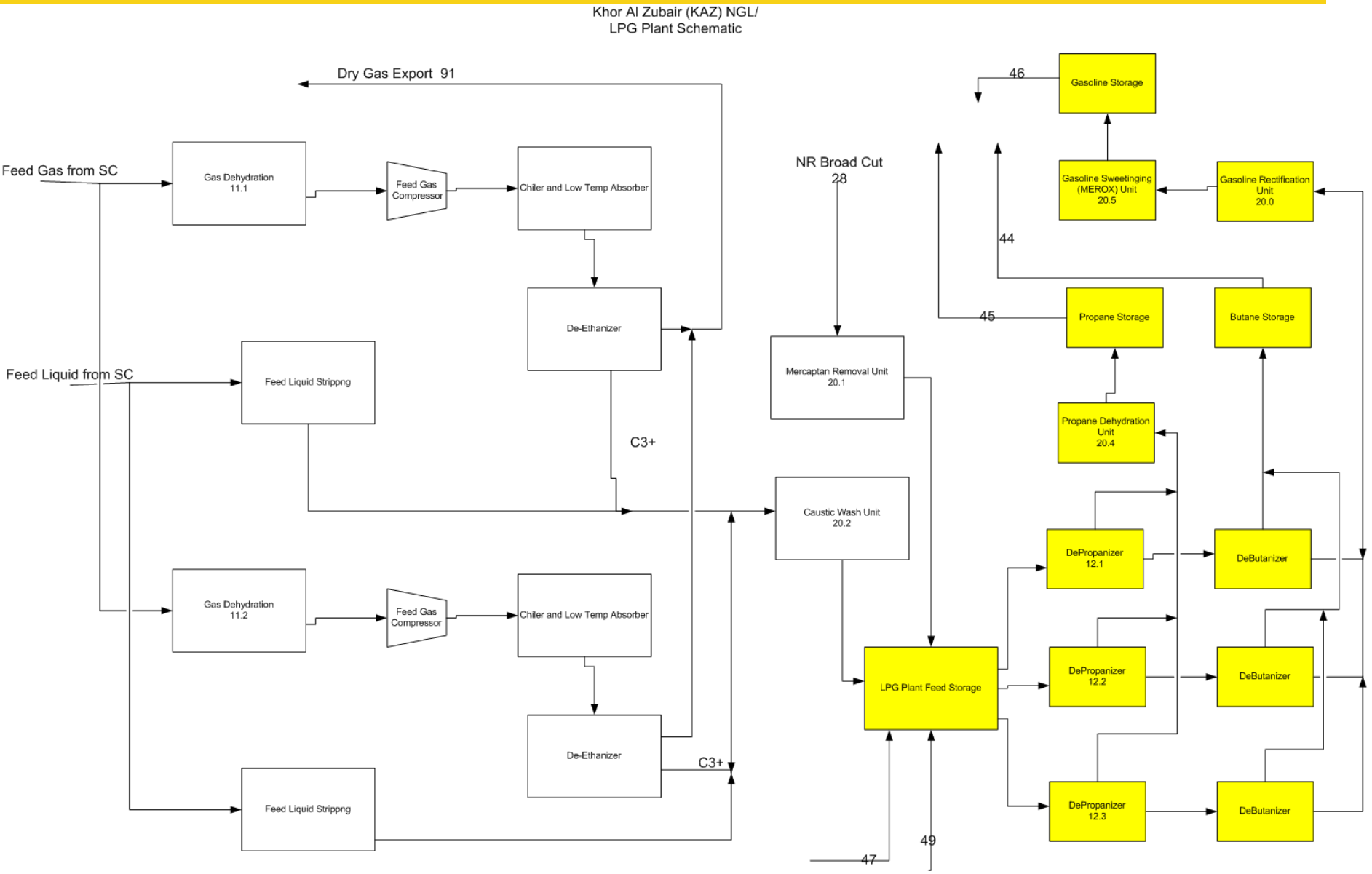
BGC: THE NETWORK



SIMPLE COMPRESSOR STATION



KAZ NGL/LPG PLANT SCHEMATIC



OBJECTIVES

Network modeling aimed at optimizing:

- Selectivity of the network
  - Vary yields of Dry Gas/LPG/C5+
  - Control: flow rate of different feed streams; compressor operating points
- Flexibility of the network
  - Identify bottlenecks (e.g hardware constraints)
  - Establish sensitivity of overall production to certain inputs
  - Optimize production under failure scenarios
  - Maintenance planning
- Profitability of the network
  - Investment planning to maximize NPV
    - $$ focused on debottlenecking the network
    - Optimized asset locations
- Environmental performance

GPROMS MODELING APPROACH

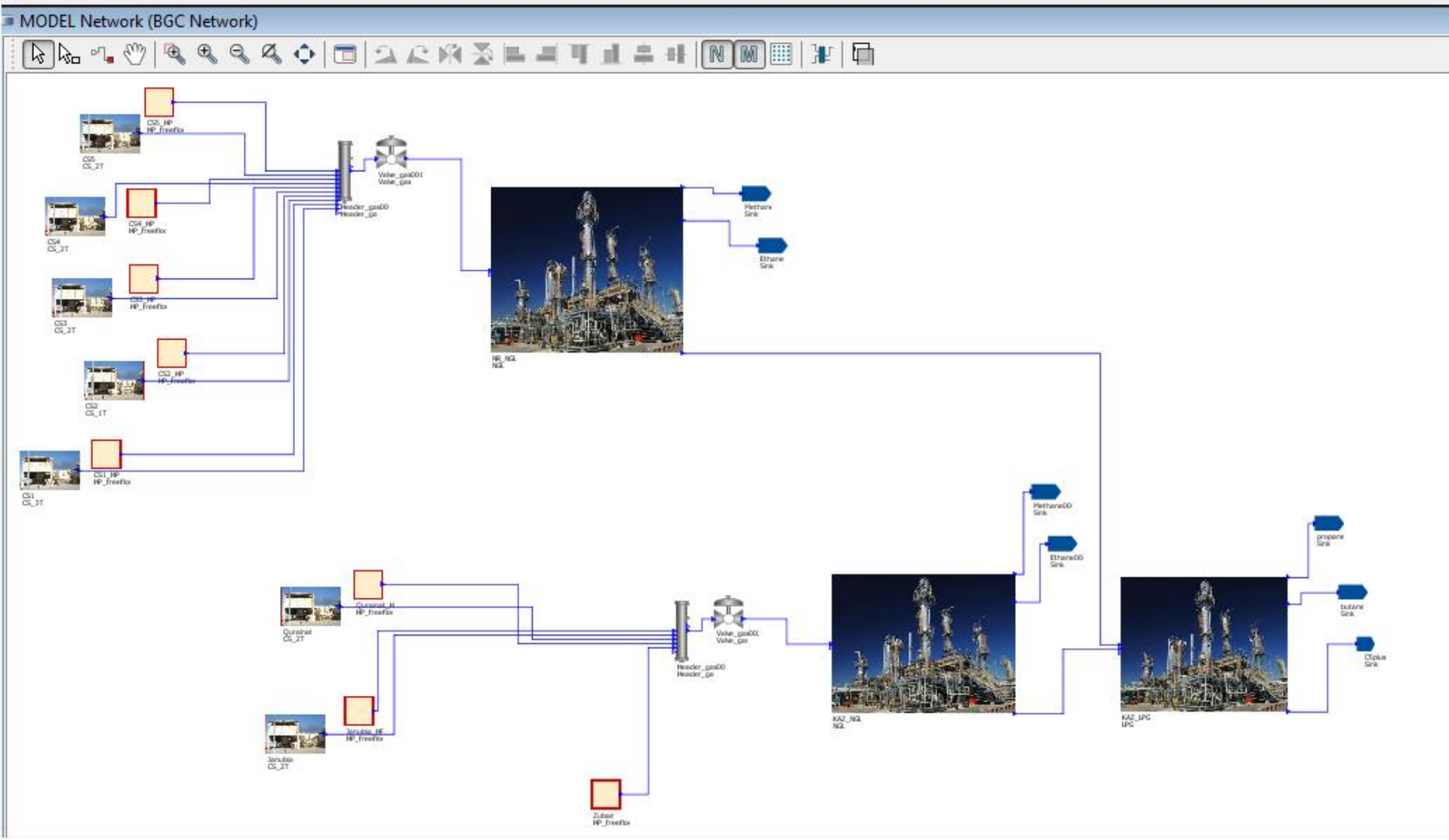
- All BGC facilities modeled as 1 Network

- Network development philosophy is top-down.
  - The nodes of the network are ‘called’ at the Network level as instances of some standard models.
  - Specific variables and parameter input done via dialog box at Network level.

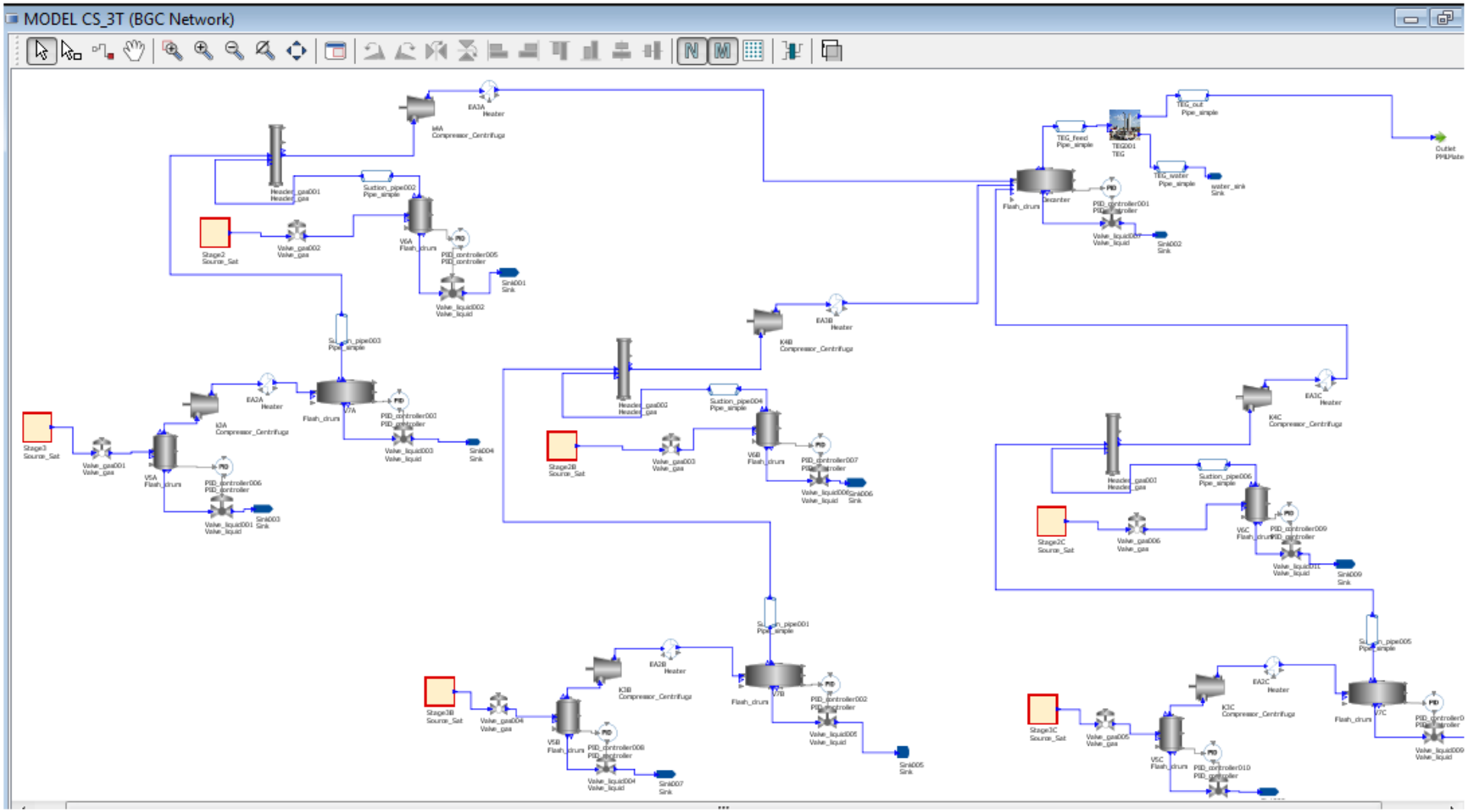
The following standardised models have been developed:

- Standard Compressor station models : 1 Train, 2 Trains and 3 Trains
- Standard NGL plant yield model.
- Standard De-Ethanizer, De-Propanizer, De-butanizer yield models
- Standard LPG plant yield model.

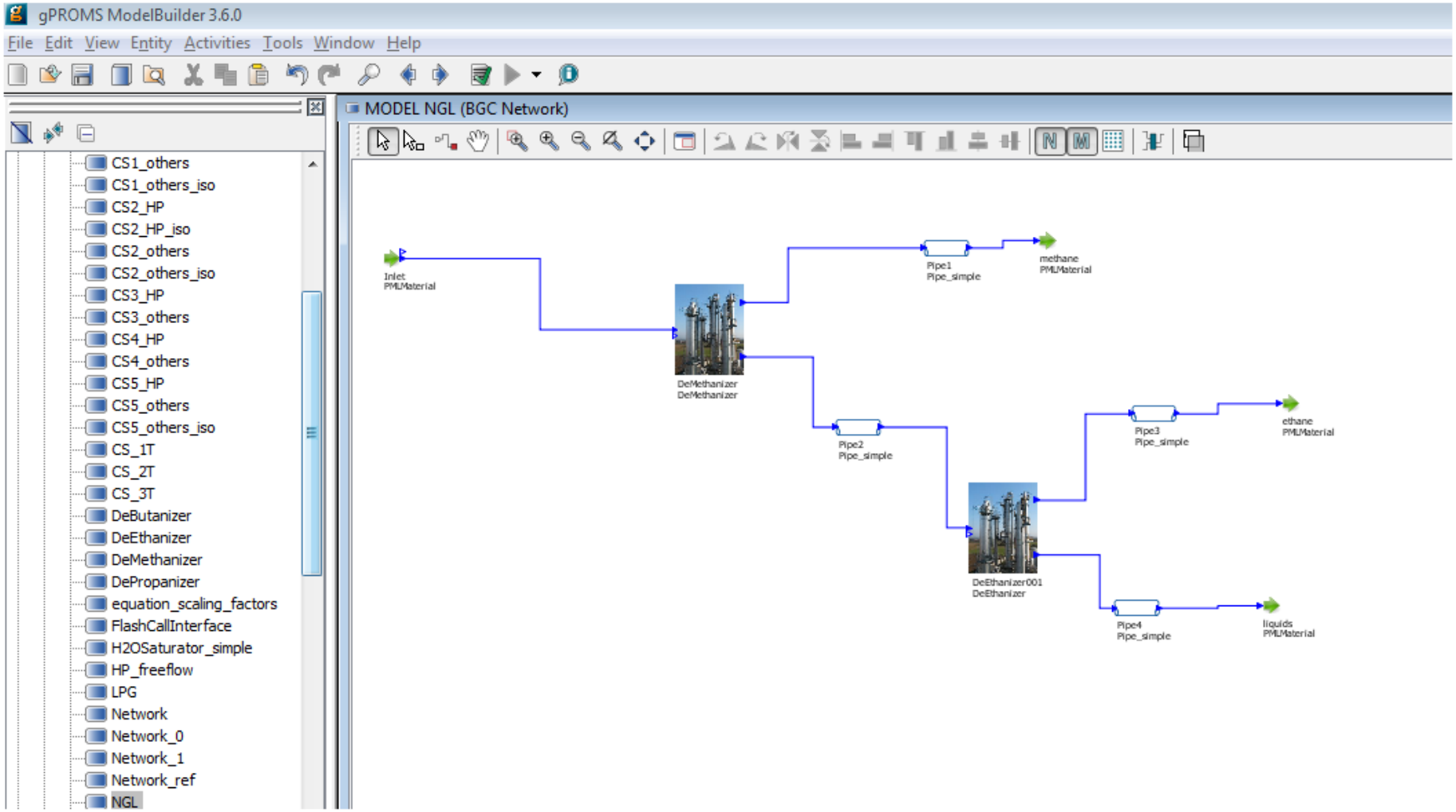
MODEL DEVELOPMENT: THE NETWORK



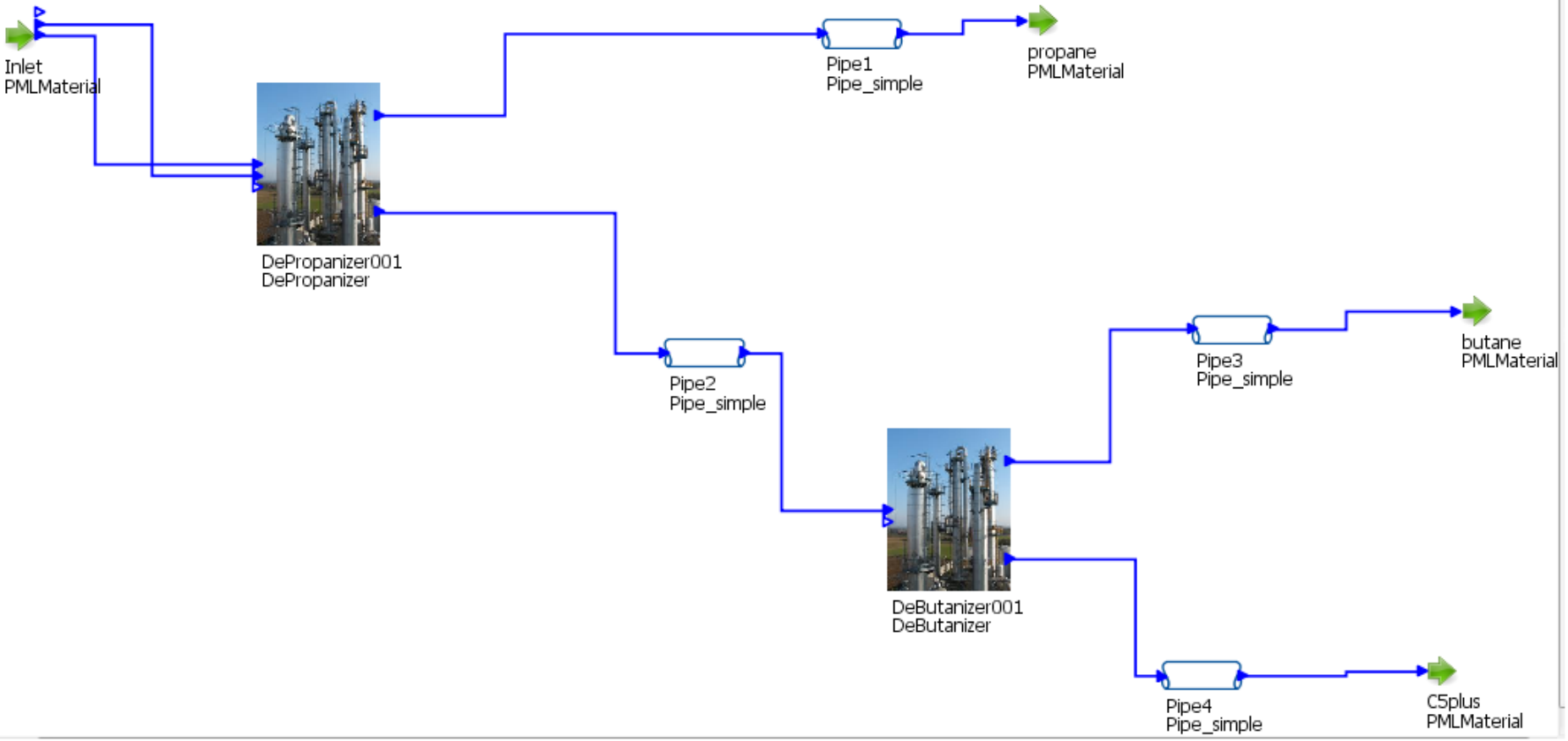
MODEL DEVELOPMENT: 3-TRAIN CS



MODEL DEVELOPMENT: NGL YIELD MODEL



MODEL DEVELOPMENT: LPG YIELD MODEL



SIMULATION RESULTS

Metric	Unit	Plant Operation	gPROMS Model	%Δ
C3+ /Dry Gas Yield	ton/mmscf	6.7	7.5	11
Compressor Absorbed Power	MW	2.19	2.21	1

- Yield difference can probably be accounted for by simplification of NGL yield models.
- Yield difference is not significantly different from accuracy of field meters.

NEXT STEPS

- Detailed models of fractionation columns
- Detailed pipeline models
- Run Optimization Cases
  - Selectivity
  - Flexibility
  - Profitability
  - ...

Questions?

Suggestions?