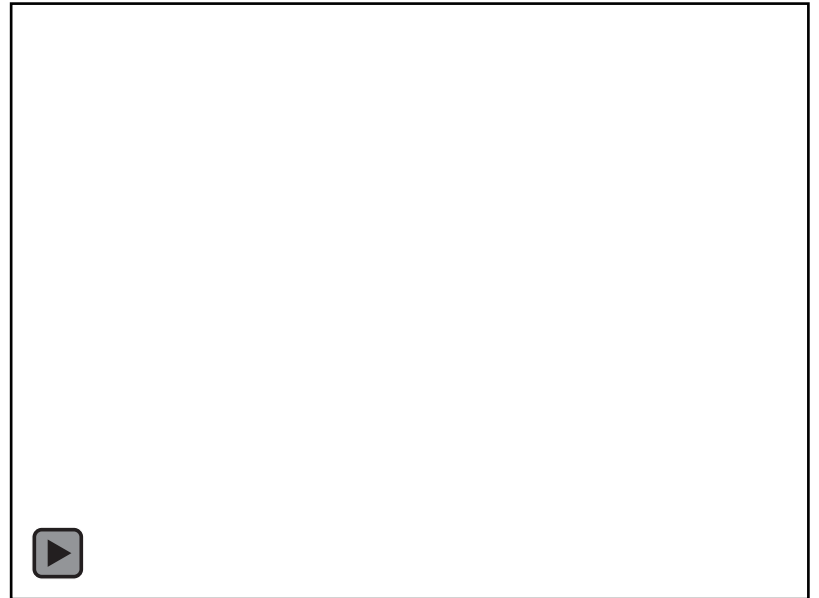


Technical Presentation

Case Study: Implementation of 500 ppm Gasoil

Krishno Sarkar



My Profile Summary

- Having 18 years of experience in Refinery Planning/ Scheduling and Operations.
- Master of Science in Petroleum Refining from Univ. of Surrey, UK.
- Completed Graduate Certificate course in Business (Data) Analytics from Cambrian College, ON, Canada.
- Worked in some of the major refineries in Middle East, India and Canada.
- Proficient in linear programming specially in AspenTech PIMS®.

Implementation of 500 ppm gasoil

Case Study:

Implementation of 500 ppm Gasoil

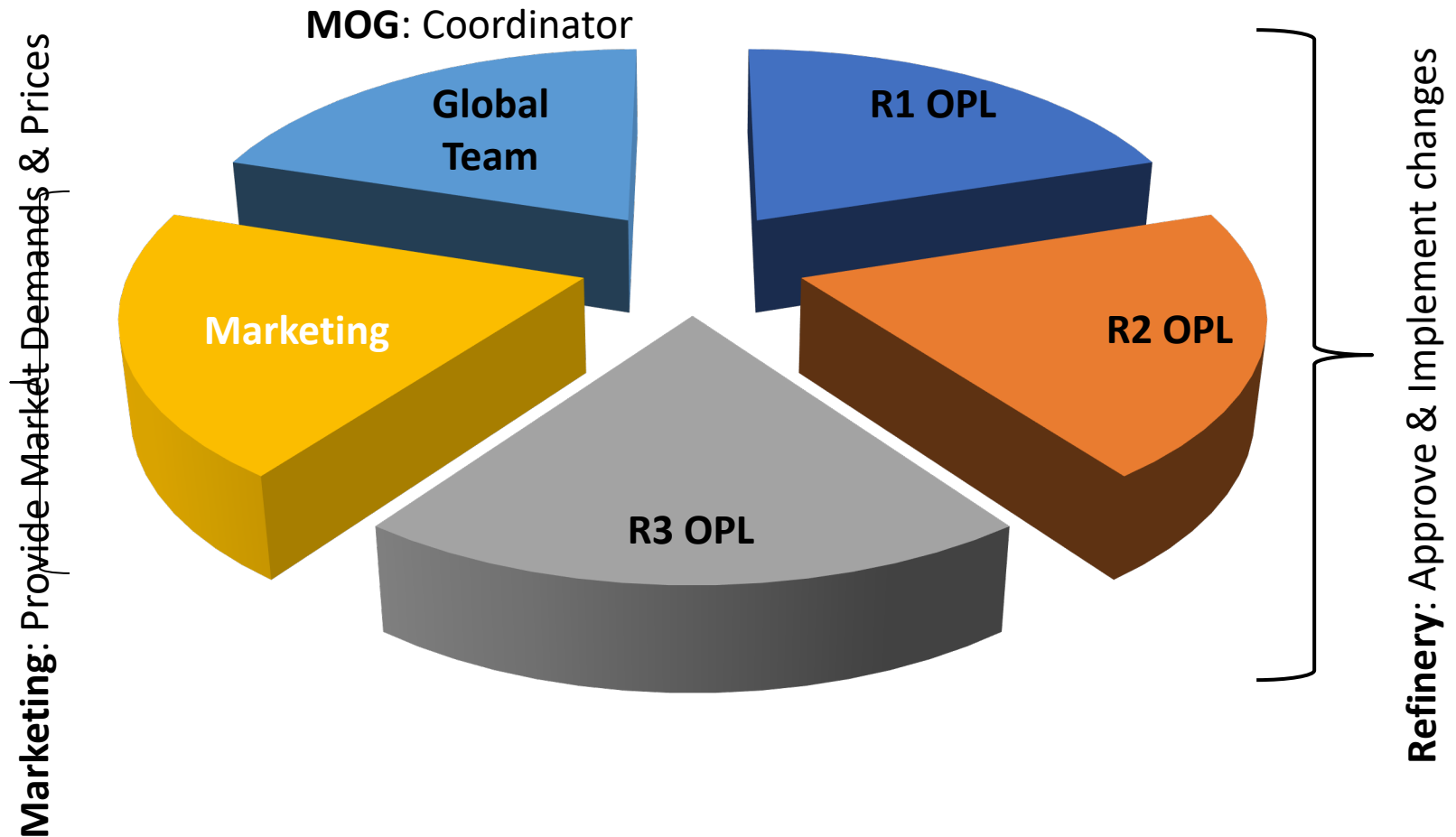
- Created multi-functional team.
- Suggested & discussed planned implementation.
- Did scenario analysis use PIMS.
- Implemented and tracked progress.
- Evaluated economic impact.
- Trained planning engineers.



Background

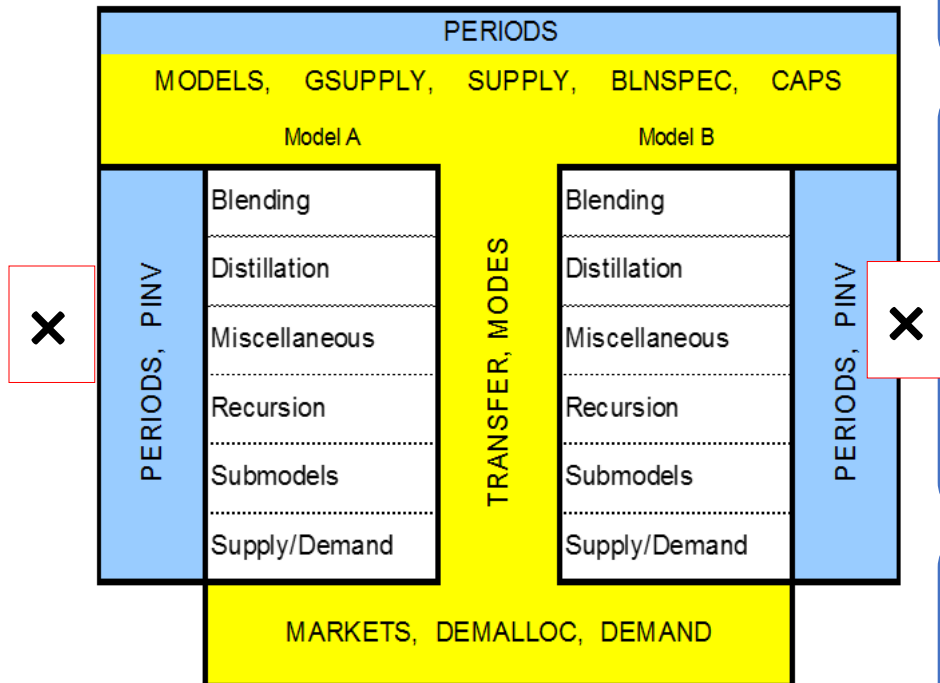
- Refinery was producing substantial 0.2% S gasoil and min. 500 ppm gasoil.
- Due to change in market conditions, Refinery is required to change into max. Low Sulphur gasoil (i.e., 500 ppm S)

Multi-Functional Team workflow



PIMS Model Used

X-PIMS Model



PIMS Model Ver. 8.0

Global Model without the inventory feature used.

Single Period Model used.

Typical average pricing/demand used (1 year).

MAA				
UNIT	Available	Blended	S	Remark
	<i>KTPD</i>	<i>KTPD</i>	<i>%</i>	
NGOD	6.9	6.9	0.005	51 MBPD
OGOD	4.4	0.0	0.150	35 MBPD
ARD	3.6	3.6	0.120	
HCR	0.5	0.0	0.001	HCR in PMD
FCC	0.04	0.0	1.100	
EOCENE	0.4	0.0	1.500	
Total	15.8	10.5	0.044	

Refinery 1 Gasoil Blend

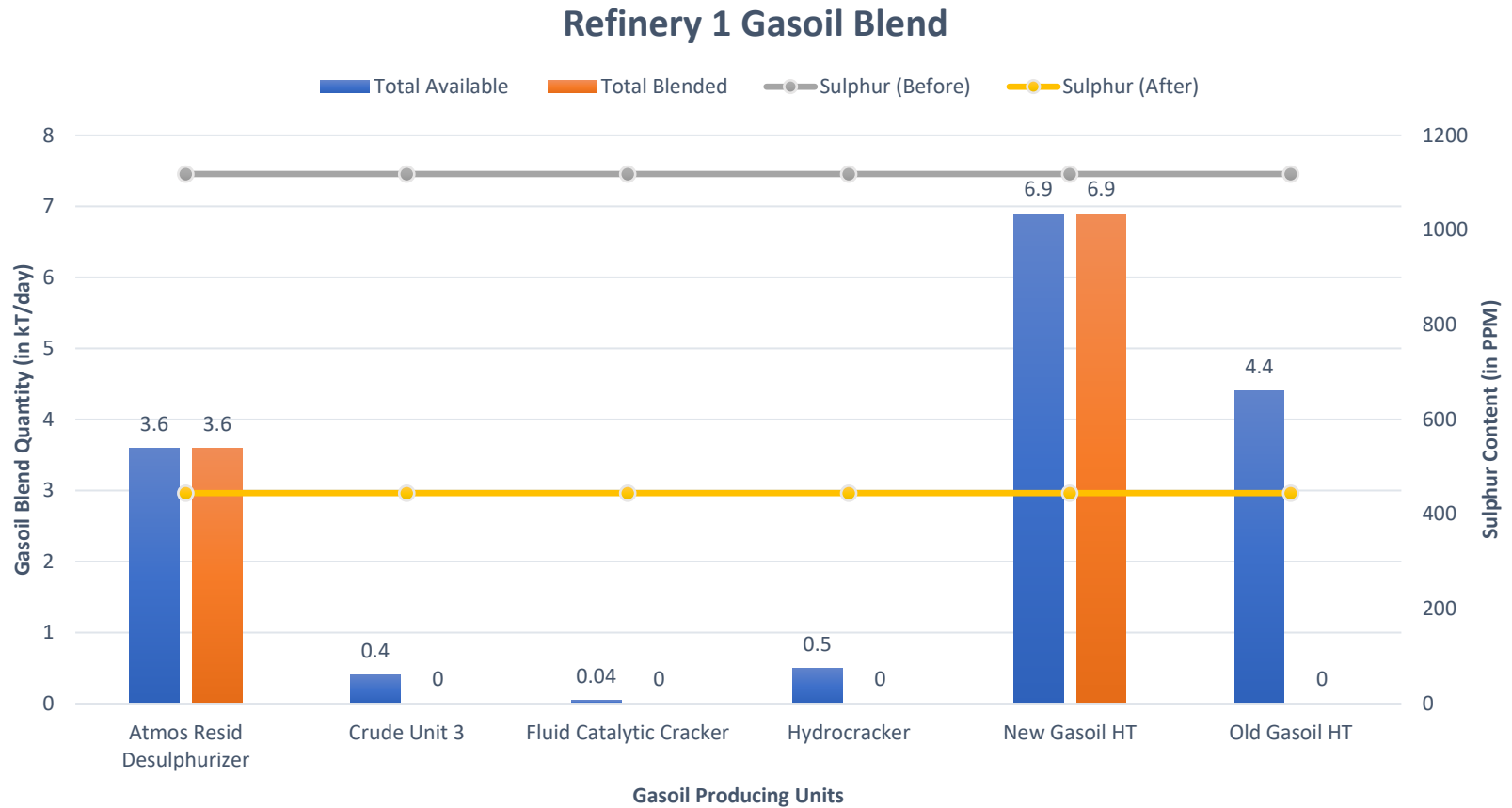
- **Refinery 1**

MAB				
UNIT	Available	Blend	S	Remark
	KTPD	KTPD	%	
DHT	5.3	5.3	0.045	Coker Dsl taken
OCR	2.4	0.0	0.130	
RCD	0.0	0.0	0.400	
HCR	1.6	1.6	0.001	HCR in Dist. Mode
DH2	3.3	3.3	0.025	
Total	12.6	10.2	0.032	

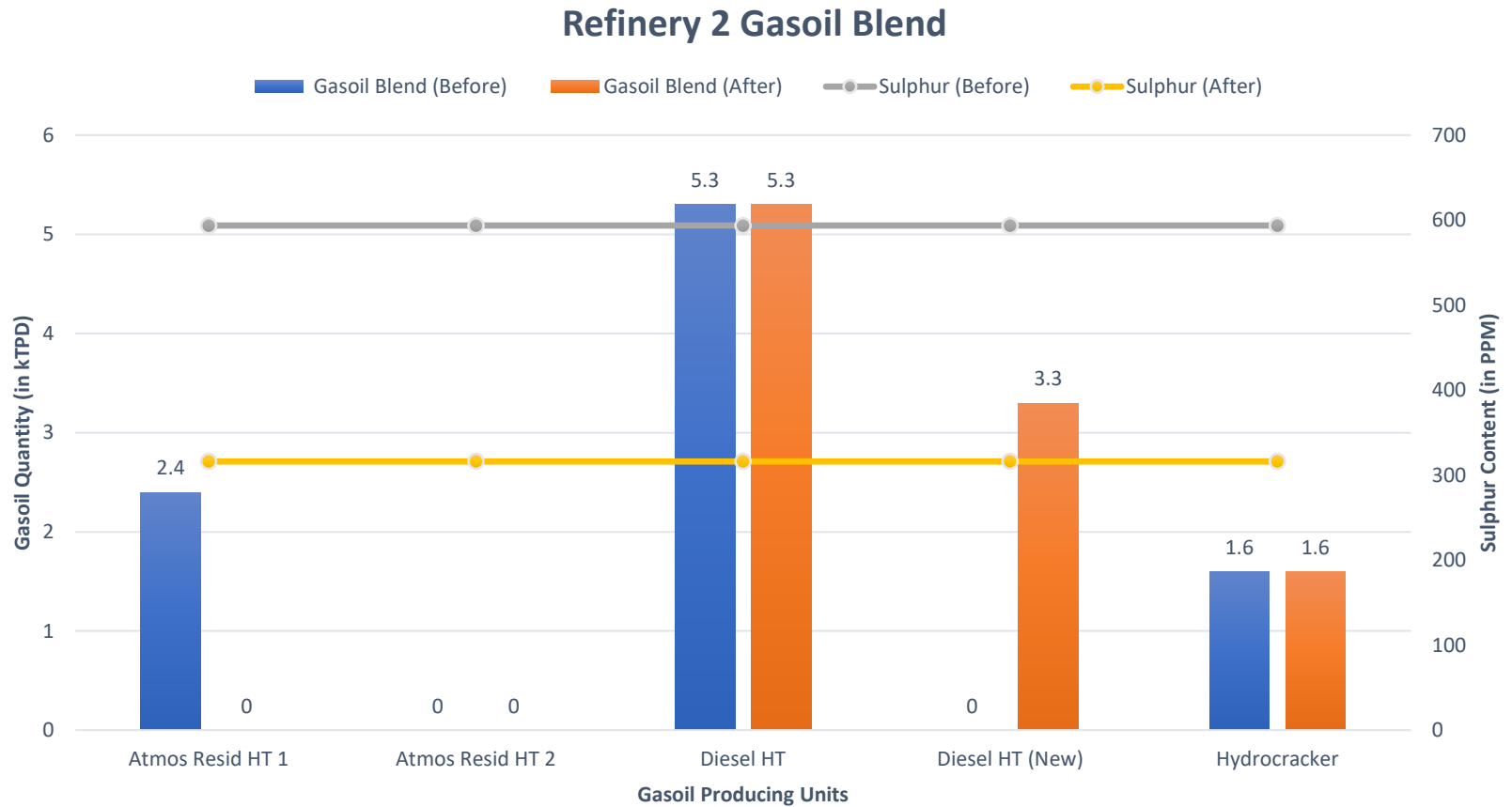
Refinery 2 Gasoil Blend

- Refinery 2

Refinery 1 Graphical Show



Refinery 1 Graphical Show



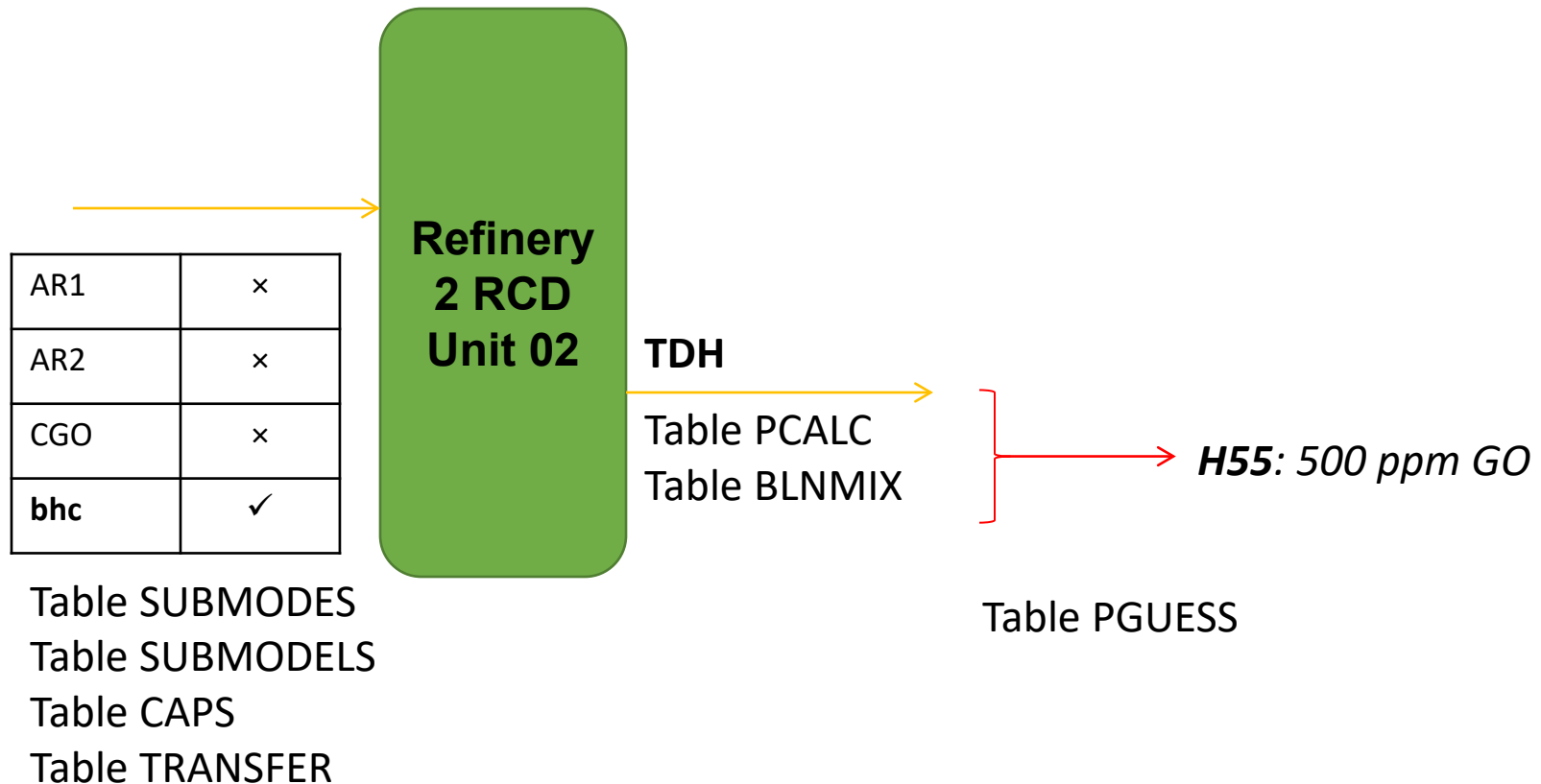
PIMS Table	TAG	Parameter	Value	Remark
CAPS	C:GON	MAX	70.0	New GOD maximized.
CAPS	C:GOD	MAX	35.0	Old GOD minimized.
PROCLIM	Z:GON	MAX	50.0	Prod. Sul. limited
PCALC	DGO:GOF	SUL	0.10	Limited to 1500 ppm S

- HCR Diesel HCG is completely stopped from mixing into NGOD diesel DGN in
- and only allowed to mix into Old GOD diesel pooling submodel SOGM

Some changes in PIMS Model

Few changes in PIMS model

MAB RESIDUE TREATER CHANGED INTO DIESEL TREATER



	Normal	Max 500	Δ
Obj. Function (k\$/day)	20380	20184	(194)
Gases (kT)			
Naphtha (kT)	18.6	18.7	0.1
Mogas (kT)			
ATK (kT)	19.0	18.1	(0.9)
Gasoil 0.2% S (kT)	6.2	3.4	(2.8)
Gasoil 500 ppm S (kT)	12.0	18.0	6.0
Fuel Oil (kT)	17.9	19.7	1.8

Case Comp

Refinery 1 New Gasoil HT capacity increased and Old Gasoil HT operated at turndown.

Refinery 2 Residue Desulphurizer unit changed from Residue Treater to Diesel Hydro treater.

Refinery 1 tankage allocation reversed to allocate more tankage to 500 ppm gasoil.

Total 500 ppm gasoil production increased by around **50%**.

The total economic impact is around **\$ 60 Million** per year.

Final Summary



Some major assignments (using Aspen PIMS)

- Evaluating Hydrocracker Priority.
- Projecting Gasoline demand.
- Evaluating Inter Refinery Transfer prices.
- Prioritizing CFS across refineries.
- Evaluating feedstock breakeven value.



Thank You