



# Heavy crude oil refining

Hood River Suomi Oy

2013

# Oil refining tasks



- EURO-5 (MSAT-2)  
fuel standard



- Operability of process

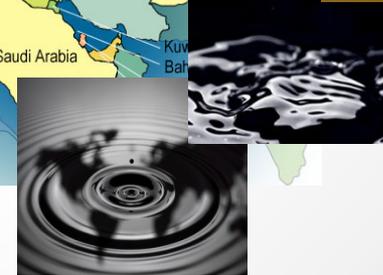


- Energy efficiency



# Baseline information

- Productive capacity: 7 MTPY  
(150 000 BPD)
- Region: Middle East
- Heavy crude oil



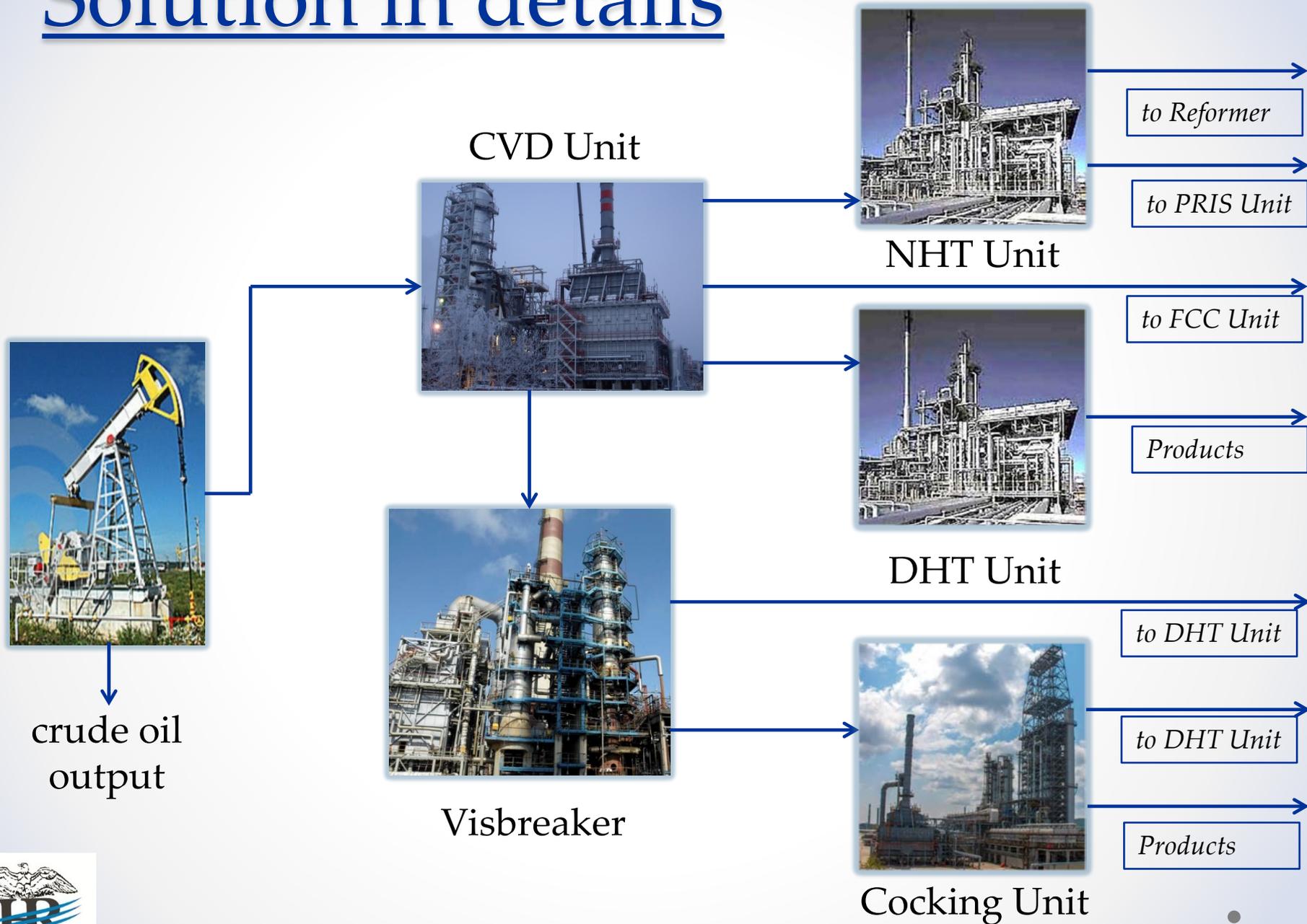
# Hood River's Solution

◆ Utilization of energy efficient technology

◆ Combining Units



# Solution in details



# Continuation of the scheme 1



PRIS



Reformer



LPG prod. Unit



FCC Unit



Sulphur prod. Unit



DHT Unit



Gas sweet. Unit

**Total cost  
≈ 1,6 Billion \$**



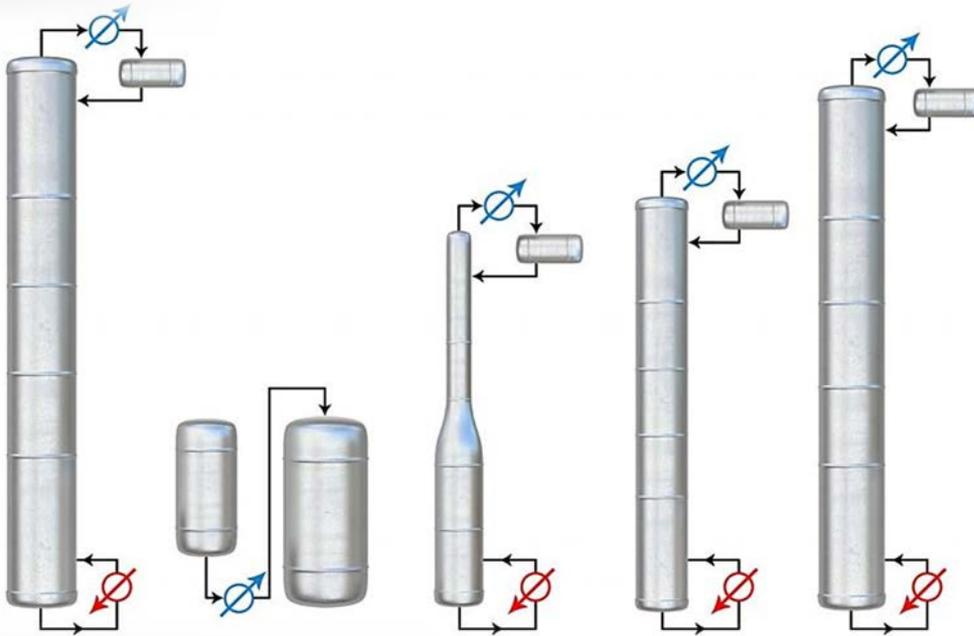
Utilization of energy efficient technology

&

Combining Units

Traditional technology

PRIS



Standard isomerization

Our solution

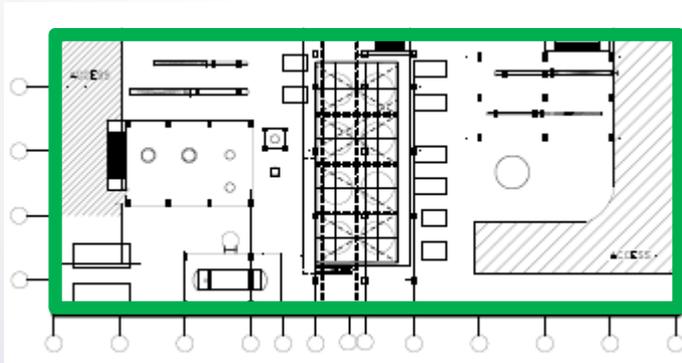


# Benefits of PRIS technology

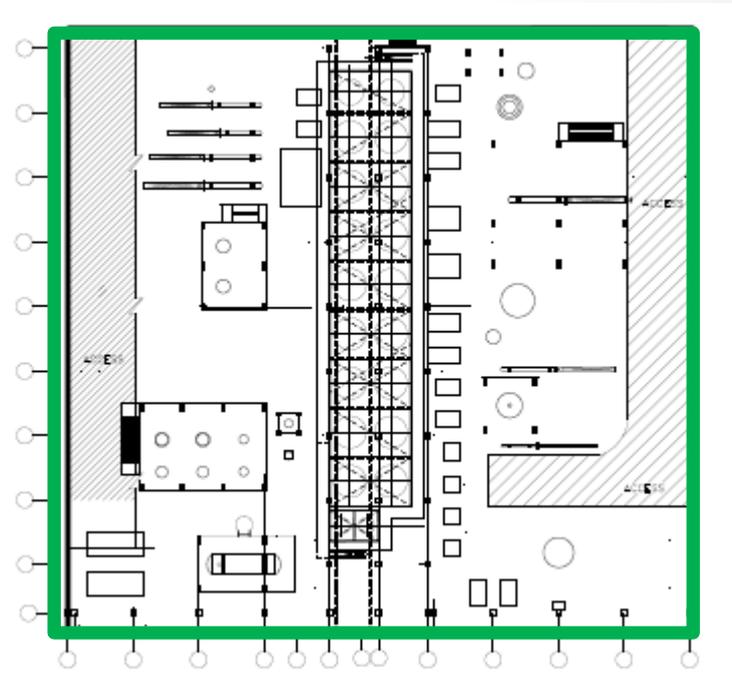
- Compact Unit

## PRIS

Takes area  
up to 50 % less



## Standard isomerization



- Requirements to Feedstock

	PRIS	Standard isom.
Benzene, %	30	5-8
C <sub>7</sub> , %	15	10

PRIS technology increases the potential utilization of Feedstock.

It makes a profit + 84,75 mln.\$ per year



- Economic parameters (2013)

	PRIS	Standard isom.
CAPEX (ISBL), \$ mln	38	76
Payback period, months	6*	18

\* - within the Russian Federation



# Financial Overview (2009)

Names of Units	Included	Capacity, kt/a	Price	Included	Capacity, kt/a	Price*
	American Solution			HoodRiver Solution		
<b>Main Process Plants</b>						
Crude Distillation Unit (CDU)	+	7,140	\$ 69,309,830	-		
Atmospheric and vacuum Distillation Unit	-			+	6,825	\$ 250,000,000
Naphtha Hydrotreating Unit	+	1,800	27,904,368	+	1,700	150,000,000
Light Naphtha Isomerization Unit	+	550	38,846,296	+	600	22,000,000
Diesel Hydrotreating Unit	+	2,500	78,210,313	+	2,800	150,000,000
Gasoline Hydrotreating Unit	+	1,200	34,193,178	-		
Heavy Naphtha Continuous Reforming Unit	+	1,200	100,611,328	-		
Catalytic Reforming Unit	-			+	970	100,000,000
Catalytic Cracking Unit	-			+	1,000	102,000,000
Atmospheric Residue Desulfurization Unit	+	4,000	346,978,596	-		
Deep Catalytic Converter (DCC)	+	3,000	269,474,185	-		
Gas Fractionator Unit	+	1,000	39,447,437	+	660	200,000,000
Visbreacking Unit	-			+	2,300	80,000,000
Cocking Unit	-			+	1,800	200,000,000
Heavy Diesel Hydrotreating Unit	-			+	570	200,000,000
Polypropylene Unit	+	400	129,235,929	-		
Hydrogen Generation Unit	+	90	90,703,010	-		
Sour Water Stripping Unit	+	1,500	12,871,119	-		
Sulfur Recovery Unit	+	150	58,583,937	+	130	40,000,000
Gas/LPG Desulfurization Unit	+	1,000	117,819,424	+	800	100,000,000
MTBE Unit	+	300	47,791,433	-		
<b>Auxiliary Units and Utilities</b>	+		737,266,061	+		
<b>Jetty</b>	+		170,883,408	-		
<b>Grossing-country Pipelines and First Station</b>	+		53,070,033	+		
<b>Other Costs</b>	+		358,201,915	+		
<b>New Tanks</b>	+		240,401,162	-		
<b>Total</b>			<b>\$ 3,021,802,960</b>			<b>\$ 1,594,000,000</b>

\*- the price is include Auxiliary Units and Utilities, Grossing-country Pipelines and First Station, Other Costs

# Hood River's Solution Benefits

- ❑ High quality fuels production according to Euro-5
- ❑ Heavy crude oil refining
- ❑ Autonomous and energy independent units
- ❑ Ability to work with multi-feedstock
- ❑ Reduction of energy consumption





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***Thank You for Your Attention!!!***

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