



ARGUS NETBACK MODEL

Contents:

Introduction	2
Northwest Europe	2
Americas	3
Asia-Pacific	3
Glossary	4

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The most up-to-date Argus Netback Model methodology is available on www.argusmedia.com

Introduction

Argus uses a netback model to calculate netback values and netback margins for a range of marker crudes in three key regional locations — northwest Europe, the US (Gulf coast) and Asia-Pacific (Singapore). Netback margins indicate the incentive to refine more crude into products. They are calculated from a mathematical model, and do not indicate the real profitability of refining.

A netback value expresses the worth of a crude in terms of the value of products available from it. Each crude has a particular yield of products with a gross product worth, which depends on product prices and the refining process. Subtracting variable refining costs such as fuel costs from the gross product worth gives the refinery gate value of a crude. Subtracting freight costs then gives the netback value, or the worth of the products, “netted back” to the crude loading terminal. Subtracting the crude price from the netback value gives the netback margin.

To calculate a crude’s refinery gate value, Argus uses a linear programming model that simulates the opera-

tions of a refinery. The model calculates the optimal yield of products to maximise the refinery gate value, according to spot product prices and within the constraints of a refinery configuration and a crude assay. The model’s three variable components are therefore:

- the crude and product prices as published in the Argus market reports
- the refinery configuration and the constraints on individual product production
- the crude assay and the constraints on refining each crude

Details of the refinery models and constraints can be obtained from High and Watt Associates (see *glossary for contact details*). The crude and product prices and a history of the refinery gate values and netback values can be obtained from Argus.

The following tables summarise the regional refinery configurations simulated by the Argus Netback Model, and the relevant product specifications.

Northwest Europe

Product specifications										
Product	Boiling range °C	Unsats % vol	Octane RON	Octane MON	MTBE % vol	RVP psi	Cetane index*	Specific gravity	Sulphur % wt	Viscosity cst@50°C
Propane		<30								
Butane		<30								
95R unleaded gasoline			95	85	<5	11.5			<0.015	
98R unleaded gasoline			98	87	<5	11.5			<0.005	
Naphtha	<100									
Jet/kerosine	180-220									
Gasoil	200-343						>35	<0.88**	<0.2	
Diesel	200-343						>45	<0.85**	<0.015	
Fuel oil 1% sulphur									<1	<385
Fuel oil 3.5% sulphur									<3.5	<385

*ASTM specification **price adjusted for deviations from 0.845

Processes modelled	
Process	Details
Atmospheric distillation	
Vacuum distillation	343-565°C
Reformer (185psi operation)	101 & 96 RON
Desulphurisation (naphtha/kerosine/gasoline/gasoil/LCO)	
Isomerisation (TIP)	
Alkylation	HF butene and propene
Fluid catalytic cracker	65%, 75% and 80% conversion
Residual FCC — selected crudes only	60% conversion
Visbreaker	

Americas (Gulf coast)

Product specifications								
Product	Boiling range °C	Unsat % vol	Octane (r+m)/2	RVP psi	Cetane index*	Specific gravity	Sulphur % wt	Viscosity cst@50°C
Propane		<30						
Butane		<30						
Gasoline			87	11.5			<0.015	
Gasoline			92	11.5			<0.015	
Naphtha	<100							
Jet/kerosine	180-220							
No.2 oil					>35	<0.88**	<0.1	
Diesel	200-343				>45	<0.85**	<0.015	
Fuel oil 1% sulphur							<1	<385
Fuel oil 3.5% sulphur							<3.5	<385

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Asia-Pacific (Singapore)

Product specifications									
Product	Boiling range °C	Unsat % vol	Octane RON	Octane MON	RVP psi	Cetane index*	Specific gravity	Sulphur % wt	Viscosity cst@50°C
Propane		<30							
Butane		<30							
Naphtha	<100								
Gasoline			>97	>85	<10			<0.015	
Jet/kerosine	180-220								
Gasoil/diesel	200-343					>35	<0.85**	<0.05	
Low-sulphur waxy residue†	343+								
Fuel oil 3.5% sulphur								<3.5	<380

*ASTM specification **price adjusted for deviations from 0.845 †selected crudes only

Processes modelled	
Process	Details
Atmospheric distillation	
Vacuum distillation	343-565°C
H ₂ production	C ₃ s/C ₄ s/naphtha
Desulphurisation (naphtha/kerosine/gasoline/gasoil/LCO)	
Isomerisation (TIP)	
Alkylation	
Fluid catalytic cracker	65%, 75% and 80% conversion
Hydrocracking — vacuum gasoil	
Visbreaker	

Glossary

ASTM	American Society for Testing and Materials
C	Celsius
C ₃	propane
C ₄	butane
cst	centistoke
FCC	fluid catalytic cracker
H ₂	hydrogen
HF	hydrofluoric acid
LCO	light cycle oil
MON	motor octane number
MTBE	methyl tertiary-butyl ether
psi	pounds per square inch
r+m	RON plus MON
RON	research octane number
RVP	Reid vapour pressure
TIP	total isomerisation process
unsats	unsaturated hydrocarbons
vol	volume
wt	weight

Further information on the refinery models and the refinery constraints used in the Argus Netback Model can be obtained from:

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