

Capability Overview



Today's economic environment demands tighter control of budgets and a greater understanding of project costs as early in the project development phase as possible. Bayphase, a leading international oil and gas consultancy, provides upstream field development solutions and decision support through rapid cost estimating.

Oil & Gas Cost Estimating Software



Seventh Edition October 2024

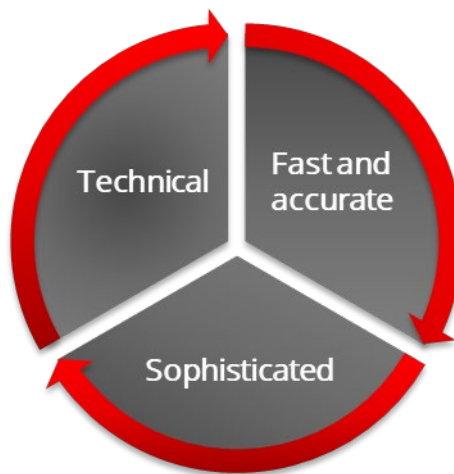


Cutting Edge Cost Estimation Analysis

NETCOSTER Onshore Production Module provides rapid and accurate analysis of global oil and gas projects from feasibility through to conceptual design. It is a cutting-edge simulation software tool developed and used by Bayphase to carry out technical definition and generate capital and operating costs for oil and gas projects.

The system is based on data gathered from a wide range of international projects executed by the company over the past 30 years. It is the result of an in-house programme to leverage the significant bank of knowledge and experience built up within Bayphase over numerous studies.

Onshore Production Module **NETCOSTER**



Technical Capabilities

NETCOSTER is used worldwide in feasibility and concept selection studies to provide engineering definition and cost estimates for field development.

It has been developed to meet the constantly changing needs and challenges of the upstream market, it keeps Bayphase ahead of the opposition through delivering estimates consistently and efficiently.

The program's engineering algorithms are based on sound engineering principles and experience derived from the development of actual onshore production facilities in many of the world's oil and gas provinces.

Sophistication

NETCOSTER provides a consistent, global platform for concept screening and optimisation and cost-control. Apart from using it in-house, we have a global network of field development experts who use our **NETCOSTER** software platform to provide engineering definition and life-cycle cost estimates for field development concepts. This easy to use tool saves hundreds of hours of in-house research and analysis time.

Speed and Accuracy

NETCOSTER also enables sound project cost modelling and evaluation. It allows our clients to make well-founded concept decisions for their development projects thereby increasing efficiency during execution and decreasing risk. It contributes greatly to successful project planning. It has been benchmarked against many actual projects – contact us for more details on this.

The **NETCOSTER** cost estimation system is modular in form and is used to estimate costs for the full range of oil and gas projects:

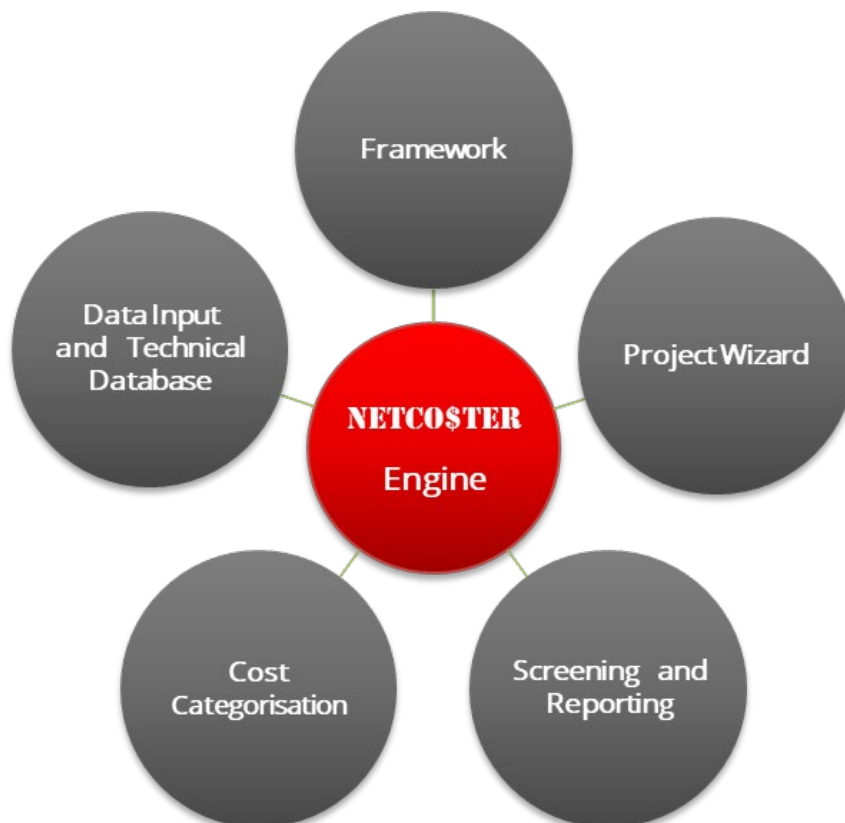
- Small, large and giant fields
- Oil, condensate and non-associated gas
- Any international location
- Sweet and sour fields

It has been deployed as a corporate modelling solution for large and small companies, and has proven to be invaluable in:

- Equity research
- Portfolio analysis
- Business development
- Mergers and acquisition
- Benchmarking
- Competitor analysis

Onshore Production Module

NETCOSTER



Framework

The **NETCOSTER** framework delivers a powerful and intuitive functionality that is core to all the estimation modules. Bayphase's framework approach delivers a powerful solution to cost modelling by utilising a number of key features:

- Transparent models developed entirely in Microsoft Excel. This delivers a consistent and familiar user interface and experience. It also takes advantage of Microsoft Excel's more advanced features therefore minimising systems requirements for running the software. Only Microsoft Office 2007 or above is required.
- There are no significant memory disk space requirements.
- Use of first principles algorithms to automate design, sizing and weight estimating for facilities takes the guess work out of cost estimation and delivers accurate results rapidly.
- The cost modules are updated twice per year through reference to market databases, supplier quotations and cost trends identified by Bayphase. In addition, key cost rates are monitored on a quarterly basis and users are given access to this data to enable them to develop fully up-to-date estimates.

Data Input and Technical Database

NETCOSTER uses primary input data such as reserves, reservoir depth, gas oil ratio etc. In addition, built in choices can be selected and customised to best fit user data. Once the field and configuration data is input or chosen, a cost estimate is run.

What it does:

- It allows the User to estimate cost for any level of reserves and virtually any type of production facilities configuration. The User inputs the field data – the more specific the data is, the more accurate the estimate will be – and follows a series of steps to define the onshore production facilities configuration.
- The program provides a number of cost data bases for the world's key oil and gas provinces but users can customise these to generate their own databases (up to three) based on their own experience.
- Once the easy to follow steps have been completed, **NETCOSTER** provides a breakdown of capital cost and operating costs.
- The cost database is weight driven and as such uses a series of algorithms to determine equipment weights. This data is then used to determine equipment costs.
- Once equipment configurations and weights are determined these are used to estimate the amount of bulks and land required to build the facility. This is then used to determine costs for materials, fabrication, transportation, construction, certification, engineering and project management.

Key benefits:

- The User can input actual observed field data to model real case.
- The input data can be varied for sensitivity analysis and enable users to understand the key drivers of a project.

Project Wizard

A powerful component of the **NETCOSTER** interface, the wizard guides the User through all steps required to create and estimate project costs.

What it does:

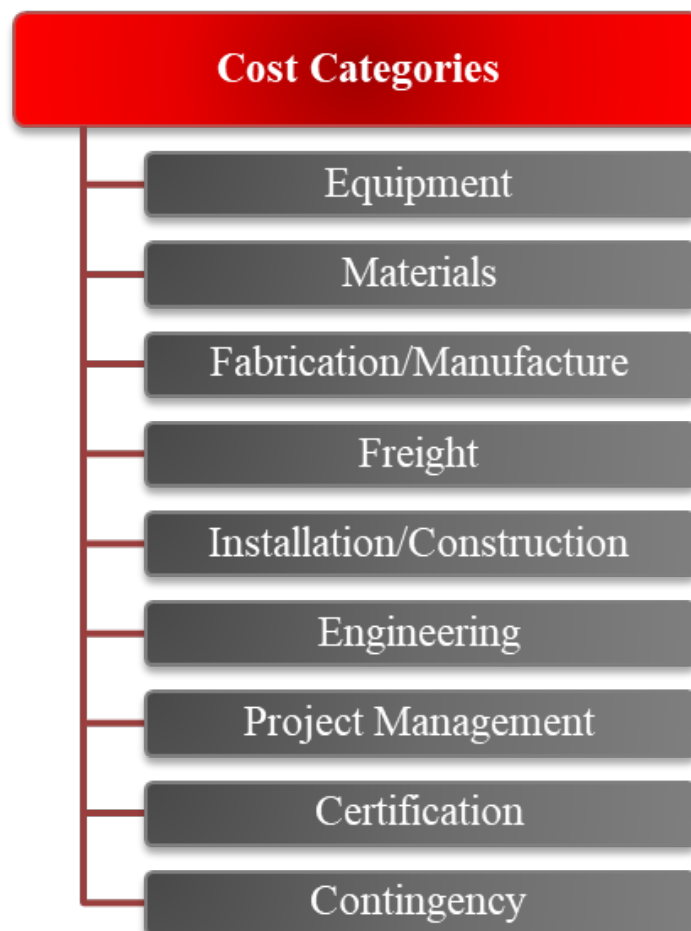
- The wizard provides step-by-step guide for creation of an asset case cost estimate through simple user dialogue screens
- The wizard enables the User to enter all data, with the assistance of additional intuitive messages

Key benefits:

- Quick and easy to use.
- Ease of navigation through the model.
- Useful for both expert and novice users alike.

Cost Categorisation

NETCOSTER provides a breakdown of the costs. The data base follows a categorisation that is applied to all modules. This categorisation is strictly maintained as all past projects have been analysed using this matrix to provide consistency. In addition, it broadly follows categorisations used by vendors and industrial cost data bases available in the market place.



Screening and Reporting

NETCOSTER is a powerful screening and reporting tool can be used to present the results of analysis, allowing users to easily compare findings from multiple projects calculated under different capacity scenarios.

What it does:

- The Program produces User defined reports such as Development Cost, Operating Costs, Cost Schedule, Cost Profiles and Charts, Technical Information, Investment and Cost Profiles.
- It is able to produce a detailed itemised cost breakdown for the production facility.
- A built-in scheduling tool allows the user to schedule costs to provide project cash flows.
- Reports can be printed or exported to spreadsheets.

Key benefits

- Enables users to use the output reports to interface with other cost estimating programs.

An integrated cost estimating solution that improves reliability, optimises performance and reduces cost and cycle time during the concept appraisal and selection phases for oil and gas companies worldwide.

Onshore Production Facilities Development Cost

Project Title	Elvira		
Case Identifier	Case 1 Gas Reinjection Turbine		
User	Bayphase Demonstrator		
Country/Region	West Africa		
Start Year for Cost Scheduling	2018		
Case Run Date	Thursday, 07 September 2017, 11:37:58		
Currency	USD		



Technical Information	Fluid Type: Oil Approximate Fluid Production Rate (boepd): 60,300 Oil Production (bpd): 50,000 Condensate Production (bpd): 60 Natural Gas Production (MMscfd): 60 Sales Gas rate (MMscfd): 60 Plant Power Generation (MW): 6.20	Hydrogen Sulphide (mol %): 0.02 Carbon Dioxide (mol %): 0.5 Elemental Sulphur Production Rate (tonnes/day): Oil Gravity (API): 33 Condensate Gravity (API): Associated Gas Molecular Weight (g/mol): 19 Power Generation for Export:
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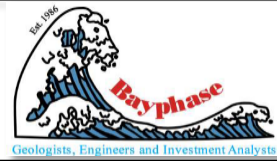
Cost Drivers	Number of Trains	Sparing Within Trains	Number of Units	Unit Equipment Weight (tonnes)	Cost (USD/tonne)	Total Cost (USD)
Equipment						
Production Separation Equipment						
Production Manifold	1	1x100%	1	4.44		
Test Manifold	1	1x100%	1	0.62		
Production Separation	1	1x100%	1	24.69		
Test Separator	1	1x100%	1	2.27		
Oil & Condensate Production Separation Equipment						
Disolvent	1	1x100%	1	24.69		
Sulphur Solvent Recover Unit & Storage						
Sulphur Solvent Unit Storage Shutters						
Liquid Sweetening						
Oil Storage Tanks	1	1x100%	1	1,244.50		
Oil Transfer pumps	1	2x100%	2	19.90		
Gas & Condensate Production Separation Equipment						
Slug Catcher						
Condensate Stabilisation						
Condensate Storage Tanks						
Condensate Transfer pumps						
Gas Processing Equipment						
Amine Treatment Unit	1	1x100%	1	38.05		
Amine Treatment Unit - Selective						
Gas Dehydration (@ -4°C)	1	1x100%	1	187.88		
Refrigeration Unit (@ -10°C)	1	2x50%	2	96.34		
Gas Injection Compressors	1	2x50%	2	87.23		
Gas Injection Manifold	1	1x100%	1	4.89		
Gas Export Compressors						
Gas Lift Compressors	1	3x50%	3	53.45		
Gas Lift Manifold	1	1x100%	1	2.00		
Gas Treatment Equipment						
Incrustation	1	1x100%	1	25.39		
Sulphur Recovery Unit						
Sulphur Storage Shutters						
Sulphur Purification Plant						
Sulphur Slurry Injection Manifold (Wells)						
Acid Gas Treatment Equipment						
Acid Gas Dehydration (@ -4°C)						
Acid Gas Compressors						
Acid Gas Injection Manifold						
H₂S Gas Treatment						
Acid Gas Dehydration (@ -4°C) - H ₂ S						
Acid Gas Compressors - H ₂ S T						
H ₂ S Injection Manifold						
CO₂ Gas Treatment						
Acid Gas Dehydration (@ -4°C) - CO ₂						
Acid Gas Compressors - CO ₂						
CO ₂ Injection Manifold						
Only Water Disposal						
Water Treatment						
Water Disposal Pump						
Water Disposal Manifold						
Water Treatment/Injection						
Water Treatment						
Water Injection Pump						
Water Injection Manifold						
Major Utilities						
Flare and Vent	1	1x100%	1	2.52		
Firewater System	1	1x100%	1	0.81		
Plant Power Generation	1	1x100%	1	46.63		
Black Start Power Generation	1	1x100%	1	10.80		
Desalination						
Steam Generation and Distribution						
Power Generation for Export						
Control Room	1	1x100%	1			
Minor Utilities						
Fuel Gas	1	1x100%	1	3.00		
Drains - Only Water	1	1x100%	1	4.50		
Drains - Sewerage	1	1x100%	1	2.10		
Instrument Air	1	1x100%	1	3.60		
Utility Air						
Inert Gas	1	1x100%	1	4.50		
Chemical Injection - Corrosion Inhibitor	1	1x100%	1	4.50		
Chemical Injection - Demulsifier	1	1x100%	1	4.50		
Chemical Injection - Anti-Scaling Agents						
Chemical Injection - Methanol	1	1x100%	1	4.50		
Chemical Injection - Glycol						
Chemical Injection - (Custom)						
Chemical Injection - (Custom)						
Diesel	1	1x100%	1	9.00		
Cooling Medium	1	1x100%	1	9.00		
Heating Medium	1	1x100%	1	12.00		
Raw/Service Water	1	1x100%	1	2.70		
Sewerage						
Drinking Water	1	1x100%	1	6.00		
Grounds						
Site Grading				0.949km2		
Perimeter Fence				0.683km		
Roads Within Plant Boundary				0.443km		
				Equipment Subtotal	1,948.10	116,939,000
Materials						
Carbon Steel Piping				276.09		
Alloy Steel Piping				0.15		
Structural Steel				14.32		
Foundations				6.513m3		
Electrical				138.05		
Instrumentation				194.81		
Safety				97.41		
				Materials Subtotal		25,628,000
Fabrication						
Carbon Steel Piping				276.09		
Alloy Steel Piping				0.15		
Structural Steel				14.32		
Foundations				6.513m3		
Electrical				138.05		
Instrumentation				194.81		
Safety				97.41		
				Fabrication Subtotal		39,800,000
Freight						
Freight					8.00%	14,589,000
				Freight Subtotal		14,589,000
Installation/Construction						
Construction Hours				1,948,000hrs		
				Materials Subtotal		77,920,000
Engineering, Project Management, Certification and Contingency						
Engineering Director				1,915,000hrs		
Oil Company Management				191,500hrs		
				Engineering and project Management Cost Subtotal		156,647,000
Certification					1.50%	
Contingency					12.00%	
				Certification and Contingency Subtotal		59,032,520
				Engineering, Project Management, Certification and Contingency Subtotal		215,679,520
				Project Total Cost		490,555,520

Total costs have been rounded to 1,000th

Unit rates have been redacted to protect our Intellectual Property

Onshore Production Facilities Operating Cost

	Project Title	Elvira
	Case Identifier	Case 1 Gas Reinjection Turbine
	User	Bayphase Demonstrator
	Country/Region	West Africa
	Start Year for Cost Scheduling	2018
	Case Run Date	Thursday, 07 September 2017, 11:37:58
	Currency	USD



Technical Information	Fluid Type	Oil
	Approximate Fluid Production Rate (boe)	60,300
	Oil Production (bpd)	50,000
	Condensate Production (bpd)	50,000
	Natural Gas Production (MMscfd)	60
	Sales Gas rate (MMscfd)	

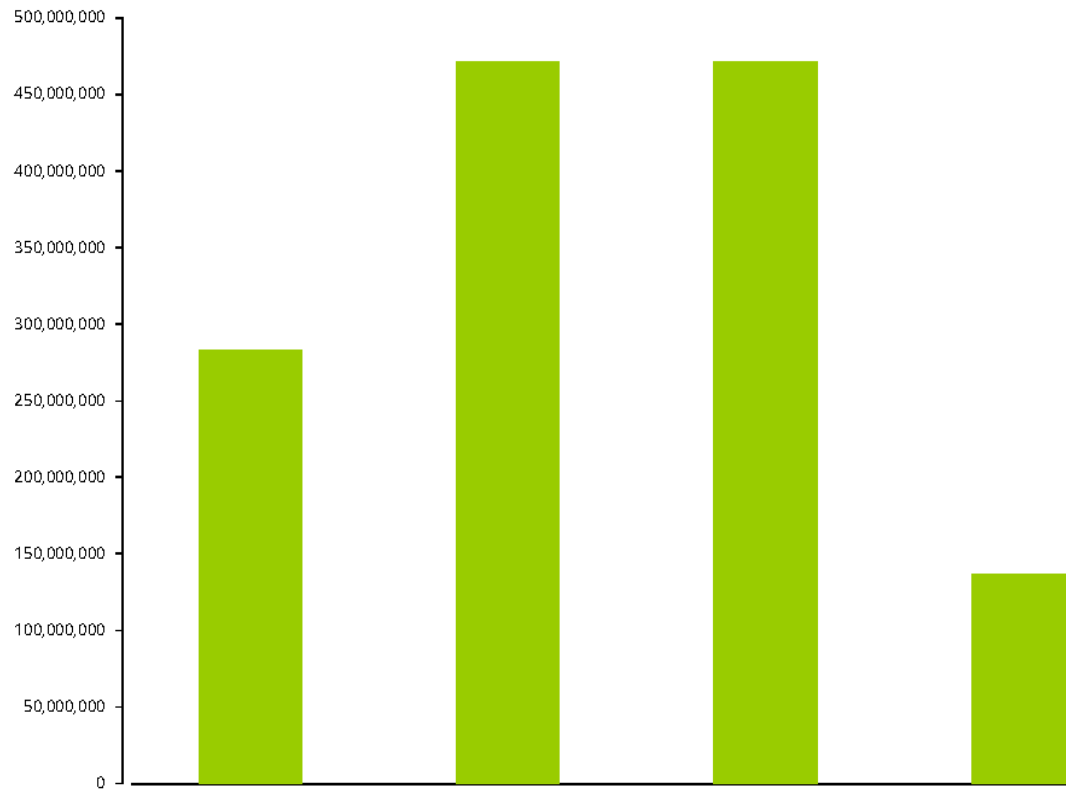
Cost Drivers	Number Required	Cost (USD/Unit)	Total Cost
Services			
Helicopter Services (AS 322 Super Puma)			
Fixed Wing Services (Tupolev 134)			
Plant Administration			
Personnel			
Expatriate	8		
Qualified	16		
Skilled	32		
Labour	32		
Vehicles			
Saloons	8		
Pick-ups	8		
Vans	5		
Buses	3		
Trucks	3		
Plant Operators			
Expatriate	4		
Qualified	8		
Skilled	8		
Labour	8		
Consumables			
Chemical Injection			
Corrosion Inhibitor Injection (bbl/year)	219		
Demulsifier (bbl/year)	110		
Anti-Foaming Agent (bbl/year)	183		
Methanol (bbl/year)	110		
Triethylene Glycol (bbl/year)	438		
Other 1			
Other 2			
Production Losses			
Sulphur Solvent (bbl/year)			
Triethylene Glycol Injection Rate (bbl/year)	22		
Diethanolamine (DEA) Injection Rate (bbl/year)	11		
Triethanolamine (TEA) Injection Rate (bbl/year)	0		
Other 1			
Other 2			
Maintenance			
Spares	0.20%		
Equipment Replacement	0.10%		
Vendor Specialists	0.15%		
Equipment Monitoring	0.05%		
Corrosion Monitoring	0.15%		
Inspection			
Inspection Specialists(% of CAPEX)	0.30%		
Vessel Inspection Frequency (Annual)	2		
Rotating Equipment Inspection Frequency (Annual)	1		
Major Equipment Inspection Frequency (Annual)	2		
Safety Systems Inspection Frequency (Annual)	1		
Technical Support (Annual)			
Manning			
Expatriate	4		
Qualified	8		
Skilled	8		
Labour	8		
Budget			
Social and Local Infrastructure	0.10%		
Studies and Audits	0.05%		
Insurance	0.50%		
Equipment			
Inspection Specialists (% of CAPEX)	0.0001		
Subtotal			19,189,000
Oil Company Management			
Oil Company Management	19,189,000	8.00%	1,535,000
Subtotal			1,535,000
Total Operating Cost			20,724,000

Total costs have been rounded to 1,000th

Unit rates have been redacted to protect our Intellectual Property

Cost Profile

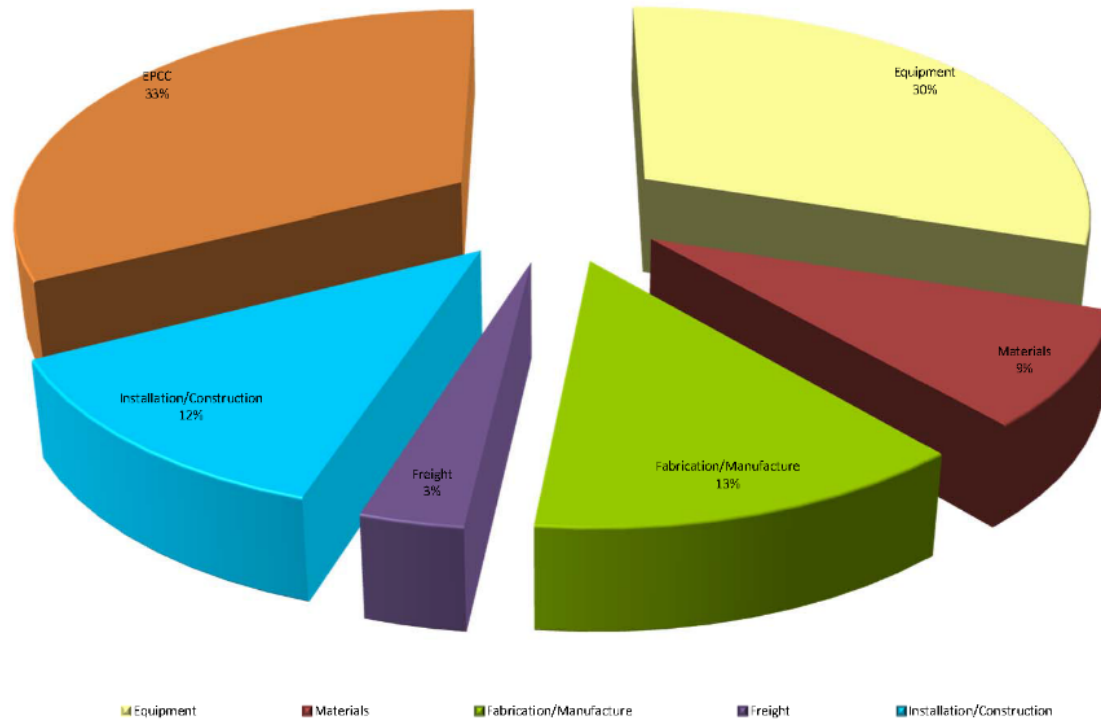
Project Title a
 Case Identifier a
 User a
 Country/Region Europe
 Start Year for Cost Scheduling 30000
 Case Run Date Monday, 29 May 2017, 15:11:30
 Currency USD



YEAR	30000	30001	30002	30003	30004
Cost (USD)	282,954,000	471,316,000	471,316,000	136,715,000	
				Total	1,362,301,000

Cost Chart

Project Title a
 Case Identifier a
 User a
 Country/Region Europe
 Start Year for Cost Scheduling 30000
 Case Run Date Monday, 29 May 2017, 15:21:14
 Currency USD



Cost Element	Equipment	Materials	Fabrication/Manufacture	Freight	Installation/Construction	EPCC
Cost (USD)	409,943,000	117,004,000	178,668,000	42,337,000	170,050,000	444,298,500
Total						1,362,300,500

Onshore Production Cost Scheduling Tool



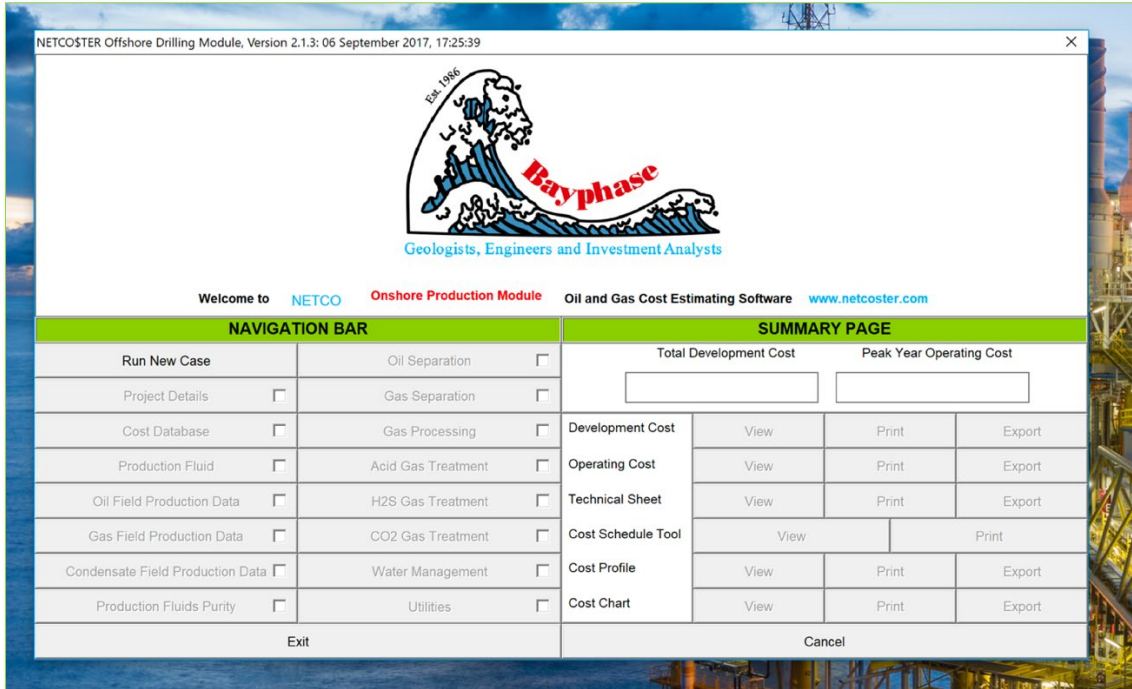
Project Title: a
 Case Identifier: a
 User: a
 Country/Region: Europe
 Start Year for Cost Scheduling: 30000
 Case Run Date: Monday, 29 May 2017, 15:11:30
 Currency: USD

Year		30000				30001				30002				30003				30004			
Quarter	Element	Start	Duration (Quarters)	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
Cost (USD)				Capital Cost Profile (USD)																	
409,943,000	Equipment	10	10		40,994,300	40,994,300	40,994,300	40,994,300	40,994,300	40,994,300	40,994,300	40,994,300	40,994,300	40,994,300	40,994,300						
11,7004,000	Materials	12	12			9,750,333	9,750,333	9,750,333	9,750,333	9,750,333	9,750,333	9,750,333	9,750,333	9,750,333	9,750,333						
1,788,668,000	Fabrication/Manufacture	12	12				14,889,000	14,889,000	14,889,000	14,889,000	14,889,000	14,889,000	14,889,000	14,889,000	14,889,000	14,889,000	14,889,000	14,889,000	14,889,000		
42,337,000	Freight	14	14				3,024,071	3,024,071	3,024,071	3,024,071	3,024,071	3,024,071	3,024,071	3,024,071	3,024,071	3,024,071	3,024,071	3,024,071	3,024,071		
1,700,500,000	Installation/Construction	14	14				12,146,429	12,146,429	12,146,429	12,146,429	12,146,429	12,146,429	12,146,429	12,146,429	12,146,429	12,146,429	12,146,429	12,146,429	12,146,429		
444,298,500	EPCC	12	12				37,024,875	37,024,875	37,024,875	37,024,875	37,024,875	37,024,875	37,024,875	37,024,875	37,024,875	37,024,875	37,024,875	37,024,875	37,024,875		
1,362,300,500	Total			Quarterly	37,025,000	40,049,000	102,940,000	102,940,000	117,829,000	117,829,000	117,829,000	117,829,000	117,829,000	117,829,000	117,829,000	39,810,000	39,810,000	30,060,000	27,035,000		
				Annually			282,954,000				471,316,000				471,316,000			136,715,000			
Investment Schedule		Year		30000				30001				30002			30003				30004		
		Cost (USD)					282,954,000				471,316,000			471,316,000				136,715,000			

NETCOSTER Onshore Production Module uses a Graphic User Interface that allows Users to input case data to arrive at their cost estimate. For illustrative purposes a number of screen shots from the program are provided below.

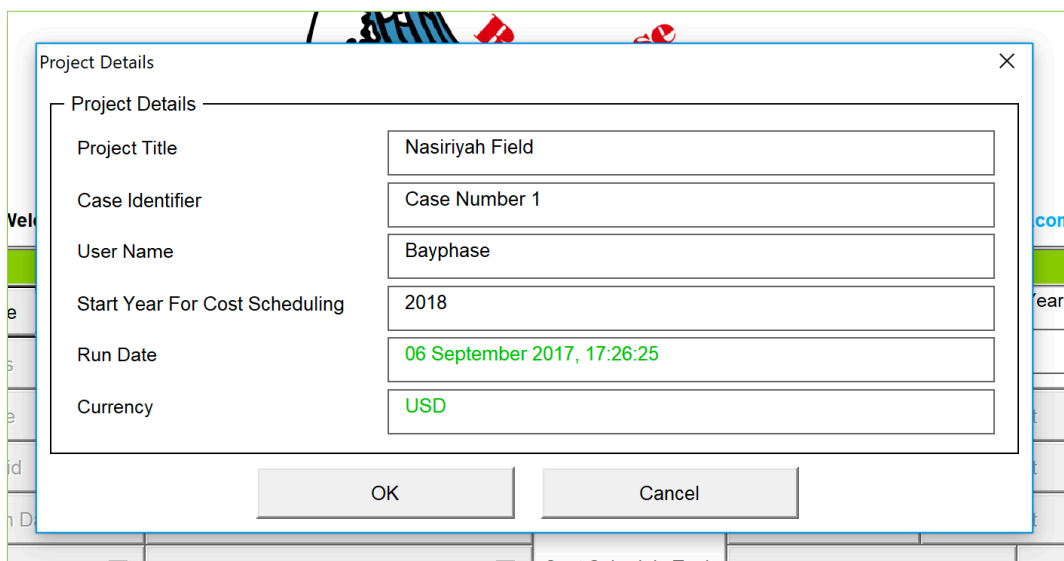
Opening User Form

This is the first form seen by the User when running a case allowing them to view the process units that can be handled by the program, it also provides the ability to access the results on completion of the cost estimating run.



Project Definition User Form

This form is used by the User to define the key parameters of the case for file accessing and cost scheduling purposes.



Data Base Selection User Form

This is the third form seen by the User when running a case and allows them to select the regional cost database that will be used as the case basis and to customise the selected basis if desired. We have developed 12 regional cost databases and the User is able to develop three separate customised databases if desired.

Cost Database

Region

- Europe
- Norway
- North Africa
- West Africa
- East Africa
- Central Asia
- Middle East
- Asia
- North America
- South America
- Eastern Siberia
- Western Siberia

Custom Cost Database

Load/Clear Customized Cost Database

Load CCD1	Clear CCD1	Iraq Cost Database
Load CCD2	Clear CCD2	
Load CCD3	Clear CCD3	

OR Create and Customize New Cost Database

- Custom Cost Database 1 (CCD1)
- Custom Cost Database 2 (CCD2)
- Custom Cost Database 3 (CCD3)

Customize Rates **Finish Customizing**

Cost Database - Other Cost Factors

<i>Freight Cost (Percentage)</i>	
Freight Cost	8
<i>Certification and Contingency (Percentages)</i>	
Certification	1.5
Contingency	15

OK Cancel

Production Fluid Definition User Form

This is the fourth form seen by the User when running a case and allows them to select the fluid type – effectively the type of upstream hydrocarbon development they wish to consider – and the units the case is to be run in. When have two set of units “field units” based on the widely used US based oil field units system and “metric” based on Former Soviet Union practice. On this form the User also enters the reservoir depth being accessed by the development a key parameter in separator, gas injection, gas lift and water injection design – and ultimately the cost of these systems.

The image shows a screenshot of a software dialog box titled "Production Fluid" with a close button (X) in the top right corner. The dialog is divided into three sections:

- Fluid Type:** Contains three radio button options: "Oil" (selected), "Gas", and "Condensate".
- Flow Rate Units:** Contains two radio button options: "Field Units (bbl/scf)" (selected) and "Metric (tonne/scm)".
- Reservoir Conditions:** Contains a text input field labeled "Reservoir Depth (m)" with the value "2400" entered.

At the bottom of the dialog are two buttons: "OK" and "Cancel". The dialog is overlaid on a background window with various tabs and labels, including "Onsh", "ng S", "Oil", "Ga", "opm", "Acid", "H2S", "CO2", "Water Management", and "Cost Profile".

That's all the space available to us to provide an introduction to **NETCOSTER** Onshore Production Module.

For further details or to receive a trail of the software contact us via the website or through using the contact details given overleaf.

Address: Bayphase Limited
2 Princess Way
Camberley
Surrey
GU15 3SP
United Kingdom

Telephone: +44 (0)1276 548431

Web: www.bayphase.com

