REFERENCE AND MODELLING APPROACH

argusmedia.com

# ARGUS OLEFINS MARGINS

**Contents:**


| | |
|---|---|
| Petrochemical production economics | 2 |
| Olefins margins | 2 |
| The central model | 2 |
| Published margins | 2 |
| Steam cracker model parameters | 3 |
| PDH model parameters | 3 |
| Currency conversion | 3 |
| Timing | 3 |
| Forecasts | 4 |
| Corrections to assessments | 4 |
| Ethics and compliance | 5 |
| Steam cracker: Regional and feedstock-specific inputs to the central model | 5 |
| PDH: Regional and feedstock-specific inputs to the central model | 7 |


***LAST UPDATED: MAY 2024***

The most up-to-date Argus Olefins Margins Reference and Modelling Approach is available on www.argusmedia.com

## Petrochemical production economics

Argus publishes information about the economics of generalised petrochemical production units based on Argus' feedstock and petrochemical price assessments and a set of underlying assumptions outlined in this methodology.

Argus petrochemical production economics are not intended to represent the economics of any particular production unit and are based around a central model, adjusted for regional characteristics.

Argus petrochemical production economics are published via the Argus Direct online platform and are available through various Argus data feeds. Subsets of this data may be included in one or more Argus publications.

A publication schedule is available at www.argusmedia.com

## Olefins margins

Ethylene cash margins measure the profitability of producing ethylene from a variety of feedstocks in different regions, based on a central model.

Propylene cash margins measure the profitability of producing propylene from propane via dehydrogenation (PDH) in different regions, based on a central model.

## The central model

Argus uses the same consumption factors and product yields for all regions to allow for an effective comparison across feedstocks and locations. The central models are designed to be regionally generic and not representative of a single technology.

The model calculates the cash cost of production in ethylene or propylene terms, less the value of co-products and returns a cash margin.

Assumptions included in the model are under continuous review and may be changed at any time.

## Published margins

Argus publishes the following steam cracker economic data for the US, northwest Europe, northeast Asia, southeast Asia and the Middle East:

- Co-product credit
- Variable cost
- Cash cost
- Cash margin
- Variable margin

Values are calculated daily for the US, weekly for northeast Asia and monthly for northwest Europe, southeast Asia and the Middle East. Monthly averages are published for each region. Values are calculated and published in USD/t for all regions.

Steam cracker economic data are published based on the following feedstocks for each region:

US:
- Ethane
- Propane
- Ethane-propane mix
- Butane
- Light naphtha

Northwest Europe:
- Ethane
- Propane
- Butane
- Gasoil
- Naphtha

Northeast Asia:
- Ethane
- Propane
- Butane
- Gasoil
- Naphtha

Middle East:
- Ethane
- Propane
- Butane
- Naphtha

Southeast Asia:
- Ethane
- Propane
- Butane
- Naphtha
- Gasoil

US, northeast Asia, southeast Asia, and Middle East data are calculated and published on a gross basis. Northwest European data are published on a net contract basis.

Argus publishes the following PDH economic data for the US, northwest Europe, northeast Asia, southeast Asia, and Middle East:

- Cash cost
- Cash margin

Values are calculated weekly for northeast Asia and monthly for the US, northwest Europe, southeast Asia and the Middle East. Monthly averages are published for each region. Values are calculated and published in USD/t for all regions.

Northeast Asia, southeast Asia and Middle East data are calculated and published on a gross basis. Northwest European and US data are published on a net contract basis.

## Steam cracker model parameters

All in USD/t ethylene unless stated.

**Ethylene:** The Argus assessment of the ethylene price per tonne, less a representative discount rate where described below and for net margin calculations only.

**Ethylene logistics cost:** An Argus assessment of the cost of ethylene logistics, includes an inflation adjustment.

**Capacity:** Assumed to be 700,000 t/yr in the US, 500,000 t/yr in Europe, 600,000 t/yr in northeast Asia, 800,000 t/yr in southeast Asia, and 1mn t/yr in the Middle East.

**Capex costs:** The sum of the following components:

- **ISBL (USD mn):** inside battery line costs — assessed per million tonnes of capacity in the US and adjusted to other regions and for the assumed capacity of the plant, includes an inflation adjustment
- **OSBL (USD mn):** outside battery line costs — assessed per million tonnes of capacity in the US and adjusted to other regions and for the assumed capacity of the plant, includes an inflation adjustment
- **Other project costs (USD mn):** assumed to be 25pc of the ISBL and OSBL, includes an inflation adjustment

**Feedstock costs:** The sum of the following components:

- **Feedstocks variable costs:** the Argus assessments for feedstocks (as outlined below) * the number of tonnes of that feedstock required to produce 1t of ethylene in the Argus model
- **Catalysts and chemicals:** the costs of chemicals and catalysts required to produce 1t of ethylene in the Argus model
- **Feedstocks logistics:** logistics costs for feedstocks required to produce 1t of ethylene in the Argus model * the amount of feedstock required to produce 1t of ethylene in the Argus model, includes an inflation adjustment

**Co-products:** The sum of the following components:

- **Propylene:** the Argus assessment of the propylene price (as outlined below) * the number of tonnes of propylene produced as a result of producing 1t of ethylene in the Argus model, less a representative discount rate for net margin calculations only
- **Butadiene:** the Argus assessment of the butadiene price (as outlined below) * the number of tonnes of butadiene produced as a result of producing 1t of ethylene in the Argus model less a representative discount rate for net margin calculations only
- **Raffinate-1:** the Argus calculation of the raffinate-1 price (as outlined below) * the number of tonnes of raffinate-1 produced as a result of producing 1t of ethylene in the Argus model
- **Pygas:** the Argus calculation of the pygas price (as outlined below)
- **Fuel credit:** the Argus assessment of the fuel price (as outlined below) * the amount of fuel produced as a result of producing 1t ethylene in the Argus model
- **Co-product logistics:** for each co-product a logistic cost per tonne is assumed for the Argus model and is multiplied by the amount of co-product produced as the result of producing 1t of ethylene — this figure is the sum of that outright dollar value for each of the co-products described above, includes an inflation adjustment

**Utilities:** The sum of the following components:

- **Power:** Argus power price assessments (as outlined below) * the amount of electricity required to produce 1t of ethylene in the Argus model
- **Fuel:** the Argus assessment of the fuel price (as outlined below) * the number of tonnes of fuel oil required to produce 1t of ethylene in the Argus model
- **Other:** The Argus assessment of the fuel price (as outlined below) * a constant

**Fixed costs:** The sum of the following components:

- **Labourer salary:** the cost of employing an assumed number of labourers at an assessed annual salary divided by the ethylene capacity of the facility
- **Foreperson salary:** the cost of employing an assumed number of forepersons at an assessed annual salary divided by the ethylene capacity of the facility
- **Supervisor salary:** the cost of employing an assumed number of supervisors at an assessed annual salary divided by the ethylene capacity of the facility
- **Maintenance:** a percentage based on the Argus model of the ISBL costs described above divided by the ethylene capacity of the facility
- **Overheads:** a percentage based on the Argus model of the labour and maintenance costs described above
- **Insurance and tax:** a percentage based on the Argus model of the capex costs described above divided by the ethylene capacity of the facility

**Total cash cost:** The sum of the variable costs and fixed costs described above.

**Cash margin:** The Argus ethylene price per tonne (outlined below) minus ethylene logistics costs and minus the total cash cost.

## PDH model parameters

All in USD/t propylene unless stated.

**Propylene:** The Argus assessment of the propylene price per tonne, less a representative discount rate where described below and for net margin calculations only.

**Propylene logistics cost:** An Argus assessment of the cost of propylene logistics, includes an inflation adjustment.

**Capacity:** Assumed to be 750,000 t/yr in US, 450,000 t/yr in western Europe, 450,000 t/yr in Middle East, 450,000 t/yr in southeast Asia, and 600,000 t/yr in northeast Asia.

**Capex costs:** The sum of the following components:

- **ISBL (USD mn):** inside battery line costs - assessed per million tonnes of capacity in the US and adjusted to other regions and for the assumed capacity of the plant, includes an inflation adjustment
- **OSBL (USD mn):** outside battery line costs - assessed per million tonnes of capacity in the US and adjusted to other regions and for the assumed capacity of the plant, includes an inflation adjustment
- **Other project costs (USD mn):** assumed to be 25pc of the ISBL and OSBL, includes an inflation adjustment

**Feedstock costs:** The sum of the following components:

- **Feedstock variable costs:** the Argus assessments for propane (as outlined below) * the number of tonnes of propane required to produce 1t of propylene in the Argus model
- **Catalysts and chemicals:** the costs of chemicals and catalysts required to produce 1t of propylene in the Argus model, includes an inflation adjustment
- **Feedstocks logistics:** logistics costs for feedstocks required to produce 1t of propylene in the Argus model * the amount of feedstock required to produce 1t of propylene in the Argus model, includes an inflation adjustment

**Co-products:** The sum of the following components:

- **Hydrogen:** the Argus calculation of the hydrogen price (as outlined below)
- **Fuel credit:** the Argus assessment of the fuel price (as outlined below) * the amount of fuel produced as a result of producing 1t propylene in the Argus model
- **Co-product logistics:** a logistic cost per tonne is assumed for the Argus model and is multiplied by the amount of hydrogen produced as the result of producing 1t of propylene, includes an inflation adjustment

**Utilities:** The sum of the following components:

- **Power:** Argus power price assessments (as outlined below) * the amount of electricity required to produce 1t of propylene in the Argus model
- **Fuel:** the Argus assessment of the fuel price (as outlined below) * the number of tonnes of fuel oil required to produce 1t of propylene in the Argus model
- **Cooling water:** an assumption of the cost of cooling water required to produce 1t of propylene in the Argus model

**Fixed costs:** The sum of the following components:

- **Labourer salary:** the cost of employing an assumed number of labourers at an assessed annual salary divided by the propylene capacity of the facility
- **Foreperson salary:** the cost of employing an assumed number of forepersons at an assessed annual salary divided by the propylene capacity of the facility
- **Supervisor salary:** the cost of employing an assumed number of supervisors at an assessed annual salary divided by the propylene capacity of the facility
- **Maintenance:** a percentage based on the Argus model of the ISBL costs described above divided by the propylene capacity of the facility
- **Overheads:** a percentage based on the Argus model of the labour and maintenance costs described above
- I**nsurance and tax:** a percentage based on the Argus model of the capex costs described above divided by the propylene capacity of the facility

**Total cash cost:** The sum of the variable costs and fixed costs described above.

**Cash margin:** The Argus propylene price per tonne (outlined below) minus propylene logistics costs and minus the total cash cost.

## Currency conversion

Where required, Argus converts the currency of model inputs at the time each input is created, and before that input has been included in the model. For example, a daily electricity price will be converted using a daily exchange rate before being included in the model, and a monthly price will be converted using a month-average exchange rate.

## Timing

Margins are calculated using the latest available Argus price assessments for feedstocks and product prices.

Monthly averages of daily (US) spot margins are also published for the named month on the first working day of the next month. For example, the January average margin will be published on the first publication date in February.

Monthly contract margins will be published for the named month on the first working day of the next month. For example, the January average margin will be published on the first publication date in February.

## Forecast

Each monthly report will contain a three-month forecast. For example, the February report will contain monthly margins updated to January, with a forecast for February, March and April.

The forecasts are based on the latest Argus Outlook reports. Selected forecast values are published in the monthly PDF report and the Data and Download spreadsheet, but are not published in the Argus Direct database.

## Corrections to assessments

Argus will on occasion publish corrections after the publication date. We will correct errors that arise from clerical mistakes, calculation errors, or a misapplication of our stated modelling approach.

If an Argus price assessment or other input to the model is corrected, the model will be re-run and corrected values distributed to subscribers.

## Ethics and compliance

Argus operates according to the best practices in the publishing field, and maintains thorough compliance procedures throughout the firm. We want to be seen as a preferred provider by our subscribers, who are held to equally high standards, while at the same time maintaining our editorial integrity and independence.

Argus has a strict ethics policy that applies to all staff. The policy can be found on our website at www.argusmedia.com. Included in this policy are restrictions against staff trading in any energy commodity or energy related stocks, and guidelines for accepting gifts.

Argus also has strict policies regarding central archiving of email and instant messenger communication, maintenance and archiving of notes, and archiving of spreadsheets and deal lists used in the price assessment process.

Argus publishes prices that report and reflect prevailing levels for open-market arms length transactions (please see the Argus Global Compliance Policy for a detailed definition of arms length).

**Steam cracker: Regional and feedstock-specific inputs to the central model**

| | | |
|---|---|---|
| **Northwest Europe** | | |
| **Ethylene** | | |
| Ethylene | Ethylene del NWE contract month 1 | See the Argus Ethylene and Derivatives methodology |
| **Feedstock variable costs** | | |
| Naphtha | Naphtha 65 para NWE cif | See the Argus European Products methodology |
| Ethane | Ethane Mont Belvieu Enterprise month | See the Argus NGL Americas methodology |
| Propane | Propane ARA large cargo | See the Argus International LPG methodology |
| Butane | Butane coaster ARA cif | See the Argus International LPG methodology |
| Gasoil | Gasoil heating oil French NWE cif | See the Argus European Products methodology |
| **Co-products** | | |
| Propylene | Propylene polymer grade del Europe contract (MCP) | See the Argus Propylene and Derivatives methodology |
| Butadiene | Butadiene delivered NWE contract month | See the Argus Butadiene methodology |
| Raffinate-1 | Calculated based on the Argus assessment of naphtha 65 para NWE cif | See the Argus European Products methodology |
| Pygas | Calculated based on the Argus assessment of naphtha 65 para NWE cif and benzene cif NWE contract less an extraction cost | See the Argus European Products methodology and the Argus Benzene and Derivatives methodology |
| Fuel credit | Fuel oil 1% NWE fob cargoes | See the Argus European Products methodology |
| **Utilities** | | |
| Power | Dutch OTC base load day ahead | See the Argus European Electricity methodology |
| Fuel | Fuel oil 1% NWE fob cargoes | See the Argus European Products methodology |
| Other | Fuel oil 1% NWE fob cargoes | See the Argus European Products methodology |
| | | |
| **US** | | |
| **Ethylene** | | |
| Ethylene | January 2010-April 2014 ethylene del USGC pipeline, May 2014-present ethylene pipeline Mont Belvieu month 1 | See the Argus Ethylene and Derivatives methodology |
| **Feedstock variable costs** | | |
| Ethane | Ethane Mt Belvieu Enterprise month 1 | See the Argus NGL Americas methodology |
| Ethane-propane mix | An 80:20 weighting of ethane:propane mix Mont Belvieu Enterprise month 1 and propane Mont Belvieu Enterprise month 1 | See the Argus NGL Americas methodology |
| Propane | Propane Mont Belvieu Enterprise month | See the Argus NGL Americas methodology |
| Butane | Butane Mont Belvieu Enterprise month | See the Argus NGL Americas methodology |
| Light naphtha | Naphtha 70 min paraffin LSR/LV USGC waterborne del $/t | See the Argus US Products methodology |
| Full-range naphtha | Naphtha full-range USGC waterborne del | See the Argus US Products methodology |
| Gasoil | Heating oil USGC waterborne fob | See the Argus US Products methodology |

| | | |
|---|---|---|
| **Co-products** | | |
| Propylene | January 2010-May 2014 propylene polymer grade del USGC pipeline, June 2014-present US Gulf coast polymer-grade propylene (PGP) | See the Argus NGL Americas methodology |
| Butadiene | Butadiene fob US contract month 1 | See the Argus Butadiene methodology |
| Raffinate-1 | Naphtha full-range USGC waterborne del | See the Argus NGL Americas methodology |
| Pygas | Gasoline 87 conv USGC waterborne fob lowest RVP and benzene US Gulf coast less an extraction cost | See the Argus US Products methodology and the Argus Benzene and Derivatives methodology |
| Fuel credit | Fuel oil No 6 3% USGC fob | See the Argus US Products methodology |
| **Utilities** | | |
| Power | The average of power ERCOT Houston off-peak day ahead and power ERCOT Houston Peak day ahead | See the Argus US Electricity methodology |
| Fuel | Natural gas hub Henry Hub day-ahead index | See the Argus Natural Gas Americas methodology |
| Other | Natural gas hub Henry Hub day-ahead index | See the Argus Natural Gas Americas methodology |

| | | |
|---|---|---|
| **Northeast Asia** | | |
| **Ethylene** | | |
| Ethylene | Ethylene fob northeast Asia USD/t | See the Argus Ethylene and Derivatives methodology |
| **Feedstock variable costs** | | |
| Ethane | Ethane Mont Belvieu Enterprise month | See the Argus NGL Americas methodology |
| Propane | Propane Japan cargo | See the Argus International LPG methodology |
| Butane | Butane Japan cargo | See the Argus International LPG methodology |
| Full range naphtha | Naphtha Japan c+f | See the Argus Asia-Pacific Products methodology |
| Gasoil | Gasoil 0.005% Japan c+f | See the Argus Asia-Pacific Products methodology |
| **Co-products** | | |
| Propylene | Propylene polymer grade fob northeast Asia | See the Argus Propylene and Derivatives methodology |
| Butadiene | Butadiene fob northeast Asia | See the Argus Butadiene methodology |
| Raffinate-1 | Calculated based on the Argus assessment of naphtha Japan c+f | See the Argus Asia-Pacific Products methodology |
| Pygas | Calculated based on the Argus assessment of naphtha Japan c+f and benzene fob South Korea half month | See the Argus Asia-Pacific Products methodology and the Argus Benzene and Derivatives methodology |
| Fuel credit | Fuel oil 3.5%S 180cst cargo Japan c+f | See the Argus Asia-Pacific Products methodology |
| **Utilities** | | |
| Power | JEPX System Price base load day ahead | See www.jepx.jp |
| Fuel | Fuel oil 3.5%S 180cst cargo Japan c+f | See the Argus Asia-Pacific Products methodology |
| Other | Fuel oil 3.5%S 180cst cargo Japan c+f | See the Argus Asia-Pacific Products methodology |

| | | |
|---|---|---|
| **Middle East** | | |
| **Ethylene** | | |
| Ethylene | Calculated based on Argus assessment of ethylene cfr southeast Asia and freight | See the Argus Ethylene and Derivatives methodology |
| **Feedstock variable costs** | | |
| Naphtha | Naphtha LR1 Mideast Gulf fob | |
| Ethane | Calculated based on fixed natural gas price of $1.75/mmBtu until January 2024, then $2.50/mmBtu | |
| Propane | Calculated based on Argus assessment of propane Far East Index (AFEI) and Argus assessment of gas carrier LPG Ras Tanura to Chiba VLGC | See the Argus International LPG methodology |
| Butane | Calculated based on Argus assessment of butane Far East Index (AFEI) and Argus assessment of gas carrier LPG Ras Tanura to Chiba VLGC | See the Argus International LPG methodology |
| **Co-products** | | |
| Propylene | Calculated based on Argus assessment of propylene polymer grade cfr southeast Asia and freight | See the Argus Propylene and Derivatives methodology |
| Butadiene | Calculated based on Argus assessments of emulsion styrene butadiene rubber (eSBR) 1502 cfr NWE and butadiene delivered NWE contract | See the Argus Butadiene methodology |
| Raffinate-1 | Calculated based on Argus assessment of naphtha LR1 Mideast Gulf fob | See the Argus Asia-Pacific Products methodology |
| Pygas | Calculated based on Argus assessment of benzene cfr ASEAN contract and naphtha LR1 Mideast Gulf fob | See the Argus Asia-Pacific Products methodology and the Argus Benzene and Derivatives methodology |
| Fuel credit | Calculated based on fixed natural gas price of $1.75/mmBtu until January 2024, then $2.50/mmBtu | |

| | | |
|---|---|---|
| **Utilities** | | |
| Power | Calculated based on fixed natural gas price of $1.75/mmBtu until January 2024, then $2.50/mmBtu | |
| Fuel | Calculated based on fixed natural gas price of $1.75/mmBtu until January 2024, then $2.50/mmBtu | |
| Other | Calculated based on fixed natural gas price of $1.75/mmBtu until January 2024, then $2.50/mmBtu | |
| | | |
| **Southeast Asia** | | |
| **Ethylene** | | |
| Ethylene | Ethylene cfr southeast Asia | See the Argus Ethylene and Derivatives methodology |
| **Feedstock variable costs** | | |
| Naphtha | Naphtha Japan c+f | See the Argus Asia-Pacific Products methodology |
| Ethane | Calculated based on Argus assessment of Ethane Mont Belvieu Enterprise plus freight assumption | See the Argus NGL Americas methodology |
| Propane | Calculated based on Argus assessments of Propane Far East Index (AFEI) and freight | See the Argus International LPG methodology |
| Butane | Calculated based on Argus assessments of Butane Far East Index (AFEI) and freight | See the Argus International LPG methodology |
| Gasoil | Gasoil 0.5% Singapore | See the Argus Asia-Pacific Products methodology |
| **Co-products** | | |
| Propylene | Propylene polymer grade cfr southeast Asia | See the Argus Propylene and Derivatives methodology |
| Butadiene | Butadiene fob southeast Asia | See the Argus Butadiene methodology |
| Raffinate-1 | Calculated based on Argus assessment of naphtha Japan c+f | See the Argus Asia-Pacific Products methodology |
| Pygas | Calculated based on Argus assessment of naphtha Japan c+f and benzene cfr ASEAN contract | See the Argus Asia-Pacific Products methodology and the Argus Benzene and Derivatives methodology |
| Fuel credit | Fuel oil 3.5%S 180cst cargo Singapore | See the Argus Asia-Pacific Products methodology |
| **Utilities** | | |
| Power | JEPX System Price base load day ahead | See www.jepx.jp |
| Fuel | Fuel oil 3.5%S 180cst cargo Singapore | See the Argus Asia-Pacific Products methodology |
| Other | Fuel oil 3.5%S 180cst cargo Singapore | See the Argus Asia-Pacific Products methodology |

## PDH: Regional and feedstock-specific inputs to the central model

| | | |
|---|---|---|
| **Northwest Europe** | | |
| **Propylene** | | |
| Propylene | Propylene polymer grade del Europe contract (MCP) | See the Argus Propylene and Derivatives methodology |
| **Feedstock variable costs** | | |
| Propane | Propane ARA large cargo | See the Argus International LPG methodology |
| **Co-products** | | |
| Hydrogen | Calculated based on Argus assessment of fuel oil 1% NWE fob cargoes | See the Argus European Products methodology |
| **Utilities** | | |
| Power | Dutch OTC base load day ahead | See the Argus European Electricity methodology |
| Fuel | Fuel oil 1% NWE fob cargoes | See the Argus European Products methodology |
| | | |
| **US** | | |
| **Propylene** | | |
| Propylene | Propylene polymer grade fob US contract | See the Argus Propylene and Derivatives methodology |
| **Feedstock variable costs** | | |
| Propane | Propane Mont Belvieu Enterprise month | See the Argus NGL Americas methodology |
| **Co-products** | | |
| Hydrogen | Calculated based on Argus assessment of natural gas hub Henry Hub day-ahead index | See the Argus Natural Gas Americas methodology |
| **Utilities** | | |
| Power | The average of power ERCOT Houston off-peak day ahead and power ERCOT Houston Peak day ahead | See the Argus US Electricity methodology |
| Fuel | Natural gas hub Henry Hub day-ahead index | See the Argus Natural Gas Americas methodology |

| | | |
|---|---|---|
| **Northeast Asia** | | |
| **Propylene** | | |
| Propylene | Propylene polymer grade fob northeast Asia | See the Argus Propylene and Derivatives methodology |
| **Feedstock variable costs** | | |
| Propane | Propane Japan cargo | See the Argus International LPG methodology |
| **Co-products** | | |
| Hydrogen | Calculated based on Argus assessment of fuel oil 3.5%S 180cst cargo Japan c+f | See the Argus Asia-Pacific Products methodology |
| **Utilities** | | |
| Power | JEPX System Price base load day ahead | See www.jepx.jp |
| Fuel | Fuel oil 3.5%S 180cst cargo Japan c+f | See the Argus Asia-Pacific Products methodology |
| | | |
| **Middle East** | | |
| **Feedstock variable costs** | | |
| Propane | Calculated based on Argus assessment of propane Far East Index (AFEI) and Argus assessment of gas carrier LPG Ras Tanura to Chiba VLGC | See the Argus International LPG methodology |
| **Co-products** | | |
| Hydrogen | Calculated based on fixed natural gas price of $1.75/mmBtu until January 2024, then $2.50/mmBtu | |
| **Utilities** | | |
| Power | Calculated based on fixed natural gas price of $1.75/mmBtu until January 2024, then $2.50/mmBtu | |
| Fuel | Calculated based on fixed natural gas price of $1.75/mmBtu until January 2024, then $2.50/mmBtu | |

| | | |
|---|---|---|
| **Southeast Asia** | | |
| **Propylene** | | |
| Propylene | Propylene polymer grade cfr southeast Asia | See the Argus Propylene and Derivatives methodology |
| **Feedstock variable costs** | | |
| Propane | Calculated based on Argus assessments of Propane Far East Index (AFEI) and freight | See the Argus International LPG methodology |
| **Coproducts** | | |
| Hydrogen | Calculated based on Argus assessment of fuel oil 3.5%S 180cst cargo Singapore | See the Argus Asia-Pacific Products methodology |
| **Utilities** | | |
| Power | JEPX System Price base load day-ahead | See www.jepx.jp |
| Fuel | Fuel oil 3.5%S 180cst cargo Singapore | See the Argus Asia-Pacific Products methodology |