

---

## Uranium Primer - Uranium Contract Pricing

Nuclear fuel trade is dominated by the long-term market. However, in recent times, the spot market has become a bit more active, but this has been catalyzed by external market players (hedge funds, uranium funds, etc). The spot market provides an important function in yielding a price indicator, but a relatively small function in terms of satisfying reactor needs. For deliveries under long-term uranium contracts, there are two prevalent pricing mechanisms: Specified Pricing and Market-Related Pricing.

### **Specified Pricing**

Specified pricing is either a fixed price, a series of fixed prices, or a base price plus adjustment for inflation to the date of delivery. The adjustment mechanism is usually either a combination of published indexes, or a fixed annual percentage rate. This mechanism was used almost exclusively during the nuclear industry's infancy. It was first typically used in sales of steam turbines and electrical equipment to utilities, and was later adapted to the sale of nuclear fuel.

Fixed/base escalated is the most predictable form of pricing and is attractive to both buyers and sellers in terms of managing cash flow and budgets. In a fixed-price contract, the parties simply agree to hard numbers that are fixed in the contract.

Base-escalated pricing has a small element of unpredictability. A base price is agreed and fixed in the contract, but it is agreed that this price will escalate—generally in line with inflation. Typical escalators may be the US Consumer Price Index or US Gross Domestic Product price inflators (in US dollar priced contracts), and the date at which these escalators would begin is also defined in the contract. These essentially prevent the contract from devaluing in real (i.e. "constant dollar") terms. The escalation can also be defined at a fixed rate, again to help predictability on both sides, but also potentially providing a useful tool within competitive negotiations.

The base price agreed by the parties is the price that is reflected in the reported TradeTech Long-Term Price Indicators and other publications.

The long-term price has typically traded at a premium to the spot price—an average of about 10 percent since 1996. Premiums have been higher when the spot price has been particularly depressed, and has reflected the difference between the marginal cost of mining companies (term prices) and excess secondary material (spot). The unprecedented volatility in prices over the past two years has caused particular disparity between the markets.

### **Market-Related Pricing**

Market-related pricing is based on the uranium market price at or near the time of delivery, and/or some other published market index, such as the average US import price. In most instances, the price is the market price less a discount (or plus a premium). The discounts are usually fixed, but in some cases are variable, increasing as the market price increases. Market-related price mechanisms nearly always include a floor price below which the contract price may not fall. The floor, which protects the seller, is usually either a base adjusted for inflation, a fixed price, or a production cost-related mechanism. In some cases, the floor used has been a government-specified floor, which is the official floor price of the country that has jurisdiction over the producers' production and marketing operations. Market-related price mechanisms also usually include a ceiling price

above which the contract price may not rise. The ceiling, which protects the buyer, is usually a base adjusted for inflation or a fixed price.

Market-related pricing has a much greater level of uncertainty, but gives both parties the opportunity to gain value depending on their respective views of the market. Typically, in a market-related contract, annual delivery volumes will reference a single or combination of price indices. These indices can include the NUEXCO Exchange Value®, TradeTech Long-Term U<sub>3</sub>O<sub>8</sub> Price Indicator, US Department of Energy Spot and/or Long-Term Price, and Euratom Supply Agency Spot and/or Long-Term Price.

Under market-related pricing, both parties will generally seek protection via a floor and ceiling price. These prices often perform much in the same way as base-escalated prices, referencing similar inflation indices. The availability (or competitiveness) of the floor and ceiling can vary significantly depending on the market environment. In a weak market, suppliers may struggle to find a floor price that protects their operating cost base, and similarly as in the recent bull market utilities were unable to secure ceiling prices. A stepping stone in negotiations towards the loss/gain of either of these protection mechanisms is the introduction of a 'soft' floor or ceiling. In the case of a soft floor, if the indexed price falls below the floor then the supplier has the right not to deliver. In the case of a soft ceiling, if the indexed price rises above the ceiling price then the utility has the right not to buy.

The value of this strategy is debatable as it offers limited protection. A supplier in need of cash flow could be forced to find a new buyer for its material in a falling market underpinned by weak demand. A buyer similarly, in need of fuel, could be forced to find a new supplier in a rising market underpinned by weak supply.

### **Other Pricing Mechanisms**

Although dominant throughout history on a worldwide basis, specified and market-related price mechanisms are not the only types that have been utilized. There exist three additional broad categories of price mechanisms, including "negotiated," "hybrid," and "cost-related" pricing. Negotiated price contracts are defined as those in which prices are to be agreed to periodically (usually annually) by the buyer and seller, and may include the use of an expert or another form of arbitration in the event the parties are unable to agree.

Hybrid pricing involves a market index, such as the spot price, which is averaged with either a base-escalated, fixed, or cost-related price. Hybrid pricing frequently involves the use of complex formulae.

Cost-related pricing is defined by a price that is tied to the cost of production from a uranium mine, often a cost plus some margin for profit. Cost-related price mechanisms, however, have been rarely used since the early sellers' market of the 1970s.

### **Negotiated Pricing**

Negotiated pricing is less common, and has generally been found in Japan, Canada, and China. A contract sets out terms defining delivery volumes, but the price is left open and is dependent on what is agreed by the parties the year or so before delivery. The pricing clause in a contract may provide broad parameters under which the annual price negotiation should be conducted. For example, it could be defined that the price agreed should reflect the market fundamentals at the time of discussion.

Price negotiations can be resource intensive, be conducted over a number of stages and span a number of weeks. The benefits, however, are that a close professional understanding is maintained that can ensure the longevity of a supply relationship and unearth other commercial opportunities. Conversely, long-standing base-escalated or fixed-price contracts may inevitably fall out of line with the market, and cause considerable, and sometimes irreparable, damage to a supply relationship.

### **Hybrid**

Hybrid pricing is also possible, and not uncommon. A combination of a number of different pricing mechanisms can be utilized in a single contract to provide pricing that has right balance of market exposure that is required.

### **Portfolio / Realized Prices**

Suppliers and utilities generally operate a portfolio strategy, contracting periodically over the long term. They look to contract in a variety of regions, using a number of companies and effectively hedge their forward positions while limiting counter-party risk. As a result, overall realized prices can be significantly divergent from spot price.

### **Long-Term Price Indicators**

In recognition of the importance of the long-term base prices in the nuclear fuel markets, TradeTech began to publish its Long-Term Price Indicators in March 1996. These price indicators are based on TradeTech's "judgment of the base price at which transactions for long-term delivery of that product or service could be concluded as of the last day of the month, for transactions in which the price at the time of delivery would be an escalation of the base price from a previous point in time." The UF<sub>6</sub> conversion market is most frequently characterized by contract prices of the specified type, usually a base price escalated up to the date of delivery.

For the long-term enrichment market, through about 1993 the "benchmark" pricing mechanism was the published price of the US government entity (AEC/ERDA/DOE) providing enrichment to the industry. In fact, the early Soviet contracts with Western European countries were typically priced at a discount from the published AEC/ERDA/DOE prices. For the European enrichers, contracts have nearly always been base-escalated pricing, with prices (and indexes) denominated in the enricher's local currency for domestic customers or in US dollars outside the enricher's home region.

### **Delivery Formats**

Natural uranium (U<sub>3</sub>O<sub>8</sub> and UF<sub>6</sub>) is nearly always sold by "book transfer" at a processing facility, after being delivered to the facility, and sampled and weighed by the processor. Although uranium is physically delivered to the facility under the ownership of a given entity, the delivered uranium is most often processed not in identifiable batches, but rather in a continuous processing stream. The processor typically has the right to use the delivered material as "working inventory" and, thus, ownership of the uranium is actually a book entry in the processor's inventory records. It is very rare for there to be a physical lot that is identified with a given owner. A "delivery" under a sales contract is then made by the seller giving notice to the facility owner that the uranium ownership is to be transferred from the seller's storage account to the buyer's storage account at the facility. (Both buyer and seller must have previously established storage accounts at the facility.)

Book transfer has several advantages over physical delivery:

- Delivery can be at any date deemed by the parties, since the material does not have to be physically transported and, thus, subject to timing uncertainties;
- Any lot size convenient to the buyer and seller can be transferred, rather than being constrained by the physical sizes of containers;
- The delivery is “certified” by a third party (the facility owner), since the material must exist in the seller’s account to be transferred and the facility owner will then notify both parties that such ownership transfer has been made; and
- The transaction is kept confidential among the buyer, seller, and facility owner, since there are no reporting requirements, as, for example, with transportation documents.

Exceptions to the “book transfer” delivery have occurred recently for purchases by India and China. For these two cases, sales prices were at a premium to general market prices—reflecting the difficulty of physical delivery to these countries.

The sale of processing services in the spot market can be made by parties that have no processing facilities but do have title to processed material, in a slightly more complicated way than a straight sale of uranium products.

### **Transportation Cost**

Since most processing contracts are set up with the buyer’s delivery of  $U_3O_8$  at a conversion facility and delivery taken of  $UF_6$  at an enrichment facility, the converter pays the transportation charge from its facility to the enrichment plant (the next processing stage). This is due to the fact that it has generally been a buyers’ market, so that the seller is expected to incur the transportation cost to the buyer’s designated facility. However, there is currently a great deal of uncertainty about the cost impact of regulations for shipping  $UF_6$  from North America to Europe, which has caused companies that provide conversion services or natural  $UF_6$  to recently require their new buyers to absorb the increased cost of this transportation.

### **Period between the Contract Signing and Shipment**

Not surprisingly, long-term contracts are often signed well before first delivery under the contracts, and may take a year or more to finalize after acceptance of the relevant commercial terms (quantities, delivery schedules, price, and delivery location). About 40 percent of those transactions were concluded within one year of the first delivery, with about 28 percent of transactions concluded a year before first delivery, and even a few (2 percent) concluded eight years before first delivery.

For general and media inquiries contact:

#### **TradeTech**

Denver Tech Center, 7887 E. Belleview Avenue, Suite 888

Englewood, CO 80111, USA

Phone +1 (303) 573-3530 | Fax +1 (303) 573-3531

info@tradetech.com | www.uranium.info