



LNG and Pipeline Commercial Structures and Practices

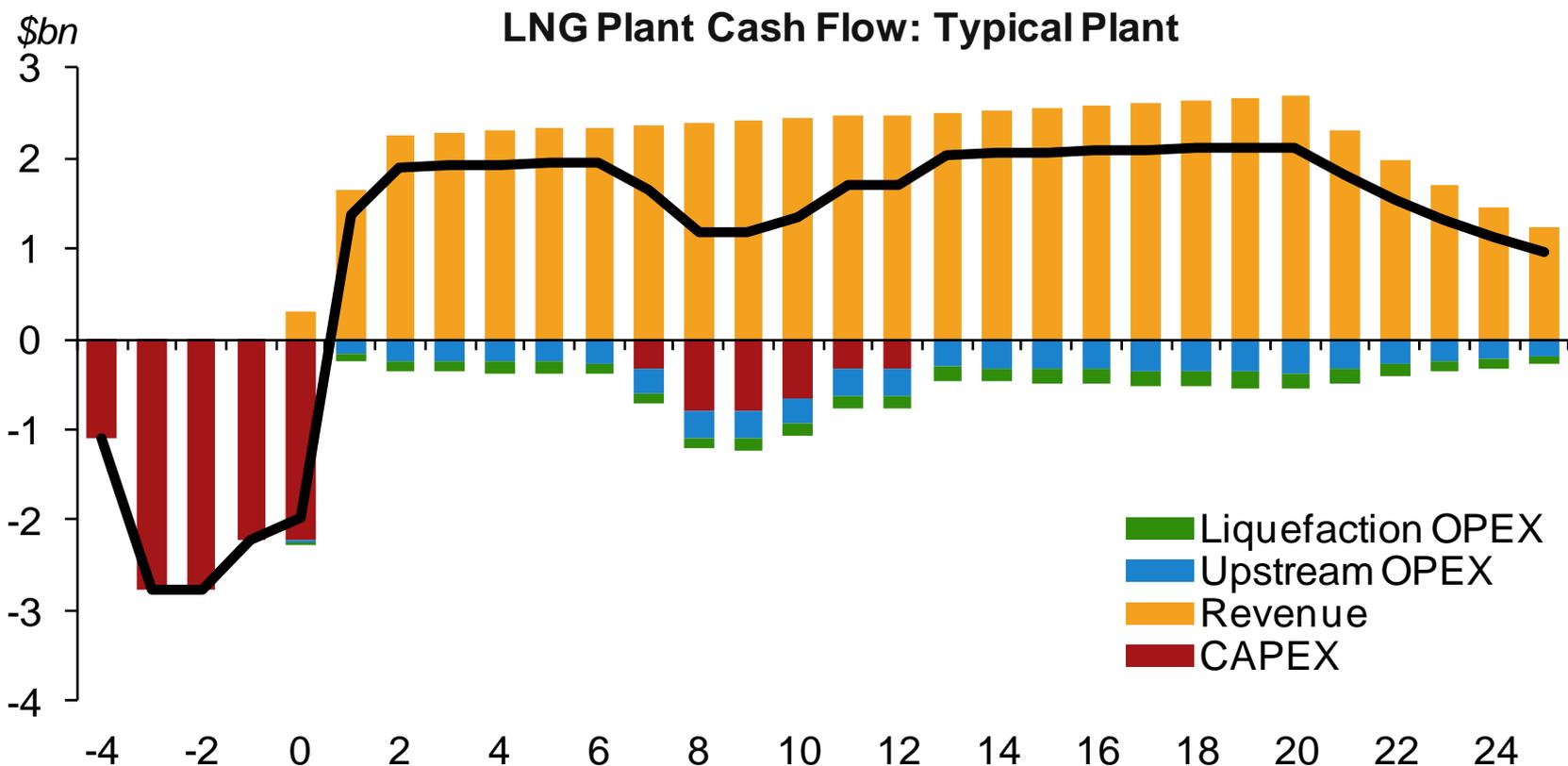
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Executive Summary

- LNG projects are big, complex, risky, multi-stakeholder endeavors. Project management, the ability to bring all the pieces together, is the critical factor for a successful LNG project.
- How a project is structured matters a great deal for allocating risk and reward—several projects have regretted the project structure and resulting contract decisions that they made.
- The most important question for Alaska is whether it wants to participate as an equity partner and along which parts of the chain.

What Does an LNG Plant Look Like?



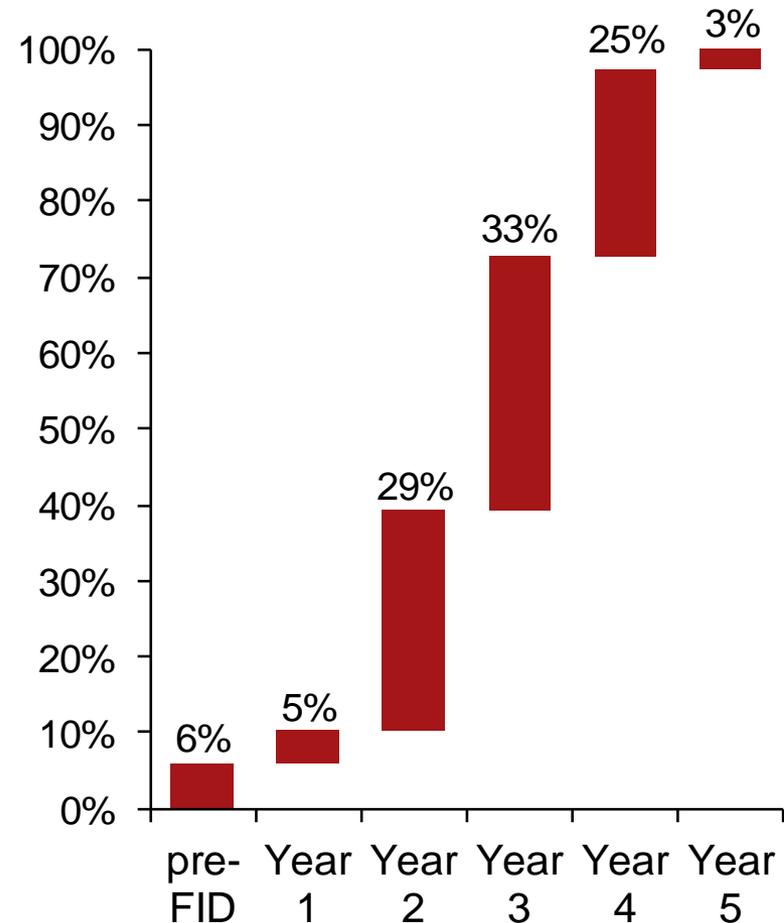
- Long **lead time** (4 years to build, several years to prepare to build)
- Large, **upfront** investment needed to develop the project (usually, tens of billions)
- Minimal **operating** expenses (only a small fraction of initial investment)
- **Long-term cash** flow (expected revenues for 20+ years)

Lots Needed Before Companies Spend Real Money

Most of the money is spent after taking a Final Investment Decision (FID); before FID, the project developers:

- Certify **reserves** to ensure that the gas is there
- Sign sales and purchase agreements (**SPAs**) with buyers, which reassure the project developers that they will be able to sell their product. These are usually long-term and obligate the buyer to take the gas
- Secure **financing**, often external and often non-resource (whereby the debt is guaranteed by the cash flow of the SPA). External financing is supported by loans and equity from the sponsors
- Award an engineering, procurement and construction (EPC) contract to a company/consortium to **build** the plant
- Finalize all **approvals** (country, local)

Indicative CAPEX for Integrated LNG Project



Main Provisions of an LNG Contract

Pricing	Most LNG contracts are priced relative to oil. In Asia, the predominant oil benchmark is the Japan Customs Cleared Price, the average price of oil imported into Japan. Typically, contracts include a ratio / discount relative to oil. In Europe, gas prices are linked either to oil (heavy / light fuel oil) or to regional hubs—the relative prevalence of the two depends on the market with some markets being almost exclusively oil-linked or hub-based. Increasingly, buyers are interested in LNG contracts that are priced against Henry Hub (the US price marker).
Duration	Long-term contracts (15-20 years) remain essential for project sanction, while there is a growing tendency to sign medium (5-10) or short-term (<5) contracts.
Destination Flexibility	In the past, LNG contracts were sold for delivery to a specific market, and the buyer could not deliver the gas to a different destination. Over time, this rigidity has lessened. Destination clauses are now illegal for contracts going into Europe. Contracts with flexible destination clauses are almost a given in the Atlantic Basin, rare in the Asia-Pacific, and have been growing in the Middle East due to Qatar.
Volume Flexibility	Buyers typically have an upward and downward allowance of ~10-20% of contracted volumes. The rest of the volumes is sold under a take-or-pay provision (where the buyer has to pay for the gas even if they choose not to lift some cargoes).
Profit Sharing	Some contracts allow the original seller to share the profit in case a cargo is diverted from its original source. Such agreements are illegal in Europe, while the lack of profit sharing has created tension in several contracts (e.g. Equatorial Guinea, Egypt, Trinidad).
Non-Compliance	Most contracts have arbitration provisions.
Renegotiation Provisions	Most contracts have some price review provisions. These may occur every 3 to 4 years, though buyers or sellers can trigger a review outside this cycle in exceptional circumstances.

The LNG Value Chain

Upstream



Liquefaction



Shipping

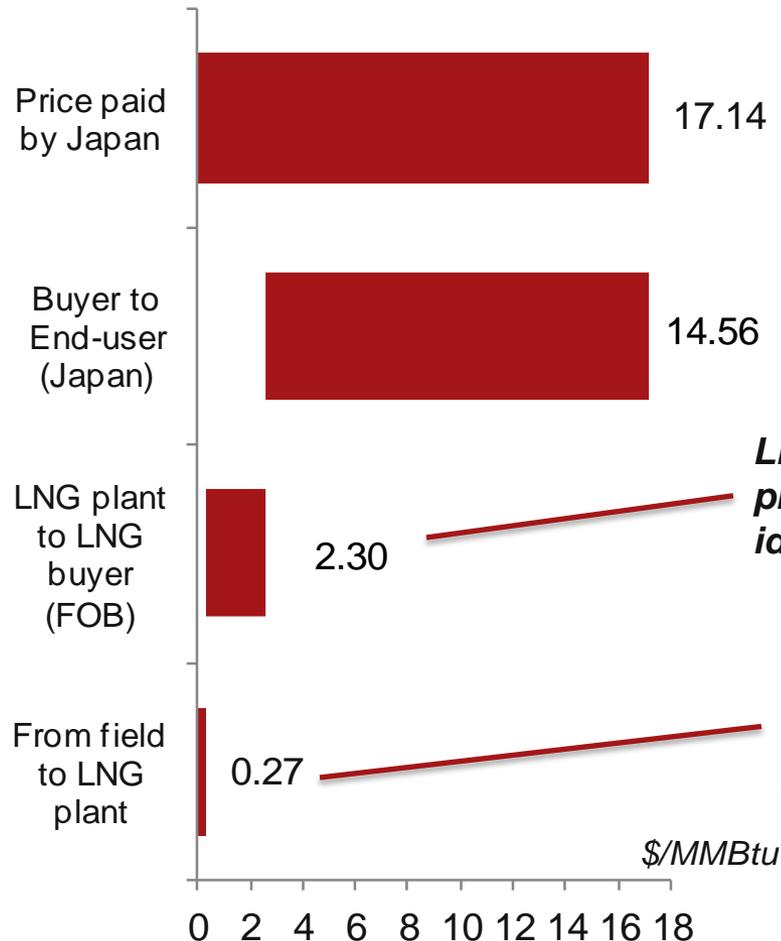


Buyer

- The companies that will **develop the gas fields** and supply the gas to be liquefied and exported. Usually projects have a primary supply source, but projects will often source gas from multiple fields and/or areas.
- The companies that will **own and operate the liquefaction facility**. These companies will assign one or more EPC (engineering, procurement and construction) contractors to build the plant.
- Either the **buyer or the seller handles the shipping**. If the buyer arranges for shipping, the sale is considered FOB (Free on Board). If the sellers arranges for shipping, it is consider CIF (Cost, Insurance, Freight) or DES (Delivered Ex Ship).
- The buyer can purchase LNG through a short, medium or long-term **contract** or they can purchase an **individual** cargo (called a spot transaction). The buyer can deliver the gas to an end-user (e.g. power plant) or can re-sell the gas.

Project Structure Really Matters

Equatorial Guinea to Japan Value Chain

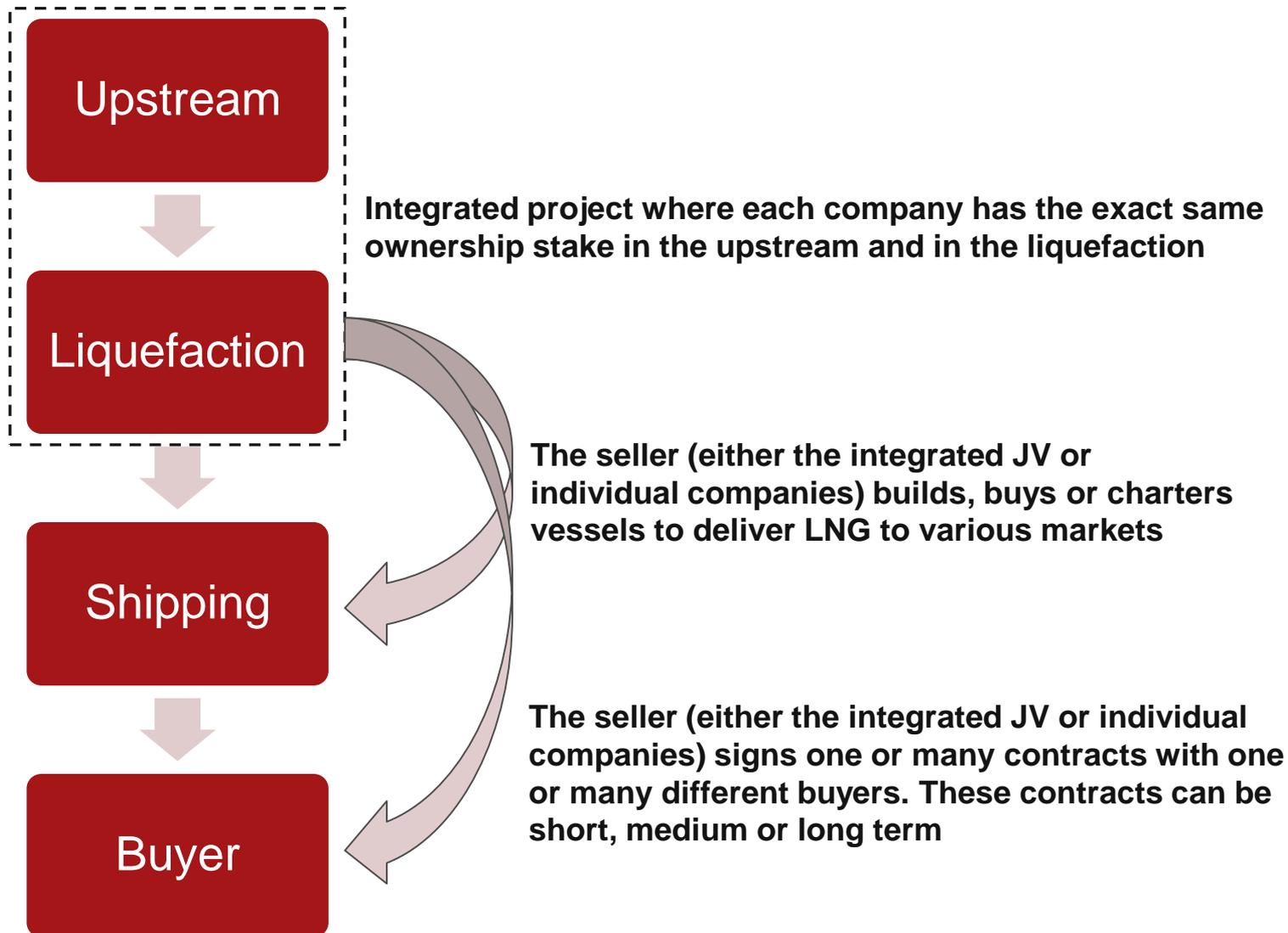


But the LNG can be sold anywhere, and high prices in Asia mean that more of the LNG has gone there; but without the upside flowing back through the chain

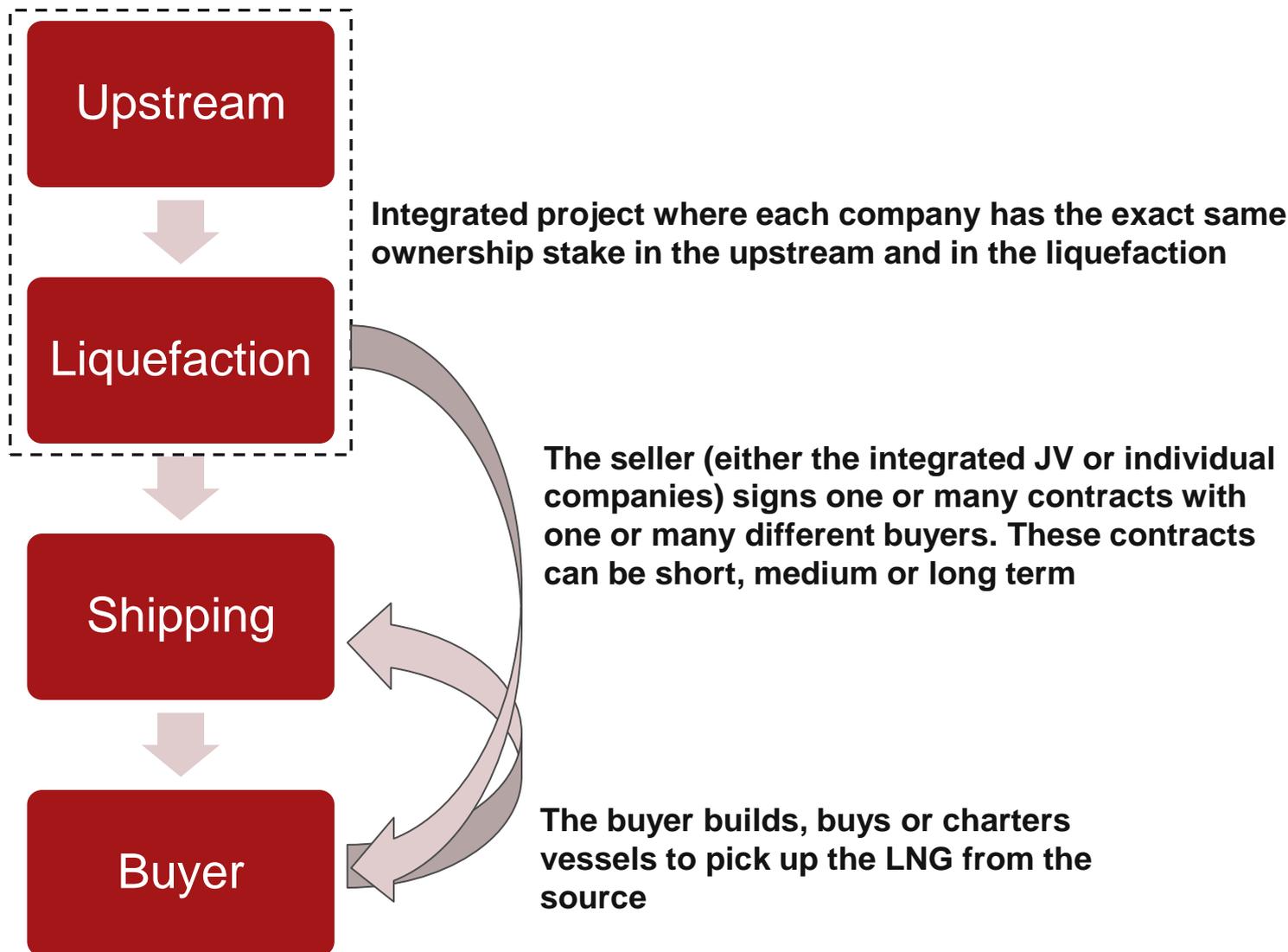
LNG is sold free on board (at the plant) for a price linked to Henry Hub because the original idea was to market this gas to the United States

Gas is sold for a price of \$0.27/mcf because the revenues from oil production drive project economics for the field

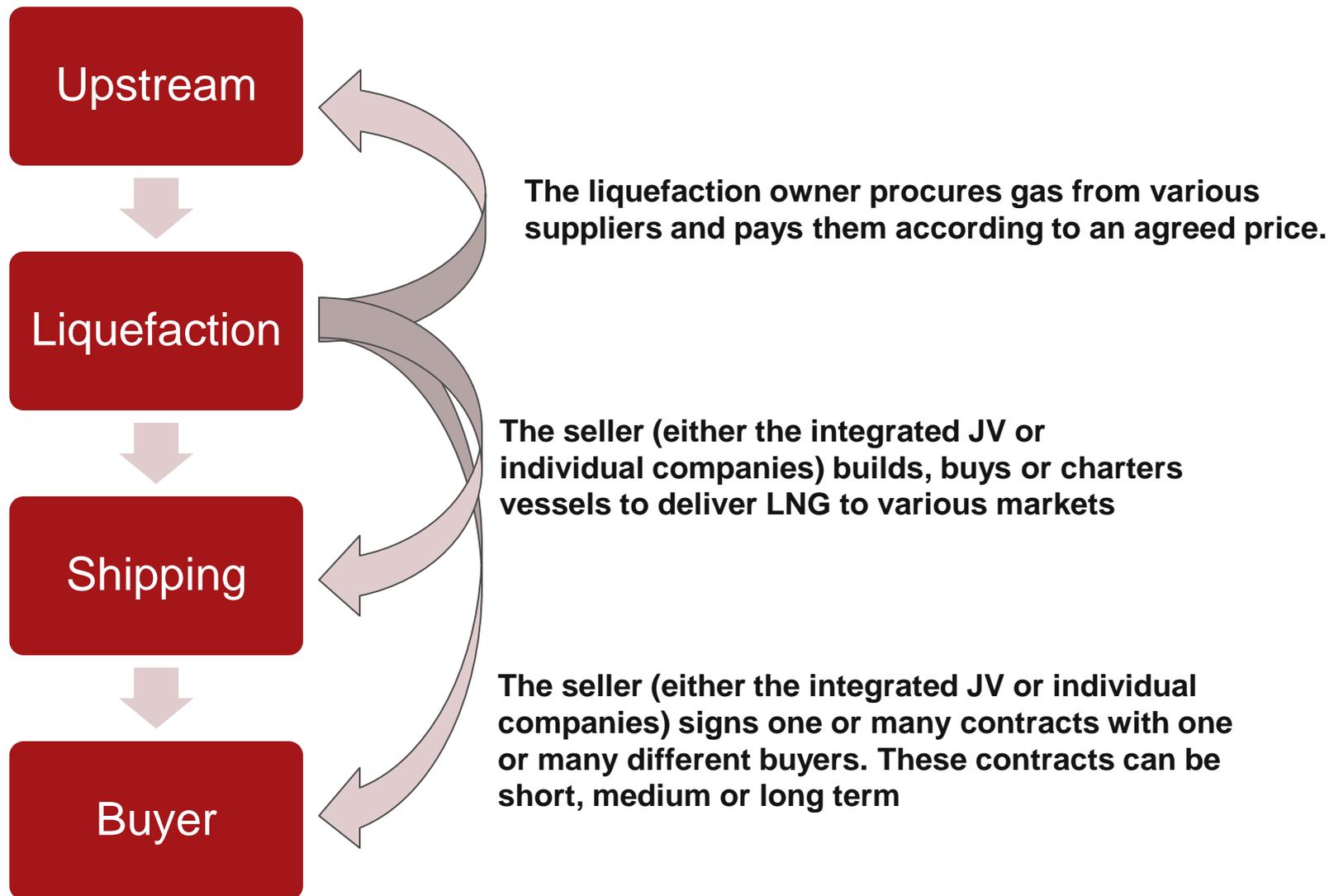
Project Structure: Integrated Joint Venture (CIF/DES)



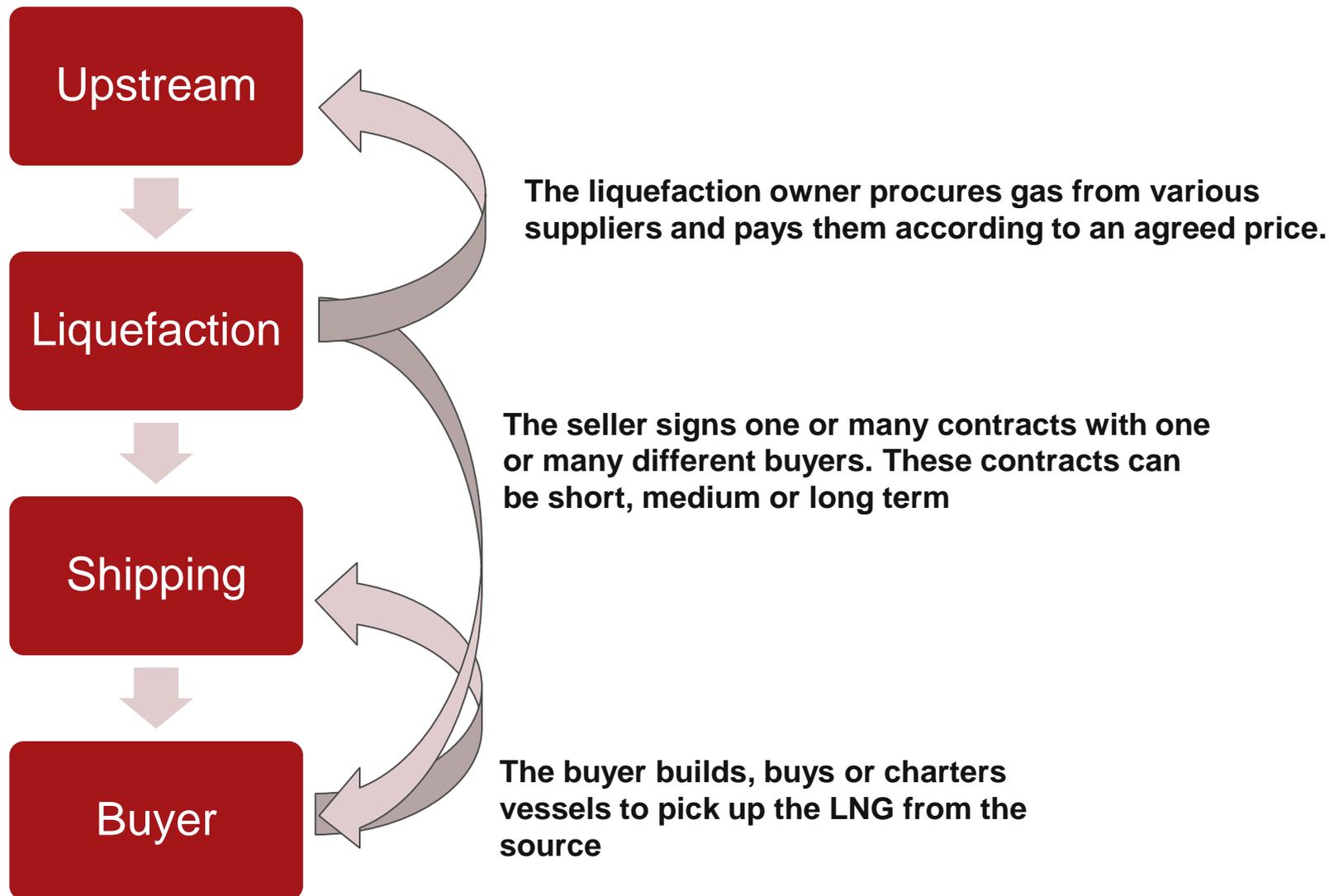
Project Structure: Integrated Joint Venture (FOB)



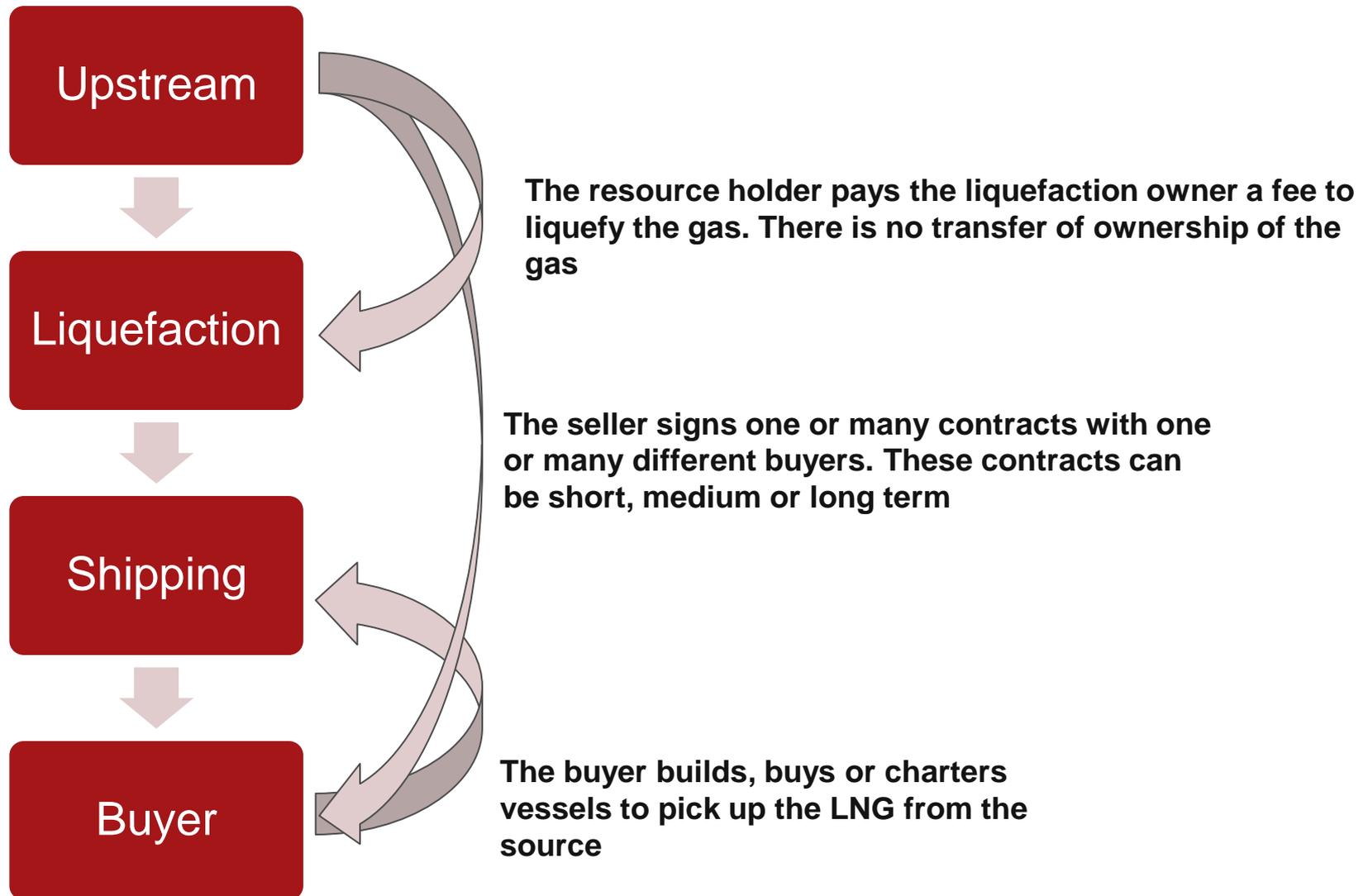
Project Structure: Bundled Plant (CIF/DES)



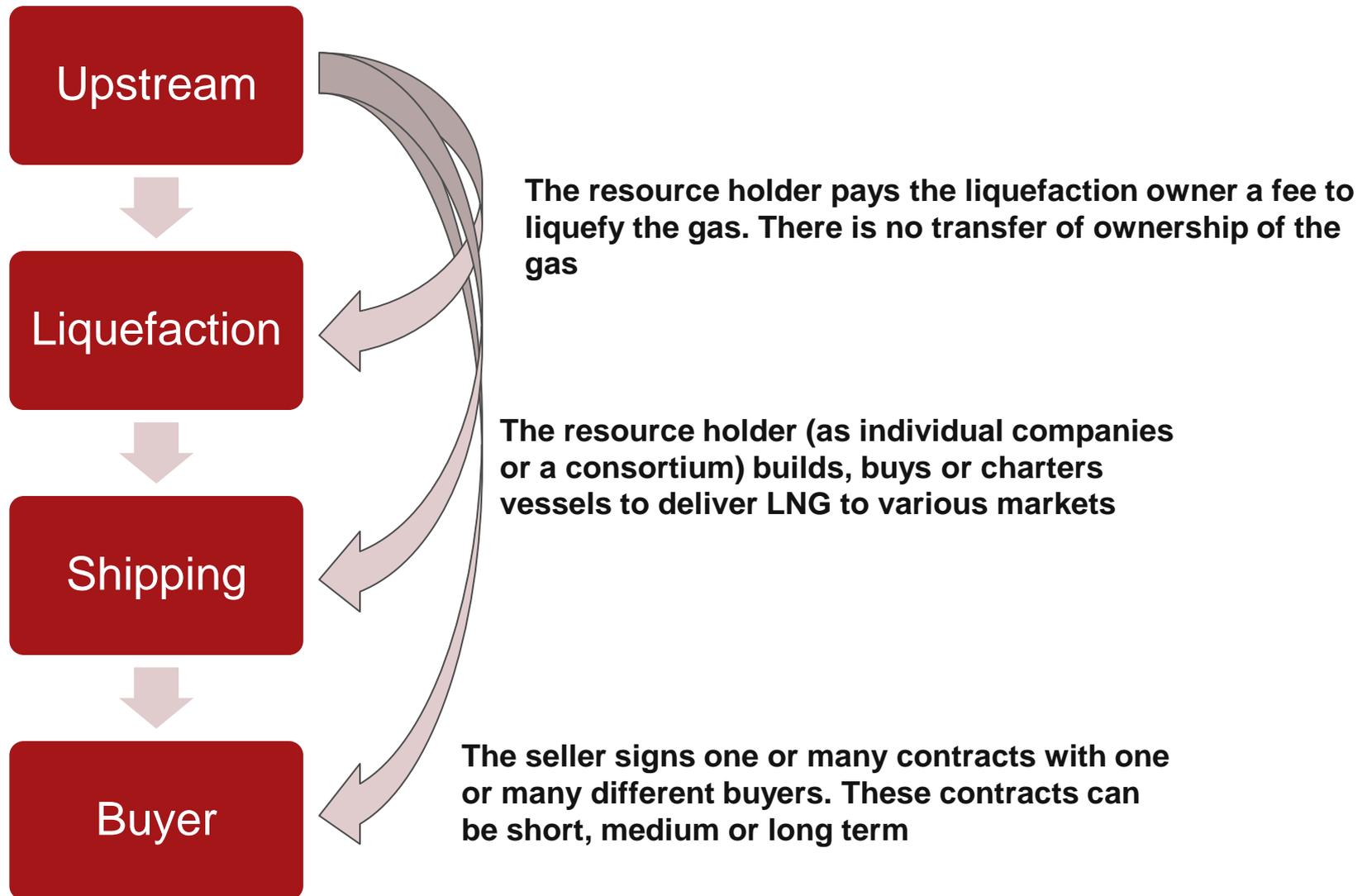
Project Structure: Bundled Plant (FOB)



Project Structure: Tolling Plant (FOB)



Project Structure: Tolling Plant (CIF/DES)



Options for Alaska to Participate



Option #1: Receive revenues through royalty gas

- In this case, the state receives a share of the production in the form of royalty (cash); the project partners have full responsibility and ownership to pipe the gas, liquefy it and sell the gas (FOB or CIF/DES).
- The key goal in this commercial structure is to create a “fair” transfer price:
 - Delivers value to the state of Alaska
 - Recognizes the risk/reward and capital commitment of each partner

Option #2: Participate as an equity partner

- In this case, the state of Alaska participates as an equity partner in the LNG project. Usually this is done through either a national oil company or other state-sponsored investment vehicle. In this structure, the state of Alaska could take royalty in kind and be a supplier into the project.
- The key questions are: where in the chain will the state participate (upstream, pipeline, liquefaction, shipping); with what equity stake; and in what form?

Selecting the proper option depends on

- What is the appetite for risk and what kind of risk?
- How to create better alignment between the project partners?
- What kind of commitment will the state make?