

ALASKA LNG (AK LNG) 101

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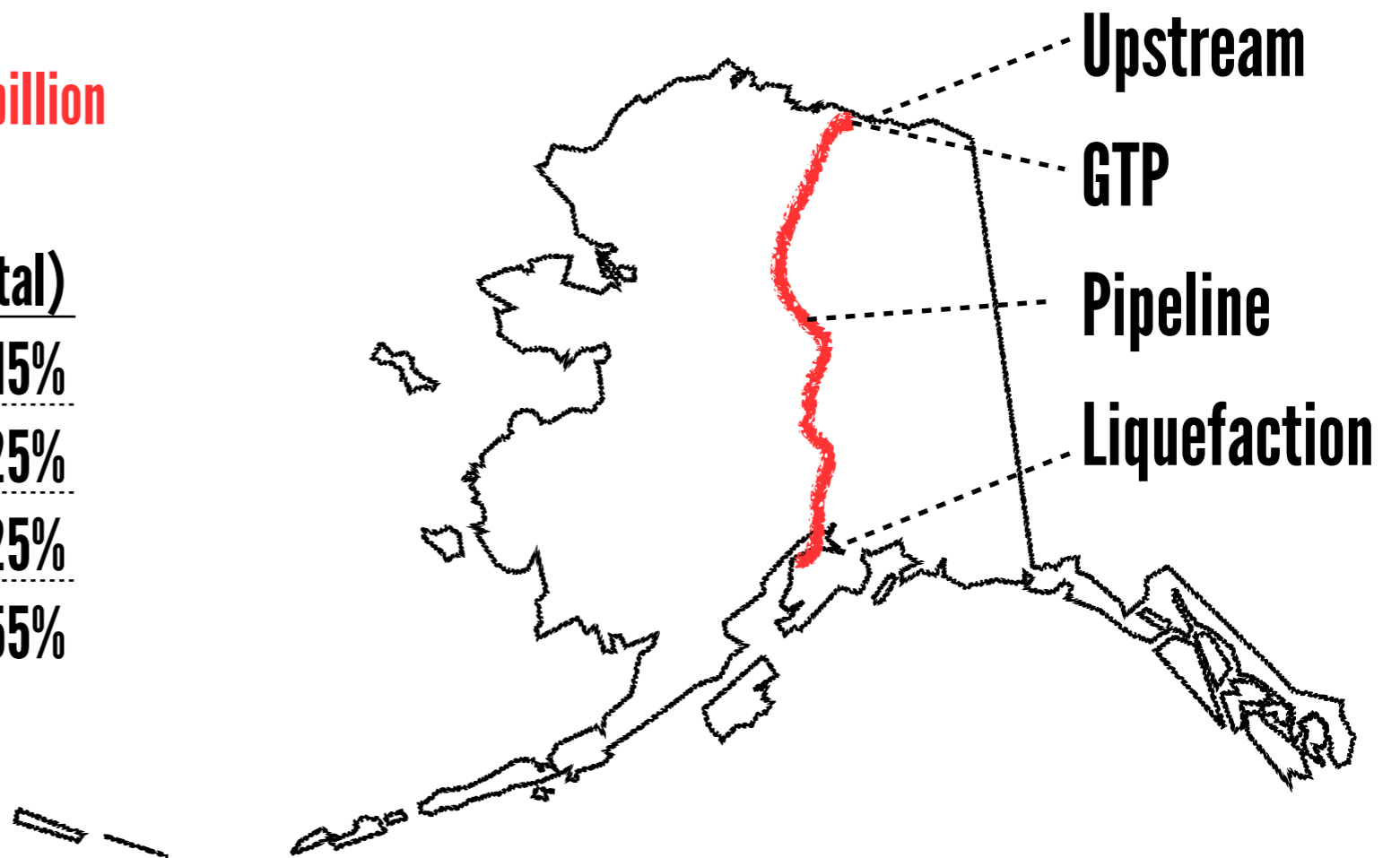
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AK LNG is a major project to commercialize North Slope gas; it consists of **four major** components:

- . **Gas production** from Prudhoe Bay (~75% of the total) and Point Thompson (25%)
- . A **gas treatment plant (GTP)** on the North Slope to remove impurities and make gas ready for transport
- . A large scale **gas pipeline** to Nikiski, with at least five off-take points for gas use within the state
- . A 15-18 million ton per annum **liquefaction facility** at Nikiski to cool the gas and make it ready for export

Approximate cost estimate is **\$45 to \$65 billion**

Segment	Approx. Cost (% Total)
Upstream	10-15%
GTP	20-25%
Pipeline	20-25%
LNG	40-55%



AK LNG path set in three agreements: a Heads of Agreement, a Memorandum of Understanding and SB 138.

Heads of Agreement (HOA)

The HOA envisioned that the state would own 20-25% of the gas and the same share of the infrastructure associated with this project.

Memorandum of Understanding (MOU)

The state assigned to TransCanada (TC) its 25% equity share in the GTP and pipeline. TC bears the state's share of the pre-construction and construction costs, and the state then pays TC a tariff to use these facilities. The state has an option to buy back 40% of its original share in the pipeline and GTP from TC (up to 10% of the total).

Senate Bill 138 (SB 138)

SB 138 provided changes to the tax code and other key areas of statute, authorized the executive branch to negotiate a range of subsequent agreements that would be required to move the project to the next phase of development, and established a broad roadmap for how the Legislature will oversee and consent to these negotiations.

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Project Stage	Pre-FEED		FEED			Construction					Online		
Investment (Entire Project)	\$400–\$500 mm		\$1,500–\$2,000 mm (Equity)			\$45–65 billion (Debt and equity)					O&M Met from cash flow		
Investment (State of Alaska)	\$50–\$125 mm		\$200–\$500 mm (Equity)			\$6–\$15 billion (Debt and equity)					O&M Met from cash flow		

FROM PRE-FEED TO FEED: THE NEXT 12-18 MONTHS

Technical	Conceptual design, route selection, narrowing of cost estimate, risk management
Regulatory	Export approvals, FERC permitting and input process from stakeholders
Commercial	Domestic gas, off-take and balancing, transportation services, LNG disposition, financing
Organizational	FEED-stage joint-venture agreements, governance agreements, lease modifications
Fiscal	Fiscal agreement, property tax

WHY LNG IS DIFFERENT THAN OIL AND RIV IS RISKY

Fixed nature of tariff in 'in value' alternative amplifies impact of price movement on state returns

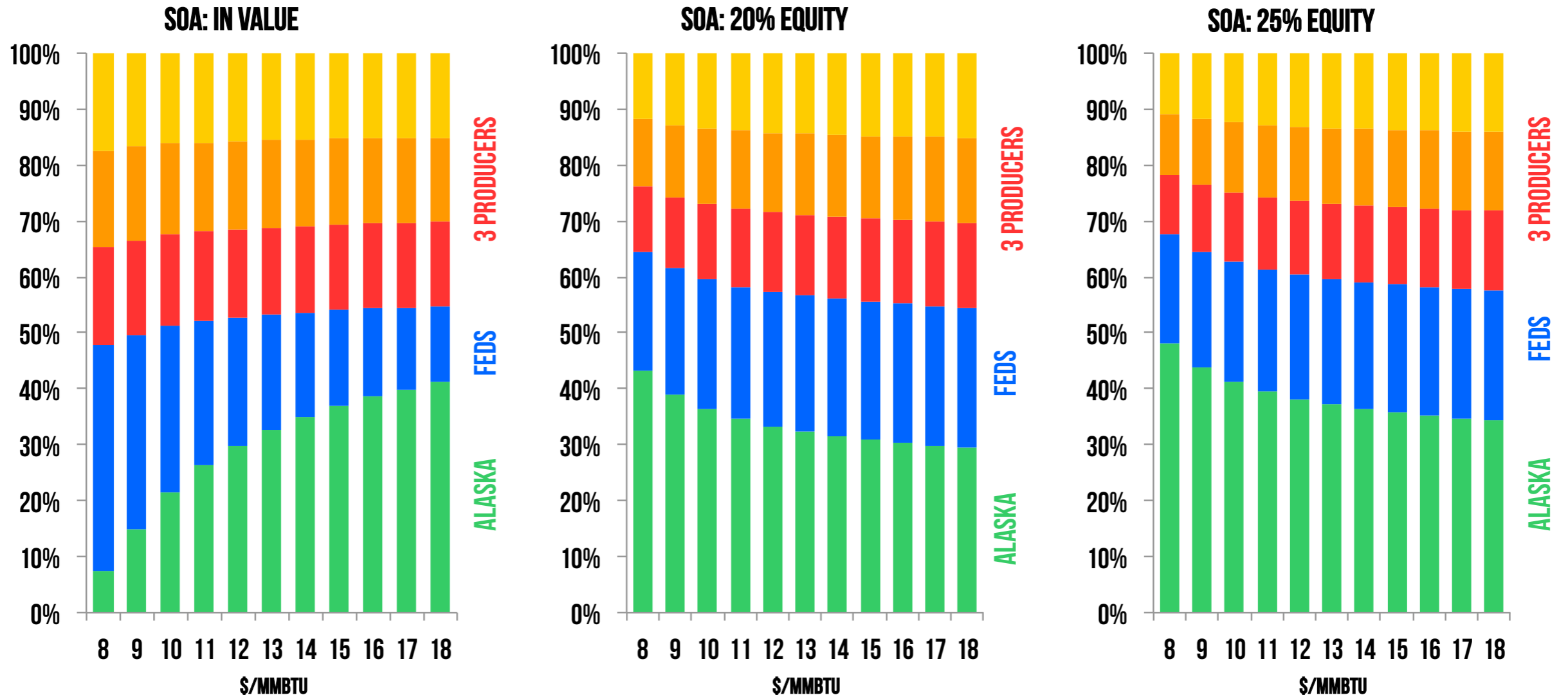
INDICATIVE LNG VALUE CHAIN IN ALASKA	OIL (\$/BBL)	GAS (\$/BOE)	GAS (\$/BOE)	GAS (\$/BOE)
RESOURCE PRICE	\$100.00	\$81.00	\$75.00	\$70.00
LESS: MARINE TRANSPORT	\$3.46	\$6.00	\$6.00	\$6.00
LESS: PIPELINE & LNG TARIFF	\$6.58	\$60.18	\$60.18	\$60.18
GROSS VALUE AT POINT OF PRODUCTION	\$89.96	\$14.82	\$8.82	\$3.82

EQUITY LEADS TO HIGHER GOV'T TAKE ON AVERAGE

'In value' entails lowest government take, especially in low prices as cash goes to producers

Split between Fed vs. SOA split depends on both 'in value' vs. 'in kind' as well as SOA equity share

PERCENT OF CUMULATIVE CASH FLOWS OVER PROJECT LIFE

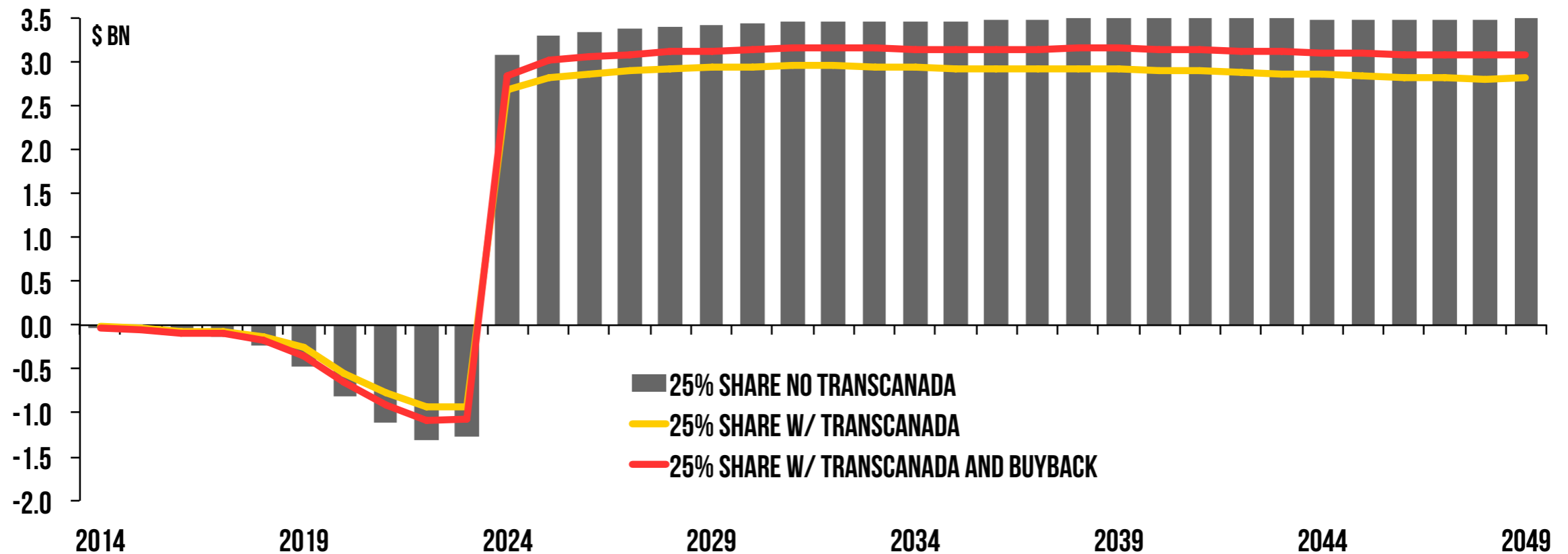


FINANCIALLY, TRANSCANADA DEAL IS AKIN TO A LOAN

TransCanada shoulders a share of SOA's capital commitments and Alaska repays over time with tariff

SOA outlays fall by \$1,700 mm (no buyback) to \$1 bn (buyback) during development period

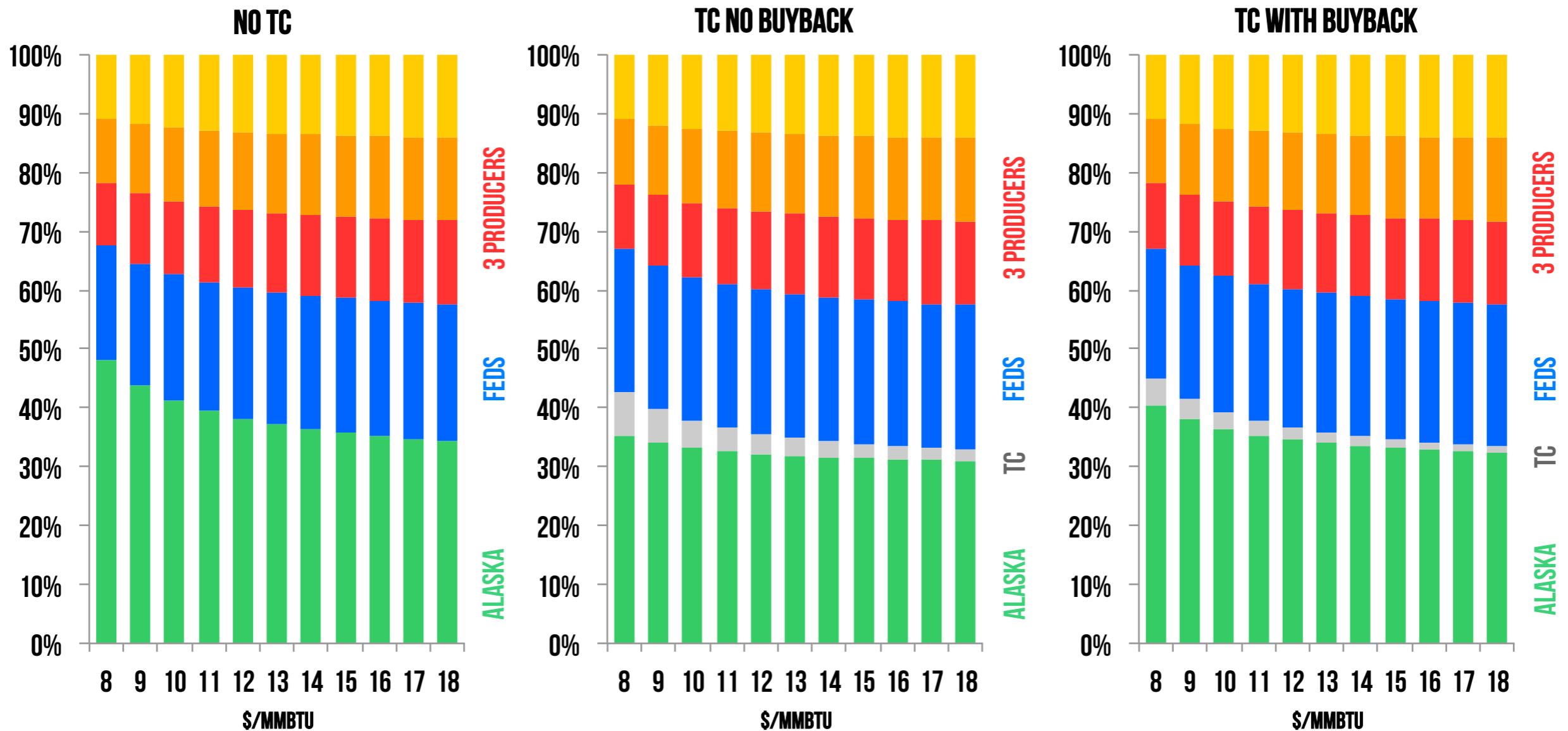
STATE OF ALASKA: CASH FLOWS FOR ALASKA LNG (70% DEBT / 30% EQUITY)



TC'S SHARE OF CASH IS RELATIVELY SMALL

TC's share ranges from 1% to 7%, depending on price levels and state's exercise of buyback

PERCENT OF CUMULATIVE CASH FLOWS OVER PROJECT LIFE, 25% EQUITY CASE



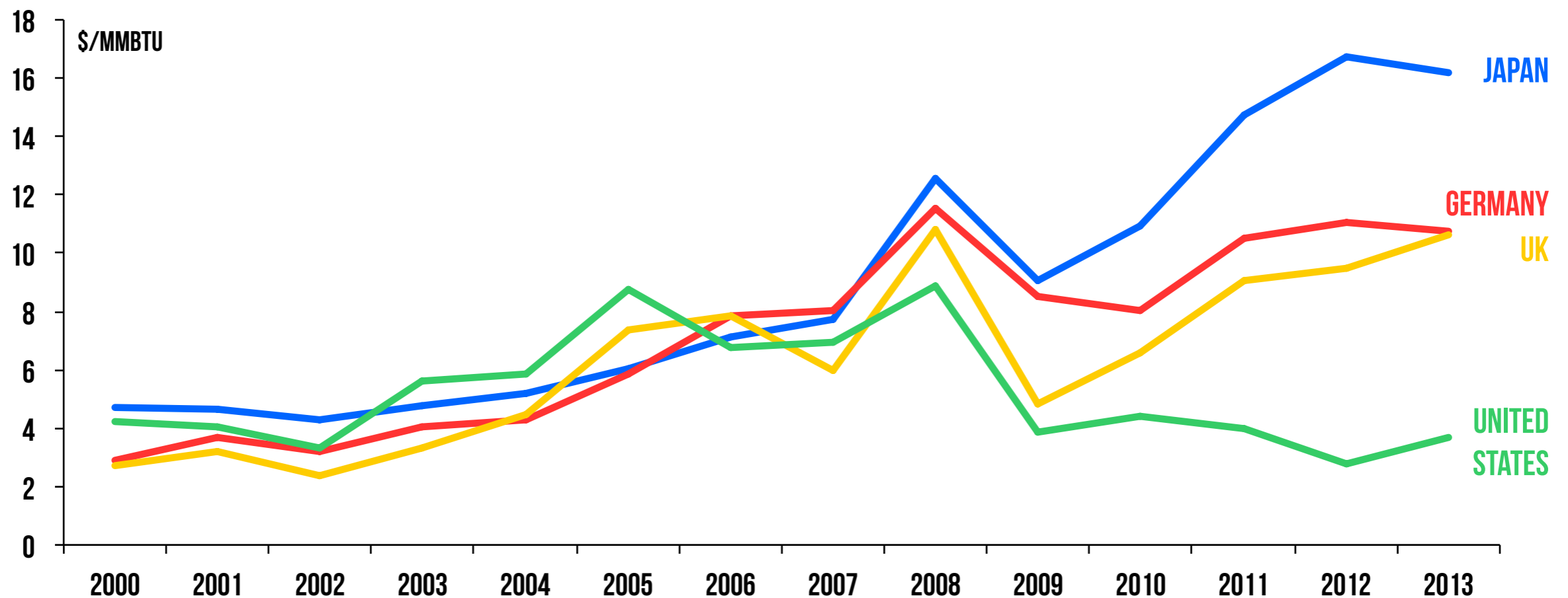
NO “GLOBAL” PRICE FOR GAS—MARKETING MATTERS

There has always been a major disparity between regional prices

In 2012, Henry Hub in the United States averaged **\$3.71/MMBtu**; the price in Japan was **\$16.17/MMBtu**

European pricing was somewhere in the middle: **\$10.63/MMBtu** in the UK to **\$10.72/MMBtu** in Germany

GAS PRICES IN SELECT MARKETS



SOURCE: BP STATISTICAL REVIEW OF WORLD ENERGY (JUNE 2014)

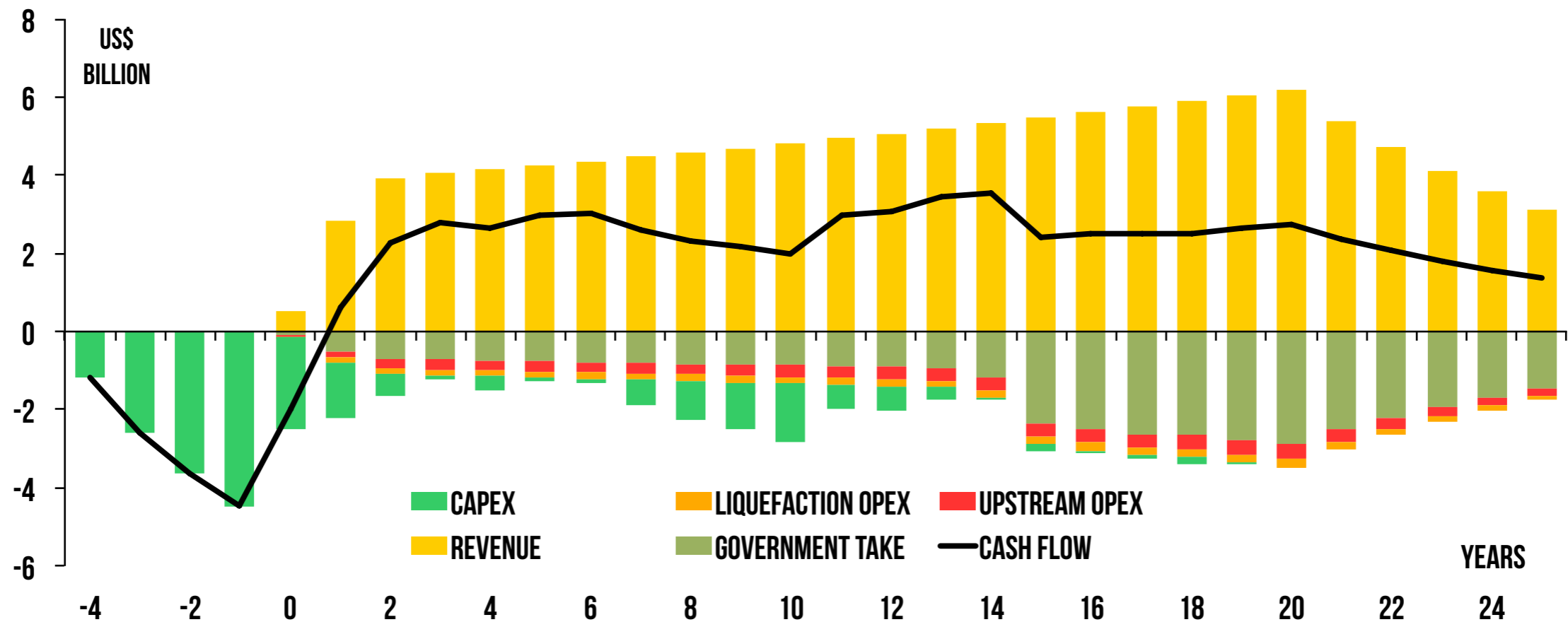
LNG IS LONG-TERM—RISK MANAGEMENT MATTERS

LNG projects take **4-5** years to build but run for **20-50** years with low maintenance / upkeep costs

Majority of LNG projects have been **expanded** and/or taken gas from new fields

Subpar rate of return tends to be bigger risk than outright “losing money”

LNG PLANT CASH FLOW: TYPICAL PLANT



PROJECTS NEED TO MOVE ON MANY PARALLEL FRONTS

Upstream Delineate resource base, certify reserves, define production plan

Midstream Define pipeline path, secure right-of-way, environmental permits

Liquefaction Define project size, processing / gas quality, project structure

Shipping Decide whether to own, lease or outsource shipping to buyers

Marketing Define commercialization plan, secure buyers, sign contracts

Financing Define financing plan, secure in-house and third-party lending

Permitting Secure permits to construct facility, export gas

Partners conduct front-end engineering and design studies (**pre-FEED** and **FEED**)

They then sign engineering, procurement and construction (**EPC**) contracts

Construction starts with final investment decision (**FID**); usually **less than 10%** of CAPEX spent before FID

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