Megaprojects

Considerations for the Alaska LNG Project

Presented by: Pegasus-Global Holdings, Inc.

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Pegasus Introduction

- Our core services provide advice and assistance on the delivery of major infrastructure projects.
- Our experience includes evaluating a variety of megaprojects – allowing us to gain insights into megaproject execution.
- Originally engaged by the State Legislature in late 2018 to provide insights on the risks associated with megaprojects, including specifically the Alaska LNG project.

Megaprojects Defined

- Costs in excess of $1 billion USD.
- Comparably high benefits and correspondingly high risk.
- Multi-year construction, often longer than a decade from feasibility planning through execution.
- Heightened political involvement and public interest.
- Many diverse stakeholders that can have substantial impacts on the project (strategically, environmentally, economically).
- Multiple prime contractors and vendors/suppliers.
- Unique aspects/scopes (i.e. not just a bigger version of a smaller project).
- Conventional project management processes and priorities often not sufficient.

Megaprojects vs. Gigaprojects

	Megaprojects	Gigaprojects
Cost	$1B-$10B in capital costs	$10-$100+B in capital costs
Scale	Typically a large single asset or tightly integrated set of assets	Typically involving multiple megaprojects within overall scope – may represent a strategic transformation by the sponsor
Governance	Owner team & EPC/EPCM contractor form core project governance team focused on project control	Multi-layer governance covering political, economic, and social aspects beyond standard project management
Risk Profile	Increased risk exposure including to 'black swan' events compared to typical projects	Even greater exposure to systemic risks outside the project (e.g. macroeconomics, political continuity)
Financing	Corporate/project finance	Sovereign, multi-lateral, long-term blended finance
Community Impact	Primarily localized	Regional/national

Alaska LNG Project Scope

- Gas Treatment Plant ($10.7B)
- Pipeline ($13.9B)
- LNG Production Facility ($19.6B)

Pre-FEED Cost Estimate, Source: AGDC presentation to House Resources Committee (1/22/2020)

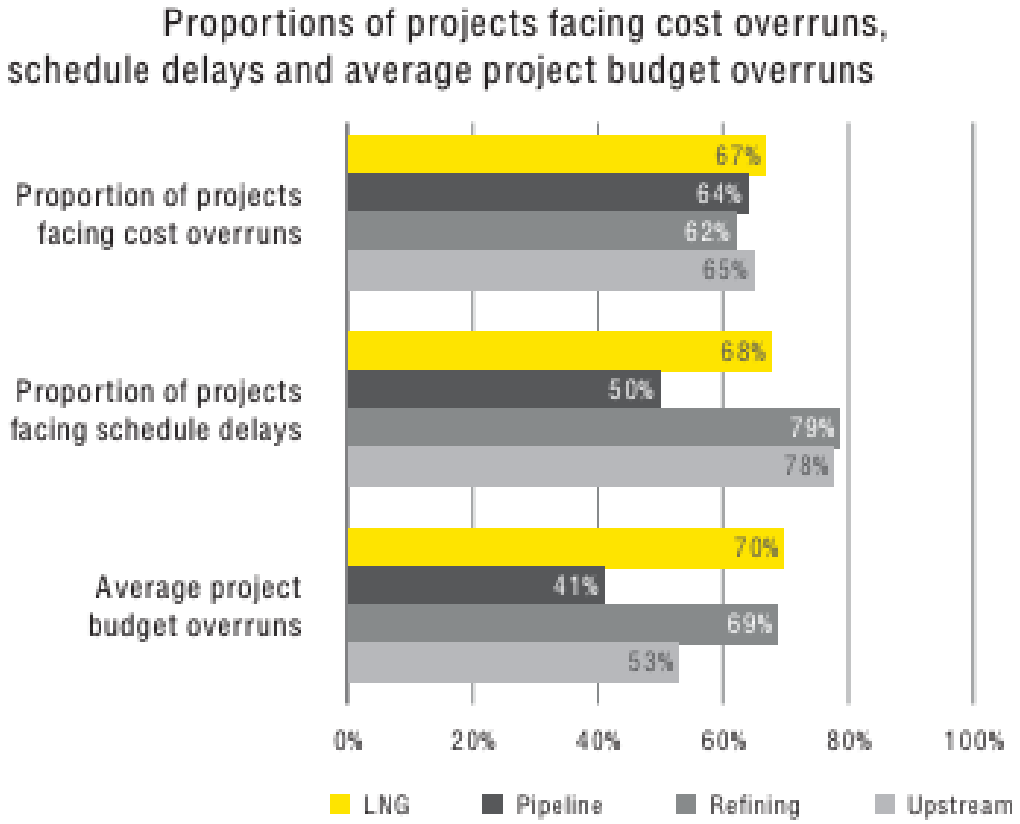
Megaproject & Gigaproject Challenges

- Long planning/execution horizons spanning multiple political cycles.
- Complex interfaces and interdependent risks.
- Scope/components that are often not standard (including FOAK).
- Decision-making and planning involves multiple parties with conflicting interests.
- Unplanned events (black swans) are often not accounted for, but mega/gigaprojects have high exposure and high resulting impacts.
- Over optimism on schedule, costs, benefits, and risk treatment.

The “Iron Law” of Megaprojects

“Over budget, over time, under benefits, over and over again.”

– Bent Flyvbjerg



Source: E&Y “Spotlight on oil and gas megaprojects” (2014)

Examples of Root Causes for Cost Overruns & Delays

Front-End Definition	Project Management	Construction	Site Conditions	Regulatory & Stakeholder Friction	Organizational & Contractual Misalignment
Insufficient FEED	Insufficient project controls	Labor shortages / lack of skilled labor	Unforeseen conditions; methodology changes	Stakeholder disputes	Insufficient owner team to manage claims & performance
Overly optimistic cost & schedule	Inexperienced owner technical support	Contractor under performance	Remote location logistics	Permitting delays & regulatory uncertainty	Ambiguous contract structures
	Poor interface management				

Pipeline Case Studies

Mountain Valley Pipeline

- Scope: ~300 mile, 42” pipeline from West Virginia to Virginia; capable of 2 Bcf/day.
- Cost: initially estimated at $3.5B, final cost estimate at $9.6B.
- Schedule: Proposed in 2014; Construction commenced in 2018 ultimately in-service in June 2024.
- Issues: challenging terrain, legal & permit challenges.

Atlantic Coast Pipeline

- Scope: ~600 mile, 42” pipeline from West Virginia through Virginia to North Carolina; capable of up to 1.5 Bcf/day.
- Cost: initially estimated at $4.5-$5.0B, last cost estimate at $8B+.
- Schedule: Proposed in 2014; Construction commenced in May 2018 before being cancelled in July 2020 (3.5 years of delay at that time).
- Issues: legal & permit challenges, regulatory uncertainty.

Trans Mountain Expansion Project

- Scope: ~600 mile, 36” pipeline (w/30” & 42” segments) from Alberta to Coastal B.C.; capable of up to 890K barrels/day.
- Cost: initially estimated at $5.4B, final cost estimate at $34.2B.
- Schedule: Proposed in 2013; planned for mid-2017 to Dec. 2019 construction; CPCN issued in Dec. 2016, revoked in Aug. 2018, re-issued in Jun. 2019; construction completed in Apr. 2024
- Issues: legal & permit challenges, regulatory uncertainty, challenging terrain, extreme weather.

Trans-Alaska Pipeline System

GAO Report Findings – Challenges and Cost Overruns

- Site-specific Challenges:
  - More groundwater than anticipated.
  - Underground construction required deeper/wider trenches than planned.
  - Wide variations in soil conditions.
  - Permafrost more difficult to move and drill than planned.
  - Less backfill material sites available, requiring additional hauling.
  - Tolerances for valve support structures far more critical than planned; temperature changes and settlement required realignment.
  - Productivity impacts in cold weather.
- Construction Cost Overruns:
  - Feasibility estimate contained no allowance for escalation (also experienced 4-year delay to start of construction).
  - Insufficient contingency (10%) compared to status of engineering and project risks.
  - Underestimated amount of elevated pipe.
  - Additional infrastructure required, but not in initial scope.
  - Underestimated support structure (camps, airstrips).
  - Underestimated scope for environmental requirements (vapor recovery, ballast water treatment system).

Trans-Alaska Pipeline System

GAO Report Findings – Lessons Learned

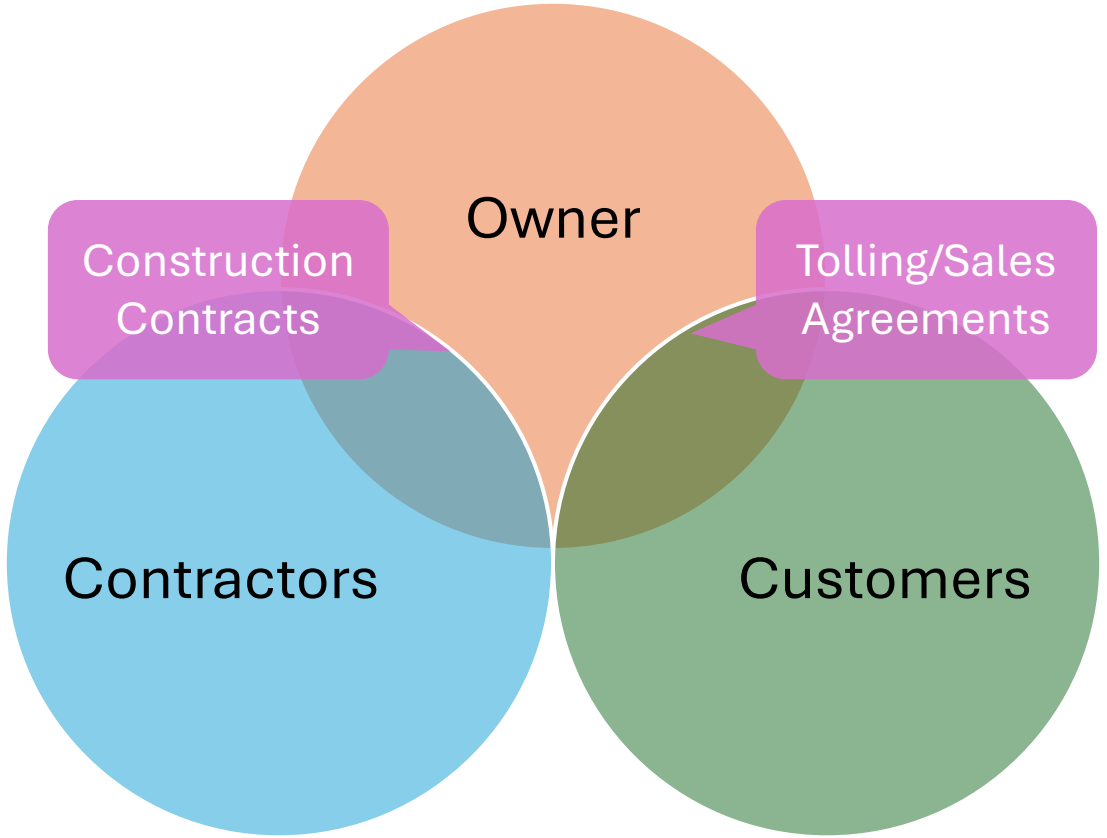
"It is widely known that construction of the trans-Alaska oil pipeline turned out to be a costly experience. This experience should be applied to future large-scale Arctic construction projects (such as the Alaska natural gas pipeline) in the hope of keeping costs under control."

Source: Comptroller General's Report to the Congress – Lessons Learned from Constructing the Trans-Alaska Oil Pipeline (June 1978)

- Initial and subsequent cost estimates should be viewed with skepticism.
- As much site-specific data as is feasible should be obtained.
- Technical and geological uncertainties should be thoroughly investigated.
- Government approval should be contingent on detailed planning for management control, including cost controls.
- Future project expenditures should have an ongoing government audit to protect the public's interest.

Cost Control Strategies

- Development:
  - Glenfarne subject to milestone-based performance requirements and bears 100% of FEED and development costs.
- Execution:
  - EPC & EPCM contracts will determine risk allocation between Owner and Contractors – shared risk/reward pools can help align interests.
  - Robust cost estimate and risk modeling supports well-informed contingency to provide funding for expected risks.
- Delivery:
  - Firm delivery obligations, with liquidated damages for non-performance.
  - Cost overrun protection to in-state customers.



Pre-FID Status of the Alaska LNG Project

Diligent Development Scorecard

ALASKA GASLINE DEVELOPMENT CORP.

- ✓ **Upstream Gas Supply**
  Developer has entered into Gas Sales Precedent Agreements for sufficient supply of Phase 1 Pipeline gas with Pantheon Resources, ExxonMobil, and Hilcorp
- ✓ **Downstream Gas Sales**
  Developer has entered-into Letters of Intent with Enstar and Donlin Gold
- ✓ **Pre-FID Activities**
  Developer has completed FEED for the Phase 1 Pipeline and is initiating Phase 2 FEED
- ✓ **Construction Management**
  Developer has entered-into an Engineering, Procurement, and Construction Management (EPCM) agreement with Worley
- ✓ **Pipeline Construction**
  Developer has announced conditional awards for EPCs to construct each spread of Phase 1
- ✓ **Line-Pipe Supply**
  Developer executed preliminary agreements for majority of the line pipe with Corinth Pipeworks S.A. and Europipe GmbH
- ✓ **Financing**
  Developer is advancing a debt finance structure

Source: AGDC President's Report, 3/19/2026

EPCM Contractor

- Organizes and integrates project across design, materials, and field execution
- Typically serves in a project management and advisement role – owner retains most cost/schedule risk

EPC Contractor

- Responsible for design, procurement, construction, and commissioning – delivery of a physical project
- May hold cost/schedule risk depending on contract type/terms

Phased Approach Introduction

Phase 1 Notes

- Initially targeted construction start in 2025 and first gas in 2029 (vs. first gas in 2031-2032 for full program).
- *"Building the pipeline reduces project risk and increases the outlook for LNG export investment."*

Source: AGDC Presentation to House Resources Committee (2/26/2024)

FID Timeline

- Phase 1 Pipeline – 2026
- Gas Treatment Plant – anticipated in 2027
- LNG Facility – anticipated in 2027

AGDC has the right, but not obligation, to invest in 5%-25% of each subproject.

Source: AGDC Presentation to House Resources Committee (5/27/2026)

"By phasing Alaska LNG, Alaska can utilize existing permits to quickly provide gas for Alaskans and provide infrastructure for future LNG exports and industrial use."

Source: AGDC Presentation to House Resources Committee (4/9/2025)

Phased Approach Considerations

- Is Phase One financeable on a standalone basis if costs are not fully recovered by Phase One customers?
- Building the pipeline first shifts risks for full project – but overall risks largely remain.
- May still require LNG imports to meet near-term in-state demand.
- What if only Phase One is completed?
  - Revenue impact from reduced flows
  - FERC approved the full project – pipeline, gas treatment, and LNG export
  - Phase One gas supply cost versus other options

Gas Supply Risks

Cook Inlet Production

- Production expected to be depleted by mid-2030s.
- Recent exploration success limited.
- General development risks: permits, leases, funding.
- Key risk: uncertainty in supply.

Phase 1 Pipeline

- Very high capital investment, more uncertainty in schedule.
- Potential for over-build if Phase 2 never completed.
  - Phase 1 customers locked into higher rate.
  - Project cost likely not fully covered by Phase 1 customers alone.
- Gas cost influenced by capital costs of project.
- Key risk: timing and project costs.

LNG Imports

- Lower capital investment, less uncertainty in schedule.
- Potential for over-build if multiple LNG import proposals move forward.
- Certain assets may be obsolete/stranded if Alaska LNG completed.
- Higher exposure to market price impacts.
- Key risk: gas supply cost.

Considerations for the Legislature

- Project appears unlikely to proceed without tax reform, given that:
  - What amount of tax alleviation works for the project and the State?
  - Will additional relief be needed to support Phase Two?
  - How are project impacts to communities addressed and paid for?
- How are Alaskans protected from capital cost overruns?
  - Glenfarne has indicated willingness to protect the State from cost overruns.
    - Without an equity position on the project, the State would not have direct exposure to cost overruns.
    - Key for Alaskans is to have assuredness on the cost of delivered gas.
- What amount of oversight is needed and from where?
  - *"The legislature shall provide for the utilization, development, and conservation of all natural resources belonging to the State…for the maximum benefit of its people."*
  - AGDC tasked with representing the State in the project.
  - Specific needs change with and without and equity position.

Thank You

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