Megaproject Risks

Considerations for the Alaska LNG Project

Presented by: Pegasus-Global Holdings, Inc.

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Megaprojects Defined

- Typically have 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.
- Many diverse stakeholders that can have substantial impacts on the project (strategically, environmentally, economically).
- 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

Megaproject & Gigaproject Challenges

- Iron law of megaprojects: “Over budget, over time, under benefits, over and over again.” – Bent Flyvbjerg
- Inherent risk exposure due to long planning/execution horizons and complex interfaces.
- Technology/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 costs, benefits, and risk treatment.

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.

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)

“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)

AGDC has reserved the right to invest a minimum 5% **up to** 25% directly in individual subprojects:

1. Phase 1 Pipeline – investment decision in 2026
2. Gas Treatment Plant – anticipate investment decision in 2027
3. LNG Facility –anticipate investment decision in 2027

Source: AGDC Presentation to Senate Resources Committee (2/23/2026)

Phased Approach Considerations

- Is Phase One financeable on a standalone basis if costs are not fully recovered by Phase One customers?
- Unclear how building the pipeline first reduces project risk.
- May still require LNG imports to meet near-term in-state demand.
- What if only Phase One is completed?
  - Municipal impacts not covered under SB 280
  - FERC approved the pipeline packaged with 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.

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

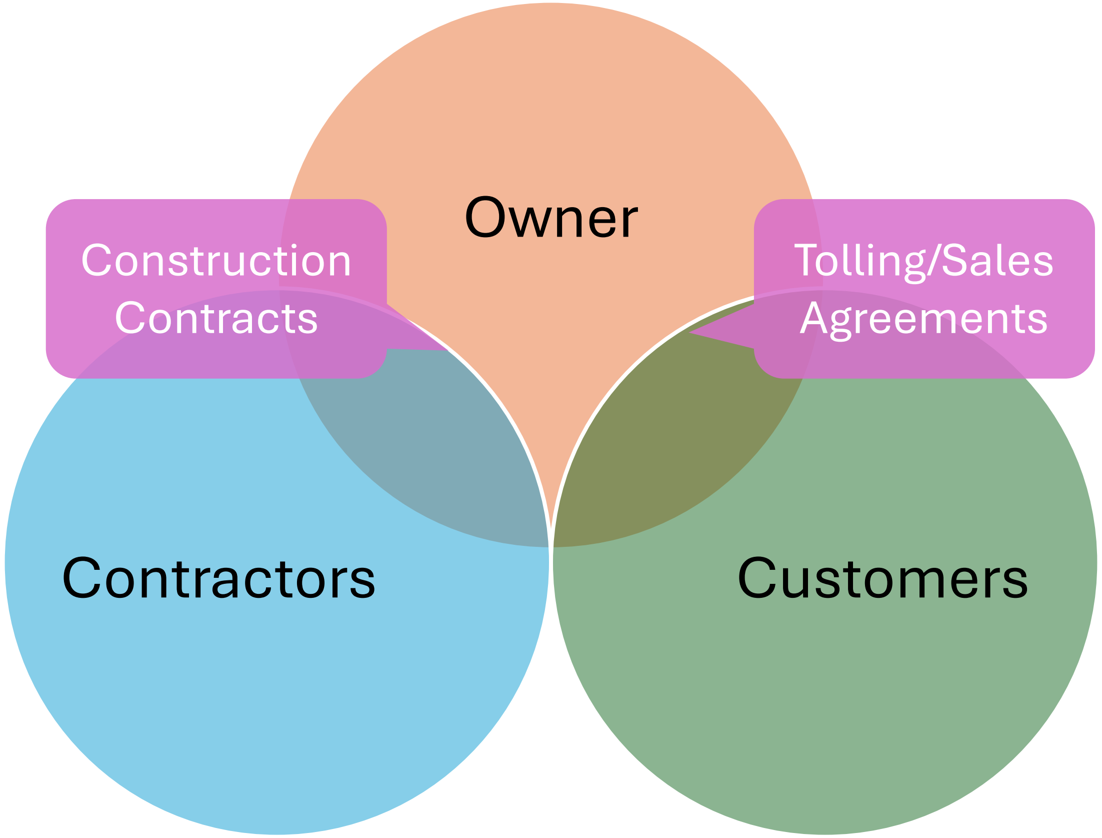
“It is widely known that construction of the trans-Alaska oil pipeline turned out to be a costly experience. This experience should be applied to future large-scale Arctic construction projects (such as the Alaska natural gas pipeline) in the hope of keeping costs under control.”

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 contracts will determine risk allocation between Owner and Contractors.
  - 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.



Thank You

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