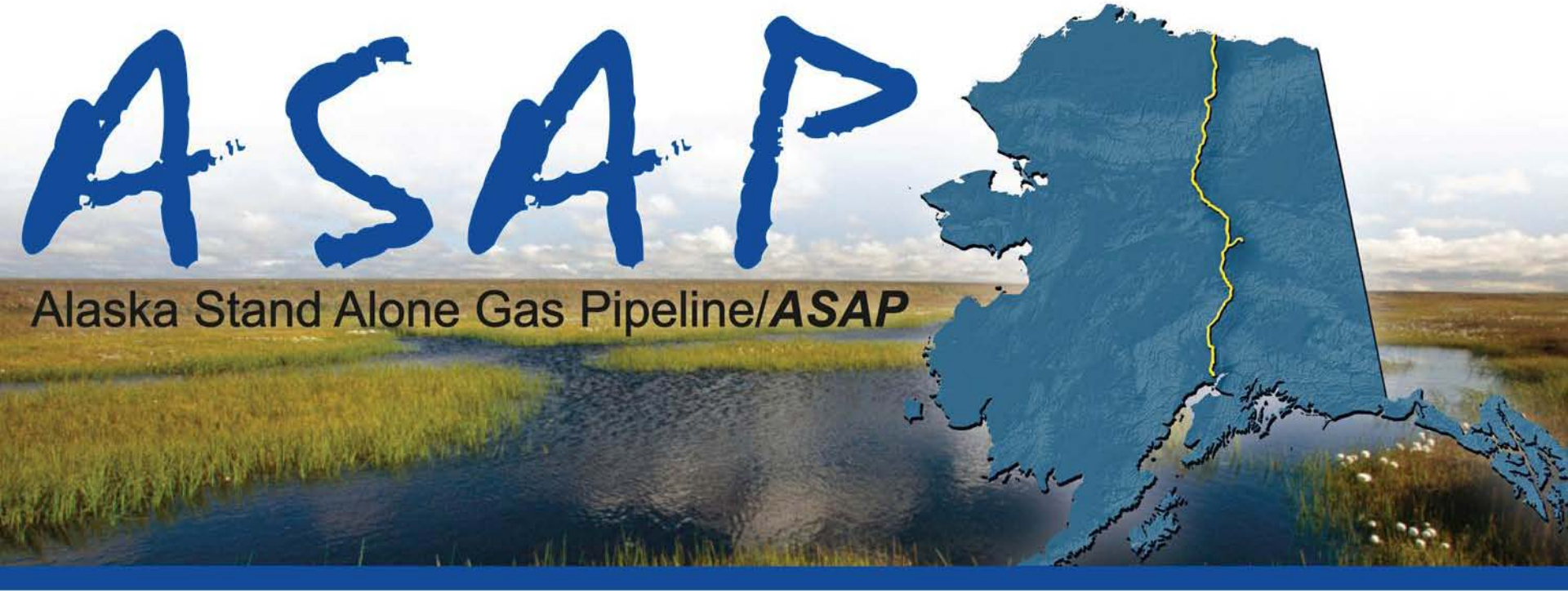


ASAP and Megaprojects

Alaska Industry Support Alliance
Fairbanks Industry Update Forum
September 21, 2011

Today's Presentation

- What is a Megaproject?
- Independent Project Analysis (IPA)
- Stage-Gated Project Approach
- Front-End Loading for Pipeline Projects
- Alaska Stand Alone Gas Pipeline/ASAP Project

Megaproject

- Total capital cost > $1 Billion (U.S. dollars)
- Industrial project examples:
  - Oil
  - Natural gas
  - Mining
  - High Volume Chemicals
- 65% of all industrial megaprojects failed to meet business objectives.

Reference: Edward W. Merrow, *Industrial Megaprojects*, page 204

“Sorry Seven”

1. I want to keep it all!
2. I want it *NOW!*
3. Don’t worry; we’ll work out the details of the deal later.
4. Why do we have to spend so much up front?
5. We need to shave 20 percent off that number!
6. The contractors should carry the risk; they are doing the project!
7. Fire those #$@S^! project managers who overrun our projects!

Reference: Edward W. Merrow, *Industrial Megaprojects*, page 2 - 7

Independent Project Analysis (IPA)

- IPA founded in 1987 to provide unique project research capability for the chemical process, petroleum, and minerals industries
- Seven global offices: U.S.A., United Kingdom, The Netherlands, Australia, China, Singapore, Brazil
- Devoted exclusively to the analysis of projects as a field of empirical research

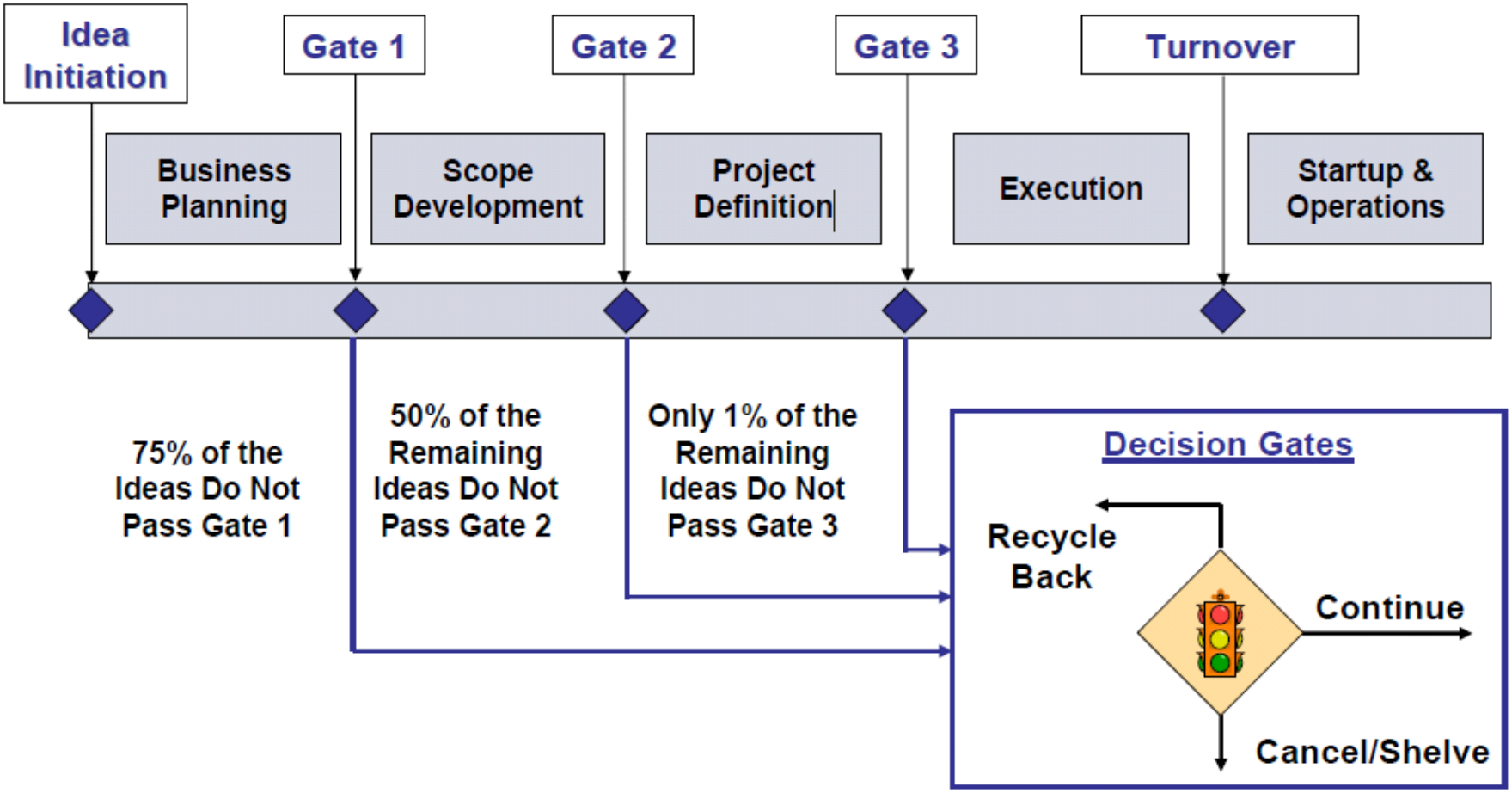
IPA Database Characteristics

- Contains over 11,000 projects
- Hundreds of projects added each year
- Over 200 companies represented – from North America, South America, Europe, and Asia
- Over 2,000 variables per project
- Covers all project phases, from R&D through first few years of operation.

Advantages of Gated System

- Forces team to follow a logical sequence in planning
- Requires deliverables to be complete before starting successors
- Provides clear opportunities to kill projects that no longer meet business objectives
- Improves communication with project stakeholders
- Provides a guide for less experienced project teams

Three-Phase Gated Approval System



FEL 1 – Business Case

FEL 1 Assessment and Index

- Market experience
- Competitive analysis
- Raw material / feedstock costs
- Investment and economic life
- Legal/Regulatory framework
- Competitive Business Plan

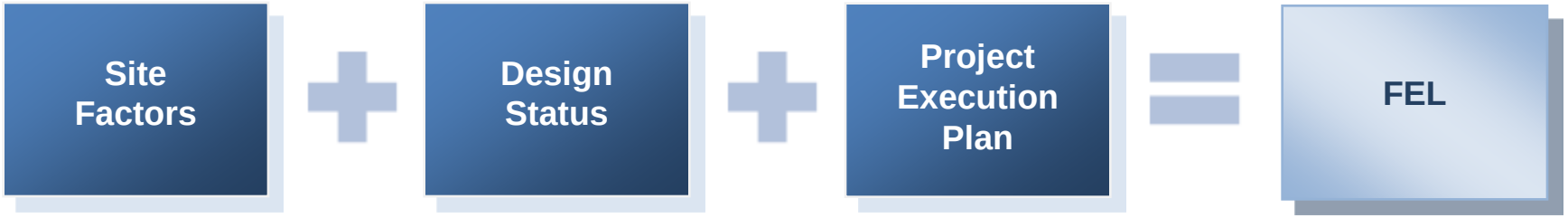
- Sponsorship and leadership
- Clear authorization and resourcing process
- Multifunctional project team
- Clear team goals and expectations
- Clear, timely, effective communication
- Effective decision making process
- Team stability

- Competitive technology selection
- Business objectives statement and charter to team
- Capacity recommendations
- Technical plan

Reference: Edward W. Merrow, *Industrial Megaprojects*, page 204

FEL 2 – Scope Development

FEL 2 Assessment and Index



- Site determined
- Equipment block layout identified
- Preliminary soils and hydrology report
- Environmental permitting requirements and strategy identified
- Health and safety requirements and strategy identified
- Labor survey completed if need
- Local content providers reviewed

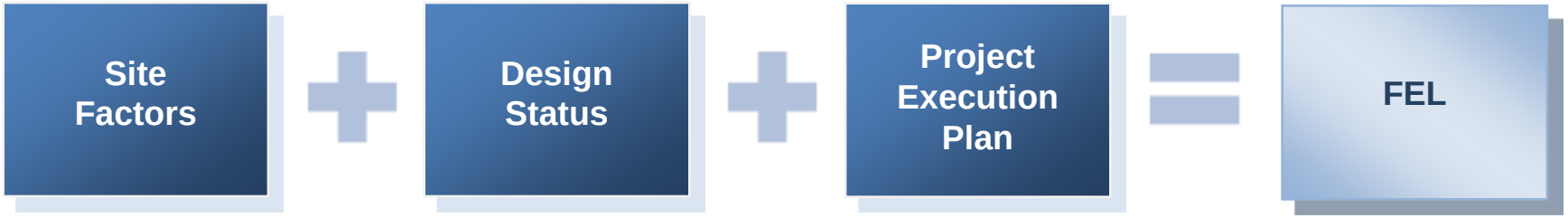
- Basic process data
  - Feedstock / product properties
  - H&MBs
- Engineering tasks
  - Written scopes
  - Single set of complete PFDs
  - Sized major equipment list
  - Utility, infrastructure and off-site requirements
  - Analysis of existing equipment
  - Full factored cost estimate
- Clear business objectives
- Participation and buy-in of:
  - Operations
  - Maintenance / turnaround
  - Business

- Execution Strategies (Not Plans)
  - Design
  - Procurement
  - Construction (module or stick)
  - Turnover sequences
  - Contracting
  - Team participants and roles
- Integrated CPM Schedule
  - FEL 3
  - Engineering
  - Procurement
  - Construction
- FEL 3 Plans (Not Strategies)
  - Contracting
  - Long lead procurement
  - Resource requirements
  - Clear Project Objectives

Reference: Edward W. Merrow, *Industrial Megaprojects*, page 207

FEL 3 – Readiness

FEL 3 Authorization Gate Front-End Loading Index



- Labor
  - Availability
  - Cost
  - Productivity
- Local materials available
- Plot plans and arrangements
- Soils data
- Environmental Requirements
- Health and safety requirements

- Engineering tasks
  - Detailed scopes
  - Feedstock / product properties
  - Heat and mass balances
  - License packages
  - Piping and instrument diagrams
  - Major equipment specs
  - Take-off based estimate
- Full agreement / buy-in of:
  - Operations
  - Maintenance
  - Business
  - Other Stakeholders
- Contracting Strategy

- Project environment:
  - Community relations
  - Regulatory liaison
  - Local content providers
- Project organization / resources
- Interface management and communication plan
- Critical path items
  - Identification of shutdowns for tie-in
  - Overtime requirements
- Plans
  - Commissioning
  - Startup
  - Operation
  - Manpower
  - Quality Assurance
- Cost / schedule controls

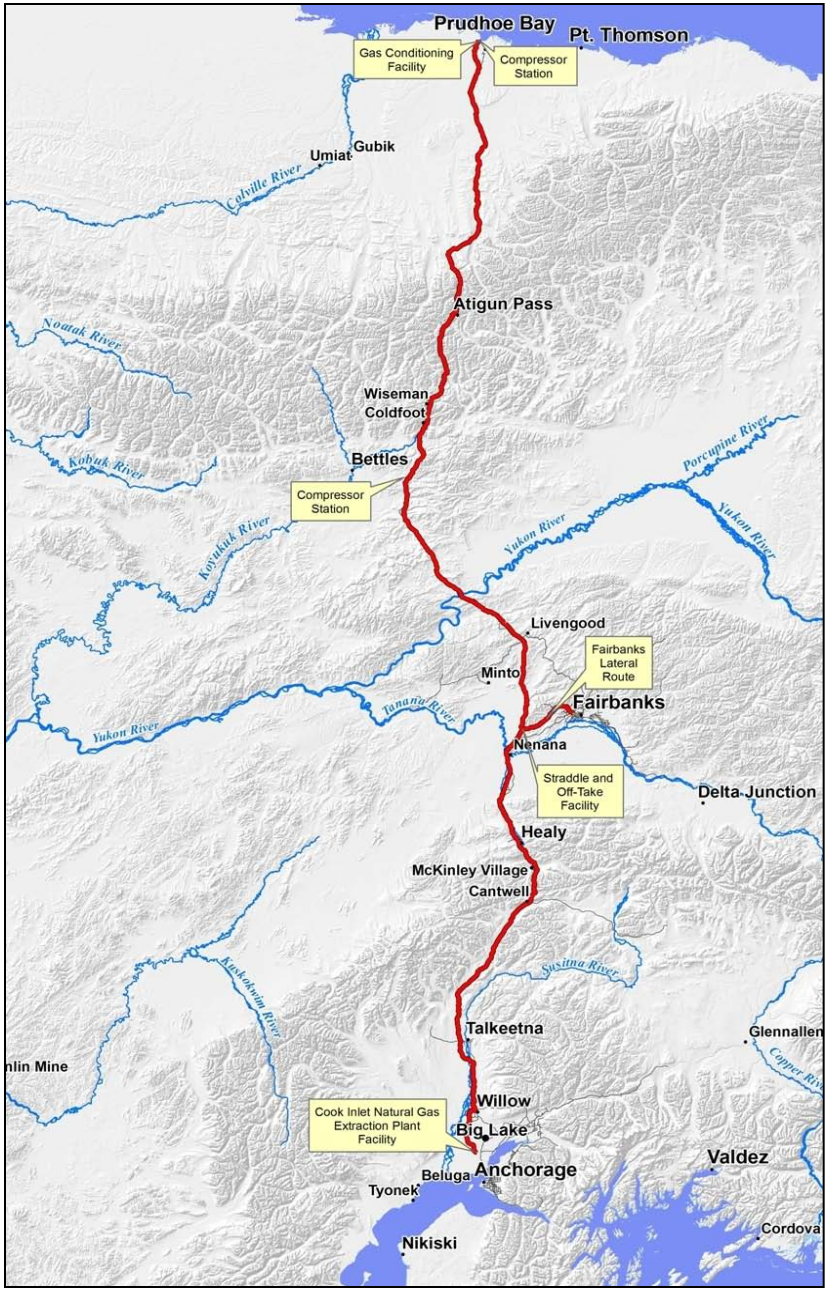
Reference: Edward W. Merrow, *Industrial Megaprojects*, page 210

ASAP Project Update

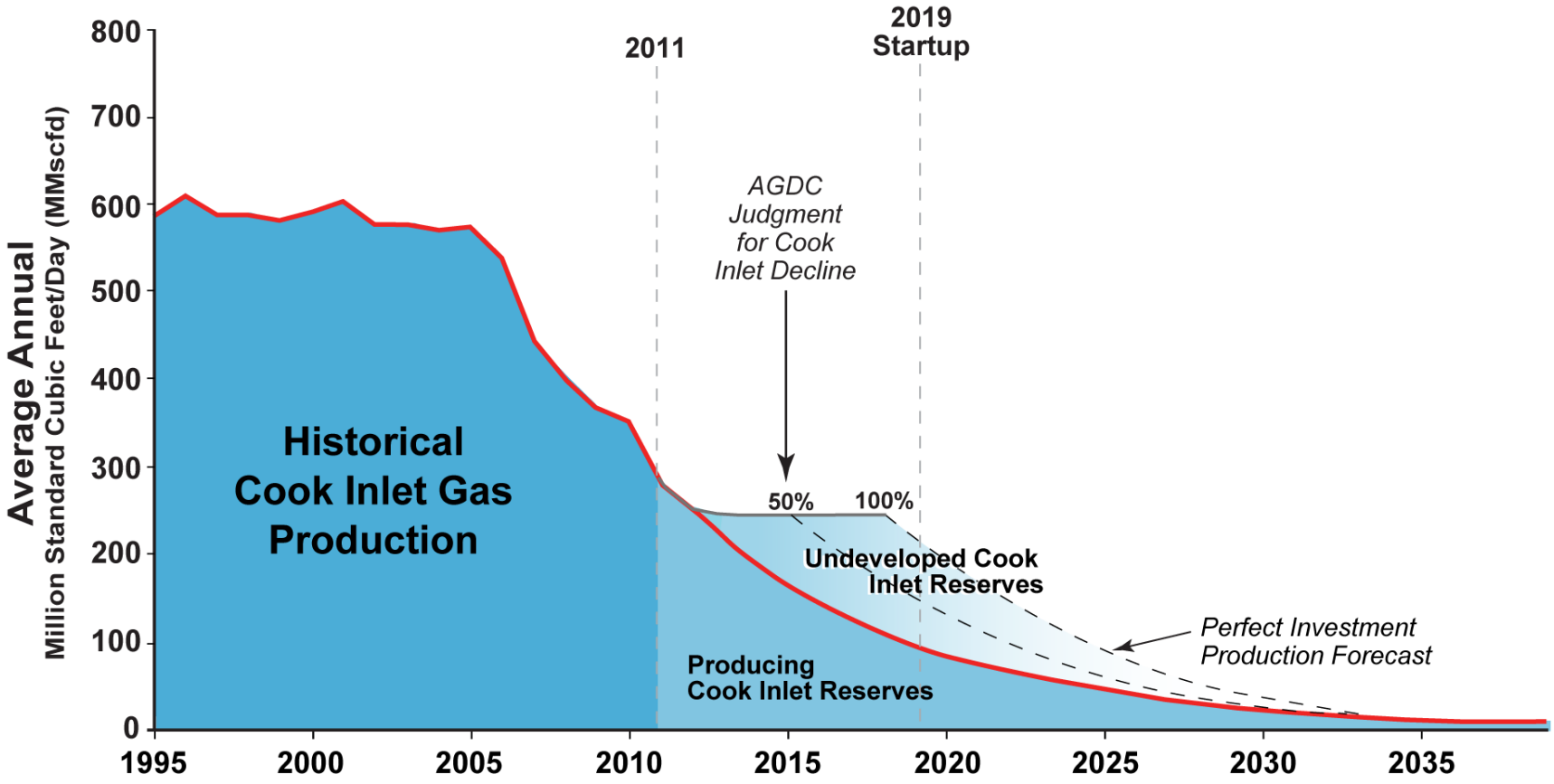
- Utilizing phased stage gate project management approach
- Completed FEL 1 on June 30, 2011; FEL 2 commenced July 1, 2011
- Permitting, commercial, and engineering activities continue in preparation for Open Season in 2013
- ASAP becomes a spur line if APP moves forward.

ASAP Features

- Mainline:
  - 737 miles long, 24” diameter
  - 2,500 psi max operating pressure
- Fairbanks Lateral:
  - 35 miles long – 12” diameter
  - Tie-in with mainline at MP 458
- North Slope Gas Treatment Facility
- Gas Take-off Facility/NGL Straddle Plant
- Two Compressor Stations
- Cook Inlet NGL Extraction Plant



AGDC/DNR Cook Inlet Production Forecast



ASAP Project Plan Findings

- **Cost of Gas to Consumers** – based on reasonable assumptions the tariff models support further ASAP Project work
  - Anchorage $ 9.63/MMBtu in 2011 dollars
  - Fairbanks $10.45/MMBtu in 2011 dollars
- **Alternative Project Schedules** – unlikely another single project will address the Cook Inlet energy shortfall in comparable timeframe
- **Project Cost** - $7.52 Billion, in 2011 dollars - plus/minus 30%

Findings, continued (2)

- **Public Ownership Model** – provides lowest tariff due to lower cost of debt and zero equity
- **Builder/Owner/Operator** – there is interest among Builder/Owner/Operators if private ownership model is selected
- **Anchor Tenants** – LNG anchor tenant appears commercially feasible
- **Business Risks** –
  - Failed open season; increased construction costs; or project delay caused by regulatory/environmental permitting

Findings, continued (3)

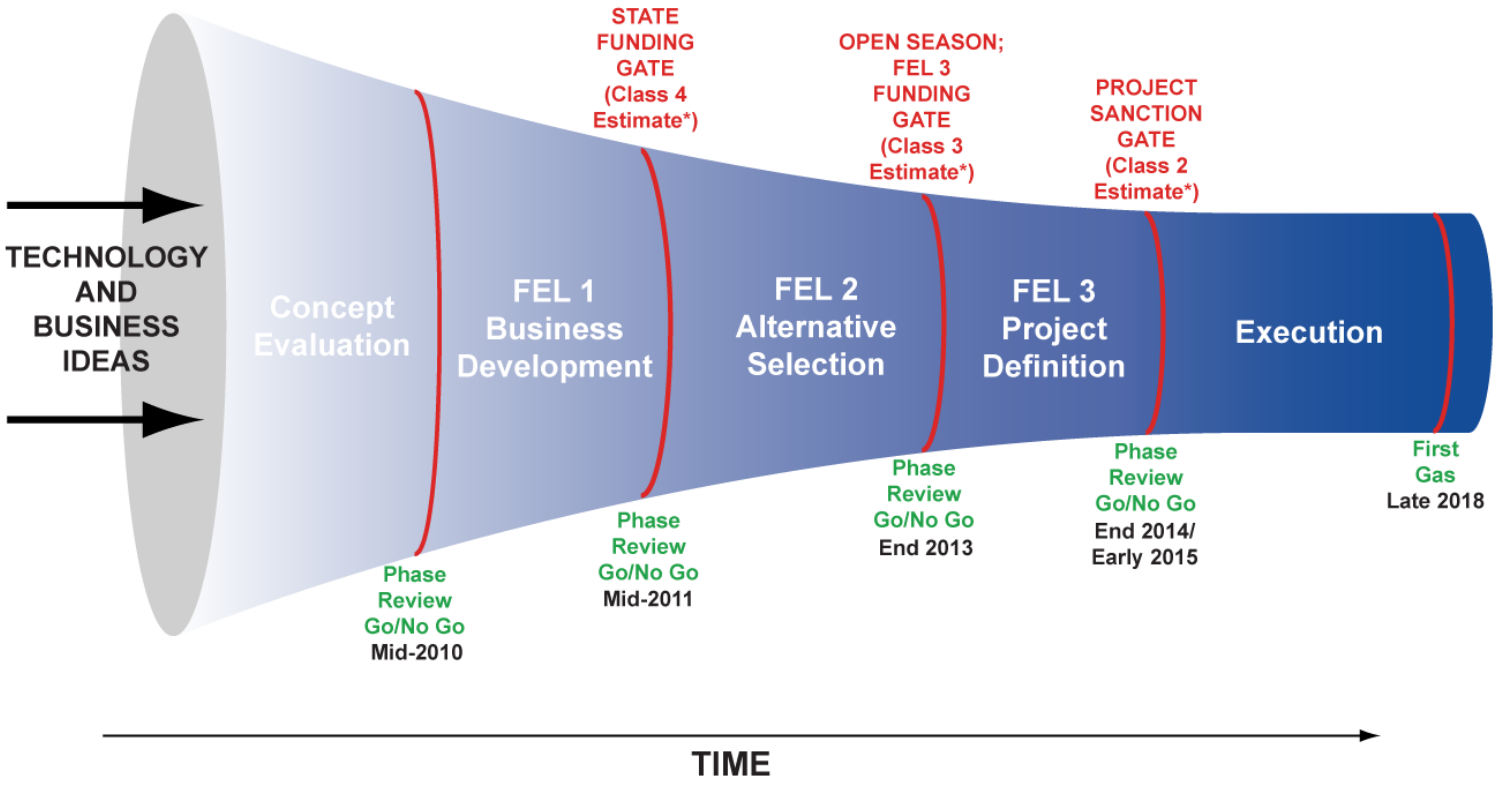
- **Route Selection** – Parks meets HB369 requirements and criteria of environmental impact statement
- **Project Schedule** – Optimized to successfully execute an open season and procure financing
- **State Lease ROW** – ASAP granted first non-conditional pipeline right-of-way by the State for the purpose of transporting North Slope natural gas to market

IPA Pacesetter Evaluation of ASAP

- Project phase - ASAP early project definition
- Significant work required prior to project execution
- ASAP - associated risks inherent with large, complex megaprojects
- Key recommendation: develop a comprehensive project development process based on a phased stage gate project delivery approach

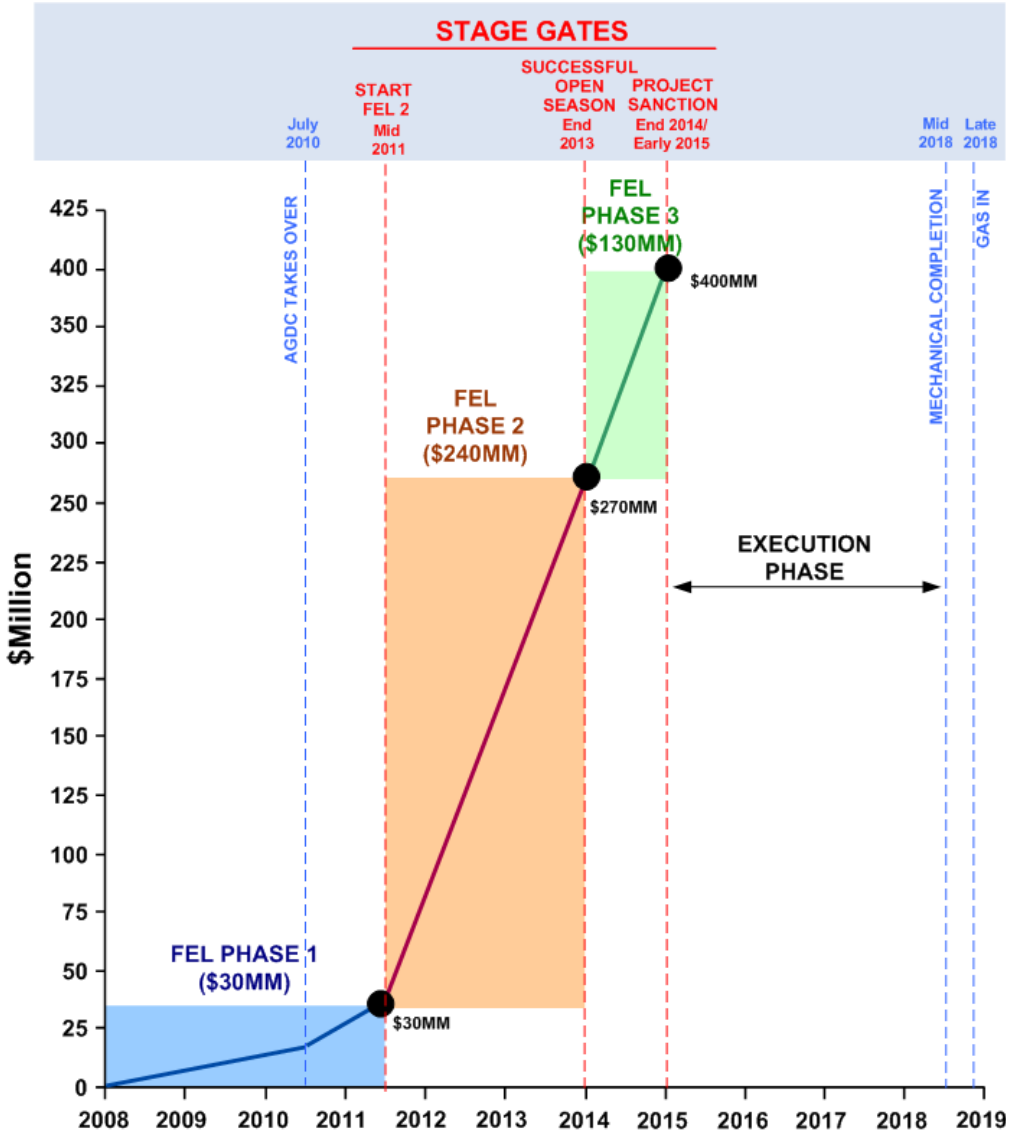
Stage Gate Approach

Front-End Development Progressively Narrows Uncertainty of Cost and Schedule

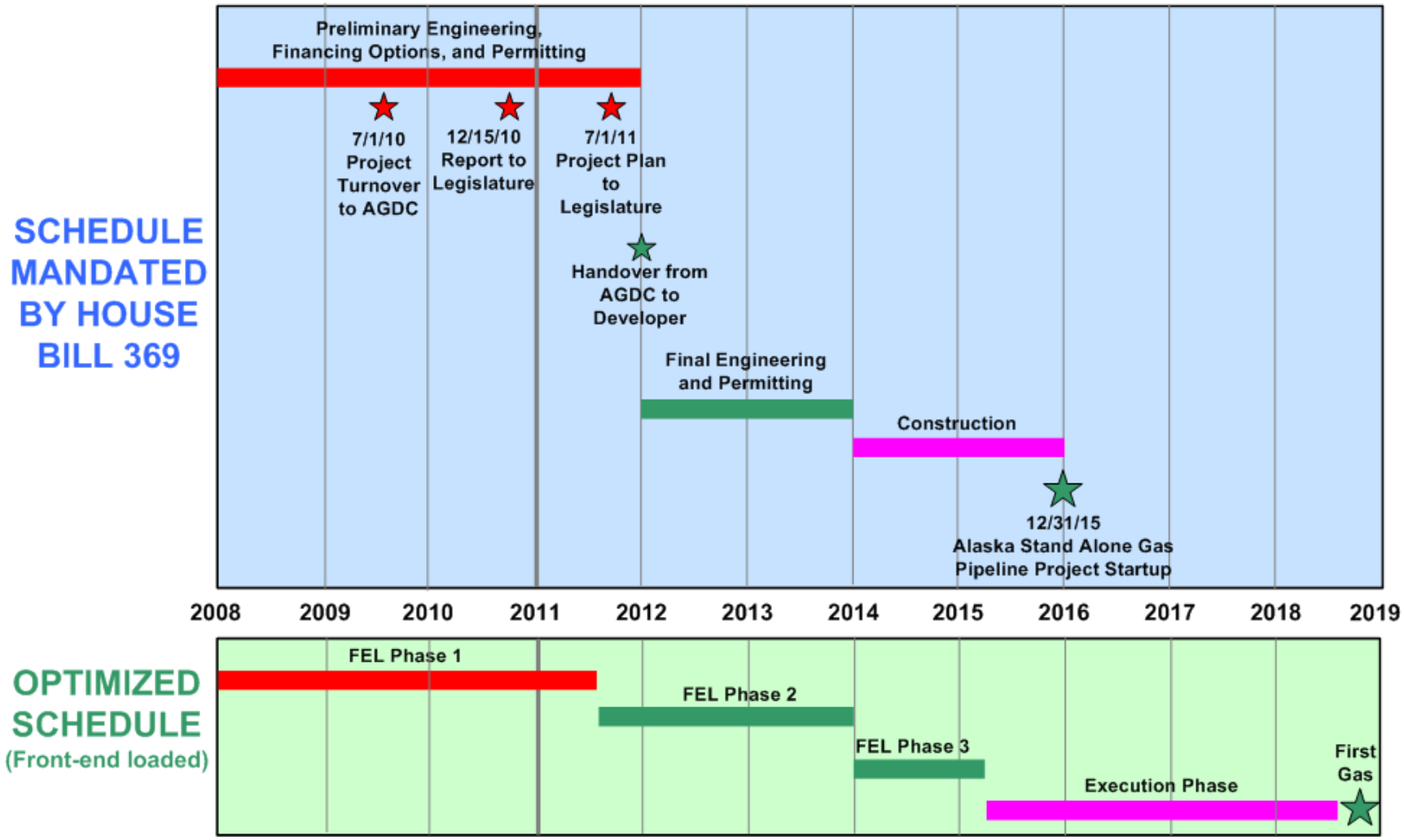


*Refers to AACE cost estimate classes (Association for the Advancement of Cost Engineering). The lower the class number, the higher the confidence in the accuracy of the estimate.

Project Definition Levels



Project Schedule



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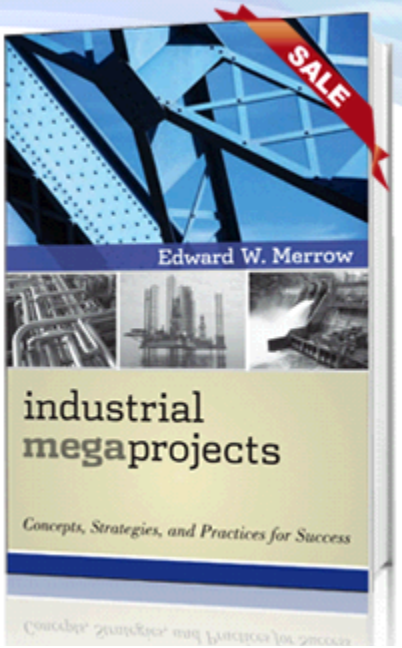

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