COMMENTS TO LEGISLATURE

on GAS CONTRACT and FISCAL INTEREST FINDINGS

to Alaska State Legislature
June 14, 2006

Investment Performance Metrics and Decision-Making: How Do by Oil and Gas Companies Make Investment Decisions?

Dr. Anthony Finizza
Consultant
Econ One Research, Inc.

5th Floor
601 W 5th Street
Los Angeles, California 90071
213 624 9600

Suite 1170
1215 K Street
Sacramento, California 95814
916 449 2860

Suite 2825
Three Allen Center
333 Clay Street
Houston, Texas 77002
713 228 2700

Suite 230
106 E 6th Street
Austin, Texas 78701
512 476 3711

How Oil and Gas Companies Look At Projects

- **Does it offer a strategic fit?**
- **Does it offer diversification?**
- **Does it create wealth (NPV >0 at market cost of capital)?**
- **Treat investment and financing as separate decisions**
  - **To ensure that all investments are evaluated on a consistent basis**
  - **Evaluate project as if it were all equity financed**
  - **But, take account of ability to create value if special financing is available (e.g. federal loan guarantee)**

Choice of Discount Rate

- **Discount at risk-adjusted cost of capital, the expected rate of return that can be realized on similar investments with equivalent risk**
  - **Currently, using 10% for Gasline discount rate**
- **Projects need to be evaluated at the risk-adjusted cost of capital, which may be above the Weighted Average Cost of Capital**
- **What makes a project riskier?**
  - **Uncertainty**
  - **Political risk**
  - **Economic risk**

econ ONE

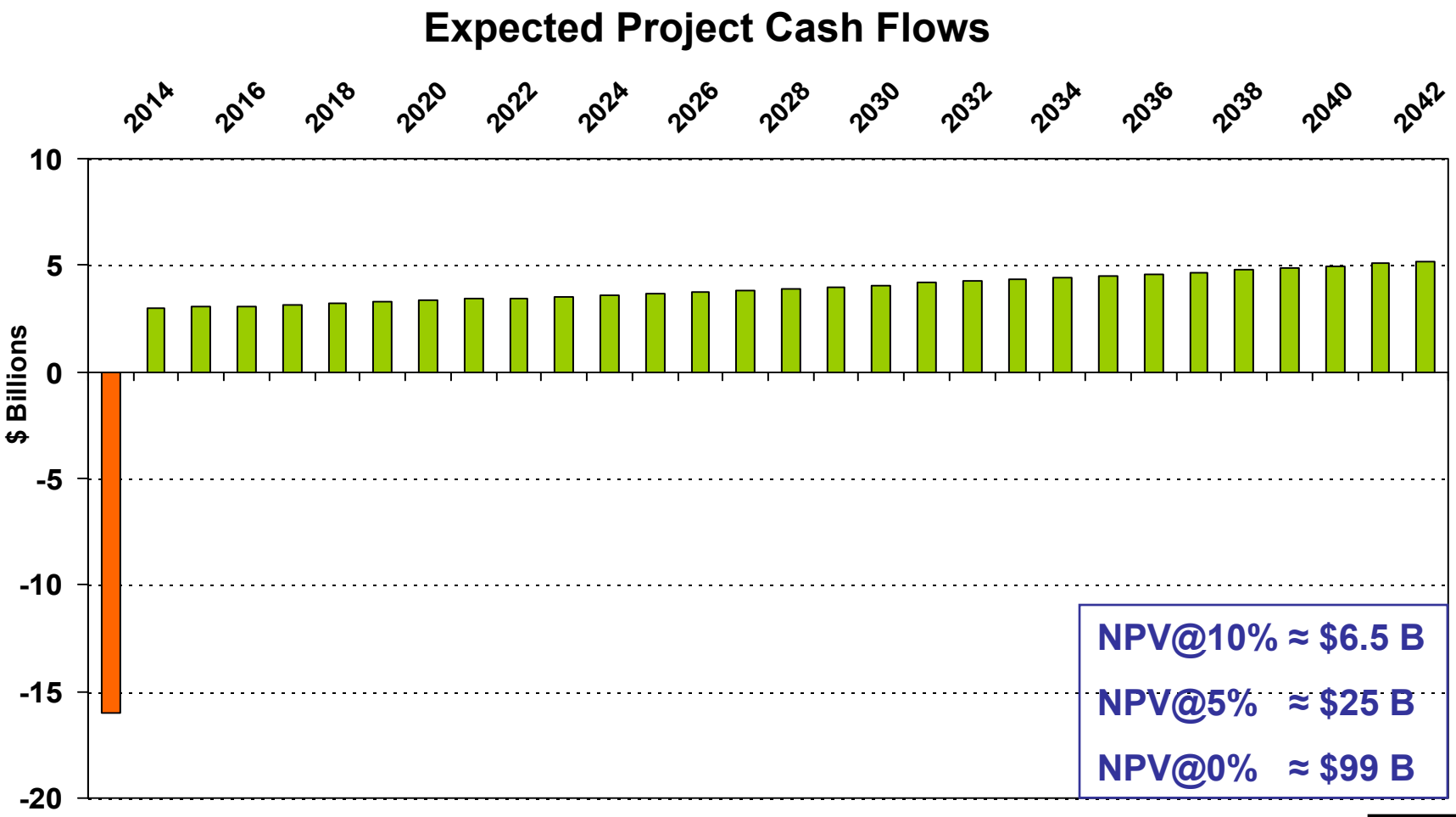
Financial Criteria

- NPV – Net Present Value
- NPV per BOE (Barrels of Oil Equivalent)
- PI - Profitability Index
- IRR – Internal Rate of Return
- Cash Flow (Undiscounted)

Financial Criteria
Net Present Value (NPV)

- **Present value of future cash flows including capital investment**
- **This is the "supreme" financial metric since a project with a positive NPV adds value to the firm**
  - **Value of the firm = PV of all future cash flows**
    = PV of cash flows from assets in place
    + PV of cash flows from future investments
- **Future cash flows discounted at rate that represents uncertainty of cash flows and when they are expected**
- **If a project generates cash in excess of that to compensate for the risk taken, the value of the firm increases**

Stylized Cash Flow



Financial Criteria
NPV per BOE

- **Measure of how much cash flow is generated from reserves found**
- **Measure is highly sensitive to price forecasts**

Financial Criteria
Internal Rate of Return (IRR)

- The discount rate at which the NPV of a project equals zero
- All projects with an IRR greater than the risk-adjusted cost of capital should be accepted when there are no capital budget restraints
- IRR of 10% currently indicates threshold rate of return without significant risk factors
- Energy companies are developing alternative projects above 15%

econ ONE

Potential Inconsistencies with NPV and IRR

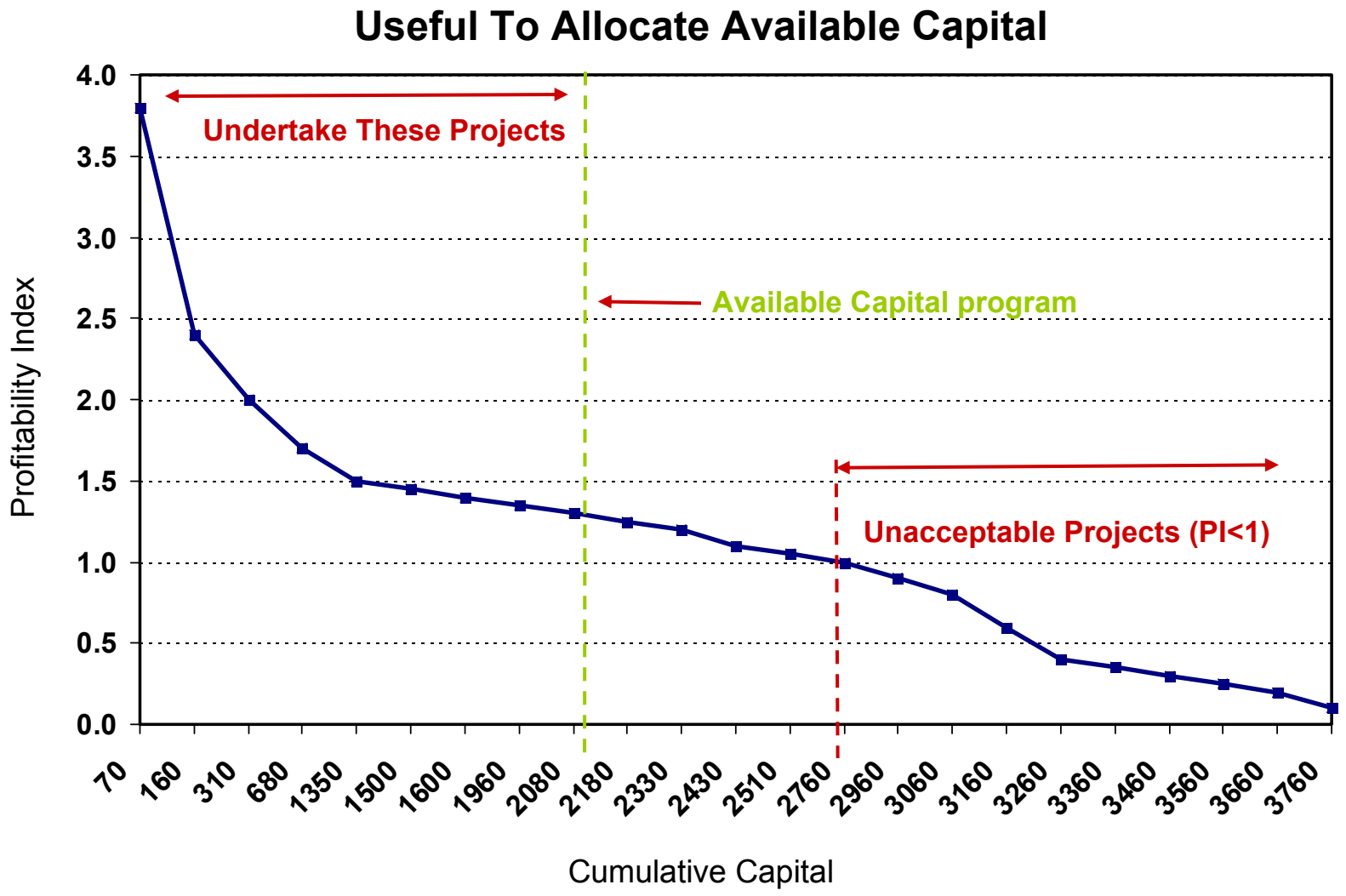
- **The NPV and IRR metrics can be in conflict. NPV dominates.**
- **The IRR should be used to test if a project exceeds the firm's risk adjusted cost of capital, which indicates it is a candidate for acceptance**
- **The IRR should NOT be used:**
  - **To compare mutually exclusive projects**
  - **To compare independent projects that are of different scale or if the timing of the cash flows are vastly different**
  - **To compare independent projects with different risks unless the cash flows have been risk adjusted or if the IRRs are compared to different risk-adjusted hurdle rates**
  - **When the IRR is considerably higher than the cost of capital, since it assumes that proceeds are invested at the IRR rate**

econ ONE

Financial Criteria
Profitability Index (PI)

- **PI = [present value of cash inflows/present value of cash outflows] at a given discount rate.**
  PI = [NPV+PV(Investment)]/PV(Investment)
- **Profitability Index captures the present value per dollar of investment - "biggest bang for the buck."**
- **PI > 1 for those projects which have a positive NPV.**
- **Measure is useful to allocate capital if there are capital restraints.**
- **Array projects from high to low and choose projects with highest PI subject to capital constraint.**

Financial Criteria
Profitability Index (PI)

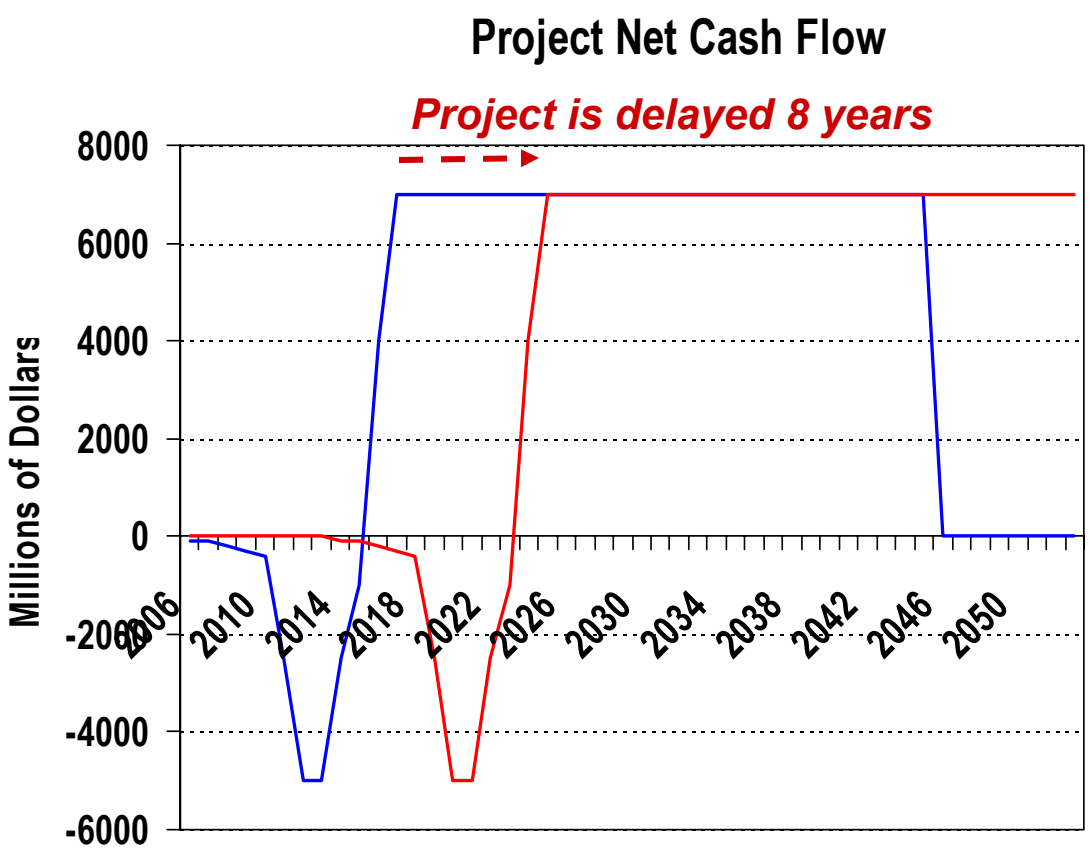


Use of Financial Metrics

Comparison of Gasline Project with Other Opportunity Projects

	Projects are Independent (Can do both)	Projects are Mutually Exclusive (Cannot do both)
	Example: Comparison of Gasline with other International Projects	Example: Comparison of Gasline (Status Quo) with Gasline (Proposed Contract)
No Capital Constraint	• Any of discounting methods work: NPV, IRR • Undertake all with NPV>0 • Note: IRR not valid if projects are of different scale	• If same scale and same risk, pick highest NPV. • If different risk, adjust cash flows for risk and use NPV • Note: IRR not valid for comparing mutually exclusive projects
Capital Constraint	• NPV preferred. • Rank projects by PI and deplete opportunity set until sum of NPVs equal capital available	• Not relevant, since the assumption is that neither projects will exceed capital constraint.

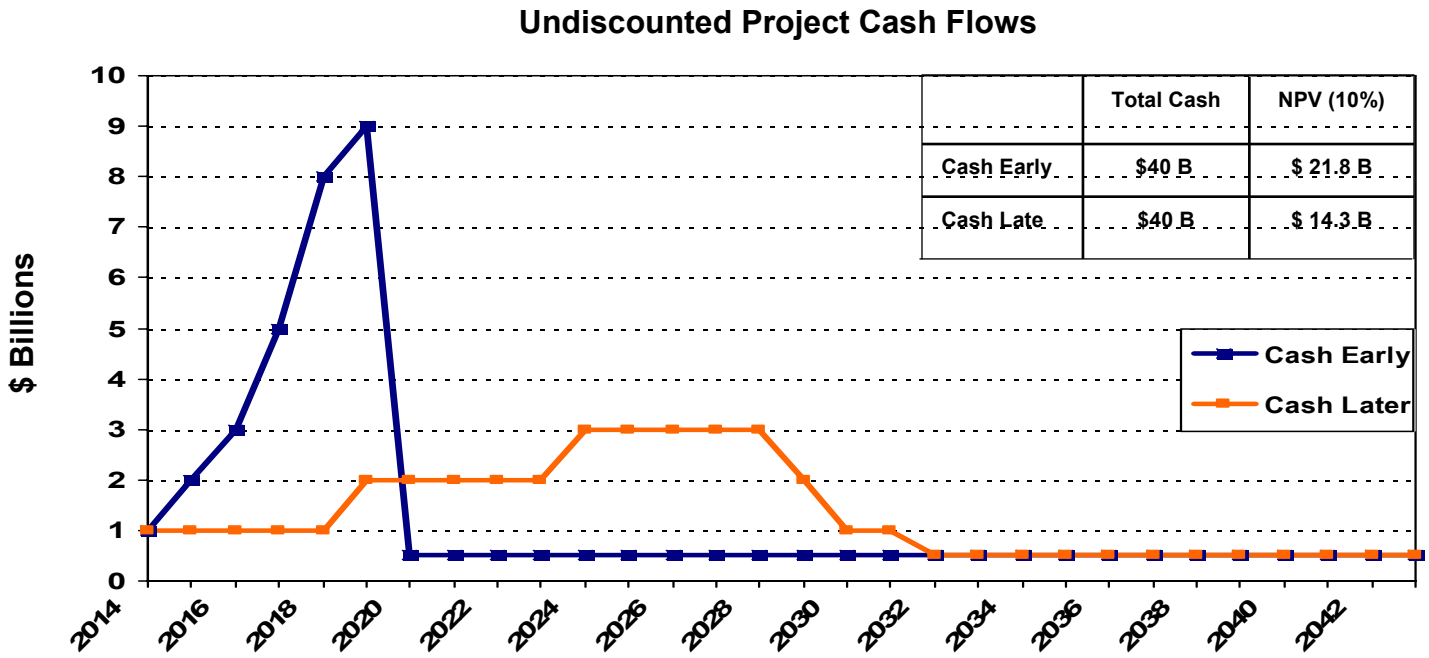
Comparison of Two Stylized Projects



	Project Early	Project Late
NPV10 ($M)	15,858	7,398
IRR (%)	21.6	21.6

Financial Criteria
Cash (Undiscounted)

- Not used as key investment metric
- Often used to view size of project in presentations to sovereign governments
- Antithetical to discounted cash flow analysis
  - Suffers from failure to reward cash early
  - E.g. Cash flows below are equivalent, but not in discounted terms



Use of Financial Metrics

- **Comparing Gasline project with other projects in the firm's project portfolio.**
  - **Assuming capital constraints, an oil and gas company would compare alternative independent projects of the same riskiness on the basis of PI (Profitability Index). If an alternative project is riskier, the PI of the riskier project would be discounted at a higher rate to reflect the riskiness of the cash flows.**
- **Comparing a Gasline proposal with another Gasline proposal or with the "Status Quo."**
  - **An oil and gas company would use NPV (Net Present Value).**
    - **Note that the two proposals may not have the same risk. (e.g. fiscal certainty making cash flows less risky)**
    - **As a practical matter, discount rate adjustment may not be considered.**
- **Evaluating the effect of a delay in the Gasline.**
  - **An oil and gas company would use NPV, not IRR (Internal Rate of Return).**
    - **Note: the IRR of a project in which the cash flows are simply delayed will be unchanged.**

econ ONE

Incorporating Risk in the Discount Rate

- If cash flows are risky, they should be adjusted to account for this risk
- As a practical matter, this is not generally done
- Instead, firms may adjust the discount rate to account for risk
  - Somewhat subjective, but guided by analytical work
  - e.g. Ibbotson work indicated the following international costs of capital, based on market data and country credit ratings
    - US ~ 12%
    - Norway ~13%
    - Qatar ~ 21%
    - Venezuela ~ 25%
  - An oil company comparing projects in the US with those in other countries will increase the discount rate to reflect the divergent risks
  - They will also lower the discount rate if there are less risky cash flows from guaranteed purchasers, fiscal certainty, etc.

Potential Constraints

Producers will not use financial metrics exclusively

Producers will address additional issues in their project evaluation

- **Do we have the personnel and skill sets to undertake the project?**
- **Will Management be able to focus on managing the project?**
  - **Is the project so complex that it will distract Management's attention from other projects?**
  - **Does the project size offer economies of scale?**
- **Is the project discretionary?**
- **What is the effect of a delay on project economics?**
  - **Will a delay allow us to undertake other projects in a more timely manner?**
    - **Do we risk losing the project or a more attractive project if we delay?**
  - **Do we have contractual obligations that impact timing?**
- **Does the project offer improved diversification?**
  - **Business Line**
  - **Regionally**
- **Do we have a competitive advantage in this project?**