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Turnkey Facilities Contractor

Flare Gas Utilization Projects - Central Asia and Africa
Turnkey Flare Gas Projects

• Many Flare Gas Recovery Projects are Economical
  • Environmental Effects Are a Colorful Benefit

• Problems
  • Capital
  • Discount Rate Used
  • Risks on the Assumptions

• 2 Types of Projects
  • Internal – Reservoir Reinjection
  • External – Gas to Market
Internal – Gas Reinjection

• Costs
  • Injection Compression
  • Injection Well

• Benefits
  • Additional Oil Recovery
  • Future Produced Gas

• Discount Rate used for Decision Making
  • Producer
  • Government
Injection Economics

• Producer
  • Incented for maximized immediate production
  • Use cash stream to obtain capital for other development
  • Shareholder expectations
  • 25% discount rate - $80 bbl in year 5 has $26 PV

• Country/NOC
  • Maximize value over project life at appropriate return
  • 10% discount rate - $80 bbl in year 5 has $50 PV
Production Profile – Gas Reinjection

RATE VS TIME

PRODUCTION RATE

ADDITIONAL OIL

ORIGINAL RECOVERABLE OIL

PRODUCED GAS

TIME

- 5 -
Production Profile

GAS RATE VS TIME

GAS RATE

FLARED GAS

ECONOMIC FACILITY

DESIGN VOLUME

TIME

- 6 -
Production Profile

RATE VS TIME

PRODUCTION RATE

DEFERRED OIL

PRODUCED GAS

ADDITIONAL OIL

ORIGINAL RECOVERABLE OIL

TIME
Aside - Liquids Removal

- Liquids should ALWAYS be removed from associated gas
  - C3+ (cooking gas) has high socioeconomic value
  - C5+ (condensate) returned to crude for sales

- 7 barrels of C5+ per 1 mmscfd
  - $9.5 million/year @ 50 mmscfd, $80/bbl
External - Monetize The Future Gas

Producer (Flaring) → Gas → Midstream → Gas → User

- LNG, CNG, Power Generation
- Gas Distribution
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Government

$ Royalties
$ Royalties Reduction

$ Payment

Reporting

- $ Payment

Government

- $ Royalties
- Royalties Reduction
External - Monetize The Future Gas

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World Bank

Government

$ Payment

Royalties Reduction

Reporting

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Conclusions

- Require long term economics to prevail
- Government leadership and policy to influence production decisions
- Reservoir education and modeling

Questions - bob@qualitas.ab.ca