



G L O B A L F O R U M

**On Flaring and Venting Reduction
and Natural Gas Utilisation**

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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

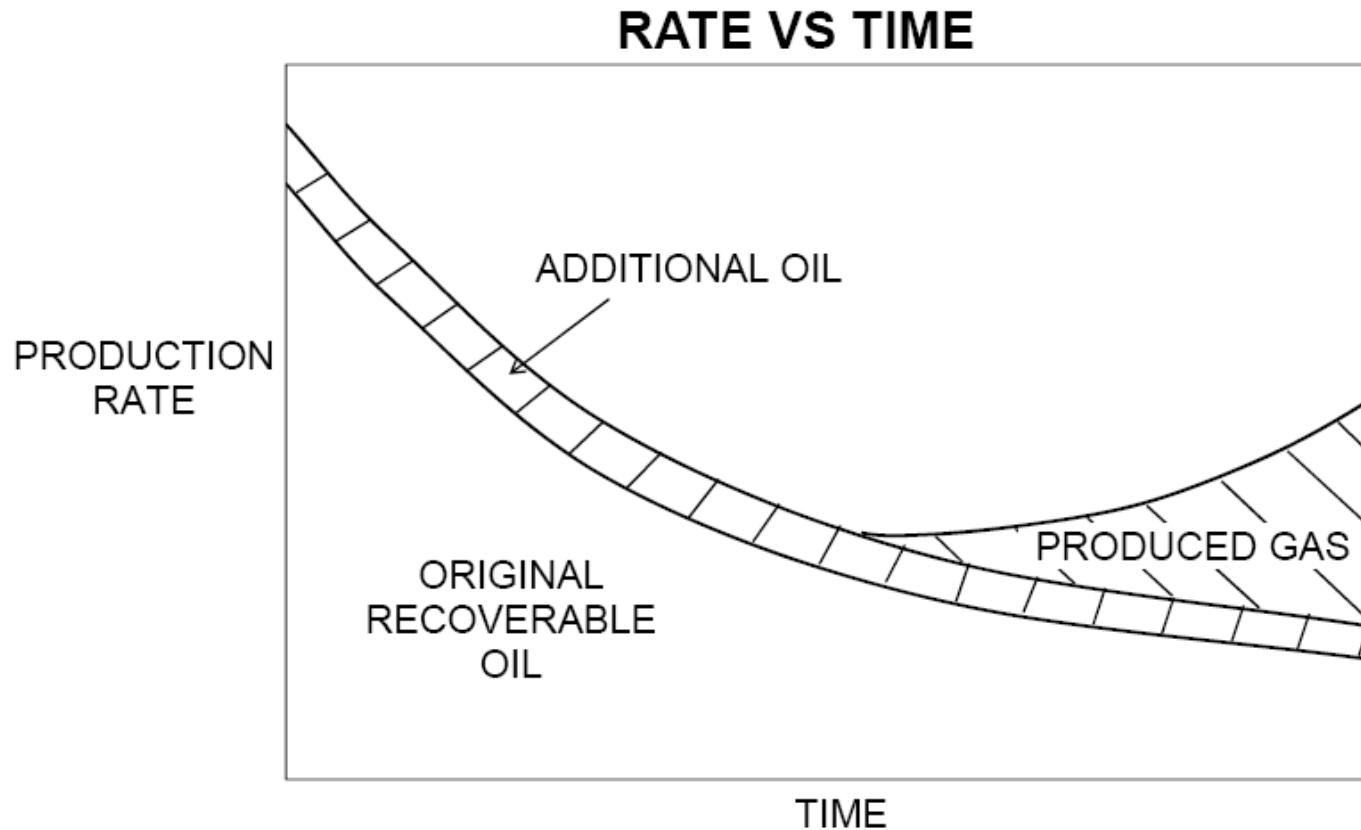
Internal – Gas Reinjection

- Costs
 - Injection Compression
 - Injection Well
- Benefits
 - Additional Oil Recovery
 - Future Produced Gas
- Discount Rate used for Decision Making
 - Producer
 - Government

Injection Economics

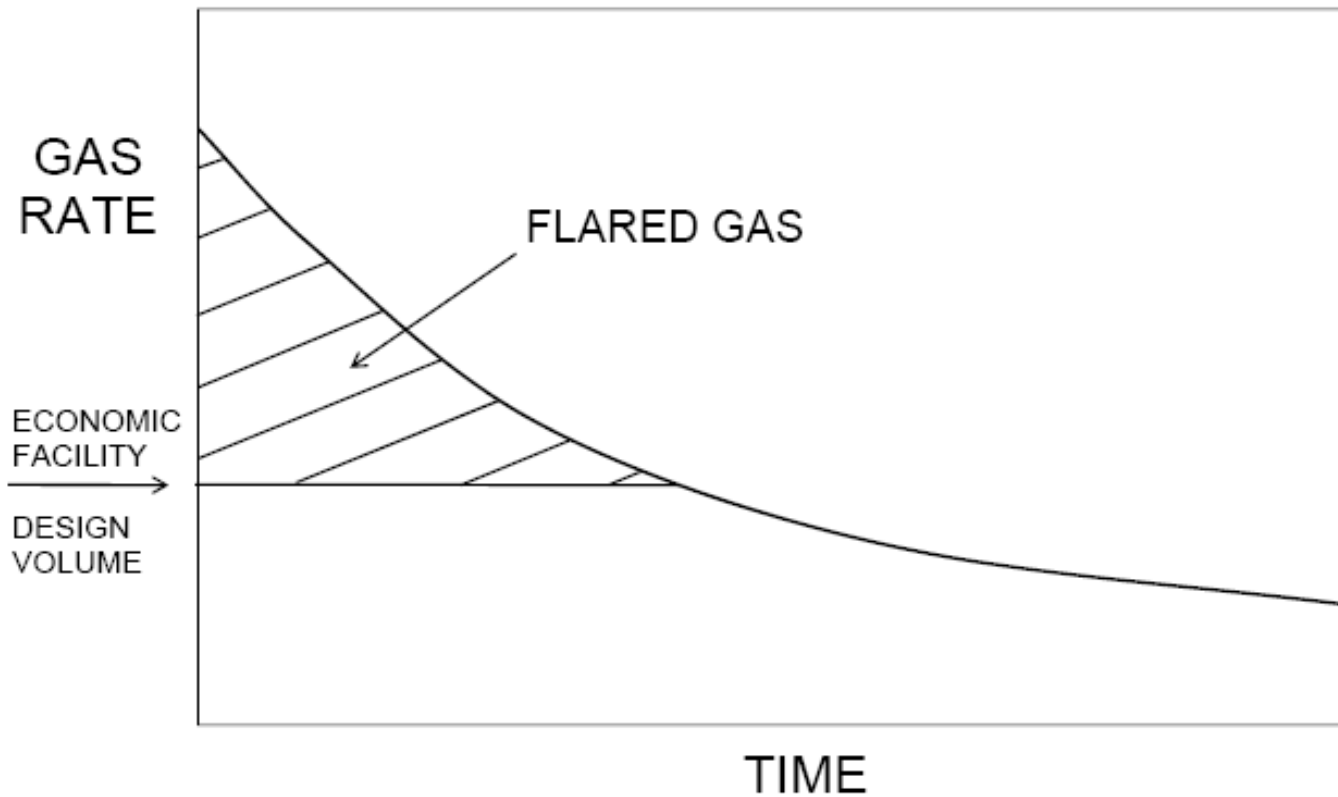
- Producer
 - Incented for maximized immediate production
 - Use cash stream to obtain capital for other development
 - Shareholder expectations
 - 25% discount rate - \$80 bbl in year 5 has \$26 PV
- Country/NOC
 - Maximize value over project life at appropriate return
 - 10% discount rate - \$80 bbl in year 5 has \$50 PV

Production Profile – Gas Reinjection



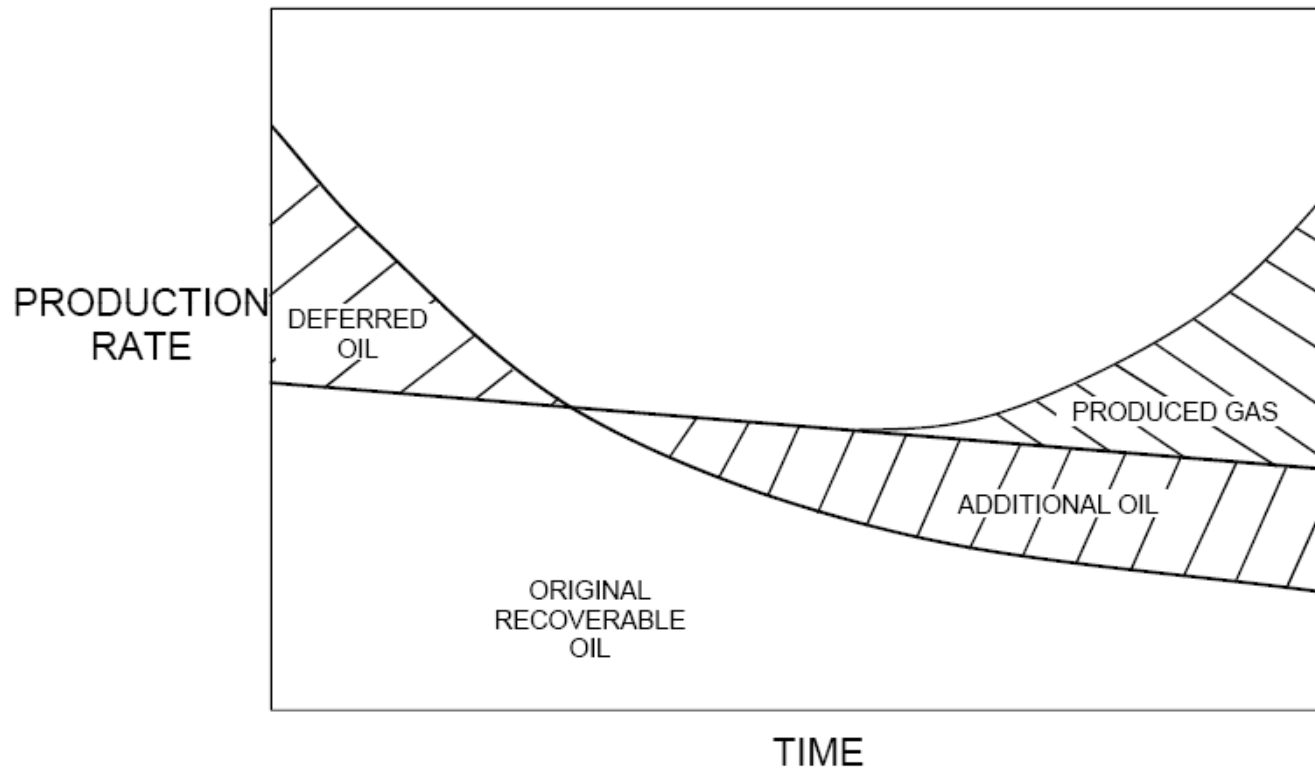
Production Profile

GAS RATE VS TIME



Production Profile

RATE VS TIME



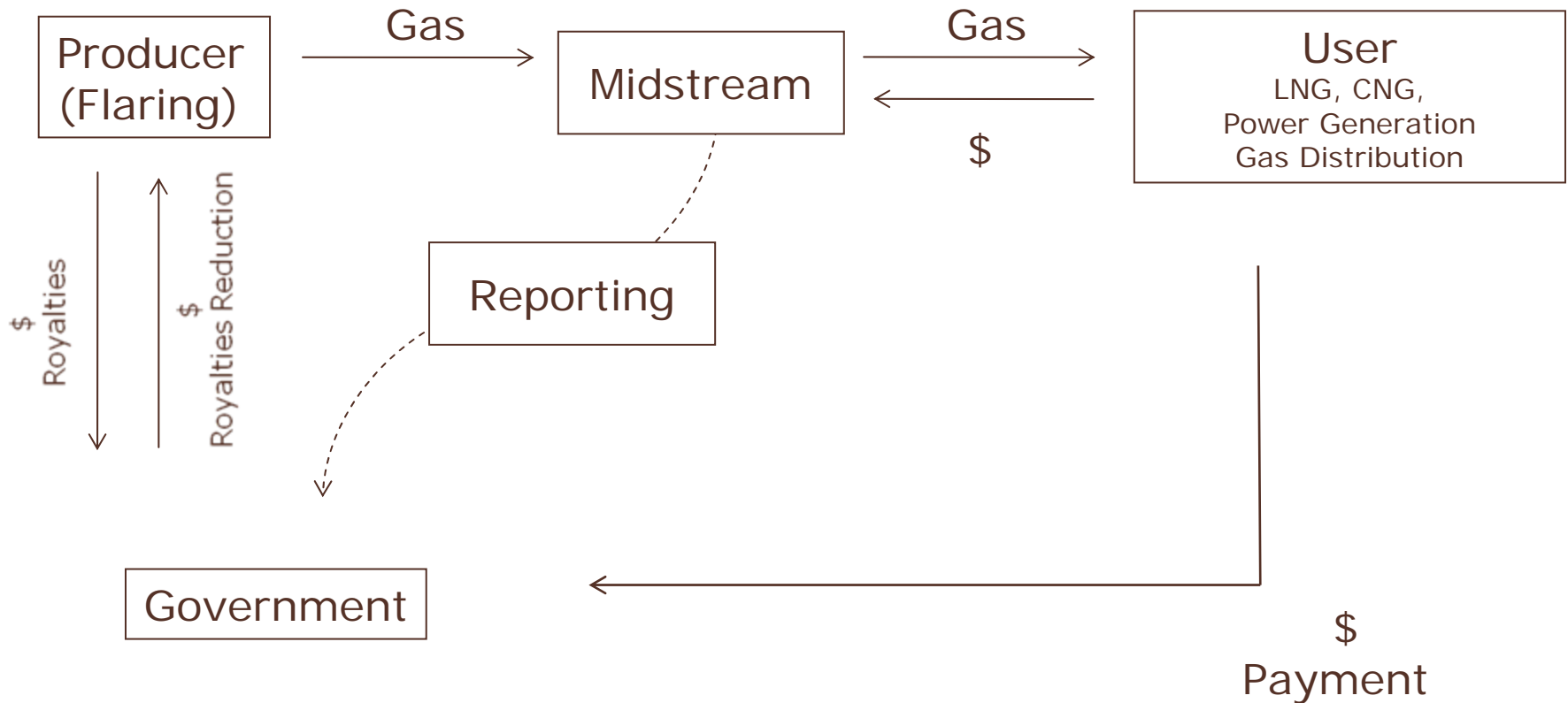
Aside - Liquids Removal

- 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

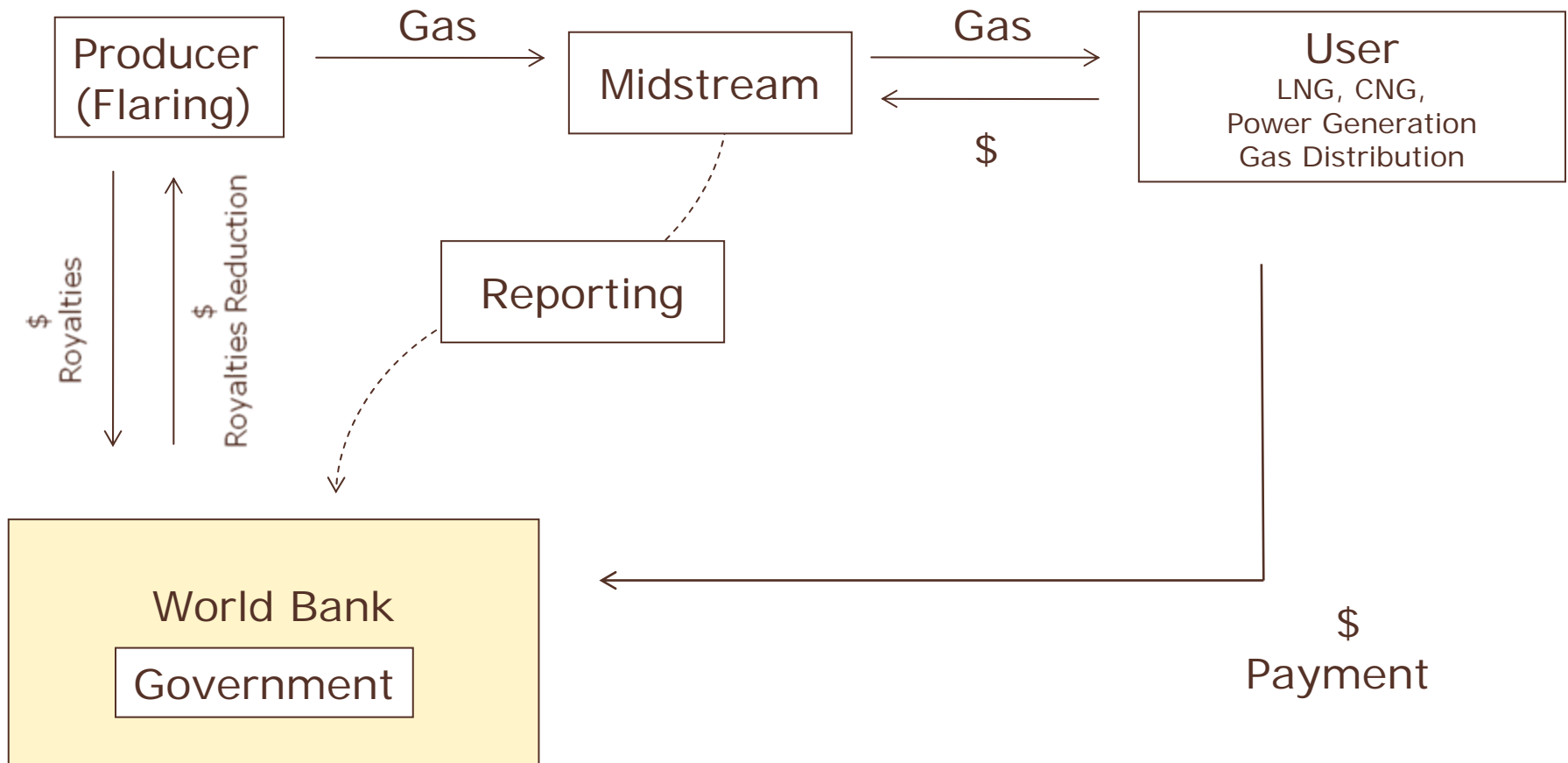
External - Monetize The Future Gas



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External - Monetize The Future Gas



Conclusions

- Require long term economics to prevail
- Government leadership and policy to influence production decisions
- Reservoir education and modeling
 - **Questions - bob@qualitas.ab.ca**