

Innovative Energy Technologies Program Project Economic Evaluation

Projects submitted under this program are expected to provide quantifiable economic benefits to Alberta through an expected increase in reserves from oil, oil sands and gas deposits resulting in incremental production and royalties to the Alberta Crown. The economic forms required to be completed and submitted with the application can be found at the following link:

<http://www.energy.gov.ab.ca/docs/oil/docs/EconomicTemplate.xls>) The pilot or demonstration project economic evaluation, full commercial project evaluation and projections of overall economic benefits to the province through the wide application of the innovative technology will be considered in the Alberta Energy evaluation of the project for Innovative Energy Technology Program (IETP) funding.

Pilot Project and Full Commercial Project Economic Evaluation

To streamline the application review process, the applicant is requested to summarize both the pilot or demonstration project and the full commercial project economic evaluations separately following the format of the attached summary tables (Table 1: Production Summary; Table 2: Cost Summary; Table 3: Royalty Summary; Table 4: Cash Flow Summary; Table 5: Economic Indicators). Summary tables are required for both the risked and unrisked case. State all assumptions used in the analysis and provide a discussion of the risks and uncertainties related to the assumptions. It is recognized that the quality of available information is highest for the pilot project and may require some additional extrapolation and interpretation in the case of the full commercial project as commitment to the commercial project will be dependent on the outcome or success of the pilot or demonstration project. State all assumptions used in the analysis and provide a discussion of the risks and uncertainties related to these assumptions. Given the wide range of potential outcomes, it is requested that you provide your information on an unrisked basis and provide a probabilistic assessment of the risk weightings separately. This will facilitate a consistent review between projects.

The applicant may provide additional economic data in support of its application. Please retain all working papers and documentation (including output from economic evaluation programs) in support of the filed economic indicators as we may request additional information to support the application during the review process.

The following summarizes the procedures, assumptions and guidelines to be applied in the submission of economic information:

1. Production forecast:

Using the format in **Table 1**, Production Summary, the applicant will provide production and sales volume forecasts for the base production case (if applicable), the incremental production case, and the combined total production case. The base production case assumes operation of the project using conventional technology and production practice until the economic limit is reached. The incremental production case is the improvement

over the base case that is directly attributable to the innovative technology. The combined total production case is the base production case plus the incremental production case. The following information should be provided in support of the forecasts:

- Applicable historical data, including production plots, decline rates, production and sales volumes;
- A reservoir characterization and assessment;
- Technical information or data supporting the forecast recovery factors under the incremental production forecast, (e.g., reservoir simulation, laboratory evaluations, results achieved from other experimental projects);
- A detailed discussion of the major technical risks and other uncertainties associated with the incremental production forecast, and a probabilistic assessment of potential variations from the forecast.

2. Cost Forecast:

The applicant will provide a listing of the major capital items (with an installed cost greater than \$10,000) and operating cost items in **Table 2 Cost Summary**. Where fuel costs are a significant portion of operating costs, fuel costs should be separated from other operating costs. The applicant will provide a detailed discussion of factors that could result in material deviations from the cost forecast. Wherever possible, all capital costs should be categorized as either strategic or sustaining. Strategic capital is that which expands production, while sustaining capital is that which maintains production.

3. Royalty Forecast:

The applicant will provide a summary of forecast royalty rates and royalty payments by commodity using the format in Table 3 Royalty Summary. (Freehold royalties must be identified separately for all cases where appropriate.)

4. Cash Flow Forecast:

The applicant will provide a cash flow forecast in Table 4 Cash Flow Summary.

5. Economic Indicators:

To assess the sensitivity of Crown royalties on project viability, the applicant will determine the following economic indicators in Table 5 Economic Indicators.

- Internal rate of return;
- Net Present Value (NPV);
- Payout period in months (undiscounted).
- NPV of Crown royalty payments.

The analysis should include Crown royalties for the pilot project (including any royalty benefits granted under other oil or gas royalty programs administered by Alberta Energy assuming no IETP benefits are provided. Refer to Section 3 for information on other royalty programs that may apply to your project.

6. General economic assumptions:

The following methodology and assumptions will be used in the economic evaluation:

- NPV and other economic indicators requiring discounted cash flow analysis will be calculated using discount rates of 6%, 8%, 12% and 15%.
- Mid-period discounting.
- The inflation and price forecasts used in the economic evaluation will be based on the most recent survey published by Chenery Dobson Resource Management Ltd: “Survey of Hydrocarbon Price Forecasts Utilized by Canadian Petroleum Consultants and Canadian Banks”. As Dobson’s survey is published twice per year (January and July), the July 2005 survey will be used for the second round of applications. The publication is available at the Alberta Energy and Utilities Board (EUB) library, and is also available at a nominal cost from:
*Chenery Dobson Resource Management Ltd.
 1304 505- 3 Street S.W.
 Calgary Alberta T2P 3E6
 Telephone (403) 262 3305*
- Forecast inflation rate: The inflation rate for the first 15 years of the project is based on Dobson’s consultant Consumer Price Index (CPI) forecast. The forecast inflation rate after year 15 (if applicable) is the 15-year growth rate shown in Dobson’s consultant price forecast survey.

Commodity price forecast:

- The following large firm consultant nominal average forecasts from Dobson’s survey will be used:
 - **Gas:** Aggregator Blended at Plant Gate.
 - **Ethane:** Ethane at Plant Gate.
 - **Propane, Butane and Condensate:** FOB Edmonton.
 - **Light Oil:** Edmonton Light Sweet Crude.
 - **Medium / Heavy Oil:** Applicable Hardisty price forecast.
 - **Bitumen:** Bitumen price at the field would be forecasted using WTI at Cushing in Canadian dollars multiplied by 0.5 (Note that the 15-year Dobson nominal price forecasts reflect the impact of inflation. The inflation rate forecast after year 15 of the project (if applicable) is the 15-year Dobson growth rate).
- **Forecast Natural Gas Liquids (NGL) price deductions:** Plant gate prices are based on Edmonton prices less the applicable transportation and fractionation deductions. The forecast inflation rate is applied to the historical NGL allowances used for Crown royalty calculation purposes (based on the rolling average for the 3 most recent production years). The historical averages to be used for the first application cycle are shown in **Attachment 1** (these will be updated (if required) for subsequent application rounds).

7. Royalty Regime:

Alberta Energy maintains generic royalty regimes for each major resource commodity: oil sands, crude oil, and natural gas and natural gas by products. In addition to the IETP, there are a number of other royalty programs that may be applicable for your project. Applicants can refer to the publication [Oil and Gas Fiscal Regimes of the Western Canadian Provinces and Territories](#) for summary descriptions of Alberta’s generic royalty regime and

descriptions of our royalty programs. **Attachment 2** provides additional program summary information for your assistance.

8. Project Funding Status

Royalty adjustments may be limited if total direct support from the Government of Alberta exceeds 30% of eligible project costs or if total direct and indirect support from the Government of Alberta, (including the royalty impact of cost deductibility in royalty calculations), exceeds 50% of eligible project costs. Additionally, cumulative funding is capped at 50% when costs are shared with other governments. In this instance, the royalty adjustment may be reduced from 30% to ensure that total government funding does not exceed 50% of total eligible project costs. The applicant should provide a tabulation of other project funding applications, including:

- Background information on the applicable program: Government agency administering the program, program duration, funding limits, qualification criteria, etc;
- Details of the application, including submission date, the amount and type of funding requested (loan, grant, other type of benefit) and applicable terms and conditions of the funding;
- Status of the application, including application process milestones and expected timeline for receipt of funds if project approved.

Please note that any funding relief from the federal Scientific Research and Experimental Development program will not be considered when determining funding from other governments.

9. Facilities Diagram:

The applicant should submit a process flow diagram and site diagram, including production equipment, and connected pipelines, gathering and processing facilities.

Overall Project Economic Benefits

Projects approved under this program are primarily expected to provide quantifiable economic benefits to Alberta through an expected increase in reserves from oil and gas deposits resulting in incremental production and royalties to the Alberta Crown.

Successful projects are expected to have broad applicability throughout Alberta. As a secondary consideration, projects are also expected to provide quantifiable economic benefits to Alberta in areas such as employment, taxes, sales, new commercial opportunities, new investment and exports. Additional benefits may also accrue from reduced energy consumption and costs over conventional technology applications.

Please provide an evaluation of the additional expected benefits from the project separate from the royalty benefits. Where appropriate provide a quantitative assessment including a spreadsheet stating all assumptions.

Attachment 1:

Natural Gas Liquid (NGL) Transportation and Fractionation Allowances:
Average for production years 2001-2003
(\$ / M³)

NGL Transportation Region	Transportation Allowance: Specification propane/butanes	Transportation Allowance: Specification pentanes plus	Transportation Allowance: NGL mix	Fractionation Allowance: NGL mix
1	6.08	9.47	10.62	9.50
2	1.87	10.57	14.57	9.50
3	6.64	15.27	19.08	9.50
4	7.52	13.76	10.38	9.50

Note: Refer to Alberta Gas Royalty Guidelines, Appendix F for description of NGL transportation regions.

Attachment 2: Summary of Alberta Royalty Programs

Conventional Oil Regime

Please note that generally these royalty programs require specific approvals before they apply.

Enhanced Oil Recovery Royalty Relief

<http://inform.energy.gov.ab.ca/il/Documents/Published/IL-2003-16.PDF>

Program Benefit: The Crown shares in certain incremental costs of EOR production by forgoing royalties on a portion of the incremental tertiary production (there are additional provisions exclusive to CO₂ injection).

Third Tier Exploration Oil Royalty Holiday

<http://inform.energy.gov.ab.ca/il/Documents/Published/IL-1993-08.pdf>

Program Benefit: This program reduces royalty, by up to one million dollars, on the oil well that results in the discovery of a new productive pool.

Reactivated Oil Well Holiday

<http://inform.energy.gov.ab.ca/il/Documents/Published/IL-1993-03.pdf>

Program Benefit: Provides royalty exemption on the first 8000m³ of eligible oil produced.

Low Productivity Oil Well Royalty Reduction

<http://inform.energy.gov.ab.ca/il/Documents/Published/IL-1993-02.pdf>

Program Benefit: Royalty is capped at 5% for up to 16,000m³ in aggregate oil production from each eligible well.

Horizontal Re-entry Oil Royalty Reduction

<http://inform.energy.gov.ab.ca/il/Documents/Published/IL-1993-04.PDF>

Program Benefit: The crown royalty rate is capped at the rate set for the average production volume for the most recent 12 months in which production occurred before re-entry.

Experimental Project Petroleum Royalty Regulation

<http://inform.energy.gov.ab.ca/il/Documents/Published/IL-1992-08.PDF>

Program Benefit: Royalty rate is capped at 5% to any oil well included in an experimental scheme, as approved by the Energy and Utilities Board, for a period specified and approved by the minister.

Conventional Gas Regime

Deep Gas Royalty Holiday (DGRH) Program

<http://inform.energy.gov.ab.ca/il/Documents/Published/IL-1985-29.PDF>

Program Benefit: The DGRHP applies to wells drilled to depths greater than 2,500 metres. The holiday value ranges from \$0.5 million net royalty at 2,500 metres to \$3.6 million net royalty at 5,500 metres. Benefits must be taken within ten years of the finished drilling date.

Otherwise Flared Solution Gas (OFSG) Program

Refer to Chapter 3, Section 6.5 of the Alberta Natural Gas Royalty Principles and Procedures:

<http://www.energy.gov.ab.ca/gmd/images/2003GuidelinesChapter3.pdf>

Goal: Encourages the reduction in the volume of solution gas being flared in the province by waiving the royalty in cases where it has been determined that it is uneconomic to conserve flared gas.

Program Benefit: Wells attached to batteries that had an established history of flaring up to the end of November 1998 were automatically approved for the OFSG program. For wells excluded from the automatic approval process, the operator must submit an OFSG application with an economic evaluation of flare gas conservation. Subject to AEUB approval, royalty is waived on solution gas volumes that are uneconomic to conserve. The OFSG royalty waiver lasts for a maximum ten-year period.