

# Upstream Petroleum Economics, Risk & Fiscal Analysis

Cash Flow Analysis, Fiscal Regimes, Risk & Decision Analysis

02<sup>nd</sup> - 04<sup>th</sup> July 2024 at Bandung, Indonesia | 26<sup>th</sup> - 28<sup>th</sup> November 2024 at Kuala Lumpur, Malaysia



## Petrosync Distinguished Instructor Guy Allinson

Director  
Petroleum Economics Pty Ltd  
Senior Lecturer at University of New South Wales

Case Studies,  
Discussion, and many  
Practical exercises!

### Position and Credentials:

- Over 40 years international experience in petroleum economics, risk and fiscal analysis
- Past President of New South Wales SPE Section
- Past NSW Chairman of SPE Management & Information Committee
- Delivered over 180 industry training courses on Petroleum Economics and related subjects in Asia Pacific, Australia and other parts of the world
- Consults for the international oil & gas industry on asset valuations and the commercial, economic and fiscal aspects of oil & gas development

### PROGRAM SCHEDULE

08:00	Registration (Day1)
08:10 - 10:00	Session I
10:00 - 10:15	1 <sup>st</sup> Tea Break
10:15 - 12:30	Session II
12:30 - 13:30	Lunch Break
13:30 - 15:00	Session III
15:00 - 15:15	2 <sup>nd</sup> Tea Break
15:15 - 16:00	Session IV
16:00	End of Day

\*Schedule may vary for each training

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### Course Overview

Given the volatility in oil prices today, the economic evaluation of an upstream oil and gas investment is essential. Business decisions involving asset acquisitions, lease-buy assessments, exploration drilling options, oil and gas field development, equipment purchases, and fiscal negotiations all require detailed economic analysis.

The course will cover cash flow analysis, deriving and understanding economic indicators and detailed probability and fiscal analysis. These are vital components of the evaluation of investments in today's international upstream oil and gas industry.

This 3 day course is a practical petroleum economics course that will provide participants with a complete understanding of the use of the techniques of economic analysis and risk analysis as currently practiced in the oil and gas industry. Participants will receive a thorough understanding of the context of economic analysis as well as practical instruction and an appreciation of the analytical techniques used. Along the course, participants will be engaged in exercises and examples to reinforce their understanding of the concepts learned.

### Course Objectives

- GAIN a thorough understanding of oil & gas economic evaluations
- IDENTIFY the main components and CONSTRUCT cash flow projections for your upstream projects
- DETERMINE key elements and determinants involved in making oil and gas investment decisions
- UNDERSTAND and APPLY economic indicators to assess oil & gas industry projects
- QUANTIFY and MANAGE uncertainty and risk faced in upstream business decisions
- APPLY Monte Carlo Simulation and other statistical methods in risk analysis to exploration and production investments effectively
- UNDERSTAND, EVALUATE and MODEL both fiscal and production sharing contract terms worldwide

### Target Audience

The course is designed for upstream E&P professionals with a need for detailed understanding of the upstream petroleum economics :

- Geoscientists
- Reservoir Engineers
- Production Engineers
- Petroleum Engineers
- Planning and Development Analysts/Executives
- Commercial Analysts/Executive/Managers
- Business Planners/Analysts/Executives/Managers
- Production Sharing Executives/Managers
- Project Executives/Manager
- Petroleum Economists
- General Managers
- Finance and Account Executive/Managers

Delegates will be required to bring a laptop computer with Microsoft Excel

## IN-HOUSE SOLUTIONS

### SAVE COST • IMPROVE PERFORMANCE • REDUCE RISK

PetroSync understands that in current economic climate, getting an excellent return on your training investment is critical for all our clients. This excellent training can be conducted exclusively for your organization. The training can be tailored to meet your specific needs at your preferred location and time. We will meet you anywhere around the globe.

If you like to know more about this excellent program, please contact us on +65 3159 0800 or email [general@petrosync.com](mailto:general@petrosync.com)

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## Training Agenda

### Day 1

#### 1. INTRODUCTION

Aims and scope

Contents

- Cash flow analysis
- Economic indicators
- Economic Evaluation Examples
- Risk analysis
- Fiscal systems and PSC analysis
- Worldwide fiscal terms

#### 2. CASH FLOW ANALYSIS

Net Cash Flow

Discussion of the main components and relative importance of components of cash flow for oil and gas investments (production, price, revenue, operating costs, capital costs, abandonment costs and fiscal costs). Oil and gas price forecasts and the treatment of price forecasts in net cash flow analysis.

**EXERCISE: Delegates' exercise in preparing a net cash flow projection**

##### Economic Life and Reserves Economic Life and

How net cash flow projections are critical in determining economic life and reserves. The effects of oil price, costs and fiscal terms on reserves estimates.

**EXERCISE: Delegates' exercise in determining economic life and estimating reserves**

##### Distinction between Cash Flow and Profit

How cash flow is distinguished from profit. The role of depreciation. When we use cash flow and when we use profit.

##### Cash Flow and Tax

How tax is incorporated into cash flow projections. The basic rules for calculating tax worldwide. The effect of tax on field development decisions. Loss carry forward and the effect of different petroleum tax regimes.

**EXERCISE: Delegates' exercises in calculating tax and demonstrating the effects of different tax regimes.**

##### Cash Flow and Production Sharing Contracts (PSC)

The basic economic distinction between tax regimes and production sharing contract regimes. How to make cash flow projections for production sharing systems worldwide. Cost recovery and profit sharing arrangements.

**EXERCISE: : Delegates' exercises in cash flow analysis with different PSC terms.**

##### Sunk Costs

The treatment and mistreatment of sunk costs in cash flow analyses and petroleum property acquisitions. Discussions of the effects of sunk costs.

##### Incorporating Inflation into Cash Flow Projections

How to inflate the components of cash flows. The conventions and the jargon.

**EXERCISE: Delegates' exercise in generating cash flow incorporating inflation.**

##### Real and Nominal Cash Flows

The distinction between real and nominal cash flows. Fiscal drag and the problems associated with taking short cuts to derive real cash flows. Common misunderstandings in the use of real cash flows.

**EXERCISE: Delegates' exercise in preparing real and nominal net cash flows.**

##### Depreciation

Coverage of the main depreciation methods used in fiscal terms worldwide

**EXERCISE: Delegates' exercise in preparing depreciation schedules**

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### Day 2

## 3. ECONOMIC INDICATORS

### Introduction

The need to measure net cash flow projections with single indicators. The indicators used in the oil and gas industry. The importance of time

### Net Present Value (NPV)

The time value of money. Compounding and discounting. Using a discount factor table and measuring the effect of time and discount rate. Discounting a cash flow projection and calculating NPV. Understanding the meaning, uses and features of NPV. Valuing petroleum properties using NPV. Preliminary discussion of choosing discount rates.

**EXERCISE: Delegates' exercises in calculating NPV and demonstrating its features.**

### Real and Nominal NPVs

The distinction between deflating and discounting and between real and nominal discount rates and NPVs. Dealing with the pitfalls of using real NPVs

**EXERCISE: Delegates' exercises in calculating real and nominal NPVs**

### Internal Rate of Return (IRR)

The definition and application of IRR. Calculating the IRR.

**EXERCISE: Delegates' exercises in calculating IRR.**

### Problems with IRR

Multiple IRRs – when, how often and how they arise. How the NPV and IRR measures can give conflicting results and how to resolve this. The effect of project delays and the use of IRR

**EXERCISE: Delegates' exercises in calculating multiple IRRs and seeing how they arise and how to interpret them**

### Payback

Calculation and use of payback and discounted payback indicators. The use of discounted payback in petroleum fiscal regimes. Problems with payback. How compound payback is used in some fiscal regimes

**EXERCISE: Delegates' exercises in calculating simple and compound payback for tax.**

### Capital Productivity Index (CPI).

Calculation and use of CPI. The use of CPI in oil companies and petroleum fiscal regimes. Capital rationing. Problems with CPI.

**EXERCISE: Delegates exercises in calculating CPIs and their application in some PSCs**

## 4. EXAMPLE ECONOMIC EVALUATIONS

### Accelerated production example.

**EXERCISE: Delegates' exercise in incremental economics and the effects of fiscal term**

### WHY YOU SHOULD ATTEND PETROSYNC'S EVENTS

- To ensure that all objectives of the course matches yours, all PetroSync programs are developed after intensive and extensive research within the industry
- PetroSync programs focus on your immediate working issues to ensure that you are able to apply and deliver immediate results in real work situations
- Application and implementation of industry knowledge and experience are the drivers for our course design, not theoretical academic lectures
- PetroSync training focuses on practical interactive learning tools and techniques including case studies, group discussions, scenarios, simulations, practical exercises and knowledge assessments during the course. Invest a small amount of your time to prepare before attending the course to ensure maximum learning
- PetroSync follows a rigorous selection process to ensure that all expert trainers have first-hand, up-to-date and practical knowledge and are leaders of their respective industrial discipline

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### Day 3

## 5. RISK ANALYSIS

### Sensitivity Analysis

Analysing the sensitivity of investment decisions to variations in input parameters. Interpreting sensitivity diagrams. The pitfalls in using sensitivity analyses for oil industry investment decisions

**EXERCISE: Delegates' exercise in preparing sensitivity analyses and using them for investment decisions**

### Probability Analysis

Defining and using probability distributions. Means, standard deviations, levels of confidence. Industry standard reserves definitions and classifications

**EXERCISE: Delegates' exercise in preparing probability analysis**

### Using Probability in the oil and gas industry

Making estimates under uncertainty in the petroleum industry. Combining uncertain variables and issues with adding reserves, adding costs and analysing economics.

**EXERCISE: Delegates' exercises in combining uncertain oil industry variables.**

### Monte Carlo Simulation

The mechanics of Monte Carlo simulation. Choosing probability distributions. The pitfalls of Monte Carlo simulation and how to avoid them. Economic analysis and reserves estimation using Monte Carlo simulation. Investment decisions using Monte Carlo simulation.

**EXERCISE: Delegates' exercises in deriving and using probability distributions of oil in place, NPV and reserves using spreadsheet Monte Carlo simulation.**

### Exploration decisions

The definition, meaning and examples economics for oil and gas exploration drilling decisions. Expected value (EV) versus probability of success lines. Using EV to compare drilling and farmout decisions. The effects of fiscal terms and common problems with using EV. Choosing probabilities of success. Valuing properties using EV.

**EXERCISE: Delegates' exercises in the economics of drilling, farming out acreage and the effects of fiscal terms.**

## 6. PRODUCTION SHARING CONTRACTS, FISCAL SYSTEMS AND TERMS IN THE ASIA PACIFIC REGION

Analysis of an example PSC in the Asia-Pacific region. Evaluating the severity of fiscal terms. How the fiscal components work. How certain fiscal terms can distort oil and gas project investment decisions. How to avoid potential investment distortion in the design or negotiation of fiscal terms. The economic comparison of fiscal terms across the world - severity and efficiency.

**EXERCISE: Delegates' exercises in showing the structure and dynamics of example fiscal regimes in SE Asia**

## 7. WORLDWIDE FISCAL TERMS

The economic comparison of fiscal terms across the world - severity and efficiency.

## 8. SUMMARY AND CONCLUSION

The above is a guide to the topics covered during the course and the approximate timing of the topic. The presenter reserves the right to make modifications to these depending on the delegates' background and experience and the progress of the course."

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### Petrosync Distinguished Instructor

#### Guy Allinson

Director

Petroleum Economics Pty Ltd

Senior Lecturer at University of New South Wales

Guy Allinson has over 40 years' experience as a practicing Petroleum Economist in the international oil and gas industry. He consults internationally and is a Senior Lecturer at School of Minerals and Energy Resource Engineering, University of New South Wales. Guy has held a range of petroleum economics and commercial positions in the oil and gas industry in Europe and the Asia Pacific regions. He has also advised companies and Governments in the Asia Pacific region on petroleum PSC and fiscal terms. He has valued many petroleum properties and companies for acquisition and sale, prepared economics research reports on the oil and gas industry and has provided commercial support for oil field operations and investments worldwide.

Guy has conducted many oil industry short courses in petroleum economics and PSC/fiscal analysis to oil industry professionals in many countries including USA, UK, Denmark, Switzerland, Australia, New Zealand, Indonesia, India, Iran, Malaysia, Thailand, Vietnam, Brunei, Egypt, Libya and South Africa. He has also given frequent presentations to oil and finance industry seminars and conferences.

#### ➔ Partial Client Lists:

Guy has delivered training courses and workshops to the following companies:

- BP
- BHP Billiton Petroleum
- Saudi Aramco
- Shell Australia, Malaysia and Brunei
- TOTAL
- Chevron Pacific Indonesia
- Conoco
- Schlumberger
- Sinopec
- ExxonMobil
- Pertamina
- Petronas
- PetroVietnam
- PTTEP
- Petrofac
- Asamera Inc
- Petrochina
- Murphy Oil
- Migas (Indonesia)
- Vico Indonesia
- Premier Oil
- Santos Indonesia
- ONGC
- Woodside
- Cairn Energy
- Oil Search
- ARCO
- Unocal
- Lasmo plc
- Roc Oil
- British Gas
- Amoseas
- JNOC
- Inpex
- Union Texas
- Norsk Hydro
- Maersk
- Romanian National Oil Company
- Libyan National Oil Company
- Egyptian National Oil Company
- Tunisian National Oil Company
- National Iranian Oil Company
- Petrocorp
- Origin Energy
- Swift Energy
- Geoscience Australia
- Sasol
- and many more.

## INVESTMENT PACKAGES

Please checklist the package that you are attending!

Upstream Petroleum Economics, Risk & Fiscal Analysis Schedules	LOCATION	PRICE
<input type="checkbox"/> 02 <sup>nd</sup> - 04 <sup>th</sup> July 2024	Bandung, Indonesia	USD 5,250
<input type="checkbox"/> 26 <sup>th</sup> - 28 <sup>th</sup> November 2024	Kuala Lumpur, Malaysia	USD 5,250

\* All prices are subject to change without notice and are not guaranteed, except that prices for an order that have been accepted by PetroSync is not subject to change after acceptance.

\* Price is nett excluding Withholding Tax if any and will be quoted separately. Please send us the withholding tax payment receipt.

### DELEGATE DETAILS

1st Delegate Name \_\_\_\_\_ Mr  Mrs  Ms  Dr  Others

Direct Line Number: \_\_\_\_\_ Email: \_\_\_\_\_

Mobile Number: \_\_\_\_\_ Job Title: \_\_\_\_\_

Department: \_\_\_\_\_ Head of Department: \_\_\_\_\_

2nd Delegate Name \_\_\_\_\_ Mr  Mrs  Ms  Dr  Others

Direct Line Number: \_\_\_\_\_ Email: \_\_\_\_\_

Mobile Number: \_\_\_\_\_ Job Title: \_\_\_\_\_

Department: \_\_\_\_\_ Head of Department: \_\_\_\_\_

3rd Delegate Name \_\_\_\_\_ Mr  Mrs  Ms  Dr  Others

Direct Line Number: \_\_\_\_\_ Email: \_\_\_\_\_

Mobile Number: \_\_\_\_\_ Job Title: \_\_\_\_\_

Department: \_\_\_\_\_ Head of Department: \_\_\_\_\_

4th Delegate Name \_\_\_\_\_ Mr  Mrs  Ms  Dr  Others

Direct Line Number: \_\_\_\_\_ Email: \_\_\_\_\_

Mobile Number: \_\_\_\_\_ Job Title: \_\_\_\_\_

Department: \_\_\_\_\_ Head of Department: \_\_\_\_\_

\*Please fill all the details including mobile number. This help us to contact participant if they are late in class or if there is any urgent update (through whatsapp/call)

### INVOICE DETAILS

Attention Invoice to: \_\_\_\_\_

Direct Line Number: \_\_\_\_\_ Fax: \_\_\_\_\_

Company: \_\_\_\_\_ Industry: \_\_\_\_\_

Address: \_\_\_\_\_ Postcode: \_\_\_\_\_

Country: \_\_\_\_\_ Email: \_\_\_\_\_

Please note:

- Indicate if you have already registered by Phone  Fax  Email  Web

- If you have not received an acknowledgement before the training, please call us to confirm your booking.

### PAYMENT METHODS

By Credit Card

By Direct Transfer : Please quote invoice number(s) on remittance advice

PetroSync Global Pte Ltd Bank details:

Account Name : PetroSync Global Pte Ltd

Bank Name : DBS Bank Ltd

Bank Code : 7171 • Bank Swift Code : DBSSSGSGXXX • Branch code : 288

Account No : 0288-002682-01-6-022 (USD)

Bank Address : 12 Marina Boulevard, Level 3. Marina Bay Financial Centre Tower 3. Singapore 018982

All bank charges to be borne by payer. Please ensure that PetroSync Global Pte Ltd receives the full invoiced amount.

### Confirmation

I agree to PetroSync's terms & conditions, payment terms and cancellation policy.

Signature : \_\_\_\_\_

Date : \_\_\_\_\_

Payment Terms : Payment is due in full at the time of registration. Full payment is mandatory for event attendance.

## PROGRAMME CONSULTANT

Name : Cay Aagen

Email : registration@petrosync.com

Phone : +65 3159 0800

## TERMS AND CONDITIONS

### DISCLAIMER

Please note that trainers and topics were confirmed at the time of publishing; however, PetroSync may necessitate substitutions, alterations or cancellations of the trainers or topics or location (classroom / Virtual). As such, PetroSync reserves the right to change or cancel any part of its published programme due to unforeseen circumstances. Any substitutions or alterations will be updated on our web page as soon as possible

### DATA PROTECTION

The information you provide will be safeguarded by PetroSync that may be used to keep you informed of relevant products and services. As an international group we may transfer your data on a global basis for the purpose indicated above. If you do not want us to share your information with other reputable companies, please tick this box

### CANCELLATION POLICY

Delegates who cancel after the training is officially confirmed run by email, are liable to pay the full course fee and no refunds will be granted. You may substitute delegates at any time as long as reasonable advance notice is given to PetroSync.

In the event that PetroSync cancels or postpones or change the trainer or change the training location (classroom / virtual) of an event for any reason and that the delegate is unable or unwilling to attend in on the rescheduled date, you will receive a credit voucher for 100% of the contract fee paid. You may use this credit voucher for another PetroSync to be mutually agreed with PetroSync, which must occur within a year from the date of postponement.

PetroSync is not responsible for any loss or damage as a result of the cancellation policy. PetroSync will assume no liability whatsoever in the event this event is cancelled, rescheduled or postponed due to any Act of God, fire, act of government or state, war, civil commotion, insurrection, embargo, industrial action, or any other reason beyond management control.

### CERTIFICATE OF ATTENDANCE

80% attendance is required for PetroSync's Certificate of Attendance.

## DETAILS

Please accept our apologies for mail or email that is incorrectly addressed.

Please email us at registration@petrosync.com and inform us of any incorrect details. We will amend them accordingly.

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## CHARGES & FEE(S)

- For Payment by Direct Telegraphic Transfer, client has to bear both local and oversea bank charges.

- For credit card payment, there is additional 4% credit card processing fee.