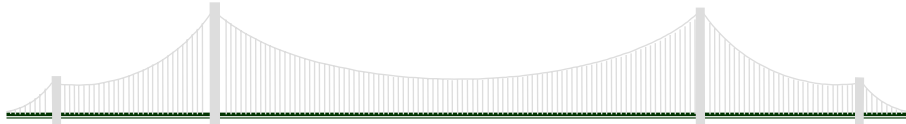
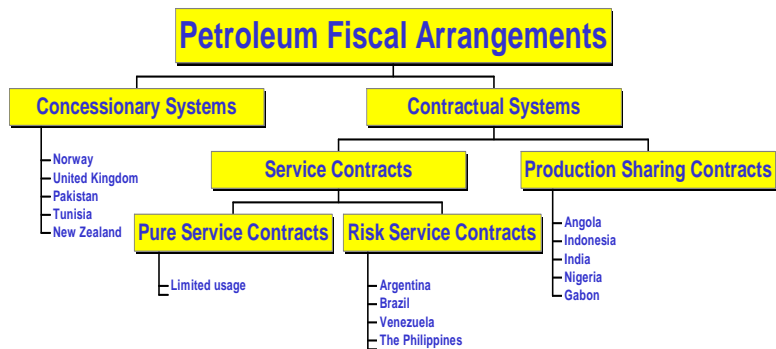


Fiscal regimes and project economy

*Dr. Alfred Kjemperud
The Bridge Group AS*



The Government Choice



BRIDGE Share, take and profit margin

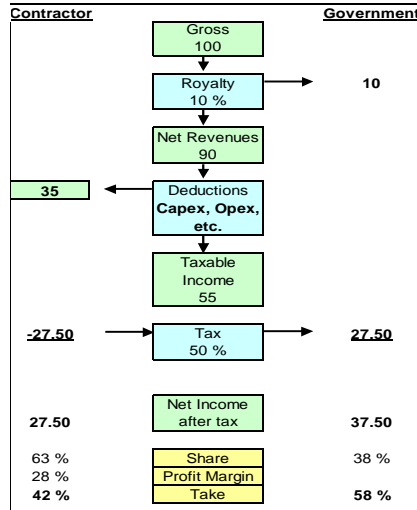
• Gross revenues	100	
• Total cost	<u>-40</u>	
• Operating income	60	
• Taxes	<u>35</u>	
• Net after tax income	25	
✓ Contractor take	42%	(25/60)
✓ Contractor profit margin	25%	(25/100)
✓ Contractor share	65%	(25+40/100)
✓ Government take	58%	(35/60)

BRIDGE Government Take

• Gross revenues	100
• -Royalties	<u>20</u>
• Net revenues	80
• Cost	<u>30</u>
• Taxable income	50
• Income tax (50%)	<u>25</u>
• After tax profit	<u>25</u>
• Contractor take :	$25/100-30=35.7\%$
• Government take:	$(20+25)/100-30=64.3\%$

Royalty/Tax System

Concession Flow Chart



Cash Flow Calculation - RT

Royalty Tax Concessionary System

Year	Oil Production Mbbbl/y	Oil Price (USD/bbl)	Gross Revenue (MUSD)	Royalty	Net Revenue	Intangible CAPEX (MUSD)	Tangible CAPEX (MUSD)	OPEX (MUSD)	DD&A (MUSD)	Total Deductions (MUSD)	Tax Loss Carry Forward (MUSD)	Taxable income (MUSD)	Income Tax (MUSD)	Net Cash Flow (MUSD)
2000		20	0	0	0	10 000	10 000					-10 000		-20 000
2001	0	20	0	0	0	5 000	8 000				10 000	-15 000		-13 000
2002	0	20	0	0	0	3 000	40 000				15 000	-18 000		-43 000
2003	4 500	20	90 000	9 000	81 000		25 000	11 500	16 600	46 100	18 000	34 900	13 960	30 540
2004	7 000	20	140 000	14 000	126 000			14 000	16 600	30 600	0	95 400	38 160	73 840
2005	5 600	20	112 000	11 200	100 800			12 600	16 600	29 200	0	71 600	28 640	59 560
2006	4 760	20	95 200	9 520	85 680			11 760	16 600	28 360	0	57 320	22 928	50 992
2007	4 046	20	80 920	8 092	72 828			11 046	16 600	27 646	0	45 182	18 073	43 709
2008	3 439	20	68 780	6 878	61 902			10 439		10 439	0	51 463	20 585	30 878
2009	2 923	20	58 460	5 846	52 614			9 923		9 923	0	42 691	17 076	25 615
2010	2 485	20	49 700	4 970	44 730			9 485		9 485	0	35 245	14 098	21 147
2011	2 087	20	41 740	4 174	37 566			9 087		9 087	0	28 479	11 392	17 087
2012	1 732	20	34 640	3 464	31 176			8 732		8 732	0	22 444	8 978	13 466
2013	1 428	20	28 560	2 856	25 704			8 421		8 421	0	17 283	6 913	10 370
	40 000		800 000	80 000	720 000	18 000	83 000	116 993	83 000	217 993		459 007	200 803	301 204

Assumptions	
Royalty	10.00 %
Depreciation	5 years straight line
Income tax	40 %



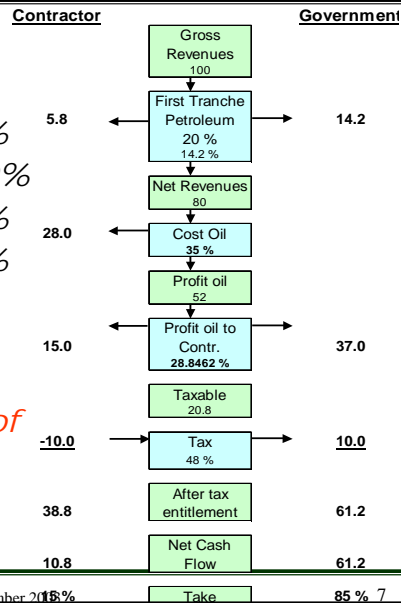
Indonesia- PSC (4th Gen.)

Mother of all PSCs

- (85/15 Split)
 - Royalty: 0%
 - FTP split 20%
 - Cost Oil : 100%
 - Profit Oil: 28.8462%
 - Tax Rate: 48%

• Effects

- The split does not change with the level of cost
- Effective Gov. take is 85%



A. Kiemperud

CCOP Pattaya, September 2018



Cash Flow Calculations - PSC

Production Sharing System

Year	Oil Production (Mbbly)	Oil Price (USD/bbl)	Gross Revenue (MUSD)	Intangible CAPEX (MUSD)	Tangible CAPEX (MUSD)	OPEX (MUSD)	Bonus (MUSD)	DD&A (MUSD)	Contractor Cost Oil (MUSD)	Total Profit Oil (MUSD)	Contractor Profit Oil (MUSD)	Tax Loss C/F (MUSD)	Income Tax (MUSD)	Net Cash Flow (MUSD)
2000		20	0		10,000		2,000		0					-12,000
2001		20	0		8,000							2,000		-8,000
2002		20	0		15,000				0			2,000		-15,000
2003	4,500	20	90,000	15,000	10,000	11,500	1,000	8,600	35,100	54,900	19,215	3,000	6,486	10,329
2004	7,000	20	140,000	2,000		14,000		8,600	24,600	115,400	40,390		16,156	32,834
2005	5,600	20	112,000			12,600		8,600	21,200	90,800	31,780		12,712	27,668
2006	4,760	20	95,200			11,760		8,600	20,360	74,840	26,194		10,478	24,316
2007	4,046	20	80,920			11,046		8,600	19,646	61,274	21,446		8,578	21,468
2008	3,439	20	68,780			10,439			10,439	58,341	20,419		8,168	12,252
2009	2,923	20	58,460			9,923			9,923	48,537	16,988		6,795	10,193
2010	2,485	20	49,700			9,485			9,485	40,215	14,075		5,630	8,445
2011	2,087	20	41,740			9,087			9,087	32,653	11,429		4,571	6,857
2012	1,732	20	34,640			8,732			8,732	25,908	9,068		3,627	5,441
2013	1,427	20	28,540			8,421			8,421	20,119	7,042		2,817	4,225
	39,999		799,980		43,000	116,993	3,000	43,000	176,993	622,987	218,045		86,018	129,027

Assumptions

Royalty	10.00%
Depreciation	5 years straight line
Income tax	40%
Profit Oil	35%

A. Kiemperud

CCOP Pattaya, September 2003

8

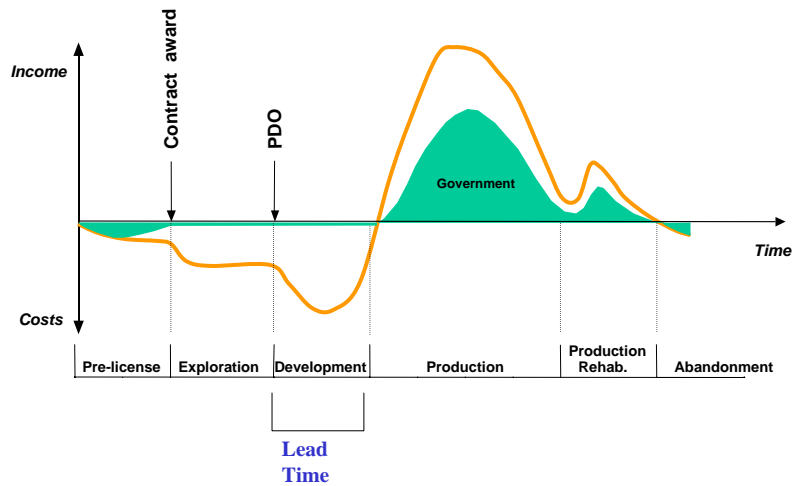
- *Paper, pencil and calculator*
- *Simple Spreadsheet*
- *Spreadsheet based modeling tools*
- *Commercial software packages*

- *Petroleum investments are*
 - *capital intensive*
 - *irreversible*
 - *high risk/uncertainty*
- *Investment decisions today are only unfolded in the uncertain future for both company and government*

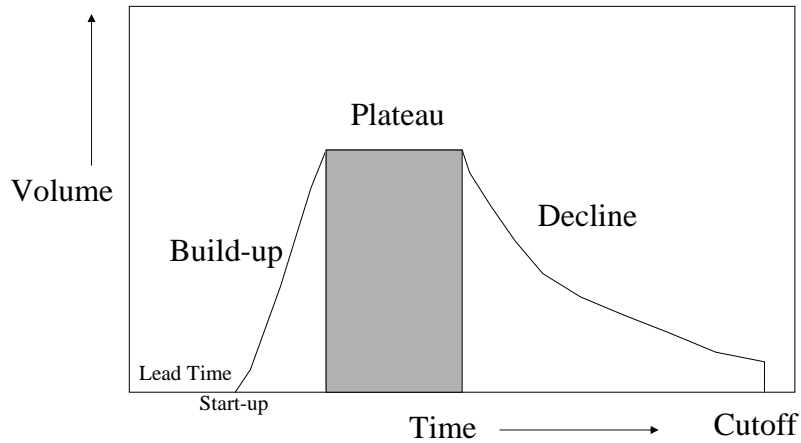
- *Petroleum project modeling is based on*
 - *- knowledge of fundamental elements in technology and economics*
 - *- empiric data*
 - *- and a bit of artistry*

- *All modeling is imperfect.*
 - *It is always a simplification of reality*
 - *Depends on quality of input*

- *The challenge is to assess the weaknesses and discover flaws*

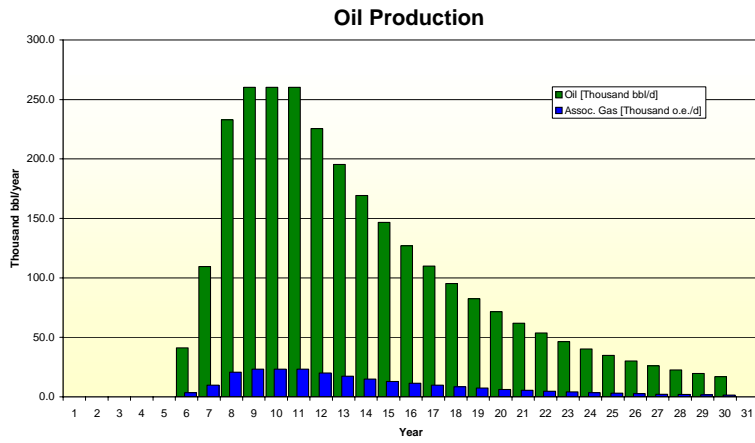


- *Production curve*
- *Oil/gas price*
- *Capex*
- *Opex*
- *Fiscal regime*
- *Discount rate*

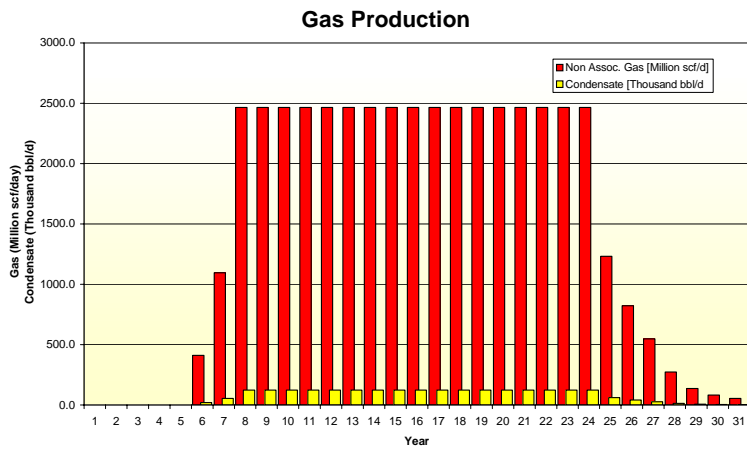


- *No of wells*
- *Plateau factor (%)*
- *Production rate per well*
- *Plateau production rate*
- *Remaining oil/gas at start decline*
- *Decline rate (%)*
- *Cut off rate*

Oil Production

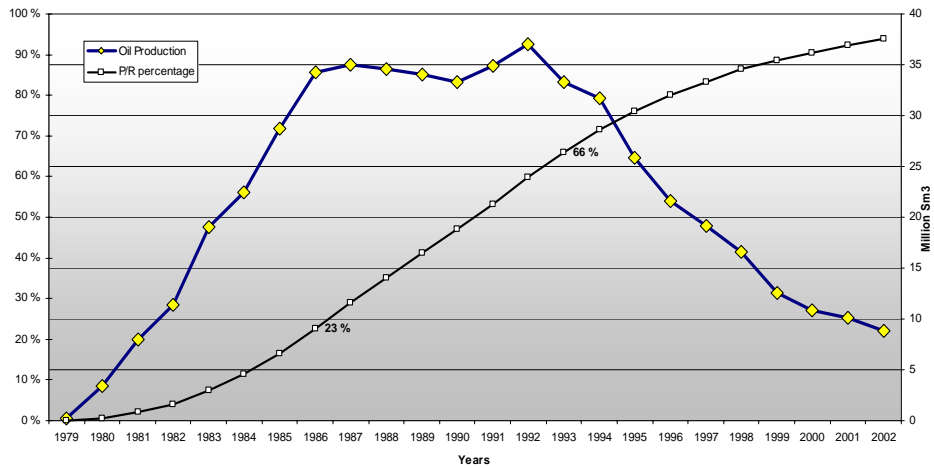


Gas Production



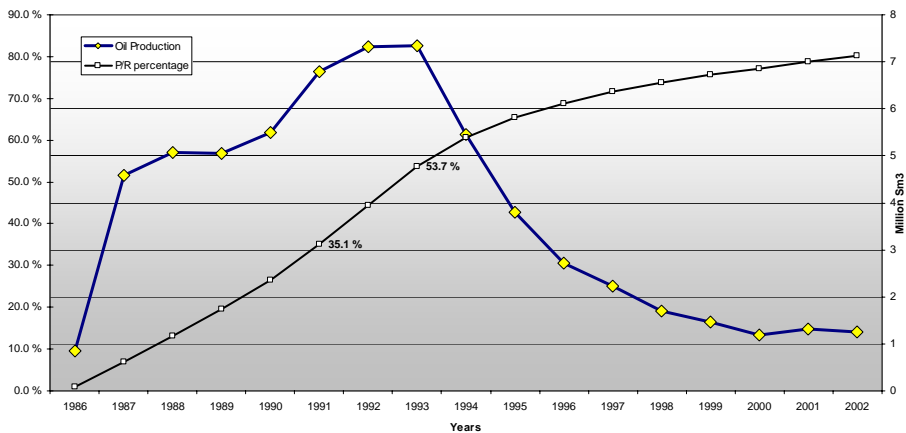
Statfjord Oil - Norway

Oil Production - Statfjord, Norway
560 million Sm3 (3520 Million bbl)



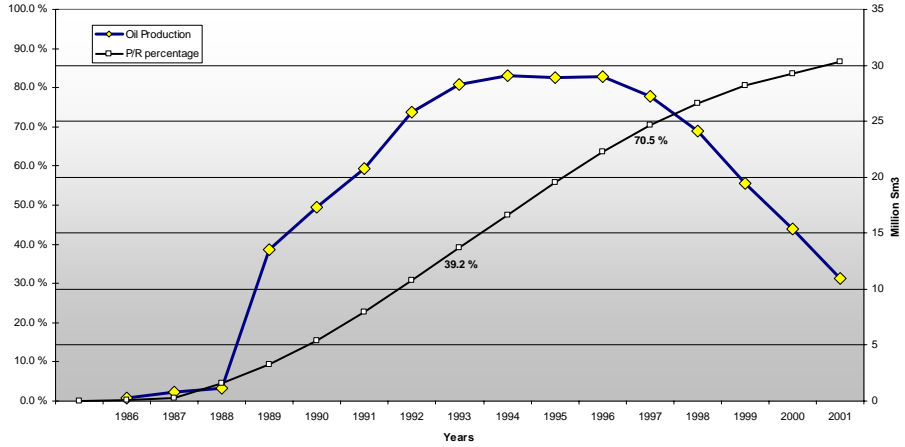
Ula oil - Norway

Oil Production - Ula, Norway
80 million Sm3 (503 Million bbl)



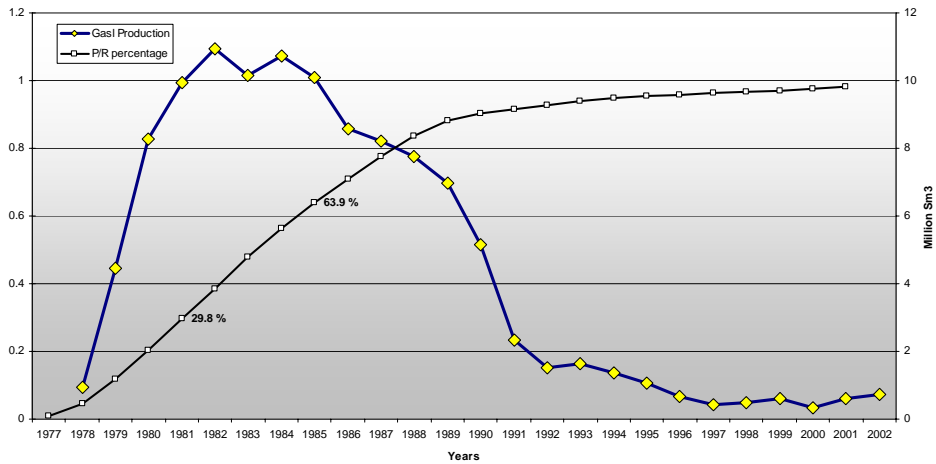
Oseberg Oil - Norway

Oil Production - Oseberg Field, Norway
350 million Sm³ (2200 million bbl)



Frigg Gas - Norway

Gas Production - Frigg Field, Norway
116 billion Sm³ (4.1 TCF)



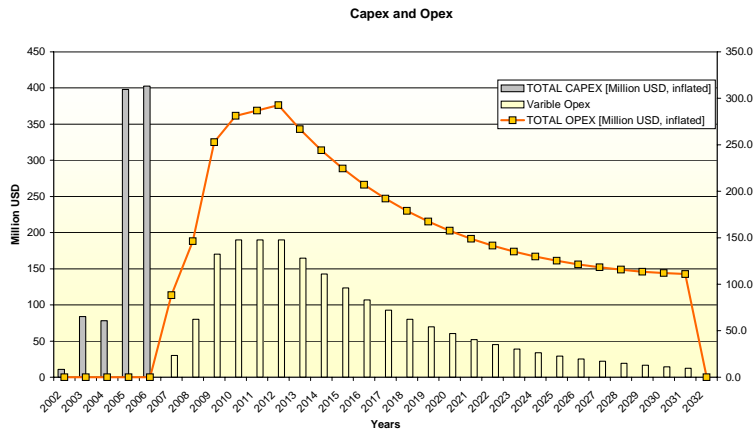
Discovery to start-up Gulf of Mexico

- *From 5 Years in 1975 to 0.5 years in 1993*

Expenditures = Cost

- *Capital expenditure*
 - *Wells*
 - *Constructions - Facilities*
 - *Pipelines*
- *Operating expenditures*
 - *The cost of running the operations*
 - ❖ *Fixed Opex*
 - ❖ *Variable Opex*

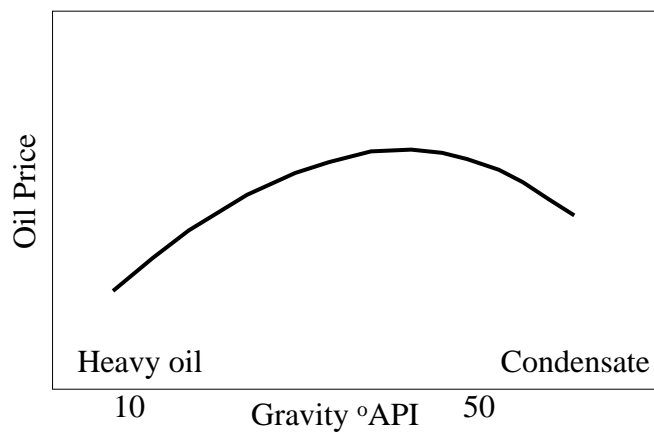
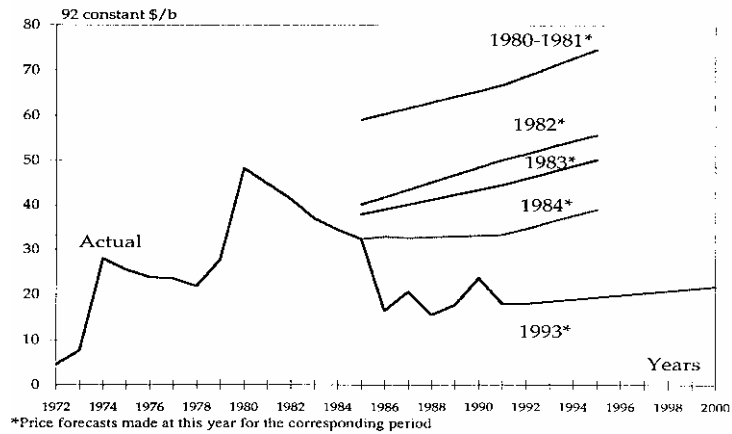
Capex and Opex



Well cost

Averages													
Field size		Exploration		Appraisal			Development/operation						
bbl	Sm ³	Expl. Well cost	Test	Appraisal no. of wells	Well cost	Duration (years)	Averages, Capex (USD/bbl)	Capex (USD/Sm ³)	First oil Years	Field life (years)	Averages, Opex (USD/bbl)	Opex (USD/Sm ³)	
10	1.6	6.9	1.14	1	6.7	1.8	5.16	32.46	3.8	6.4	6.72	42.3	
25	4.0	7.43	1.31	1.43	7.29	1.83	4.34	27.27	4.17	6.86	5.30	33.34	
50	7.9	7.43	1.31	2.14	7.29	2.17	3.68	23.13	5.17	9.00	4.93	30.99	
125	19.9	7.43	1.31	2.29	7.29	2.83	2.93	18.43	6.33	13.00	4.41	27.76	
250	39.7	7.43	1.31	3.14	7.29	3.67	2.51	15.79	7.67	16.86	3.89	24.47	
500	79.5	7.43	1.31	3.86	7.29	4.17	2.09	13.17	8.33	19.57	3.47	21.84	
160.00	25.44	7.34	1.29	2.31	7.19	2.74	3.45	21.71	5.91	11.95	4.79	30.12	

Arabian light price evolution forecasts



The price adjustment of heavier crude is 2-3% per °API

- *Several check points are usually built into programs*
 - *Royalty % per year*
 - *Profit share % per year*
 - *R-factor calculation*
 - *Production plot*
 - *Capex and Opex plot*
 - *Depreciation plot*

- | <u><i>BASIC ASSUMPTIONS</i></u> | <u><i>Rule of Thumb</i></u> |
|---------------------------------------------|-----------------------------|
| • <i>Capex/bbl</i> | <i>3-5 usd</i> |
| • <i>Capex as % of Gross Revenue</i> | <i>10-20%</i> |
| • <i>Opex/bbl</i> | <i>3-5 usd</i> |
| • <i>Opex/peak year as % of total Capex</i> | <i>4-8%</i> |

- *Work Commitment*
- *Bonus Payment*
- *Royalties*
- *Cost Recovery (Cost Oil)*
- *Profit Oil*
- *Government participation*
- *Domestic Market Obligation*
- *Ring fencing*

- *Real models will be demonstrated and discussed*