

EOR-IOR in Indonesia 1

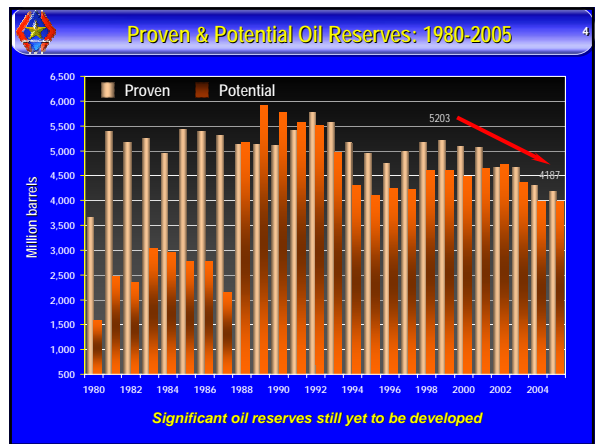
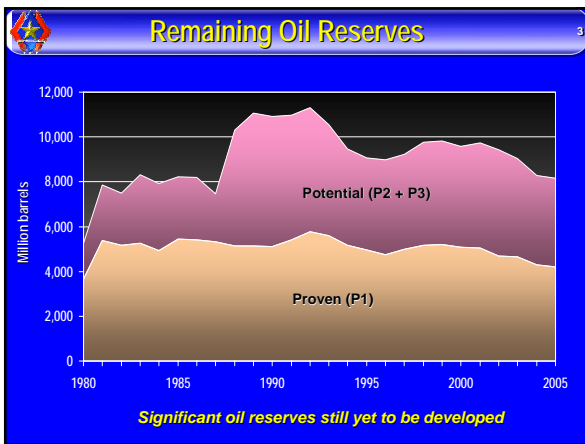
"Challenges to Increase Oil Production"

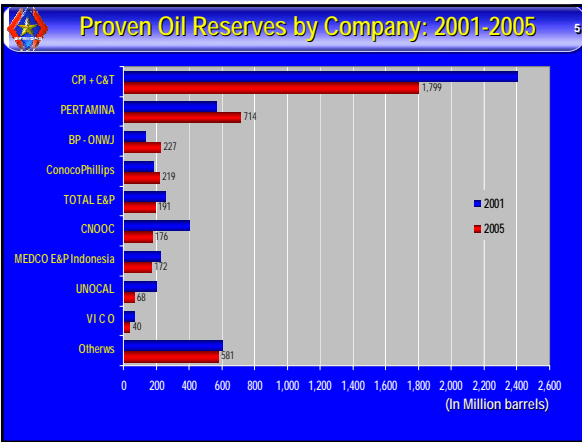
Dr. Abdul Muin
Senior Adviser, BPMIGAS

CCOP EOR/IOR Workshop
Jakarta, June 14, 2006

Content 2

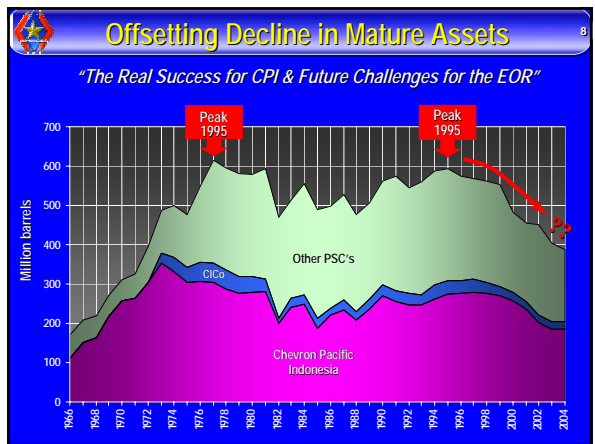
- *Indonesia's Brief on Upstream Oil & Gas Industry*
- *Medium-term Production Target: Challenges and Opportunities.*
- *Role of Technology and Reservoir Management in increasing asset's value*
- *Role of BPMIGAS and Chevron to answer those challenges*

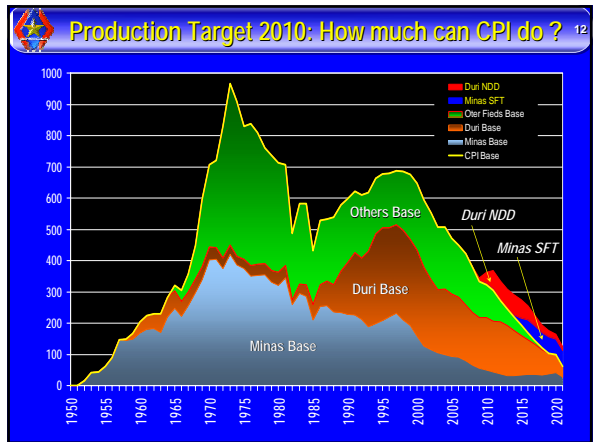
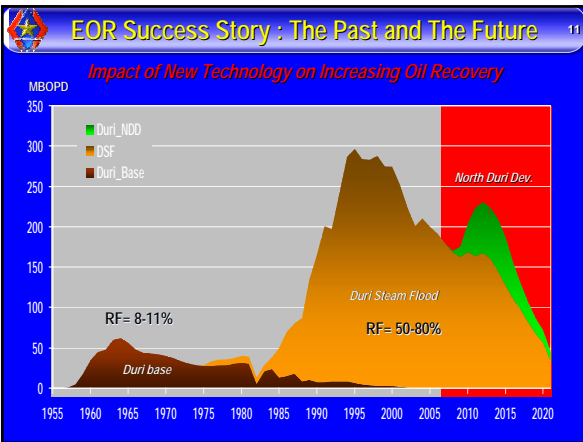
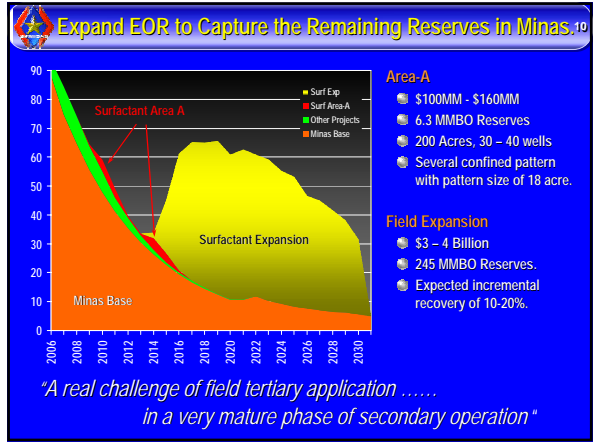
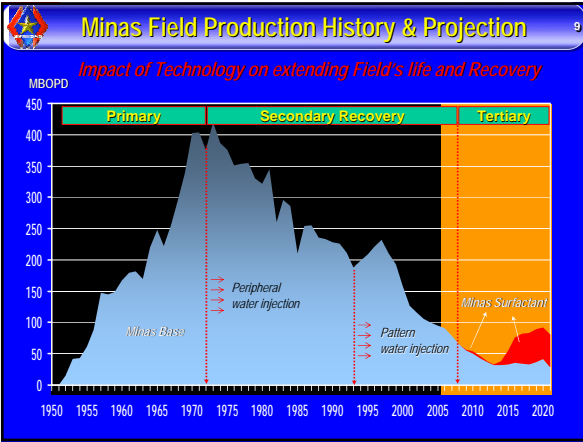




- ### The Status of Indonesia Oil Fields
- #### Mature Stage
- The majority of oil fields is in a mature stage.
 - Though total remaining reserves are still important, *the efforts to halt production decline are highly cash-dependent*.
 - Offsetting this lost production, which deals with high production levels, *requires sustained development of new fields and sustained drilling*.
 - Due to declining field size discoveries, *activity levels need to increase over time* to deliver same amount of oil.

- ### Oil Production : Facts & Figures
- *Peaking in 1995 at 1.62 Mb/d, Indonesia oil output dropped by 35%, down to < 1.06 Mb/d in 2005 (or 5% per year)*
 - *More than 90% of the current oil production comes from mature fields with decline rate of about 5-15% per year.*
 - *The Asia economic crisis in 1997 and the 1998's low oil prices, were responsible for lower Global E&P Spending and Activities:
.....hence, speeding up decline in oil production of Indonesia.*

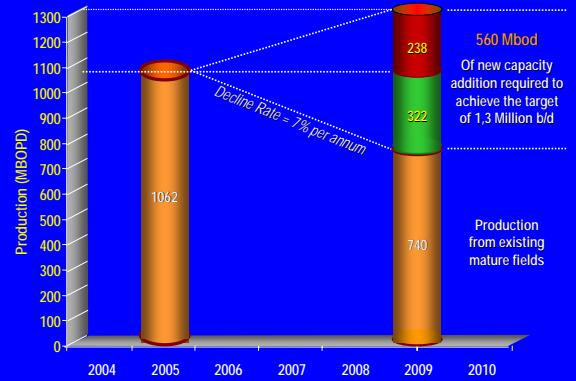




Applied IOR/EOR Technologies in Indonesia 13

- Water-flood : *Minas, Kotabatak, Bekasap and Widuri fields.*
- Steam-flood : *Duri field; (Batang, Kulin and Rantau Bais fields → candidates).*
- Gas lean injection : *Handil field.*
- Chemical Flooding : *Minas (pilot project in progress).*
- Vibro Seismic Impact Technology (VISIT): *pilot project*
- GreenZyme: *pilot project in progress*

Challenging Production Target : 2005-2009 14



How to Achieve This Production Target ? 15

Key Issues

- *How to halt and reverse this decline?*
- *Can we achieve the GOI's target ? 1.3 Mb/d by 2010*
- *Role of Major Producing Contractors*
- *Role of Government of Indonesia (GOI)*

Challenges to This Production Target ? 16

This is a very difficult task !!! As it requires:

- Increasingly Huge Capital Investment Flow
- Reservoir Management and Technology Breakthroughs
- Good Strategic Plan and Day to Day Monitoring Program
- GOI Policy's breakthroughs (Legal & Fiscal System).
- Simplified Processes & Procedures (POD, AFE & Procurement)
- Joint Multidisciplinary Task Forces



Other Constrains & Challenges:

17

- Available Drilling and Production Facilities
- Human Resources constrains (*in BPMIGAS & PSC's*)
- Time constrains: *3-4 years to 2009's production target*
- Approval processes for POD, AFE, and Procurement



Challenges for New EOR/IOR Projects:

18

- Technical Progress: to locate "by-passed oil" & "overlook reservoir", to select cost effective drilling technology
- Further cost reduction for EOR material
- Better understanding on Reservoir heterogeneity and fluid characteristics
- Compatibility Studies : EOR Technique selection
- Conceptual Development Scenario



But, Opportunities are also there

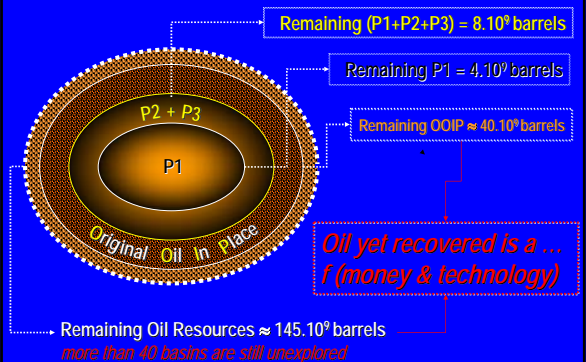
19

- Oil resources to be recovered is still quite abundant
- Current High Oil Prices (*>\$50/b*) at least in medium-term, will guarantee MARR of new projects (*including all types of IOR-EOR Projects will be economic at current HOP*)
- *Many PSC's have already proven upstream technologies, long experiences, and currently abundant cash available*
- GOI has a strong political will to facilitate and encourage the PSC's in enhancing their build-up capacity



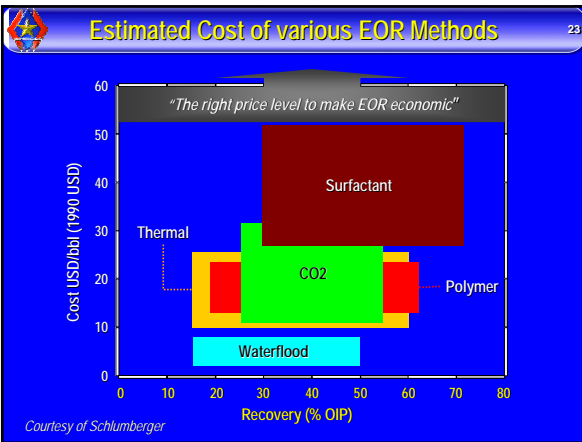
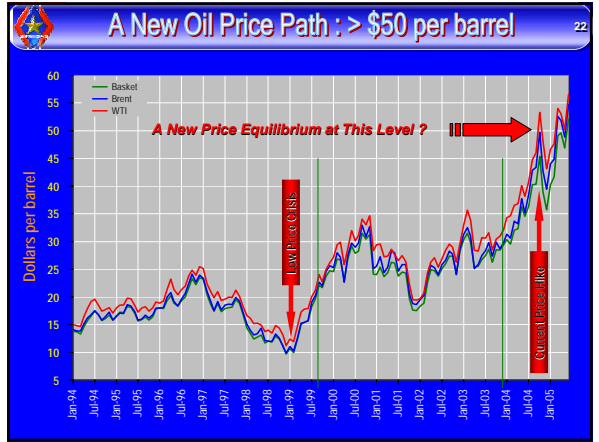
How much oil left ? And be recoverable ?

20



**The Status of Indonesian Oil Fields:
Remaining Reserves, Production & Expected Add. Reserves
1 January 2005**

RF Current (%)	NO OF FIELDS	COOP MSIB	Ultimate Rec. Reserve MSIB	RF. Util. (%)	Production EOPD MSIB	Cumulative Production MSIB	RF. Current (%)	Remaining Reserve MSIB	Remaining COOP MSIB	Add Reserve (MSIB) 5%	10%
RF > 50%	21	10,795,201	5,998,411	54.91	152,094	5,578,002	51.67	393,316	4,867,780		
50% > RF > 40%	41	11,415,338	5,416,324	47.46	138,913	4,974,331	43.39	441,972	5,938,012	293,951	398,001
40% > RF > 30%	61	14,230,038	6,043,617	42.29	330,598	4,881,024	34.16	1,162,593	8,246,421	412,321	584,632
30% > RF > 15%	102	17,839,432	4,956,448	27.67	212,336	4,149,998	23.26	786,463	12,911,934	646,039	1,201,199
15% > RF > 0%	68	7,823,681	1,294,765	16.44	111,631	707,975	8.99	596,808	6,528,892	338,945	457,889
TOTAL	222	54,340,037	22,324,800	41.08	824,016	19,593,483	36.04	2,741,338	30,015,208	1,367,291	2,714,174



- What BPMIGAS & GOI Can Do?**
- **Production Sharing Contracts (if necessary).**
 - Incentives (for Exploration in New Frontier)
 - Incentives (Marginal & Brown fields and New EOR)
 - **Efficient Process for POD, WP&B, and AFE Approval**
 - Reorganization of BPMIGAS to provide a "Proper Vehicle"
 - Legal support for "Fast Track Development Policy"
 - **Better Fiscal Regimes**



How much new additional oil be producible ?

25

*The prospects are there ...
It is just ...a function of
money & technology
and better partnering*

