

# Saudi Arabian Upstream & Downstream Investments

## OPEC – EU Roundtable on Energy Policies

May 2007

### How Uncertain is the Future?

- ❖ “A Half Century of Long-Range Energy Forecasts: Errors Made, Lessons Learned, and Implications for Forecasting”. Roger Bezdek and Robert Wendling in 2002, identified the following common mistakes:
  1. Underestimation of the size of world energy resources
  2. Underestimation of the role of prices and the adaptability of markets
  3. Failure of technology forecasts to capture their changing nature
  4. Substantial overestimation of primary energy consumption
  5. Strong influence by events and trends of the time of the forecasts
  6. Overzealous assumptions on changes in people behavior
  7. Assumption that policy can overcome economics

## US DOE projections for Saudi Arabian oil production capacity

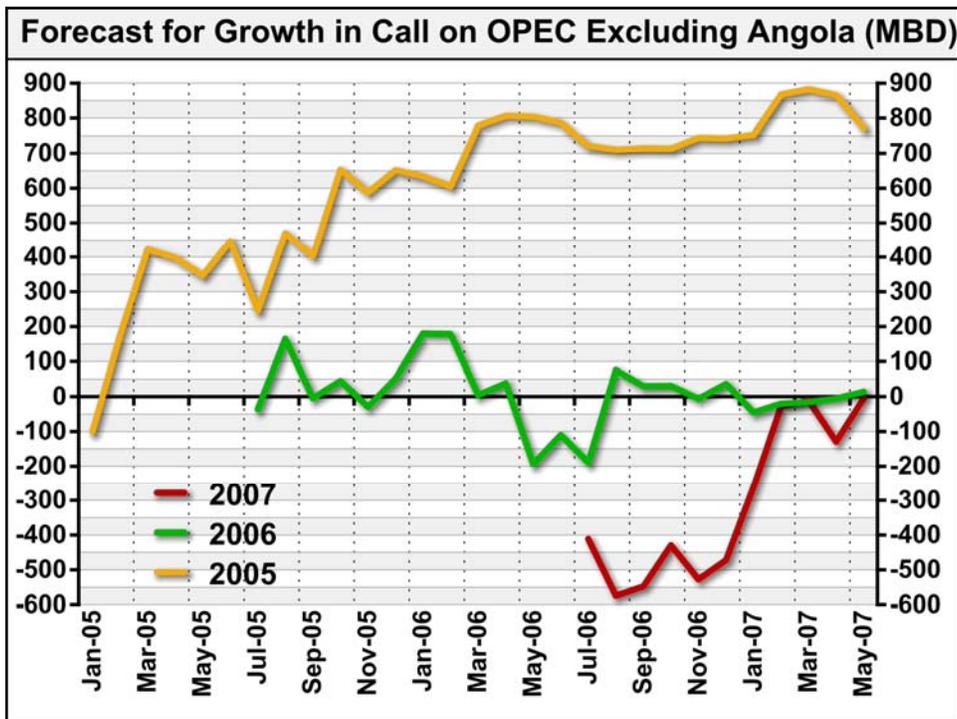
		2000	2005	2010	2015	2020	2025	2030
Forecast Date	1996	11.5	12.8	14.9	21.2			
	1997	11.4	13.3	15.8	22.3			
	1998	10.9	11.2	13.5	17.2	23.8		
	1999	11.1	13.7	14.1	16.2	20.0		
	2000		13.6	14.7	17.7	22.1		
	2001		12.6	14.7	18.4	23.1		
	2002		12.5	14.6	18.2	22.1		
	2003		11.1	13.6	15.7	19.5	23.8	
	2004			13.2	14.4	18.2	22.5	
	2005			14.0	14.5	15.4	16.3	
	2006			14.4	14.8	14.5	15.1	17.1
	2007						14.9	18.4

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## No Relief in the Short Term Either

- ❖ Although there is no shortage of opinions and analysis
  - International organizations, Academia, think tanks, banks, oil companies, journalists and consultants
- ❖ Initiatives such as industry roundtables, conferences, JODI and others have improved transparency and information availability. However
  - Oil markets display substantial weather and consumer habit seasonality
  - The oil industry has a history of disruption due to different causes such as weather and others
- ❖ Therefore a great deal of uncertainty is usually observed in supply / demand forecasts extending just a few months and quarters

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## Predetermined Elements

- ❖ Global economic prosperity requires stable energy supplies
- ❖ Oil is a fungible, trade-dependent good with a global market
- ❖ Oil role as the world's largest source of energy will not be challenged over the next two decades
- ❖ Global oil resource base is ample and can support the world's energy needs today and in the future

**Meeting the energy challenge of today and in the future is a multifaceted challenge requiring the timely mobilization of the technical, financial and manpower resources to produce, transport, refine and market this resource base**

**Excess oil capacity will remain the most effective mechanism to deal with short and long term uncertainties inherent in the marketplace**

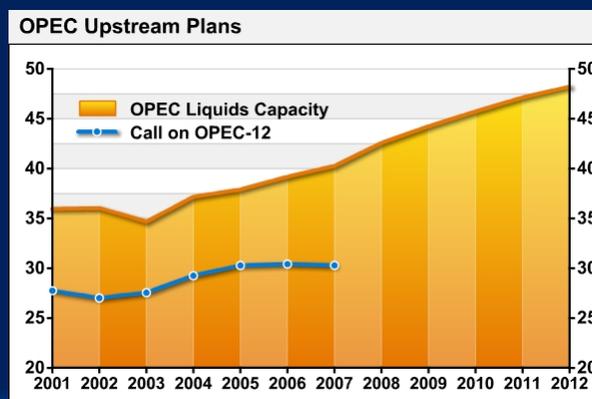
## Excess Oil Capacity

	Excess Capacities Prior to Supply Crises in million BBL / Day		
	OPEC	Saudi Arabia	% of Spare
August 1980 (Iran/Iraq war)	1.8	1.0	56
July 1990 (Kuwait Invasion)	4.0	2.9	73
November 2002 (Venezuela Strike)	3.5	2.7	78
February 2003 (War on Iraq)	2.3	1.6	70
September 2005 (GoM Hurricanes)	1.8	1.5	90

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## OPEC Capacity Plans

- ❖ OPEC liquids production capacity will rise by more than 8 million BBL / Day through the coming five years
- ❖ Comparing this growth in capacity with the expected call on OPEC reveals that spare capacity will expand



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## Saudi Arabia

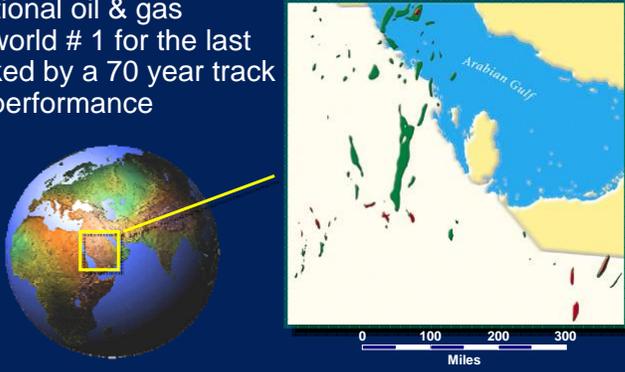
- ❖ The Kingdom has embarked on ambitious expansion programs targeting many sectors of the economy
- ❖ Hydrocarbon related investments will top \$100bn in the coming five years
- ❖ The Saudi Arabian Oil Company, Saudi Aramco, is central to this ambitious expansion program which is unparalleled in the company's history because of its size and breadth
- ❖ This undertaking relies heavily on core competencies developed within Saudi Aramco as will be shown...

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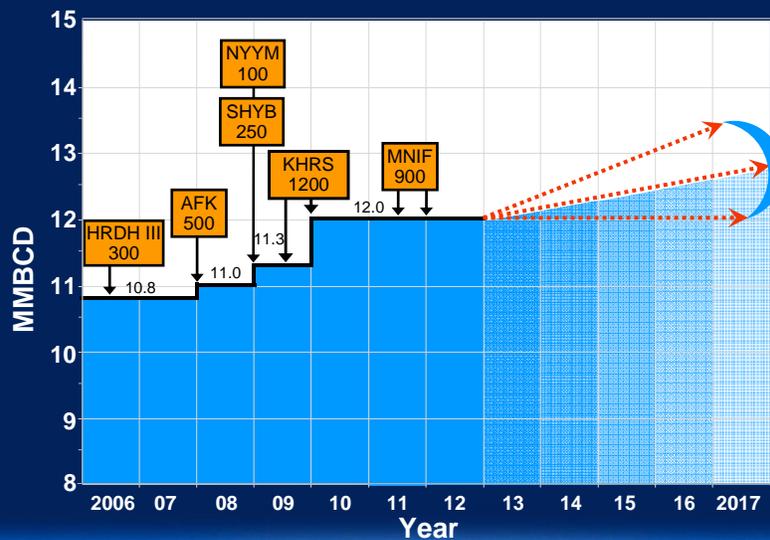


### Saudi Aramco

- ❖ Integrated international oil & gas company ranked world # 1 for the last 17 years and backed by a 70 year track record of reliable performance
- ❖ 96 fields
- ❖ 320 reservoirs
- ❖ 260 bn BBLs proved oil reserves



## Saudi Aramco Plans - MSC Outlook



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## Upstream Strategy

- ✓ Replace 100% of produced reserves
- ✓ Maintain 1.5 to 2.0 MMBD of spare capacity
- ✓ Employ best in class reservoir management practices

	Year	Volume MBD	Grade
AFK	2007	500	AL
Shaybah	2008	250	AXL
Nuayyim	2008	100	ASL
Khurais	2009	1,200	AL
Manifa	2011	900	AH

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## Upstream Strategy

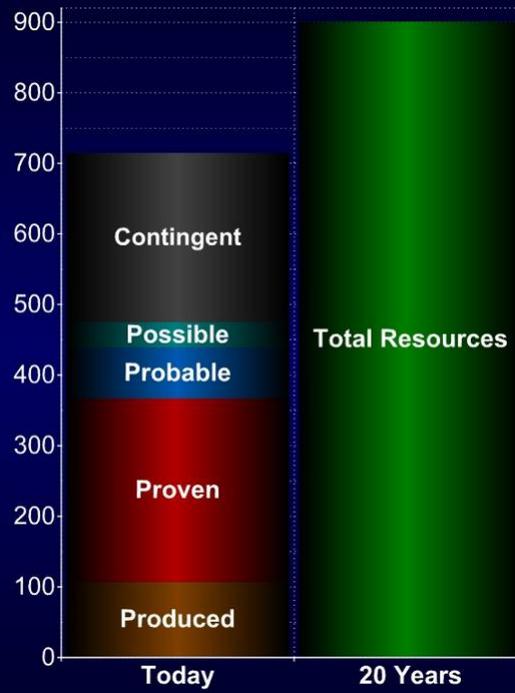
- ✓ Replace 100% of produced reserves
- ✓ Maintain 1.5 to 2.0 MMBD of spare capacity
- ✓ Employ best in class reservoir management practices

	Year	Volume MBD	Grade
Haradh I	1996	300	AL
Shaybah	1998	500	AXL
Haradh II	2003	300	AL
Abu Safah / Qatif	2004	800	AM / AL
Haradh III	2006	300	AL
AFK	2007	500	AL
Shaybah	2008	250	AXL
Nuayyim	2008	100	ASL
Khurais	2009	1,200	AL
Manifa	2011	900	AH

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## Long Term Strategy

- Expand resource base from current level of 716 billion BBLs to over 900 billion barrels
- Increase recovery to 70% by way of conventional and enhanced oil recovery



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**POWERS Simulation**

**Seismic Data to Geosteer a horizontal well at 13000'**  
 Tested 30 mmscfd at 3600 psig (Unstimulated)

**Production Equalizer**

**"Smart" Well Completion**

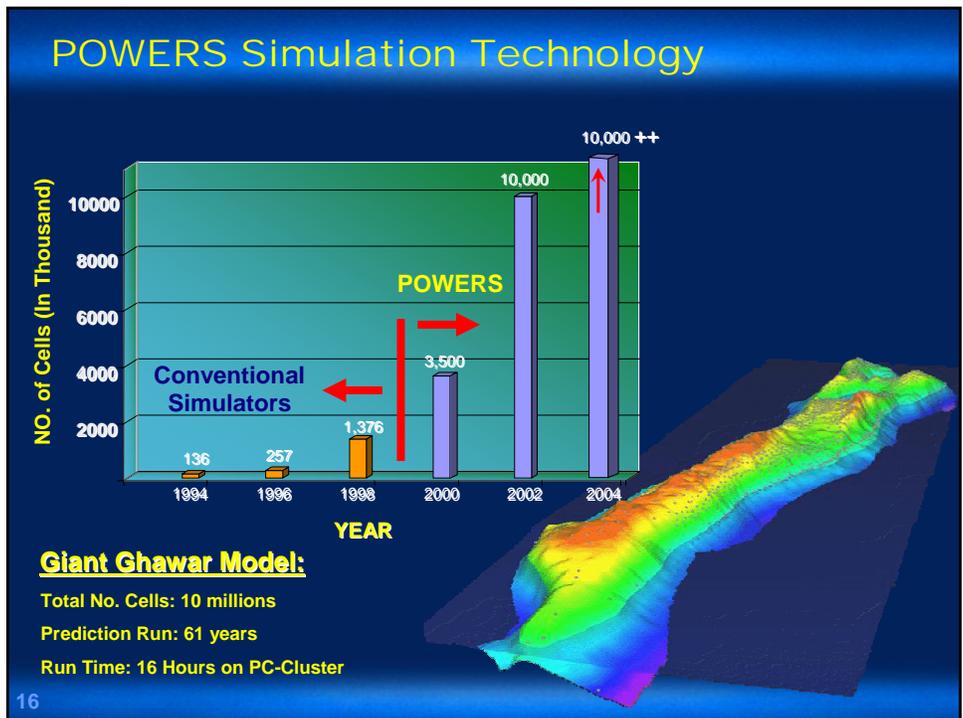
**Multi-Lateral Horizontal Drilling**  
 3,000 B/D (1 km Horizontal) | 10,000 B/D (12 km Max. Reservoir Contact)

**Expandable Screen Liner**  
 9.85" @ 8000' | 7" liner @ 8000' | TD @ 10300'

**Under-Balance Perforation**

**Advanced Seismic Imaging**  
 Commercial Package | Small Area (DETECT) | U.S. Patent pending

**"Intelligent" Natural Gas Lift**



# Real-Time Monitoring & Geo-steering

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# I-Field

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- Subsurface Sensors & Control
- Surface Sensors & Control
- Real-Time Reservoir Management

## Downstream Expansion Plans

- Pursuing world scale domestic and international downstream investments with major refining industry leaders
- International downstream investments in major markets, whether established or growing
- In Kingdom investments with multiple export options
- Integrating petrochemical opportunities with domestic refineries where appropriate
- **Refinery Expansion**
  - Motiva – USA
  - Petron – Philippines
  - Fujian – China
- **Grassroots Refineries**
  - Jubail (Total) Saudi Arabia
  - Yanbu (COP) Saudi Arabia
  - S-Oil – South Korea
  - Qingdao – China
- **Petrochemical Integration**
  - PetroRabigh – Saudi Arabia
  - Ras Tanura – Saudi Arabia

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## Putting it all together

- 54,000 employees from 50 nations after starting from a base of less than 2,000 employees in 1946
- 85% Saudi nationals
- Human resources development
  - Entry level training
  - Professional development
  - Leadership development
  - Self development
  - E-learning
  - Performance management programs
  - Attraction and retention



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## In Conclusion

- Uncertainty is a certainty, both in the near and long term
- Meeting the energy challenge today and in the future requires a substantial mobilization of resources, which is well underway within OPEC
- Spare capacity will continue to be required by the market
- Saudi Arabia is committed to playing its part in meeting the future energy challenge and to maintaining 1.5 to 2.0 MMBD of spare capacity over and above market requirements.

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