Emerging Investment Opportunities in Primary Upstream Petrochemical Projects

Saudi Arabian International Gas Conference

May 17, 2004

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Beginnings of the Petrochemical Industry

1. **Feedstocks from Master Gas System (MGS)**
   - Gather & process associated gas
   - Provided methane, ethane & NGL feeds
2. **Government policies to attract investment**
   - Royal Commission for Jubail & Yanbu
   - Incentives to "jump start" the industry
3. **Established Saudi Basic Industries Corporation (SABIC) to build/operate industrial facilities**
   - Government and private funding
   - Independent and joint ventures

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Saudi Arabia's Petrochemical Growth History

- **Exponential growth fostered by advantaged feedstock**
  - 25 Chemical plants in '70s, US $0.5 Billion
  - 300 plants in 2000, about US $20 Billion investment
  - Forecast more than 500 in 2005
- **Requirements for expanded feedstock**
  - Associated gas inadequate to meet needs
  - Saudi Aramco developed non-associated gas to supplement
- **More than 50 Petrochemical Products:**
  - Approximately $10 Billion in annual sales
  - Sold in nearly 100 countries

Saudi Primary Petrochemicals
% of World Supply

- **18 Petrochemical Complexes**
- **15 International joint ventures**
- **14,000 Employees**
- **About 60% of Saudi non-crude export revenues**

Methanol
3.8 mmtpa
15%

Styrene
1.1 mmtpa
6%

2003 Total: 40 MM Tons

2010 Total: 60 MM Tons

MTBE
2.9 mmtpa
10%

Ethylene Glycol
2.3 mmtpa
11%

Ethylene
6.0 mmtpa
6%

Polyethylene
2.8 mmtpa
5%

Polypropylene
1.2 mmtpa

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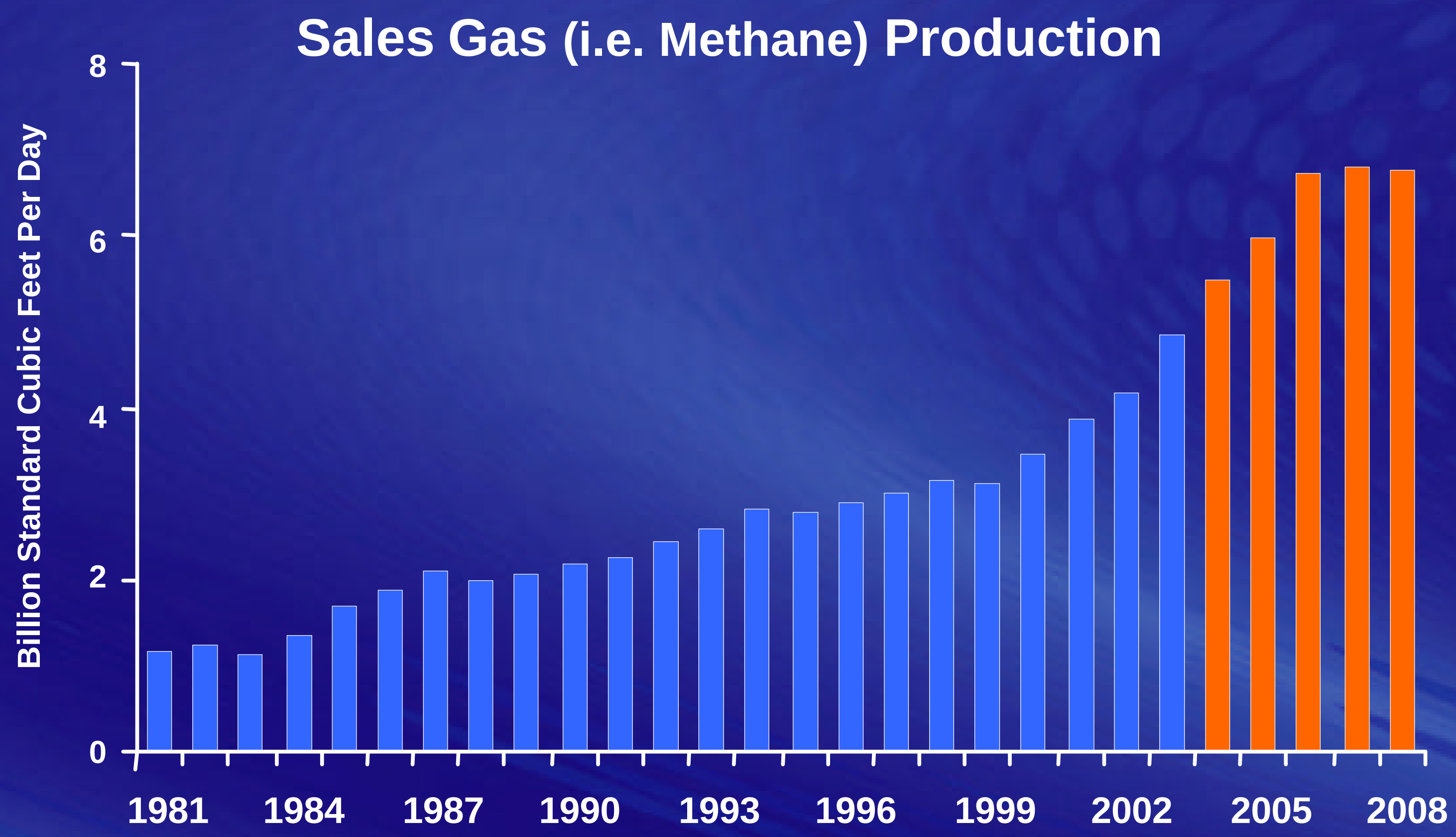
Saudi Arabia's Feedstock Supply Sources

- **Gas-based – Near Term**
  - 235 trillion cubic feet of proven reserves:
    - Associated with oil = 60%
    - Non-associated = 40% -- historical growth @ 5 TCF per year
  - Ethane and NGL increment to feed next wave of projects
- **Upstream gas deals & future Saudi Aramco discoveries – Longer Term**
- **Petrochemicals from refinery integration (e.g. Aromatics & FCC)**

Supply of sales gas is steadily increasing…



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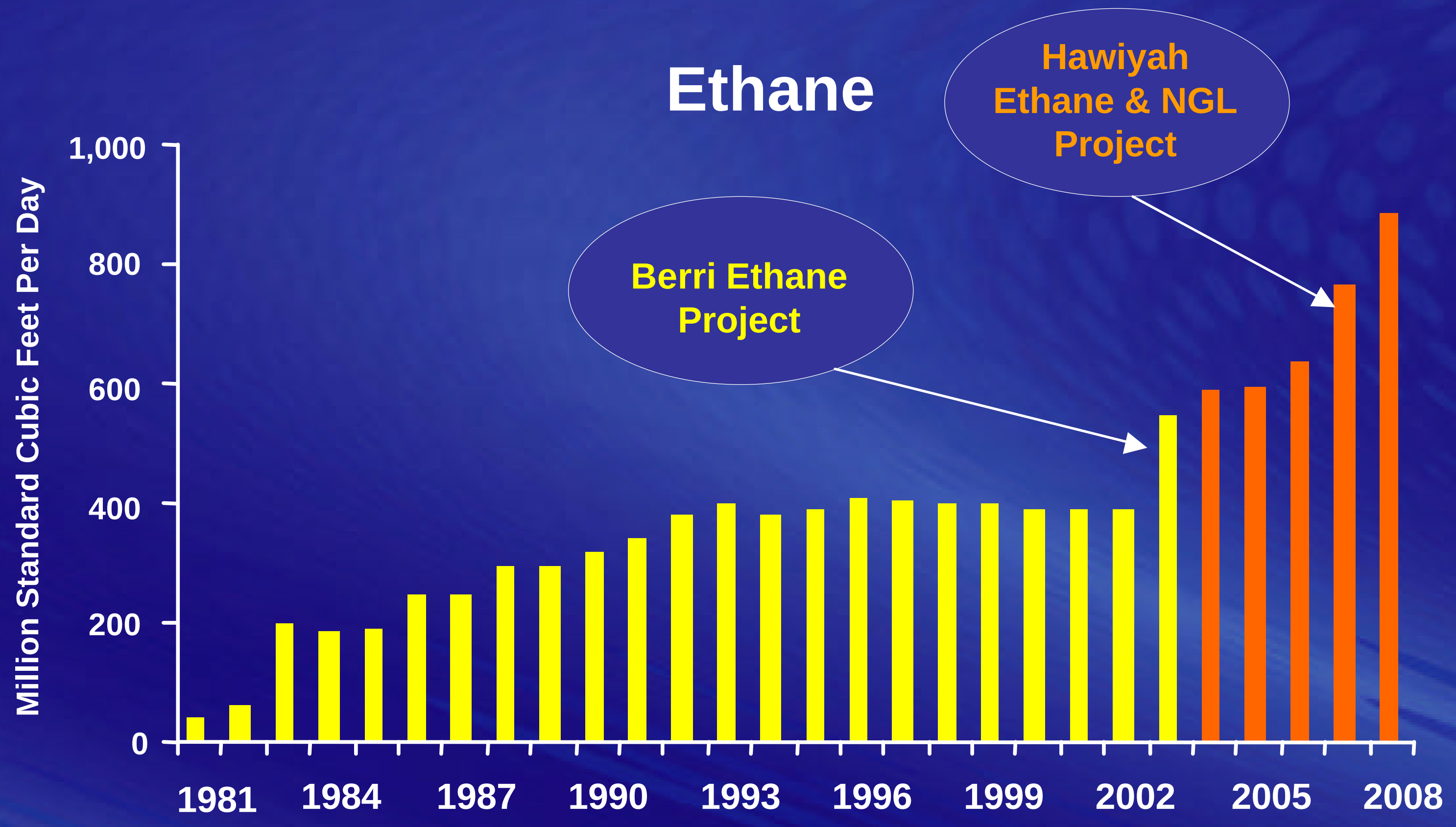
New Increments of Ethane Supply



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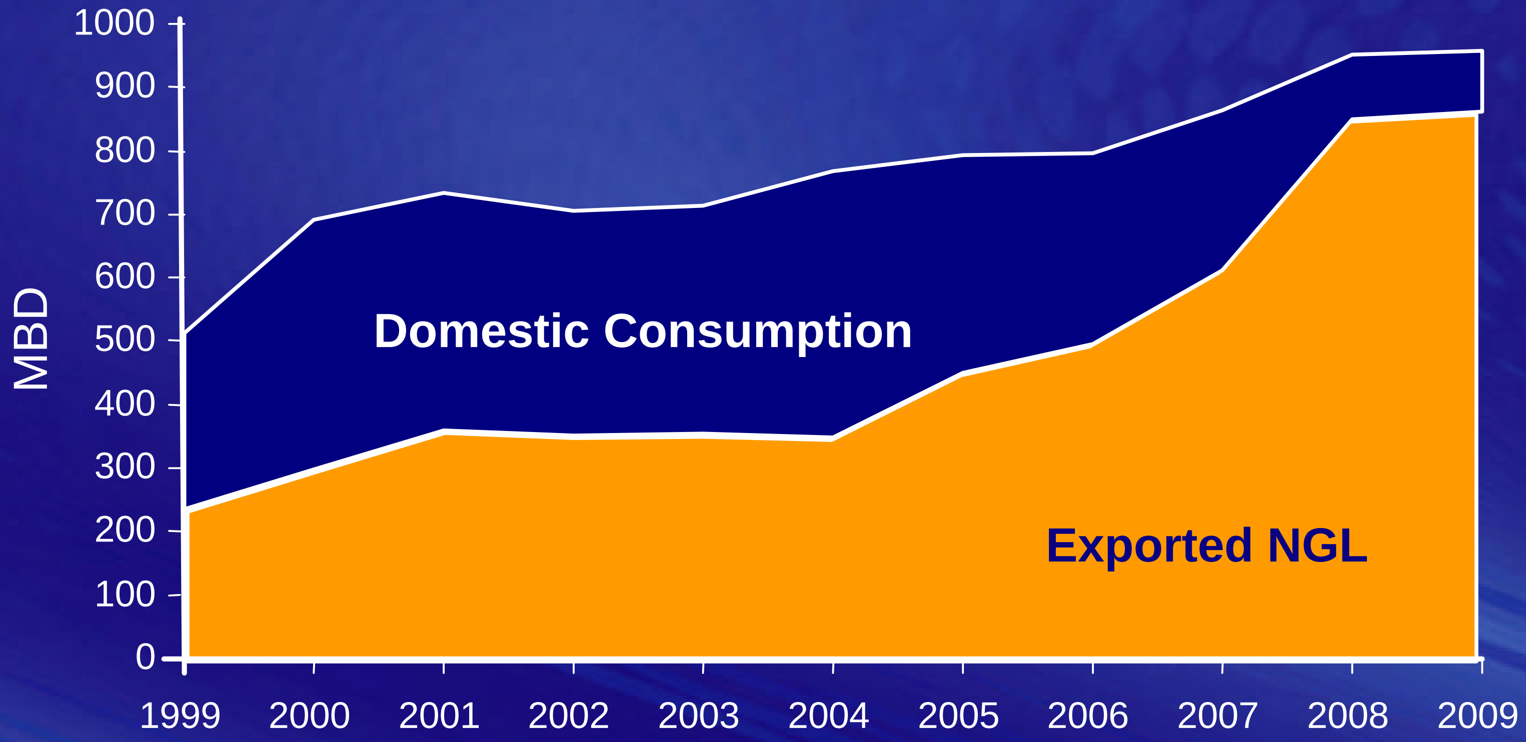
NGL production is steadily increasing, more volumes are being directed to the domestic market



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Summary of Near Term Gas-Based Developments

- **$3 billion + Saudi Aramco investment for new ethane & NGL capacity**
- **400 MMSFD ethane 250 MBD NGL and 500 MMSFD methane allocated to new mega petrochemical projects.**
  - Ethylene production will more than double
    - 6 million tons end of 2003 to +13 million tons by 2008
  - Other large NGL and methane projects allocated feed
- **Rabigh Project – integrates ethane cracking with high olefins cat cracking - $4.3 billion investment by Sumitomo Chemical/Saudi Aramco**
- **New supplies will drive $20 billion in downstream investment creating more than 12,000 new direct jobs and adding $billions to Kingdom's GDP**

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Next Wave of Projects

Cracker Projects			
Company	Feedstock Allocated	Products	Expected Start-up
Jubail United Petrochemical Co. (100 % Sabic)	Ethane-Propane	Polyolefins-EG	4Q 2004
Jubail Chevron Phillips –Phase 2 (CPC & Saudi Ind. Invest. Group)	Natural Gasoline	Styrene	1Q 2007
NPIC-Al-Zamil @ Jubail	Ethane-Propane	Polyolefins / VAM	1Q 2007
SABIC @ Yanbu	Ethane-Propane	Polyolefins, EG	2Q 2007
SHARQ (50%Sabic 50% Mitsubishi & others) @ Jubail	Ethane-Propane	PE & EG	1Q 2008
Jubail Chevron Phillips - Phase-3 @ Jubail	Ethane-Propane-Natural Gasoline	Polyolefins, Alpha Olefins, Styrene, K-resins	4Q 2008
Project Management & Development Co. @ Jubail	Ethane-Butanes	Polyolefins, BPA, Amines	2Q 2008
Rabigh Project @ Rabigh Refinery Sumitomo Chemical/Saudi Aramco	Ethane-V. Gas Oil	Gasoline, Polyolefins, Propylene Oxide, Ethylene Glycol, Alpha Olefins, Acrylics	3Q 2008

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Next Wave of Projects (Contd)

Project	Expected Start-up
Propane Dehydrogenation to Propylene & Derivatives	
National Petrochemicals Industrialization Co (NPIC) @ Jubail	Under start up
National Polypropylene Company (NPPC) @ Jubail	1Q 2006
Al-Zamil Group @ Jubail	3Q 2007
Alujain Company @ Yanbu	1Q 2008
Butane-Based Projects	
Gulf Advanced Chemicals Industries (Sipchem Affiliate) (Butanediol / MAN) @ Jubail	1Q 2006
Alujain Company (Iso-octane Project) @Jubail	1Q 2008
Methane-Based Projects	
SAFCO-4 (SABIC Affiliate) (ammonia / urea) @ Jubail	4Q 2005
Saudi International Petrochemicals Company (Sipchem) (methanol / acetic acid) @ Jubail	1Q 2006
National Petrochemicals Industrialization Company (NPIC) (methanol / acetic acid) @ Jubail	1Q 2007

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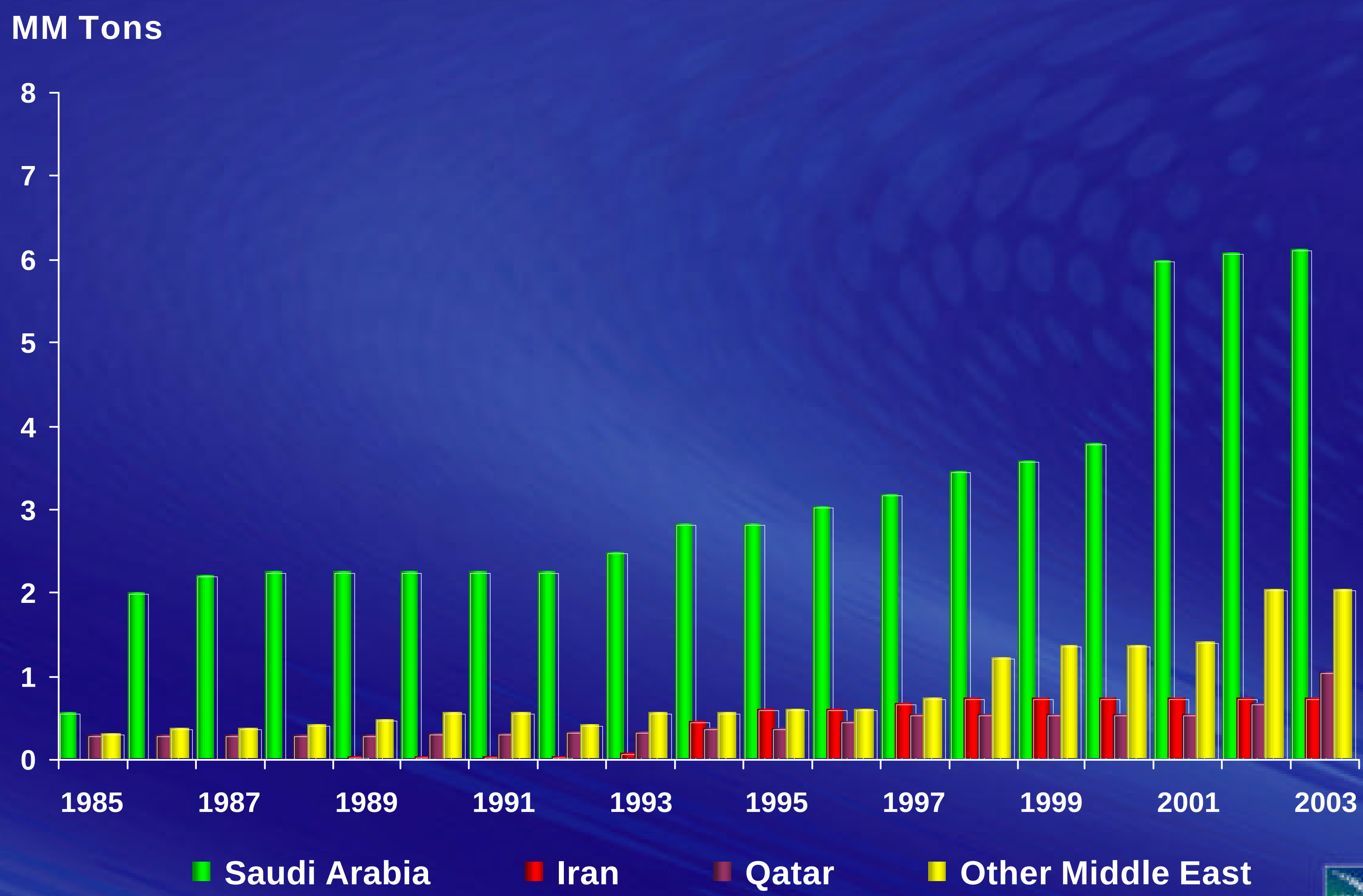
Growth in Middle East Ethylene Capacity



Source: CMAI

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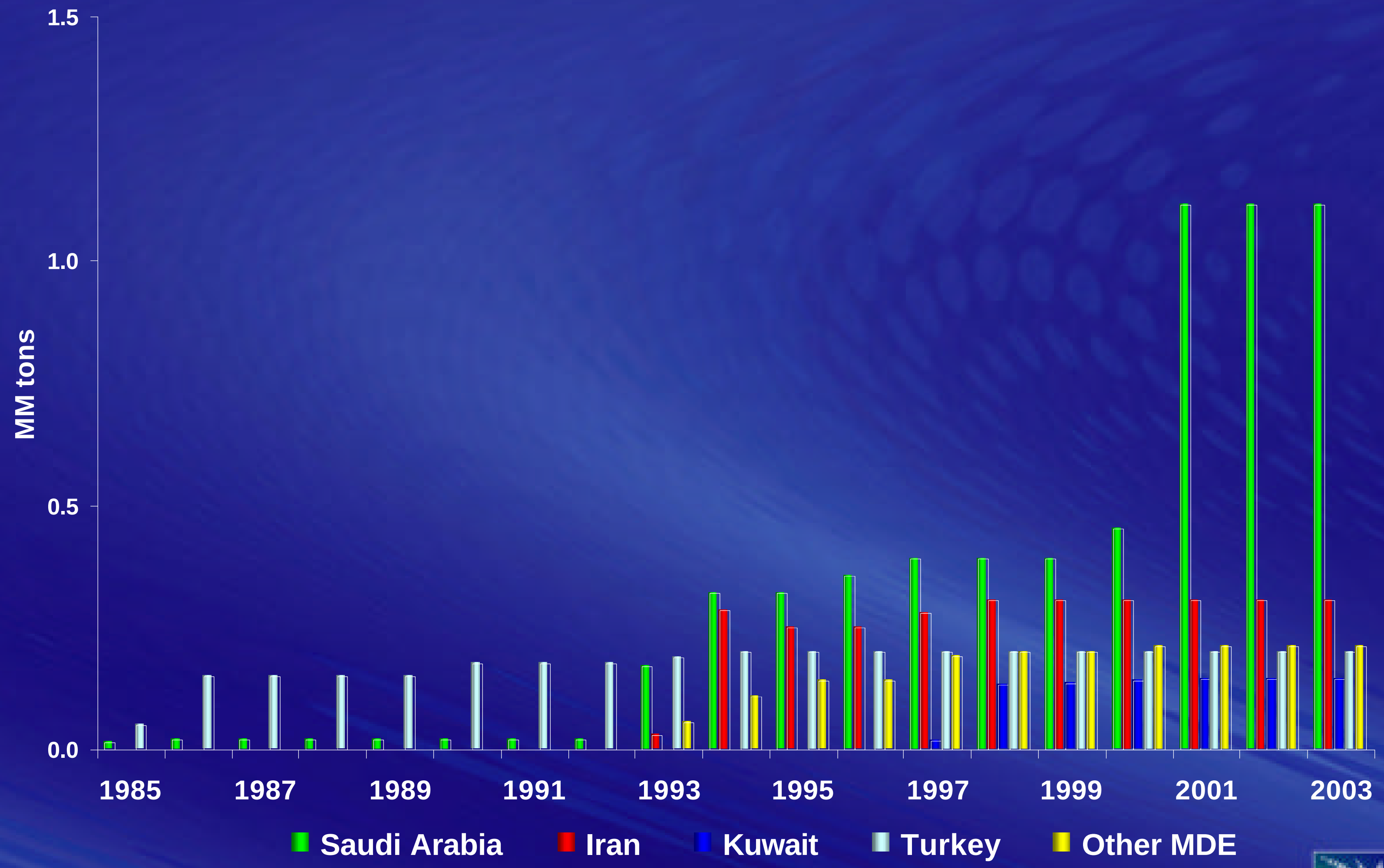
Growth in Middle East Propylene Capacity



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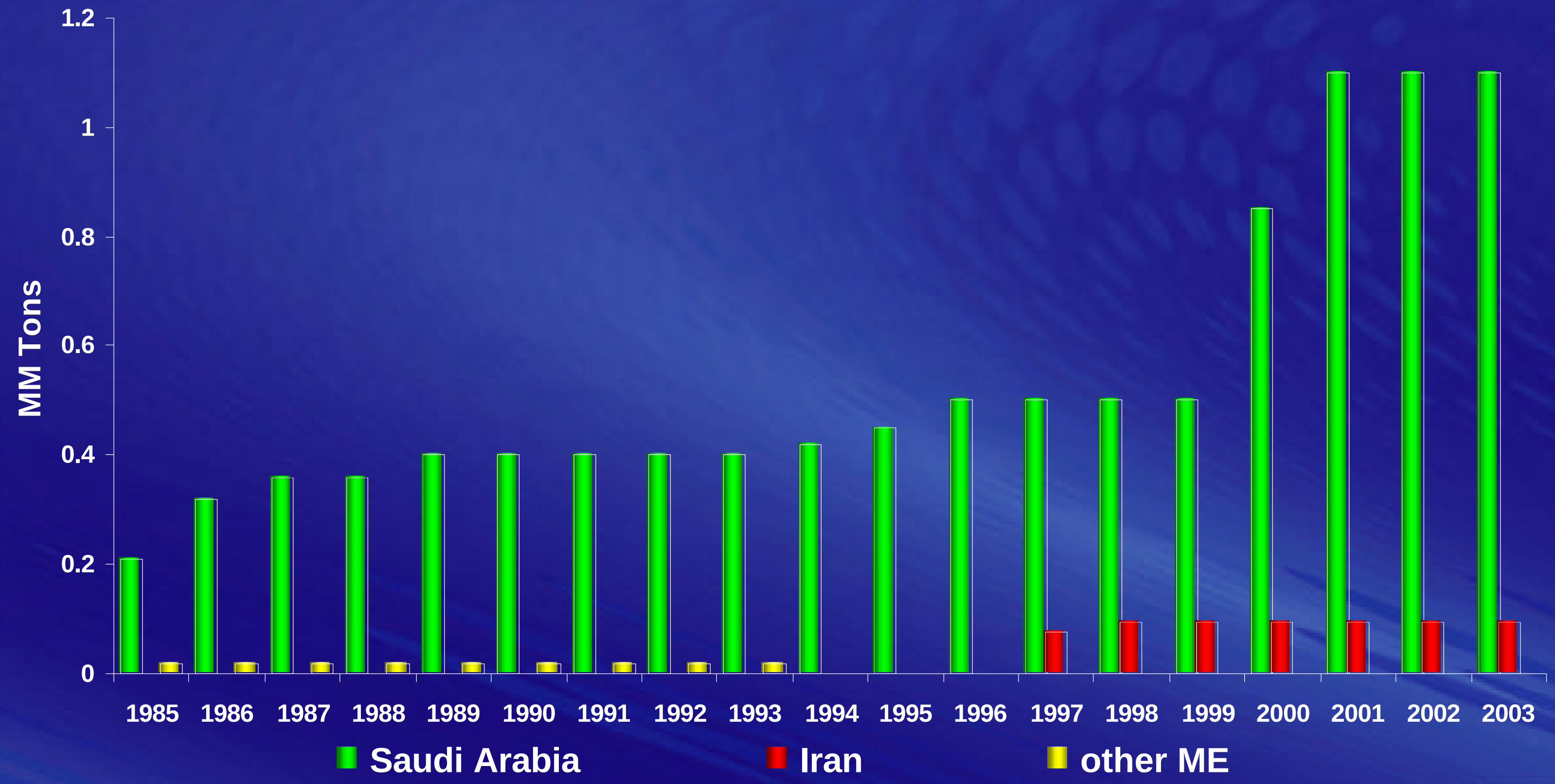
Growth in Middle East Styrene Capacity



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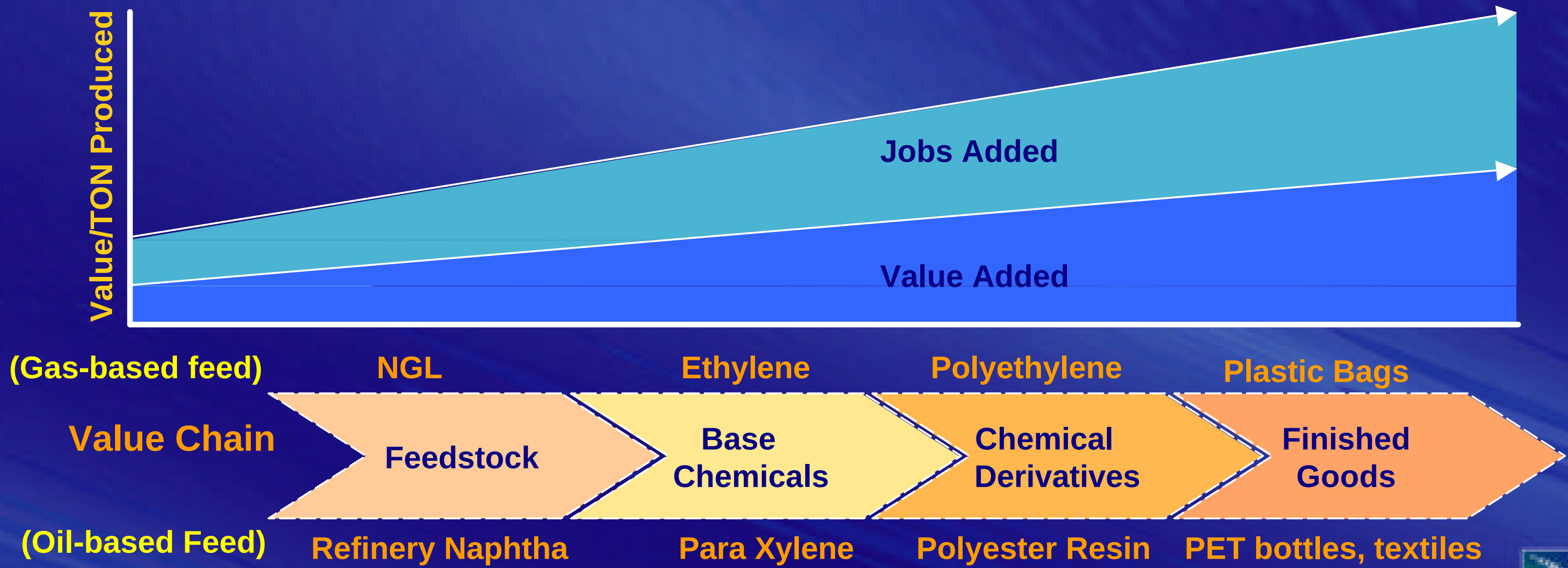
Long Term Vision

- Leverage advantaged cost position by adding value though the chain
- Diversify the industry
- Capitalize upon industry cluster synergies

Kingdom needs added jobs and investments from the industry



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Thank You

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