

13th International Energy Forum - Kuwait, 12-14 March 2012

Panel 1: “Meeting Future Energy Demand: Planning and Investment for the Long-term”

MENA Energy Investment in A Global Setting

Assessment and Implications for Policy and Long-term Planning



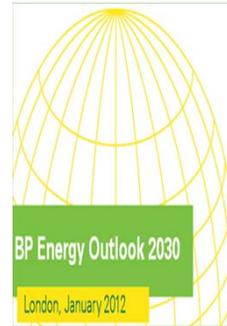
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Outline of presentation

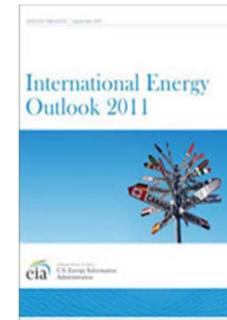
- Major shifts in global energy demand growth patterns
- Energy investment needed to balance supply-demand
- IEA's MENA upstream 'Deferred Investment Case'
- Summing up and implications for policy and planning

What makes current projections compelling and what differentiates them?

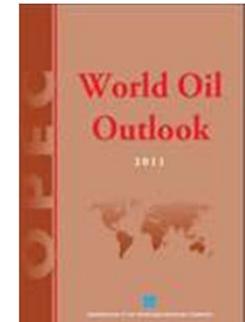
- Broad scope and strategic focus
- Varying long-term horizons
- Nuanced thematic emphases
 - Energy diversification
 - Energy efficiency
 - Energy poverty
 - Environmental impacts
- But few explicitly derive investment



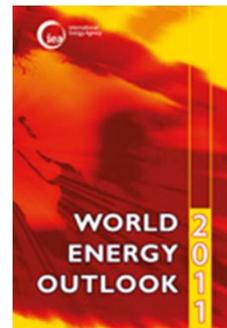
BP 2030



EIA 2035



OPEC 2035



IEA 2035



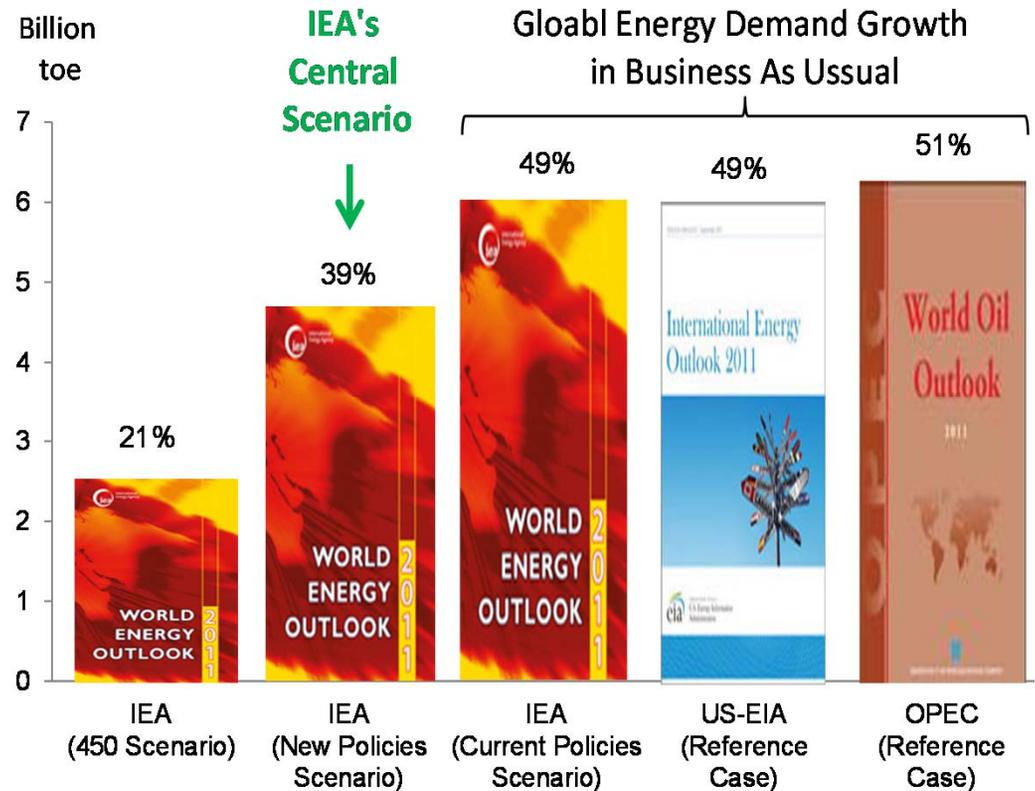
XOM 2040



SHELL 2050

Only the policy-advisory Institutions consider explicitly investment though to varying degrees

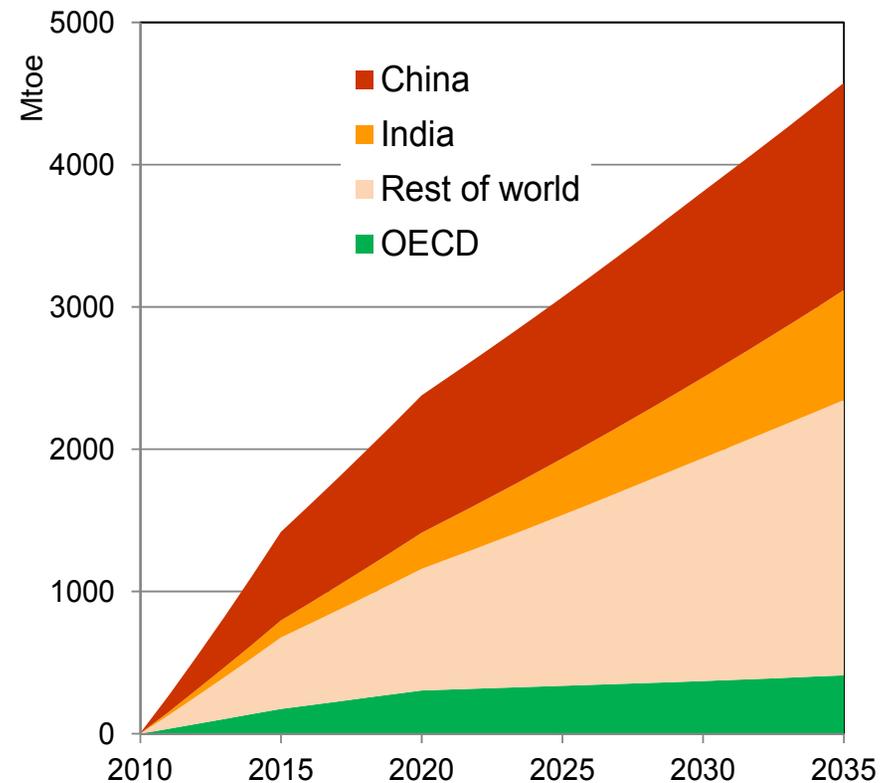
- The US-EIA (qualitatively) and OPEC (quantitatively for oil) base their investment on current policies
- In contrast, the IEA base its investment projections on a central scenario: the 'New Policies Scenario'



Source: APICORP Research Compilation

Underlying all projections is a major shift in geographical energy demand patterns...

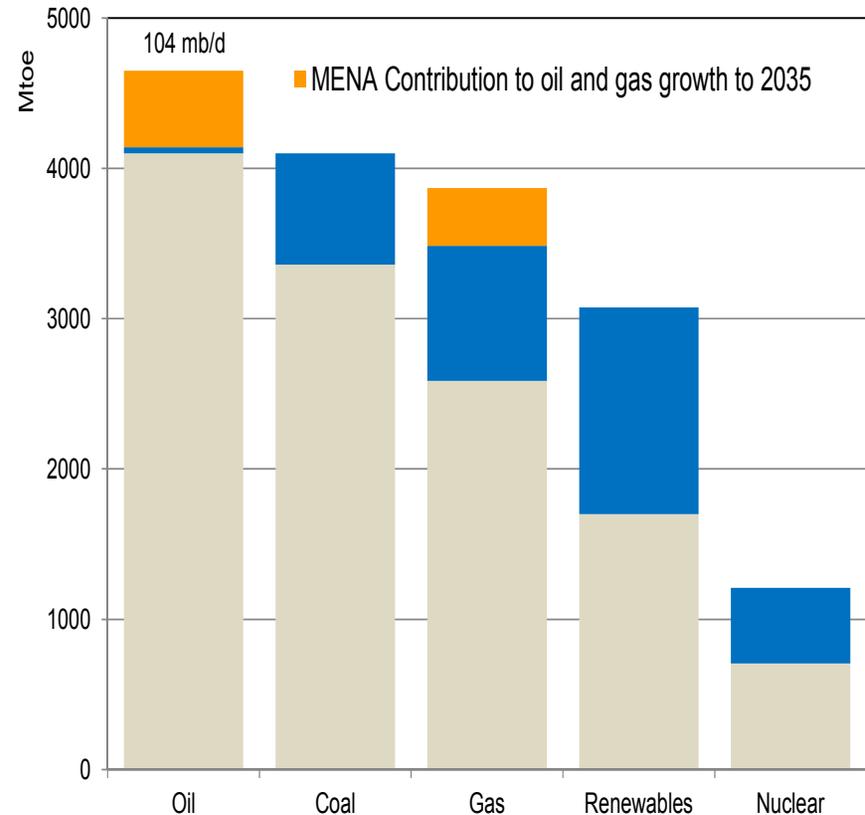
- Driven primarily by population and economic expansion, global energy demand increases by 39% to 2035
- This central-scenario growth is accompanied by a major shift in the geographical pattern
- Non-OECD responsible for 90% of the increment, with China and India alone accounting for half the total



Source: IEA World Energy Outlook 2011
(adapted from original)

... and significant changes in the sources of energy

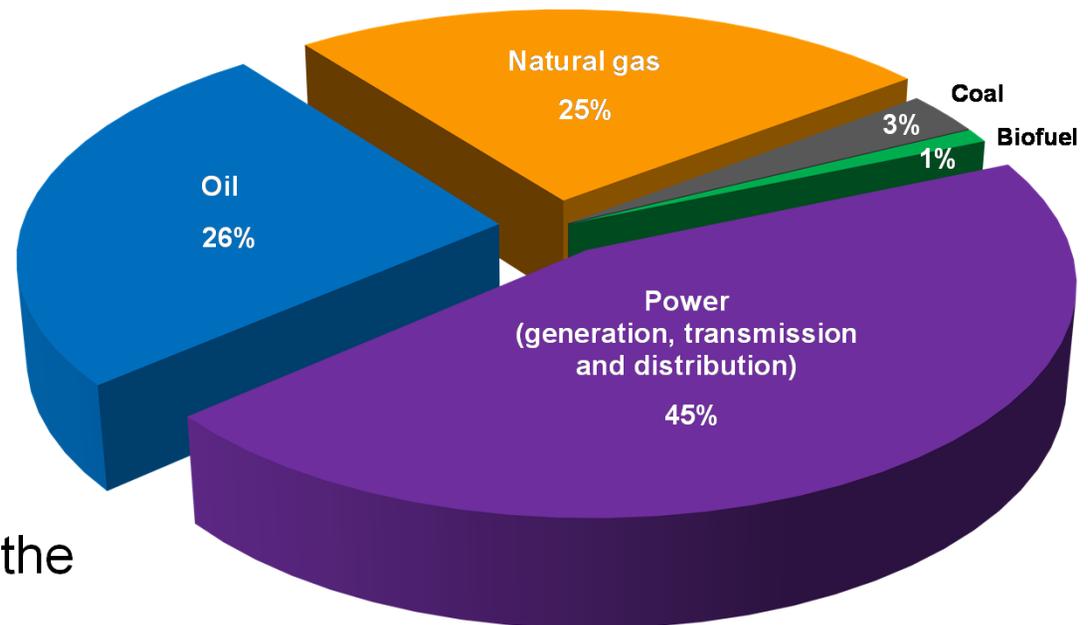
- Still driven by transport, oil is to remain the primary source of energy for the world economy
- Natural gas nearly catches up with coal as it ultimately wins in the competition for power generation
- MENA is expected to supply the bulk of growth in oil and a substantial amount of natural gas



Source: IEA (adapted)

The energy investment needed to balance global supply and demand grows to \$38 trillion dollars

- Cumulative investment amount to \$37.9 trillion (2010 dollars)
 - Oil supply: \$10.0 trillion
 - Gas supply: \$9.5 trillion
 - Coal supply: \$1.2 trillion
 - Biofuel supply: \$0.4 trillion
- The highest share is that of the power sector: \$16.9 trillion

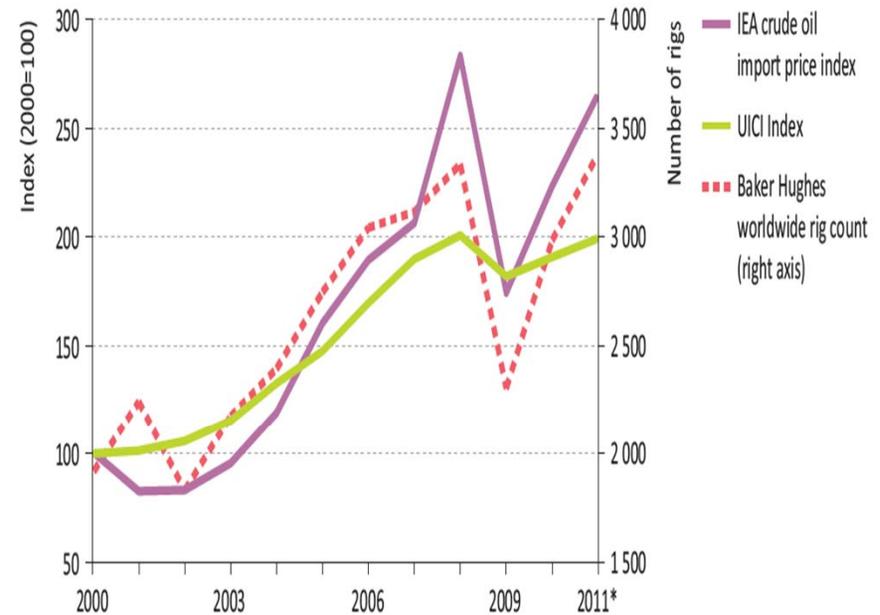


Total investment: \$37.9 trillion

Source: IEA (adapted)

Cost inflation is the most important factor driving the increase in energy investment

- According to the IEA, costs have doubled during the last decade, due to increase in the cost of material, personnel, equipment and services
- Our interpretation lies in the concurrent inflation of the main cost components of EPC:
 - cost of input factors
 - contractors' margins
 - project risk premiums
 - cost of 'excessive largeness'



*Preliminary estimates based on trends in the first half of the year.

Notes: The IEA Upstream Investment Cost Index (UICI), set at 100 in 2000, measures the change in underlying capital costs for exploration and production. It uses weighted averages to remove the effects of spending on different types and locations of upstream projects. The IEA crude oil import price index is set at 100 in 2000.

Sources: IEA databases and analysis based on industry sources; Baker Hughes databases (BH, 2011).

Source: IEA World Energy Outlook 2011

In the context of ongoing turmoil, the impact of a MENA 'Deferred Investment Case' is most relevant

- According to the IEA, MENA is potentially expected to invest \$2.7 trillion upstream through to 2035
- But in the medium term such an investment may be delayed due to:
 - Deteriorating investment climate
 - Renegotiations of contracts
 - Prudent/conservative policies
 - Tougher economic sanctions
 - Damage to infrastructure (conflict)
 - **Constraints on financing**

Box 3.5 • Assumptions and methodology of the Deferred Investment Case

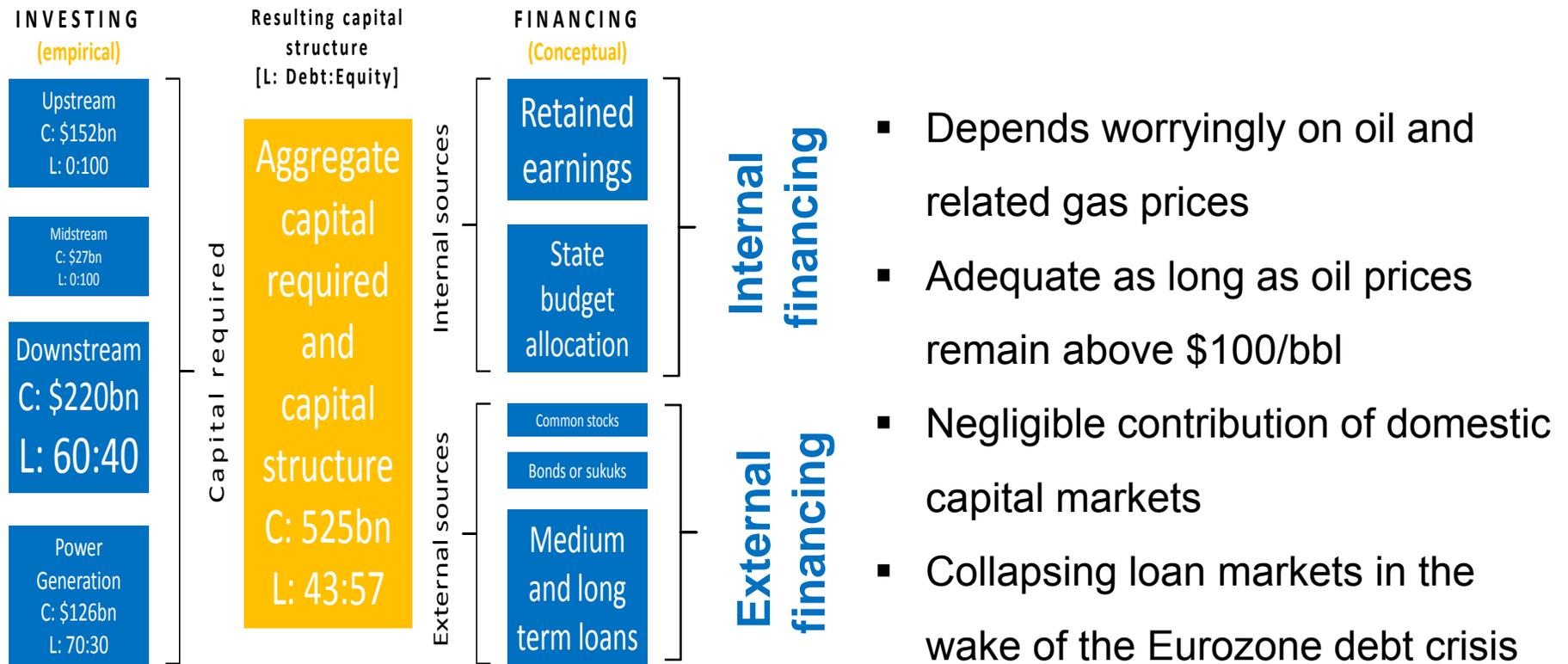
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The assumptions on reduced investment in the upstream oil and gas industry in MENA were fed into the oil supply module of the World Energy Model (WEM), generating a lower level of output from already producing fields and fields to be developed in each country in the region. The impact on international oil prices was derived through several iterations of the WEM supply and demand modules to find the oil-price trajectory that brings non-MENA supply and global demand into equilibrium in each year of lower MENA supply.

With the exception of international fuel prices, assumptions about all the other factors driving energy demand and supply in the MENA region and elsewhere were kept the same as in the New Policies Scenario. End-user fuel subsidy policies in MENA and other countries were assumed to remain as they are in the New Policies Scenario. The terms of trade between consuming and producing nations would be likely to change over the projection period, as oil-producing countries would benefit in the short term from higher revenues from imports. However, our analysis shows that, over the projection period as a whole, the cumulative net revenues of MENA do not change significantly compared to the New Policies Scenario. The same holds true for import bills in importing countries. For these reasons, and to avoid unduly complicating comparisons with the New Policies Scenario, the GDP assumptions of the New Policies Scenario have not been changed. In practice, reduced investment in MENA and higher oil prices would be likely to affect the path of GDP growth to a different extent in different regions.

Source: IEA, Ibid.

Our MENA energy capital structure highlights specific funding constraints

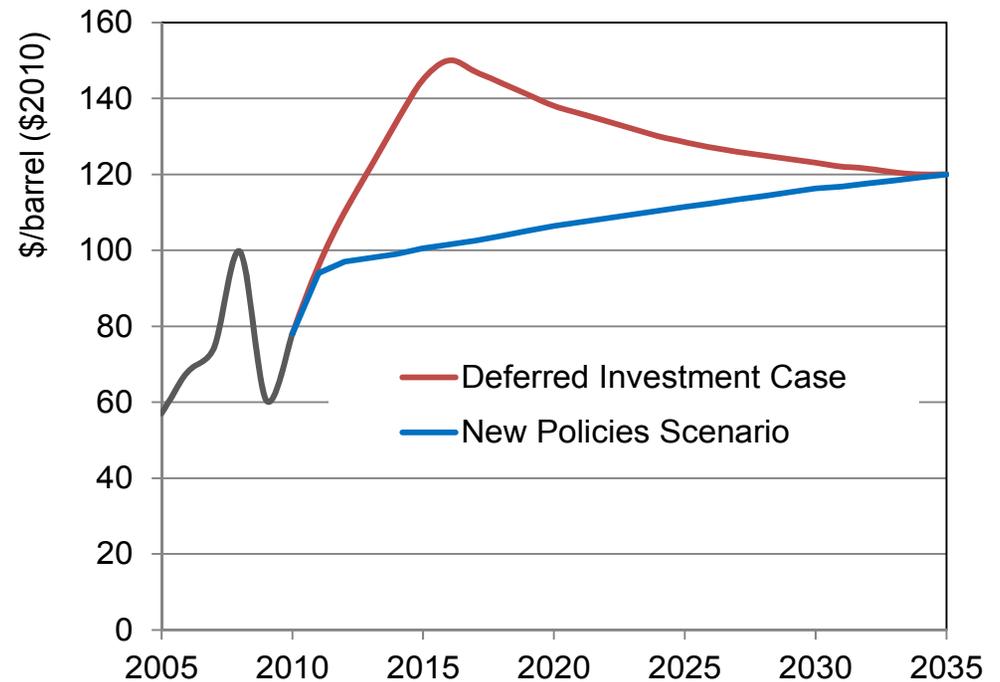


APICORP Research

Source: APICORP Research - MENA Energy Investment Outlook 2012-2016

The IEA's DIC has many impacts, mostly underpinned by soaring oil and gas prices

- Oil price increases to \$150/barrel (\$175 nominal), before converging towards the IEA's central scenario
- More complex to analyze and predict, gas prices also expected to increase, though not to the same extent as oil



Source: IEA World Energy Outlook 2011

Summing up the context and investment assessment

- Amid major shifts in demand and supply patterns, MENA is to provide the bulk of oil output growth, and a large amount of gas
- This involves upstream investment of over \$100bn per year through to 2035 in the IEA's central scenario
- It is far from certain that such magnified levels will be forthcoming
 - In the medium term, the causes for delay are all likely when not already a reality
 - In the longer term, MENA's core producers are treated as passive residual suppliers

The implications for policy and planning can be wide-ranging and far-reaching

- In the medium term:
 - Assuming no demand destruction, more spare capacity need to be available
 - But how that can be planned in face of lead-time investment uncertainty?
- In the longer term:
 - Fiscal conditions permitting, very prudent and conservative depletion policies will likely continue
 - Unless a new paradigm of cooperation addresses the challenges of economic diversification