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## Recent Energy Outlooks: A review of four outlooks

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# Stylized facts

- Uncertain future of energy world
  - Financial Crisis: when will the global economy turn around
  - GHG mitigation: Copenhagen outcome?
- Unknown impacts on energy of:
  - Urbanization
  - Aging
  - Cost-of-carbon policies
- Unpredictable factors
  - Technological innovation/breakthrough
  - Political instability
  - Natural disasters
- There are four reports so far:
  - EIA, IEA, ExxonMobile, Conoco-phillips

# IEA outlook 2009

- Focus is on the carbon constrained world
  - 450 ppm scenario
  - “A wholesale transformation of the way we produce and use energy
- By 2030
  - 1/3 of the TPES will be zero-carbon fuels
  - 2/3 of the required reduction in 2020 comes from efficiency measures
  - More reduction ‘required’ from non-OECD: financing issue
  - 10 trillion of additional investment required
    - 0.5% of GDP in 2020, 1.1% of GDP in 2030

# Understanding IEA's

- IEA's BAU is “surprisingly” identical to EIA's – a long arm of coincidence?
  - In 2030 the 40 billion ton of CO<sub>2</sub> (40 giga ton in EIA)
- A series of numbers that cannot be verified
  - Reduction in energy bills by 8.6 trillion dollars
- What is a “wholesale transformation”?
- It is not known what is the criteria for the selection of measures: minimum cost?
- How did they build their scenario: A recursive approach?
- No mention of “prices”: drivers? Cost of carbon?

# EIA outlook

- Worldwide energy consumption will increase by 44% between 2006 and 2030
  - Non-OECD countries accounts for 82% of the incremental
- Oil price will rise to \$130/bbl in 2030
- Unconventional liquids will meet ½ of the incremental liquid growth
- Despite the fast growth of NRE, fossil fuels will share over 80% of commercial energy in 2030
- Unconventional sources would provide about ½ of the growth in global liquids
- OPEC's share in conventional energy production will rise



# ExxonMobile

- By 2030
  - Energy consumption will increase by 35%
    - APEC developing countries will use more energy
  - Oil will remain the largest source of energy supply at 34% (40% growth)
    - Transport is one of the fastest growing sectors
  - Power generation is the largest and the fastest growing segment of global energy demand, sharing 40% of the world total
    - Coal , natural gas, nuclear will share about 30% each with 10% of NRE
  - Natural gas will overtake coal as the second-biggest global fuel source
    - APEC demand will grow 150% by 2030

# ExxonMobile continued

- Brazil kazakhstan, and other non-opec will offset the decline of the mature fields in the united states and the north sea
- The resource base is enogh through 2030 and beyond, but the call for OPEC will increase to 45 ~50 MBDOE.
- The global liquid will grow from 84 MBDOE to 108 MBDOE in 2030
- Wind, solar, and biofuels will grow at 9.3% per year but site avaialability will limit the growth
- Cost-of-carbon polices will increase elec. tariffs

# Conoco-Phillips

- Focusing on oil
  - In the short-run, dampened demand with high spare capacity and high inventory will keep oil price low
  - Demand will rebound to put pressure on price in the mid-term
    - 25% increase from 2007 to 2030 at \$110/bbl
  - Conventional non-opec crude production has peaked
    - OPEC share will increase
  - Natural gas demand will rise with the supportive policies: Transition to a low carbon economy



# What are missing?

- Common understanding: Models are an abstract, and extremely simplified world – no preaching warranted
- Positive approach; “value judgment” – not a sound rationale for the projection
  - “Devils are in details”
    - Market structure, industrial organization, regulations
- Reflections on the past: Previous outlooks

# Likely Scenario

- Reality check
  - Politically infeasible solutions: climate change
  - Technological progress: slow maybe
  - Who make decisions: stakeholders?
- Extension of the status quo
  - Market mechanism will prevail
  - Closer to BAUs