GLOBAL ENERGY INVESTMENTS: WHAT’S NEXT?

Dr. Fatih Birol, Executive Director, International Energy Agency
IICEC 8th International Energy and Climate Forum, 13 October 2017

IEA
The global energy context today

- Global energy markets are changing rapidly
  - *North America entering a new age of energy prosperity*
  - *Solar at records highs, driven by policy support & cost reductions*
  - *Electric car sales are growing exponentially*

- Digitalization is having profound impacts on the energy sector

- Local air pollution is becoming a key driver of energy policy

- There is no single story about the future of global energy; policies will determine where we go from here
Global energy investment fell 12% in 2016, a second consecutive year of decline. Total energy investment was $1.7 trillion in 2016; electricity sector investment overtook oil and gas for the first time, while energy efficiency saw the biggest growth.
China remains the first destination of energy investment in 2016

China represented 21% of global energy investment (supported by renewables, electricity networks and energy efficiency), followed by the US and Europe.
US shale oil is shaking up global markets even at lower oil prices

US shale oil production

US shale oil has surged in recent years on enormous cost savings & technological improvements; The US is set to lead the growth in global oil supply over the next 5 years.
Natural Gas: The United States accounts for 40% of global production growth

Since 2009, US shale has added the equivalent of two Qatars to the global balance; Middle East and China set to significantly expand production to 2022
Renewables closing the gap with coal

Renewable generation to expand by over a third with its share increasing from 24% in 2016 to 30% in 2022, rapidly closing the gap with coal.
Price discovery through competitive auctions effectively reduces costs along the entire value chain; Auctions with long-term contracts will drive almost half of new capacity growth.
A large share of energy use is still not subject to efficiency standards

The amount of global energy use covered by mandatory efficiency policies grew in 2016, but 68% of energy use remains uncovered. We owe the efficiency gains of today to the policies of the past.
Trucks were responsible for nearly 40% of the growth in global oil demand since 2000; they are the fastest growing source of oil demand, in particular for diesel.
A modern truck sector is still a long haul away

Nearly 40 countries have fuel efficiency standards for cars. Only Canada, China, Japan and the United States have standards for trucks.
The potential of clean energy technology remains under-utilised

<table>
<thead>
<tr>
<th>Solar PV and onshore wind</th>
<th>Energy storage</th>
<th>Electric vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport – Fuel economy of light-duty vehicles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy-intensive industrial processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lighting, appliances and building equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More efficient coal-fired power</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbon capture and storage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport biofuels</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Not on track**
- **Accelerated improvement needed**
- **On track**

Recent progress in some clean energy areas is promising, but many technologies still need a strong push to achieve their full potential and deliver a sustainable energy future.
Global clean energy R&D funding needs a strong boost

R&D funding on clean energy has remained steady at around $37 billion/year, leaving significant room for growth.
Closing remarks

• While a continued focus on oil security is essential, a broader approach to energy security is needed to reflect changing nature of natural gas & electricity markets

• New oil market dynamics & subdued upstream investment are ushering in a period of greater market volatility

• A wave of LNG is the catalyst for a second natural gas revolution, with far-reaching implications for gas pricing & contracts

• The next chapter in the rise of renewables requires more work on systems integration & expanding their use beyond the power sector

• Addressing environmental challenges will require an energy transition of exceptional scope, depth & speed, including stronger R&D efforts