About RFF

Resources for the Future is an independent, nonprofit research institution in Washington, DC. Its mission is to improve environmental, energy, and natural resource decisions through impartial economic research and policy engagement.

RFF is committed to being the most widely trusted source of research insights and policy solutions leading to a healthy environment and a thriving economy.
About the Global Energy Outlook

Numerous organizations produce long-term energy outlooks
But they are difficult, if not impossible to compare directly

- Primary energy reporting units: TOEs, Quads, Mboe, and Joules
- Primary energy content:
- And much more

These inconsistencies prevent decision-makers from understanding the full range of potential energy futures, or differences in viewpoint
What the Global Energy Outlook does

Provides an “apples-to-apples” comparison of long-term energy outlooks
We group and label scenarios according to source and policy/technology assumptions

<table>
<thead>
<tr>
<th><strong>“Reference”</strong></th>
<th><strong>“Evolving Policies”</strong></th>
<th><strong>“Ambitious Climate”</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>No new policies, technologies evolve similar to recent trends</td>
<td>Announced policies and/or expert judgement of the modeling team</td>
<td>Built around achieving long-term climate goals (&lt;2°C by 2100)</td>
</tr>
</tbody>
</table>

- **EIA Reference**
- **Equinor Rivalry*”**
- **IEA Current Policies (CPS)**
- **IEEJ Reference**
- **OPEC Reference**

- **BNEF**
- **BP Evolving Transition**
- **Equinor Reform**
- **IEA Stated Policies (STEPS)**
- **ExxonMobil**

- **BP Rapid Transition**
- **Equinor Renewal**
- **IEA Sustainable Development (SDS)**
- **Shell Sky**

*Equinor Rivalry scenario assumes continued geopolitical challenges.
Incorporating COVID-19 into our analysis

• All these projections were made before the effects of COVID-19 were fully understood
• These long-term outlooks are therefore based on short-term economic growth and energy consumption assumptions that are no longer valid
• To address this, we incorporate additional analysis throughout the report based on data from the IEA, EIA, and other sources
• We highlight the importance of underlying economic growth assumptions embedded in energy outlooks
Energy outlooks assume a narrow range of long-term economic growth

Thousands of dollars per capita ($2018 at PPP)
Empirical research suggests that the likely range of future growth is far wider.
Most scenarios show energy additions rather than a clear transition at the global level.
Global CO$_2$ emissions stabilize with Evolving Policies, and fall under Ambitious Climate scenarios

Note: Net emissions calculated where available by summing gross emissions and negative emissions (e.g., biomass with carbon capture and storage).
Liquids demand shrinks in the West and surges in the East under most scenarios

Note: “East” includes Asia Pacific, Middle East, and Africa; West includes Americas, Europe, and Eurasia.
Global coal demand slows, with deep policy-driven uncertainty in the East

Note: “East” includes Asia Pacific, Middle East, and Africa; West includes Americas, Europe, and Eurasia.
Solar surges in the decades ahead

Solar share of global electricity generation

- BNEF
- EIA
- Equinor Renewal
- IEA Sust. Development
- BP Evolving Transition
- Equinor Reform
- IEA Current Policies
- IEEJ Reference
- BP Rapid Transition
- Equinor Rivalry
- IEA STEPS
- Shell Sky
Additional areas of focus in the 2020 GEO

• Looking to the past and the future of solar
• Evolving projections for China, India, and Africa
• A close look at the Kaya identity components of energy outlooks
Explore the data

• Harmonized data from all sources are available online
• Visualize, sort, and download data
• Includes outlooks from 2017, 2018, 2019, and historical data

www.rff.org/geo

We welcome your feedback. Please send questions, comments, or suggestions to
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Short-term effects of COVID-19

Estimated change in GDP and energy consumption, 2019 - 2020

Data source: IEA 2020
Thank you!

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