Alternative Fuels: The Evolution of Energy and Refining Industry



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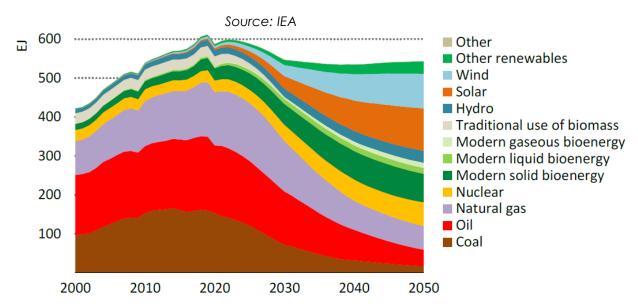
Global Energy Mix in 2050

IEA's Net Zero Emissions (NZE) scenario for 2050

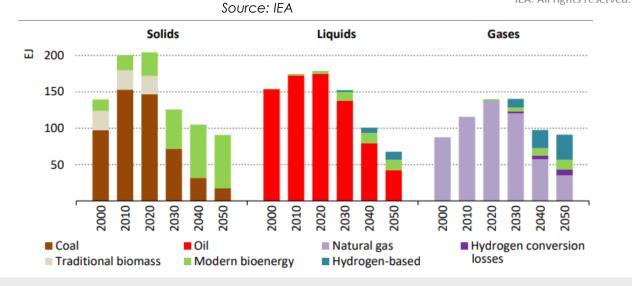
1. The direct use of low carbon electricity,

Demand for electricity is expected to be multiplied by 2.5x by 2050, for direct use to ensure the decarbonization of the economy, but also to produce green hydrogen (20% of electricity production in 2050).

- 2. Acceleration of improvements in energy efficiency.
- 3. Low carbon energy sources i.e biomethane, blue/green hydrogen and bioenergies are expected to meet 20% of global energy demand.
- 4. The large-scale rollout of CCUS processes









The Refinery as an Energy Hub

Refineries are expected to be part of extended value chains capable of processing legacy and alternative feedstock while presenting a low carbon footprint.

Integrated sourcing of renewable energy

- Solar
- Wind
- Green H2

Crude Oil & Natural Gas

New feedstock streams

- Bio sourced feedstock
 - WCO, Bio-oil
- Low carbon blend-stock
- Plastic and organic waste (raw or pre-processed)



- CO2 source for P-t-X
- Blue H2

Low grade heat



CC(U)S

Lower GHG fuels and products

- Low emissions fuels with higher bio-content levels or produced from waste (HVO/SAF)
- Low GHG fuels & petrochemical feedstock
- Synthetic fuels/ H2

egacy oil refining products

New Processes & Systems

- Electrolysis/Power-to-X
- Oil-to-chemicals processes
- Feedstock specific pyrolysis or other thermochemical treatment
- Coprocessing / units repurposing
- Waste heat recovery /Energy storage
- Electrification & CCS
- Digitalization



Strategic Pillars Guiding our Path Forward

Resilience

Sustainable Growth

Refining, Supply & Trading

Mobility and Retail

Renewable Energy

Alternative Fuels & Circular Economy



- Operational Efficiency and Flexibility
- Decarbonization
- Digitalization
- Diversification into Petrochemicals



- Enhanced
 Customer Value
 Proposition
- Electrification and e-mobility
- Lower Carbon Fuels



- Diversified
 Operational RES
 Portfolio
- Strong Pipeline for Organic Growth
- Expansion into New Technologies including Batteries and Storage





- Natural and Renewable Gas
- Hydrogen
- Advanced Biofuels

В



- Waste
 Management and
 Recycling
- Lubricants
 Recycling and
 Regeneration
- Biofuels Feedstock Development

Driving Growth and Change Across a Diverse, Multi-Energy Portfolio



Motor Oil (Hellas): 50 years of continuous development



Thank you very much!

