



Energy Sustainability Working Group (ESWG) Workshop on Enhancing Market Stability and Security

Session 1: Security in the Global Energy Market: Cross-cutting Aspects of Global Energy Security

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- Investment in Global Economic Stability and Energy Security
- Energy Outlooks, Policy and Technology Pathways
- Whole System Solutions of the Circular Carbon Economy
- The Role of the Joint Organisations Data Initiative (JODI)
- Collective Responses in an Evolving Energy Market Environment



Instability defers investment

Market fluctuations and more variable expectations erode investor confidence



GLOBAL ENERGY SECURITY THROUGH DIALOGUE



Decline Rates and Demand Scenarios to 2040

Major investment is needed to maintain energy security across all scenarios





Long cycle investment has yet to recover

Notwithstanding investment in short cycle and brown field production



Rystad and BCG IEF Knowledge Partner Analysis



Tight liquids assets decline at a higher rate than conventional posing a supply risk





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Hydrocarbons comprised 81% of demand in 2018 Fossil fuels reliance remains between 78% and 58% in main scenarios

World Primary Energy Fuel Shares in 2018 and Outlook for 2040



TENTH IEA IEF OPEC SYMPOSIUM ON ENERGY OUTLOOKS A COMPARISON OF RECENT IEA AND OPEC OUTLOOKS



Projections vary by 50 mb/d, representing a widening gap between business-as-usual and sustainable development



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The Planning Fallacy in Behavioral Economics

Douglas Hofstadter's Law (1979):

"It always takes longer than you expect, even when you take into account Hofstadter's Law"

Daniel Kahneman and Amos Tversky (1979)

"projections on how much time will be needed to complete a future task display an optimism bias and underestimate the time needed"



Past trends and behavioral economics predict the gap will widen



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The Circular Carbon Economy How do we grow and develop in a sustainable way?

Recycle

Reuse





The Circular Carbon Economy **Towards Rational and Sustainable Resource Solutions**

Recycle Reuse Chemically transforming CO₂ Using CO₂ without into products using renewables changing its molecular form Removal of CO₂ All options that reduce CO₂ entering the atmosphere from the atmosphere

Reduce



The Circular Carbon Economy Towards Rational and Sustainable Resource Solutions

Recycle

Biofuels Polymers Synthetic Fuels Building Materials Fertilisers and urea Methanol and chemicals

Capture from all sources Energy efficiency Fuel switching Renewables Nuclear **Reduce**



Reuse

Enhanced oil recovery Super critical generation Enhanced water recovery Water energy food Nexus Hydrogen and storage

Direct air capture with storage Natural sinks; forests, soil, oceans Bioenergy with carbon capture Sequestration ineralisation



Collaboration on innovation and technologies Laboratory R&D focus guided by the demands of CCE





The Circular Carbon Economy

Inclusive dialogue on the IEF platform helps make it happen

Recycle

Reuse



Reduce





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Better Data on All Energy Sources is key as market gravity shifts to growth economies and matrices include new technologies









Beyond JODI Oil & Gas, greater data transparency is needed on all sources to enable investment in energy security and orderly transitions



JODI-Gas Launch in 2014





Much progress made since 2000

•	2000:	JODI was set up by (APEC/EUROSTAT/IEA/OLADE/OPEC/
		UNSD)

- 2003: JODI became a permanent initiative
- 2005: The IEF assumed the role of JODI Coordinator
- 2005: JODI-Oil world database (90+ Countries) opened
- 2009: JODI-Gas "exercise" (52 Countries) initiated
- 2014: GECF became a JODI Partner
- 2014: JODI-Gas with 75+ Countries launched
- 2016: JODI Heads Endorsed the JODI 5-Year Plan
- 2017: JODI Data on Industry Platform (Bloomberg & Reuters)
- 2018: JODI included OAPEC and AFREC as JODI Associates





JODI 5-Year Action Plan: Key Objectives

Objective 1: Continue to enhance the quality of JODI data

Objective 2: Improve the timeliness of data reporting mechanisms

Objective 3: Continue to strengthen capacity building efforts

Objective 4: Strengthen engagement with the JODI user/energy data analytics community

Objective 5: Raise JODI brand-awareness

Objective 6: Consider improvement of data transparency for other forms of energy

Objective 7: Identify and engage expanded JODI Champions







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The stellar rise of renewables, or hydrogen in future, is widely supported but does not change reliance on hydrocarbons

Synergies between sectors can accelerate affordable and inclusive energy transformations

Technology neutral dialogue on whole systems solutions from renewables to circular carbon models create a more predictable investment environment

Reducing barriers stimulates technology transfer, investment and trade to the scale energy security, and sustainable development requires

Policy makers should lead by example and ensure timely and complete energy data is made available in JODI to strengthen energy security and orderly transitions







KNOWLEDGE GENERATION Through Dialogue ENERGY ENERGY SECURITY TRANSITION Through Dialogue Through Dialogue