



能源与环境政策研究中心



Center for Energy & Environmental Policy Research

**IIASA Workshop on Connectivity in the Digital Age:
Digital Futures of Trade and Economic Cooperation in Eurasia**

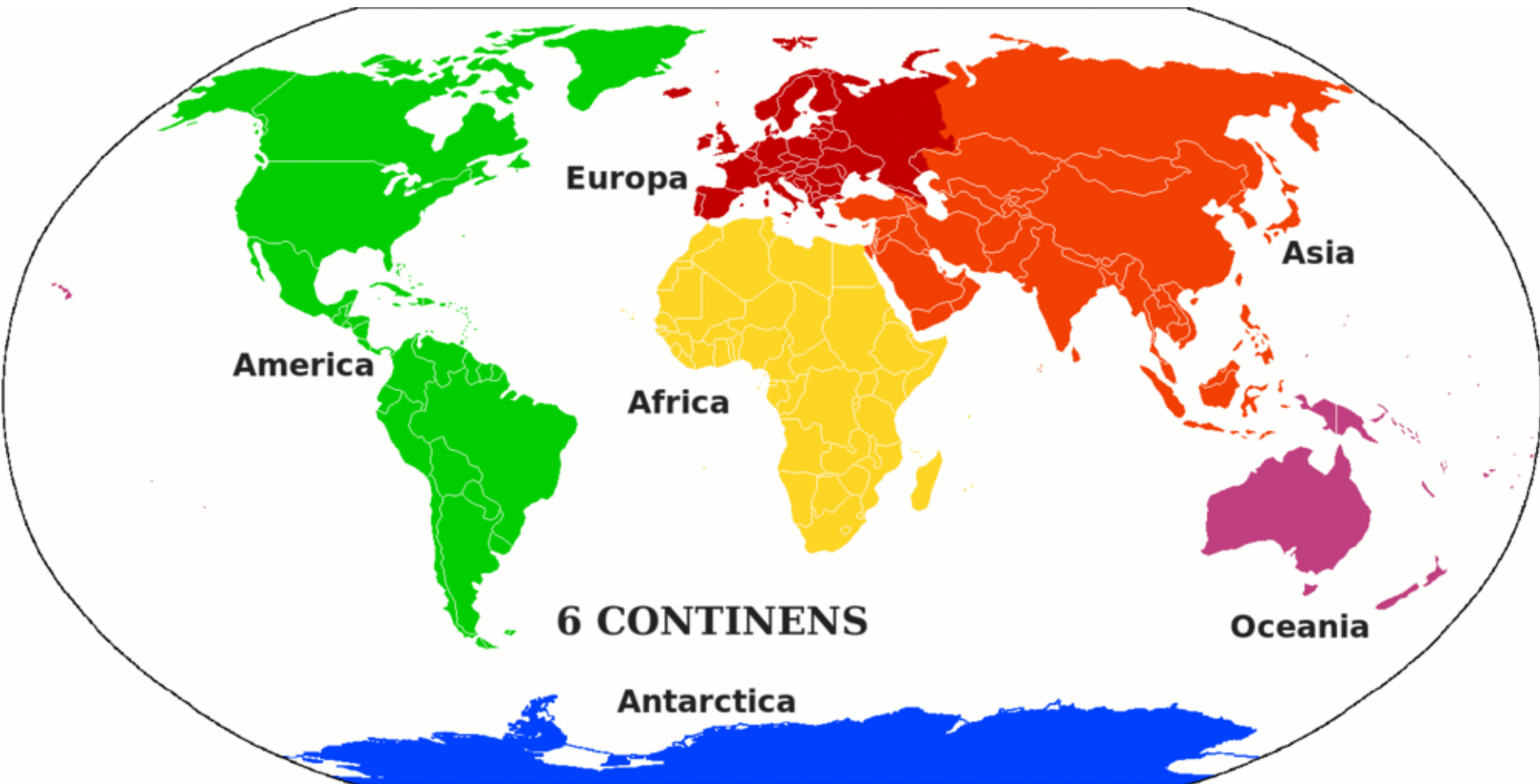
Energy Cooperation and Digital Future under the Belt and Road Initiative

Ying Fan

School of Economics and Management, Beihang University
Center for Energy and Environmental Policy Research
Dec. 2-3, 2019 Laxenburg, Austria

Background

Eurasia is a natural connection between Europe and Asia, is expected to be a new growth continent, a driver to the global economy.



B&R initiative

An economic cooperation framework among countries in the region. B&R started from old Silk Road which was a successful connection between Europe and Asia.



B&R initiative

An economic cooperation framework among countries in the region. B&R started from old Silk Road which was a successful connection between Europe and Asia.



By the end of October 2019, China had signed 197 "Belt and Road Initiative" cooperation documents with 137 countries and 30 international organizations, **64 of which are from Eurasia.**

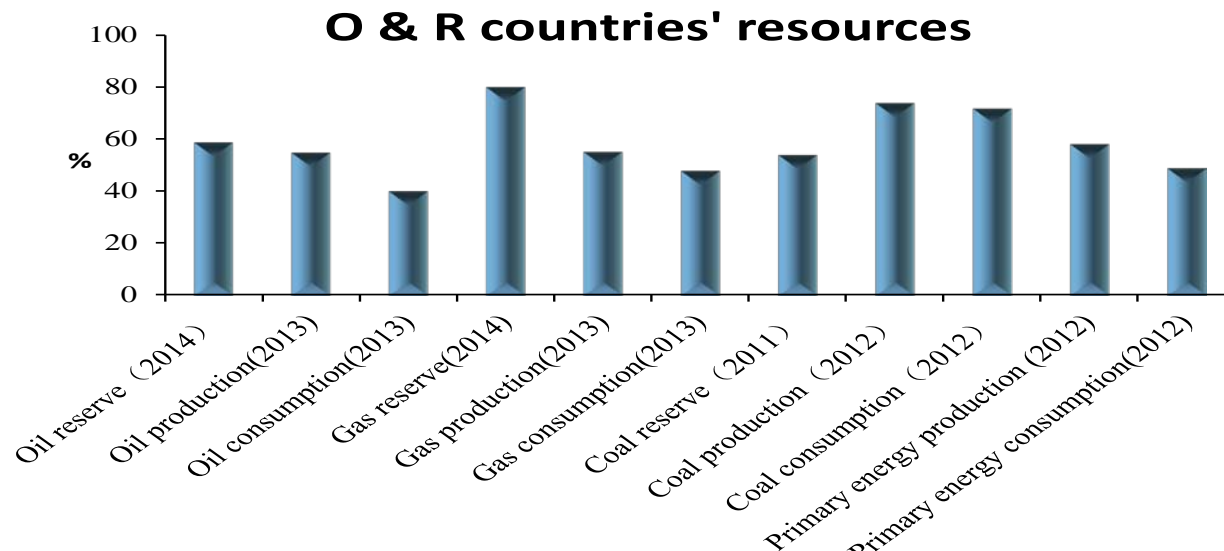
The foundation for energy cooperation under B&R

Advantages :

- ◆ Abundant oil, gas and unconventional resources
- ◆ Widespread oil and gas pipeline networks
- ◆ Multi regional energy cooperation networks
- ◆ Great potential on energy demand growth within the region

Shortages :

- ◆ Energy industrial support system
- ◆ Pipeline capacity of infrastructure
- ◆ Exploration and development technology
- ◆ Energy cooperation form
- ◆ High transportation risk
- ◆ Platform for communication and coordinated work



Energy cooperative target under B&R

- Ease and solve the bottleneck problems in energy as well as social and economic development faced by the countries within the region
- Promote the processing and transformation of energy resources, and encourage integrated and extended industrial chain of energy and resource cooperation
- Form a collective response mechanism to cope with the price fluctuations and supply risk
- Ensure an effective security mechanism for energy transportation and an innovation mechanism for the development and use of new energy
- Foster innovation in the global energy governance system, promote equal, open and inclusive energy cooperation for all countries, improve the rules for global energy cooperation

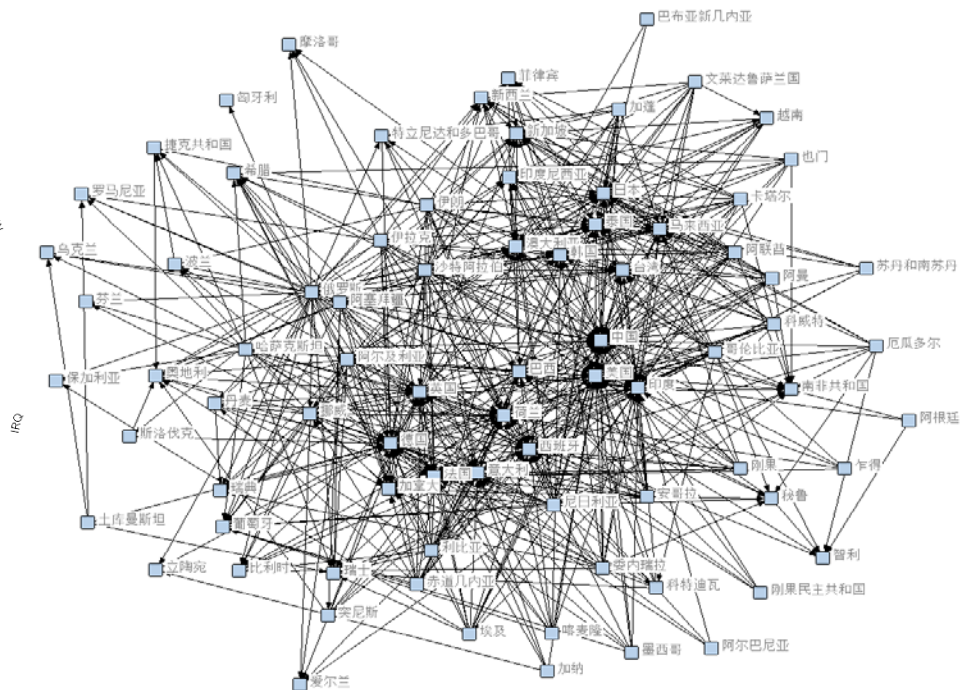
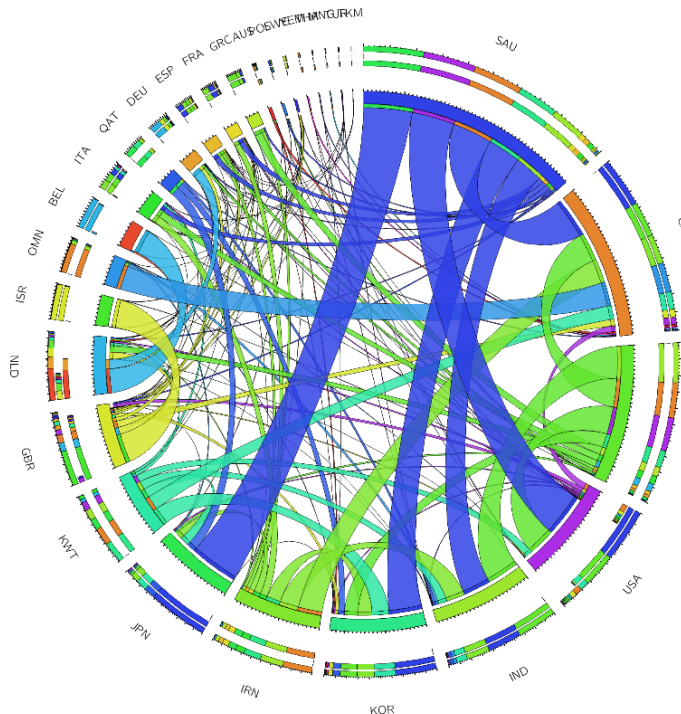
B&R will make a breakthrough on global energy cooperation and governance!

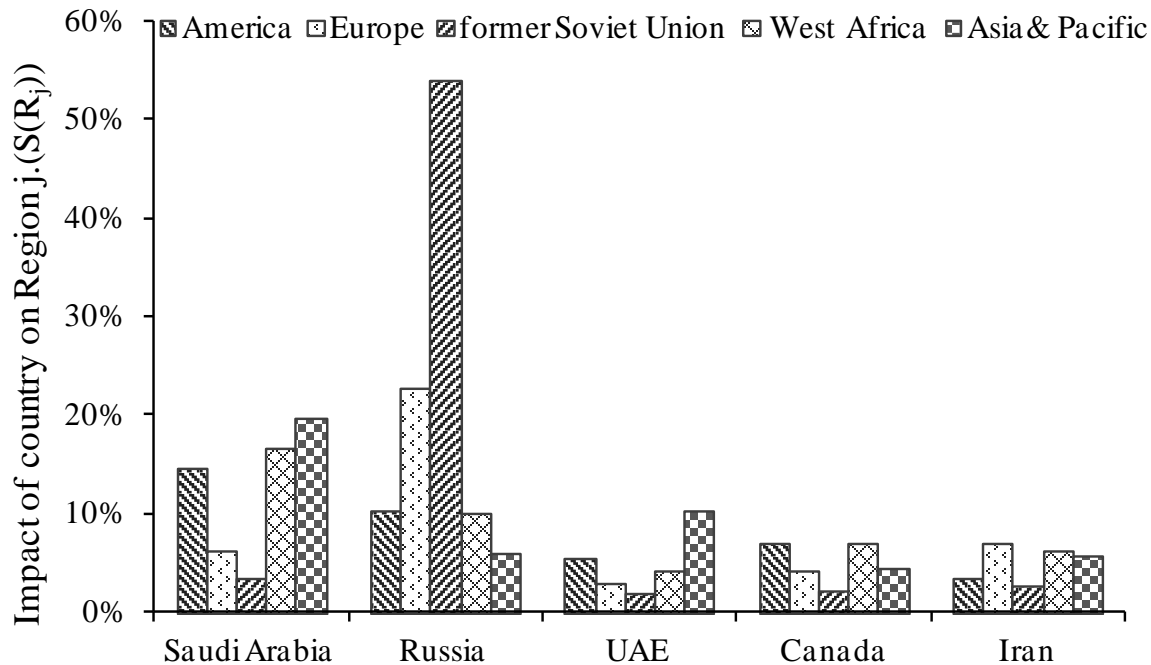
B&R energy cooperation has wide potentials

- B&R can greatly improve the stability of the global energy trade networks
- B&R can effectively strengthen global energy security
- B&R is beneficial to optimize the economic structure and reduce investment risk

The stability of the global oil trade network

- ◆ During 2013-2017, the global oil trade grew by 10.7%. The countries along the belt and road are important exporters of oil trade, which occupied over 55% of global oil trade.
- ◆ Sino US trade frictions, Iran embargo and political risks in the Middle East have an impact on the security and pattern of global oil trade.

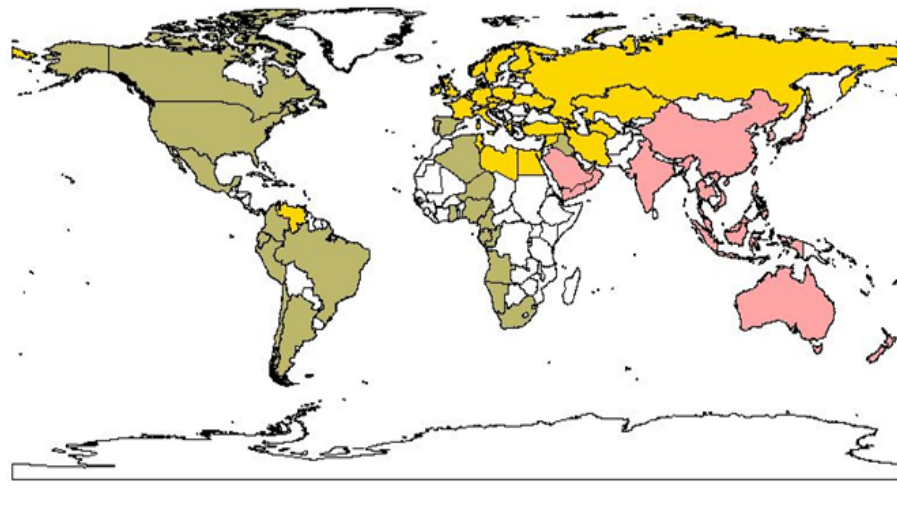




The main areas influenced are divergent for different large oil-exporting countries.

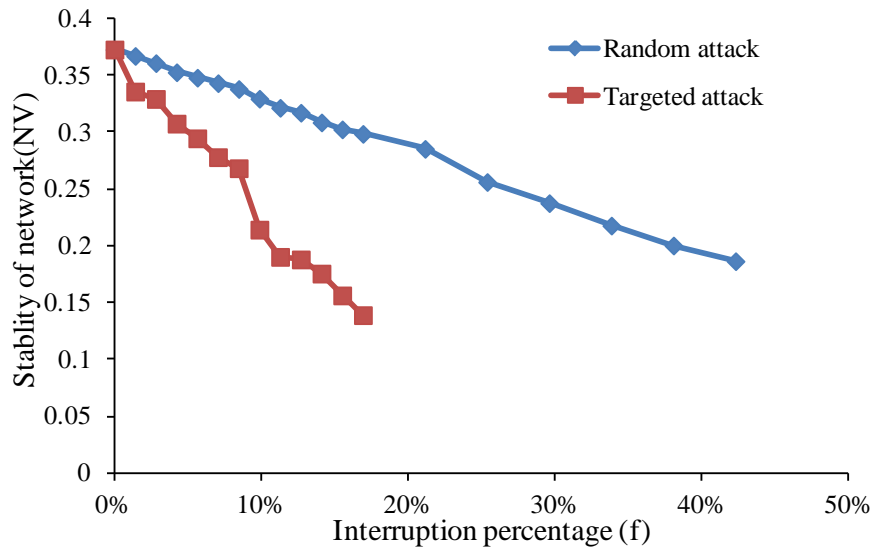
The trade influences distribution of main oil-exporting countries

Three main oil-consuming areas, including ‘South America-West Africa-North America’ trading bloc, ‘Middle East-Asian-Pacific region’ trading bloc, and ‘the former Soviet union-north Africa-Europe’ trading bloc

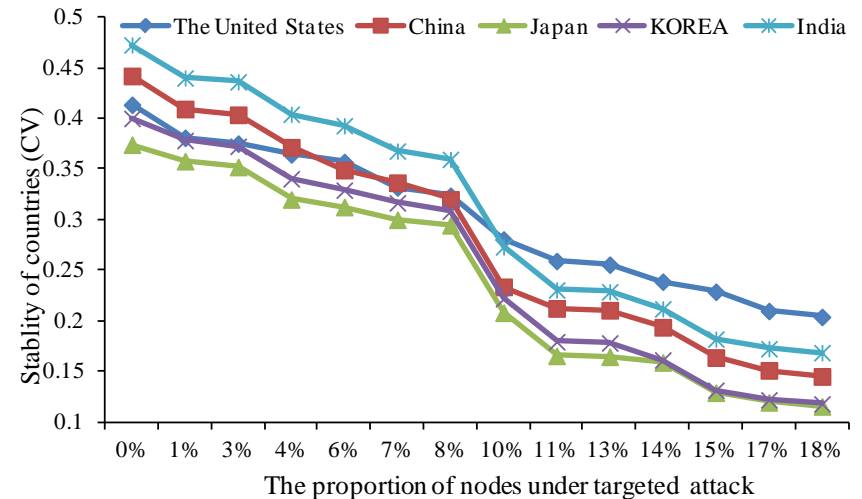


The community structure of the global oil trade

- The oil trade network shows the characteristic of ‘robust but yet fragile’
- It is robust for the oil trade network to the random attack, while is fragile to targeted attacks
- The US illustrates its high ability of resistance and diversification to the export interruption
- For China, Japan, Korea and India, the trade stability decrease significantly, indicating their high vulnerability



The stability of oil trade network under different attack modes



The stability of main oil-importing countries

Improve the stability of the global oil trade network

- The influences on global trade of the major exporters are generally evenly distributed which indicates that both the supply and demand sides tend to adopt diversified strategies to spread the risk, avoid systematic risk, and improve the stability of trade.
- The Top three countries are under B&R which contribute 20%, 13.0% and 7.5% to the stability of global oil trade, respectively.
- The countries along the Belt and Road as a whole contributes 63.3% .

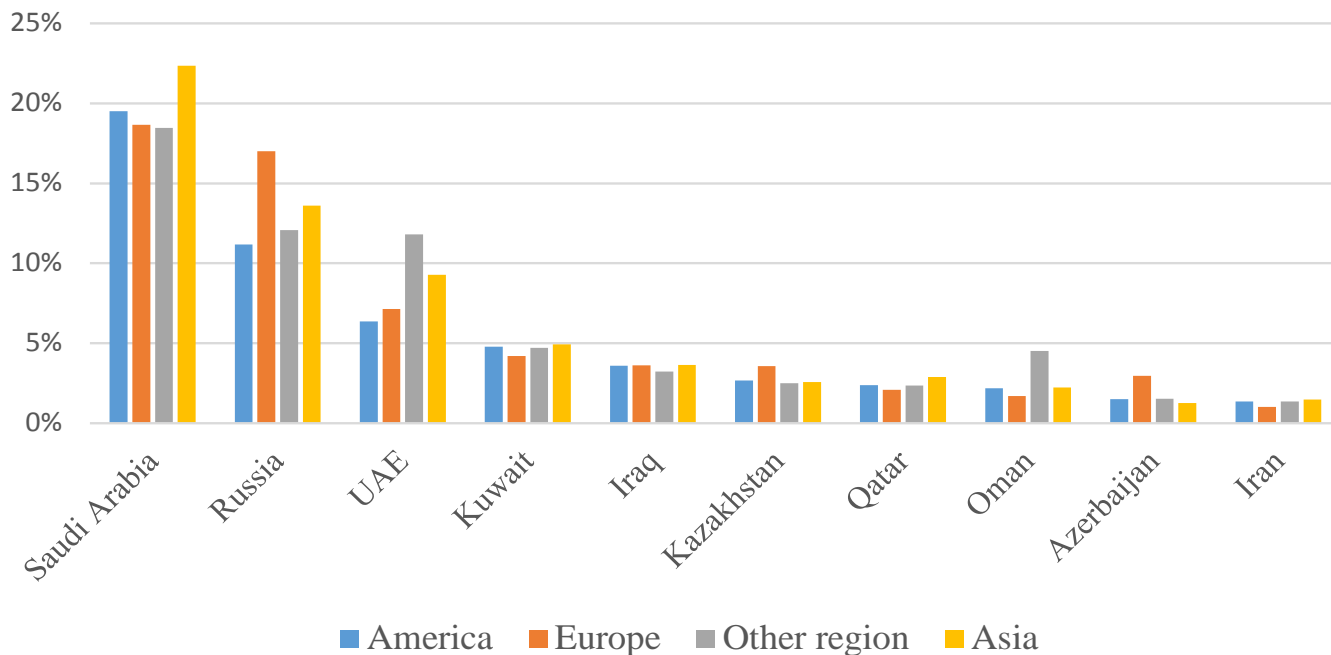


Figure. Regional distribution of influence for major exporters

Energy investment risk assessment

◆ Risk factors affecting overseas energy investments has six dimensions

- political risk
- economic foundation
- investment environment
- energy resource potential
- environmental constraints
- bilateral relation

◆ A fuzzy integrated evaluation model

Global energy security

- ◆ Different investment risk among B&R countries
- ◆ Shortage of effective investment due to unstable political situation and high risk
- ◆ New bilateral and multilateral investment cooperation systems are expected to form an effective mechanism to control the risk and encourage long-term investment
- ◆ The cooperation can effectively lower the risk of investing and contribute to global energy security

Implications from the energy cooperation among B&R countries

1. Put forward new ideas about energy cooperation

- Help improve the energy cooperation mechanism that covers various regions, fields and countries
- Extend integrated and multi-level industrial chain of energy cooperation
- It is flexible and complements with existing energy plans
- Promote the development of energy industry of less developed areas in Asia, Europe and Africa
- Facilitate the formation of a sustainable energy development path for the countries along the Belt and Road.

Implications from the energy cooperation among B&R countries

2. It is consistent with the ideal of global energy governance, and is more inclusive

- Energy governance under the Belt and Road Initiative is more in line with the multilateral global energy governance framework
- Is able to better reflect the interests of all participants, including energy suppliers, energy consumers and the transit countries into the same framework
- Provide a unified platform for dialogue and cooperation, and facilitate a more organized governance mechanism for the energy market from an international perspective

Implications from the energy cooperation among B&R countries

3. It is conducive to global energy security, and thus benefit all

- Emphasizes dealing with the systematic risks of the global energy security system, stabilizes the global energy supply and demand through multi-dimensional energy cooperation
- Finally contribute to the security of the global energy system through keeping the stability of energy investment and .

Implications from the energy cooperation among B&R countries

4. It can promote low carbon development

- Energy cooperation under B&R will be extended to new and renewable energy sectors, to build a green energy demonstration belt
- Accelerate green and low carbon development through the upgrading of energy production and consumption patterns as well as technical advancement
- Promote to build the regional and international new energy cooperation platform, and step up the transfer of new energy technologies
- Improve large-scale natural gas utilization, enhance the exploration and development of natural gas, and develop unconventional gas resources such as shale gas, coal seam gas and deep water oil and gas.
- Positive contribution to regional and global low carbon development

Energy cooperation priority areas under B&R

- Building coordination and communication platform
- Building energy trade platform
- Building financial support platform
- Building energy resources reserve mechanism (SPR)
- Improving energy transmission networks
- Promoting the transfer and application of new and clean energy technologies
- Connection of energy system, such as electricity grids

All of these needs solid basis of infrastructure, especially the digitalization of the whole system.

The foundation of digitization under B&R

- Among the countries along the Belt and Road, the resources of network infrastructure and network talents in Central Asia and West Asia are relatively scarce. This “digital gap” leads to their low participation in the digital economy.
- The “digital gap” also shows that developing countries still have market development potential in the digital field.
- In 2016, with the help of the Belt and Road Initiative, the information society level of the countries along the route increased by 2.78% year-on-year, which was higher than the global average of 2.1%.

The opportunities of digitization of energy under B&R

- Cooperation is moving from unilateral to regional under positive policy support
- Cooperation opportunities are in many fields, such as technology, economy, investment , etc.
- There is a wide market for huge investment and construction of power infrastructure
- Promoting cross-border optimization of regional power allocations to greatly reduce the use of fossil energy
- Including more variable renewable energy into electricity grid needs quick response and digital support

How should digitization serve B&R

- **Technology** : High-performance, fast, and secure international information infrastructure
- **Digital** : Easier communication with each other to overcome the obstacles of cultural communication
- **Business** : Improve the difficulties faced by cross-border business in customs clearance, logistics, etc.
- **Enterprise** : Digital transformation of enterprises

The challenges of digitization of energy under B&R

- **Large differences** in economic and social, infrastructure development level, energy demand, management standards and technical standards, **connection**
- **Complex political situation** and unstable political factors bring security risks to energy security, **critical thinking**
- **Pressure on grid dispatch** to deal with variable intelligent renewable energy, **based on big data**
- **More flexible** green energy trading market model, **based on real time pricing system**

Sum up

- Digitalization is important infrastructure for energy cooperation along with B&R
- The coordinative development of the area requires digitalization
- There are still challenges to make a digital Eurasia
- The digitalization is the future



能源与环境政策研究中心



Center for Energy & Environmental Policy Research

Thank you !

Questions and comments are welcome.

Ying Fan
Beihang University
yfan1123@buaa.edu.cn