The Caspian Energy Development: Delicate balancing act between shifting Geopolitics and Geo-economics

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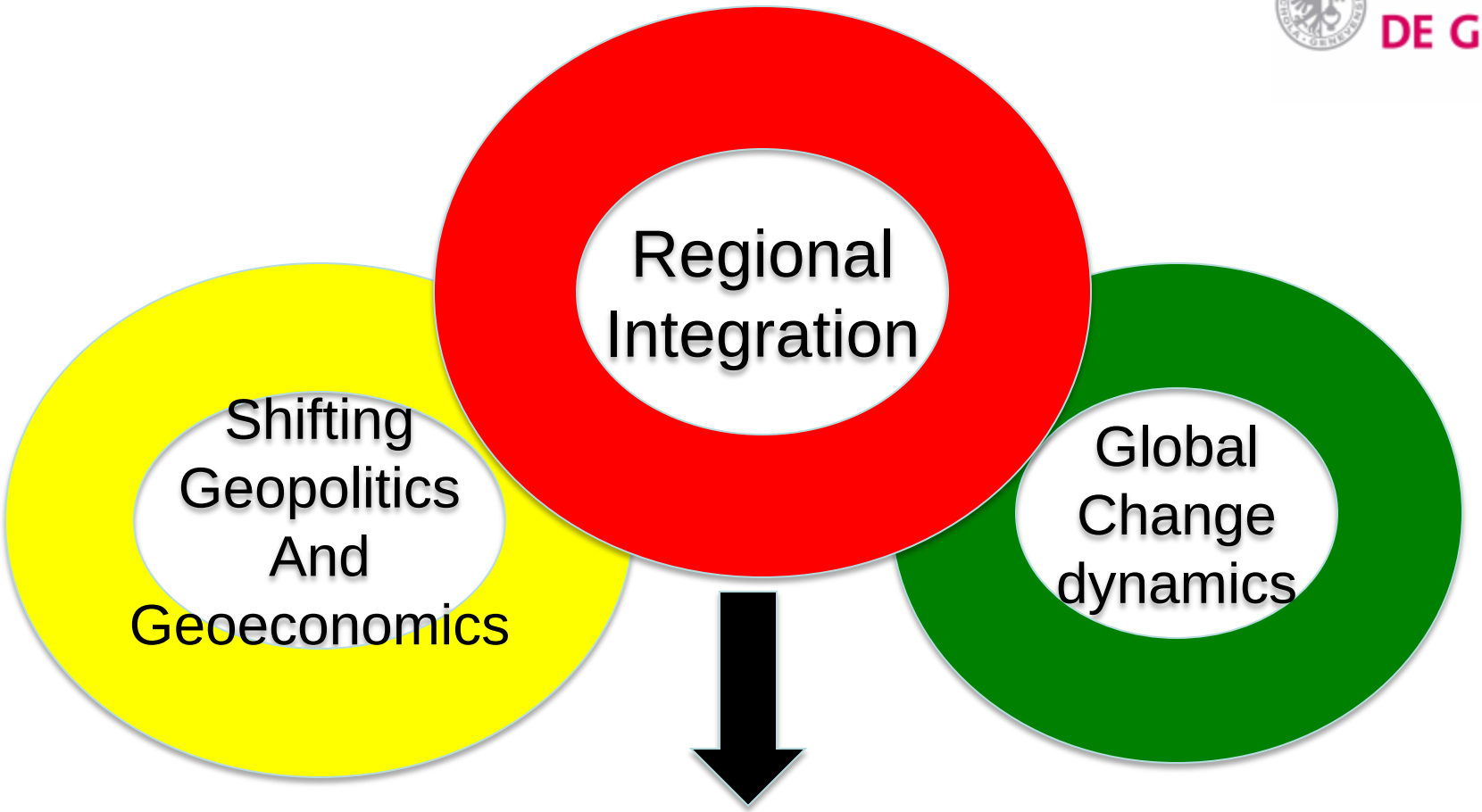
- Caspian global geo-economy connections
- Caspian global Geopolitical connections
- Regional processing of Risks and Insecurities

Caspian Energy and global shifts



Regional concerted and integrated Capacity to process new risks and insecurities

- **1- Energy security**
- **2- Environmental security**
- **3- Socio-political / human security**

What is meant by Regional Integration?

Agreed upon principles and norms to cooperate towards common economic, environmental and socio-political goals to acheive broader socio-political and security objectives

- Regional integration through supranational institutional decison making frameworks towards:ß

- Removing trade barriers in the region,
- increaasing the free movement of people, labour, goods, and capital across national borders,
- Reducing the possibility of regional armed conflict (for example, through Confidence and Security-Building Measures),
- In face of global shifts (ex- Global change), adopting concerted and cohesive regional policies and issues, such as the environment, climate change and migration.

1- Global energy security connections

Energy sector and its significance	Energy security concerns and the population affected	
	Shorter term	Longer term
Oil (125 countries, 5.9 billion)*	>75% import dependency (**3 billion**) consumption growth >5%/year (**1.8 billion**)	Reserves/Consumption <15 years (**1.7 billion**)
Gas (78 countries, 2 billion)*	>75% import dependency (**650 million**)	Reserves/Consumption <16 years (**780 million**)
Coal (45 countries, 4.5 billion)*	>80% import dependency (**300 million**)	
Nuclear (21 countries, 1.3 billion)**		Average age of nuclear power plants >25 years (**1.9 billion**) Start of last plant construction >20 years (**1.4 billion**)
Hydro (58 countries, 1.5 billion)***	Low diversity (one or two major dams) (**730 million**)	
Electricity (all countries)	>50% dependency on imported fossil fuels (**600 million**) low diversity (one or two fuel sources) (**450 million**)	annual demand growth >6%/year and/or access rate <60% (**4.2 billion**)
Transport	>50% dependency on imported fuels (**4.9 billion**)	annual consumption growth >8% (**1.7 billion**)
Industry (>25% of GDP in 60 countries; 4.5 billion)	>50% dependency on imported fuels (**800 million**)	
Residential and commercial (all countries)	>50% dependency on imported fuels (**500 million**)	Reliance on traditional biofuels for >80% of the residential sector energy (**700 million**)
Cross-sectoral energy supply (all countries)	>50% overall import dependency (**700 million**) low diversity of PES (one or two dominant sources) (**1 billion**) cost of energy imports >20% of export earning (**2.5 billion**); cost of energy imports >10% of GDP (**200 million**)	energy intensity >50% of world average (**400million**) consumption growth >6% (**1.8 billion**) consumption per capita <30 GJ/year (**3 billion**)

Notes: PES – primary energy sources;

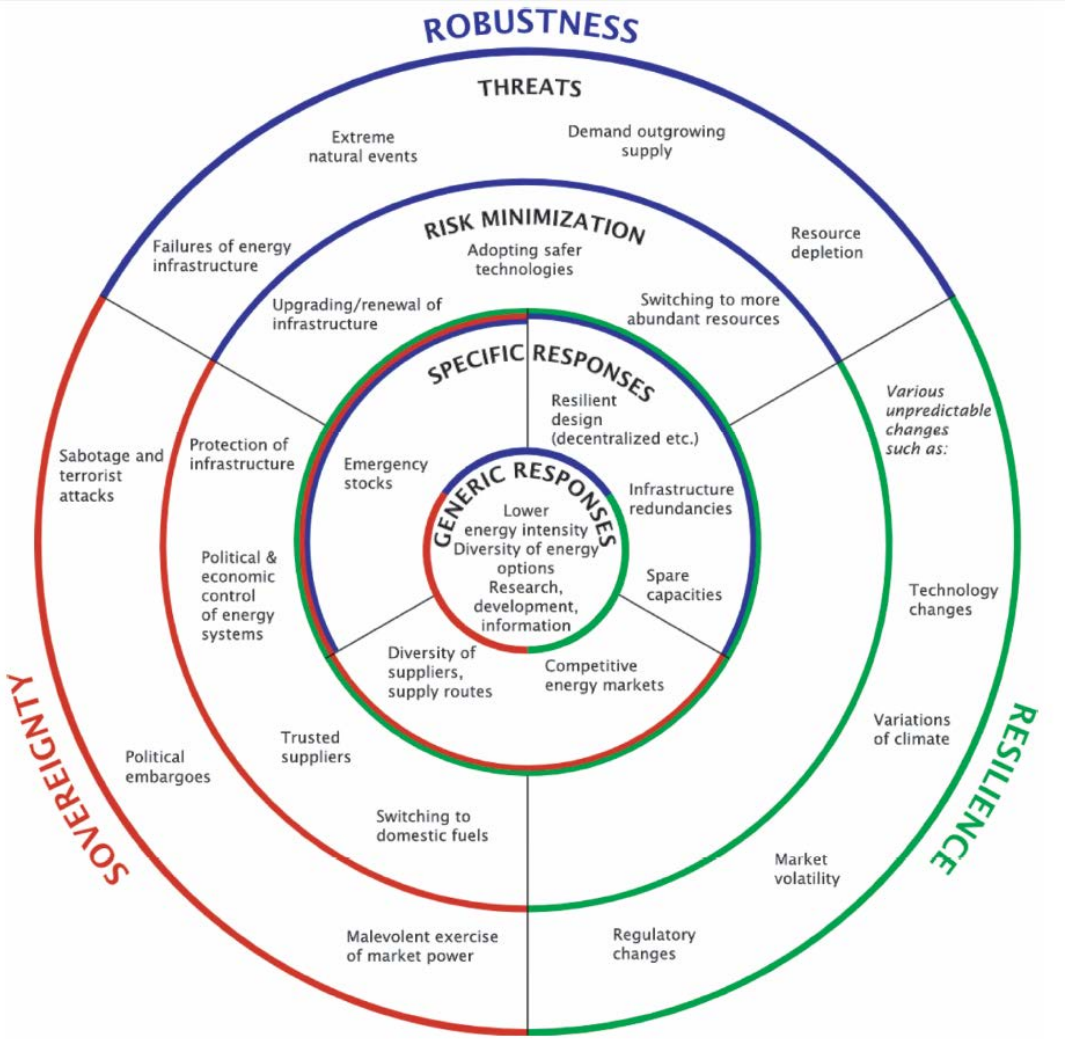
Numbers in brackets indicate the number of people who live in countries with the indicated energy security conditions;

* – more than 10% in total energy supply; ** – more than 10% in electricity generation; *** – more than 20% in electricity generation

Three perspectives on energy security

Perpectives	Historic roots	Key risks for energy systems	Primary protection mechanisms
Sovereignty	War-time oil supplies and the 1970s oil crisis	Intentional actions by malevolent agents	Control over energy systems. Institutional arrangements preventig disruptive actions
Robustness	Large technological accidents, electricity blackouts, concerns about resource scarcity	Predictable natural and technical factors	Upgrading infrastructure and switching to more abundant resources
Resilience	Liberalization of energy systems	Diverse and partially unpredictable factors	Increasing the ability to withstand and recover from various disruptions

Three perspectives on energy security



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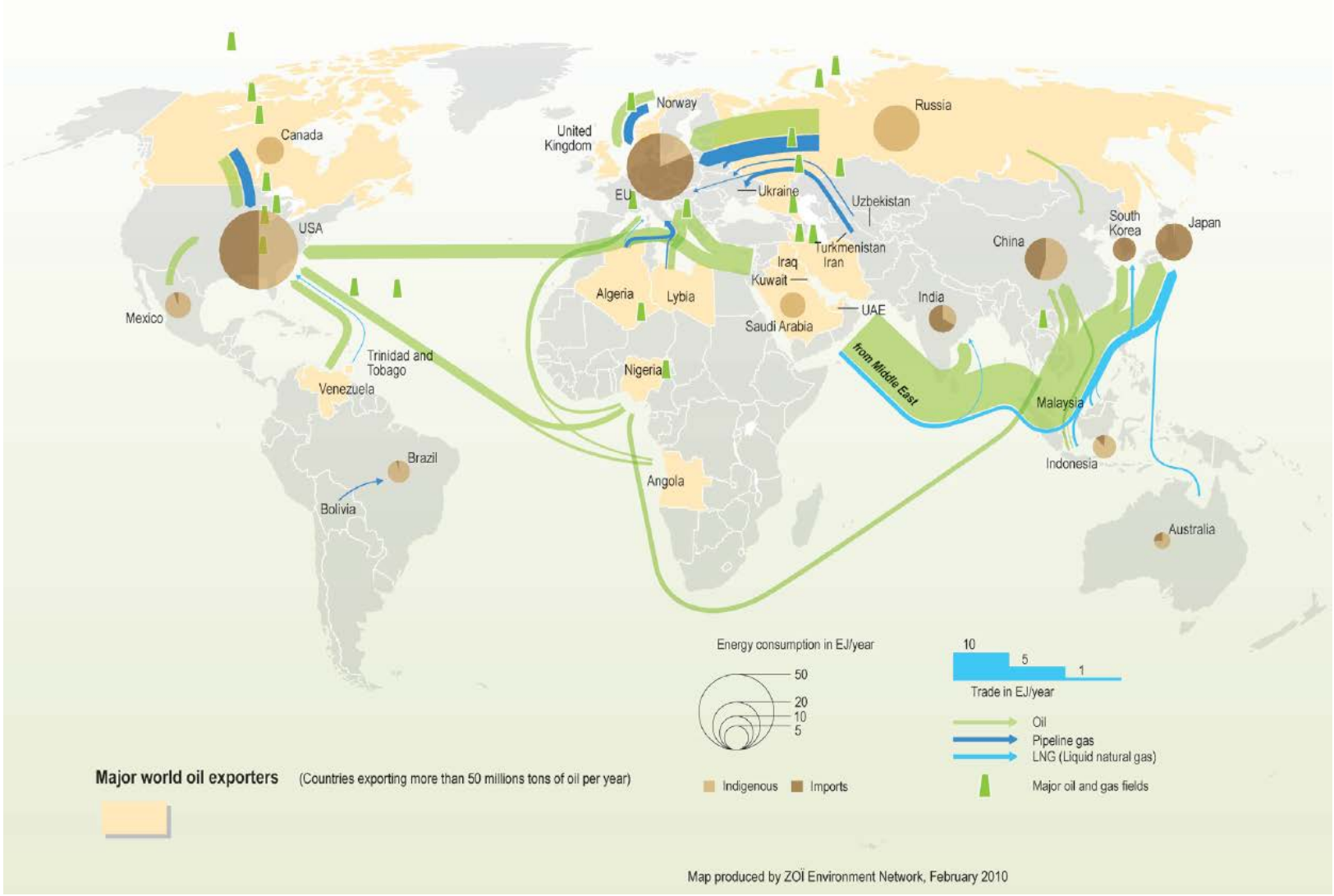
Energy security concerns analyzed

Energy subsystems	Energy security dimensions		
	Robustness	Sovereignty	Resilience
Global level			
Globally traded fuels: oil, coal, and gas	Availability of resources and reserves	Share of international trade in the overall production	Dominance (share) of a fuel in the total global PES mix
		Geographic concentration of fuel production	
Nuclear fuel cycle		Geographic concentration of uranium enrichment, manufacturing of nuclear power plant components, and reprocessing of nuclear fuel	
National level			
Energy sources			
Fossil fuels: oil, natural gas, and coal	Available domestic reserves (R/C ratio)		
	Demand growth for a particular fuel	Import dependency	Diversity of import routes
Hydro energy	Climate change effects on water availability and variation	Usage of transboundary water resources	Diversity of hydroelectric dams (see also electricity generation)
Electricity generation and transmission	Age of power plant fleet Growth in consumption of electricity Reliability (frequency of blackouts) Access rate	Reliance on imported fuels	Diversity of fuels used for electricity production Diversity of power plants
End-use sectors: industry, transport, residential and commercial, energy exports	Growth (decline*) in energy demand for the sector	Reliance on imported fuels within the sector	Diversity of energy sources used in the sector
National energy systems (cross-sectoral)	Energy intensity Growth in overall energy consumption Energy consumption per capita	Overall import dependency	Overall diversity of PES used in the national energy system

Notes: Concerns quantified by indicators are highlighted in bold. * – for energy exports

Geographical patterns of global oil and gas production and trade



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Vulnerabilities of primary energy sources

Energy security perspectives	Robustness		Sovereignty		Resilience
Globally traded fuels					
	Global R/P ratio	Projected demand growth 2008–2035*	Share of international trade in global production in 2009	Number of people (billions) in countries with import dependencies over 25/50/75%	Diversity of global producers by region, SWDI
Oil	30 yr.	15%	66%	5.3/3.6/3.1	1.63
Gas	80 yr.	44%	29%	2.2/0.75/0.65	1.84
Coal	150 yr.	19%	14%	1.3/1.1/0.70	1.92
Other energy sources					
Nuclear	Aging of nuclear power plants; sensitivity to political interventions		Concentration of enriched uranium and reactor manufacturing technologies; nuclear fuel cycle controlled for non-proliferation reasons		Generally large facilities; difficult to substitute in case of failure
Hydro	Sensitivity to water availability; vulnerability to climate change in some regions.		Hydroelectric facilities located on internationally shared rivers		In certain cases extremely large facilities providing majority of electricity of certain countries
NRES	High initial costs; intermittency of supply		Technological dependencies; potential import dependencies for biofuels		Generally assumed to be higher than in the case of traditional sources due to distributed generation and more diverse energy mix

Source: see main text; *– New Policies Scenario (IEA, 2010a).

Energy Security the Kashagan example

- Regional integration through supranational institutional decison making frameworks through:

- The cost of production is rising everywhere including in established regions like the Caspian: Kashaghan oil field, heralded as one of the biggest global discoveries of reserve discovred in 2002 has cost 116 billion dollars as of 2012/ (one of th most expensive energy projects in the world.

- In 2013 China and Kazalhstan signed a new deal to inject 5 billion dollars in the project towards integrating the Chinese market and network.

Caspian Oil-Gas Export Connections

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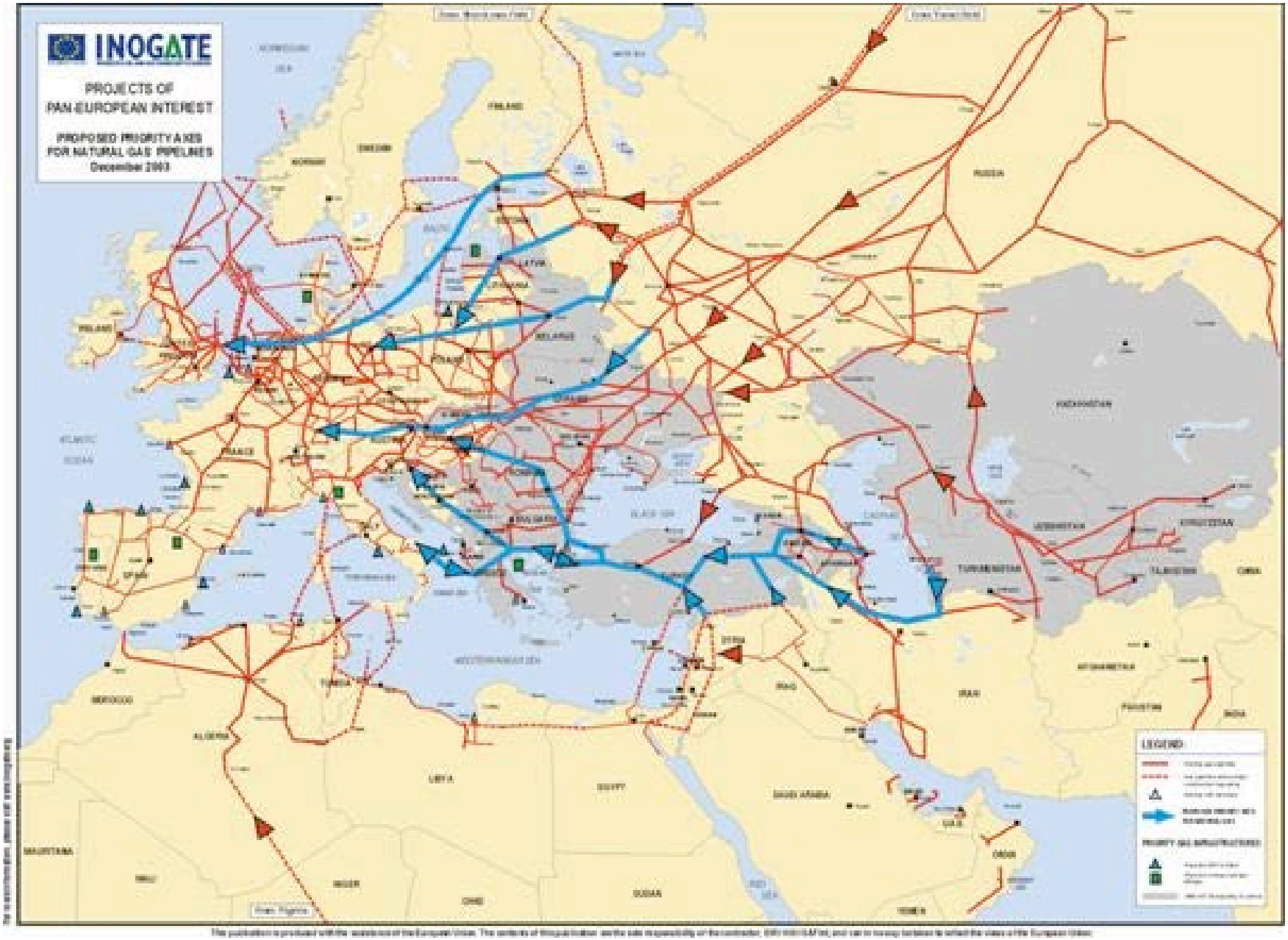
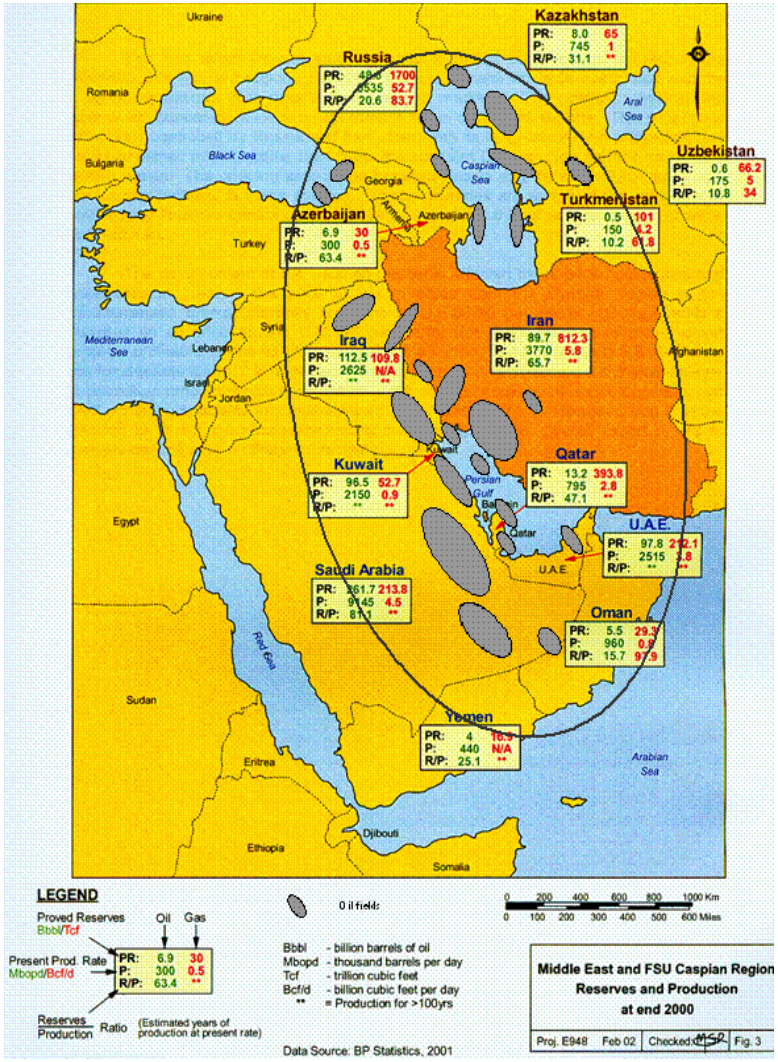
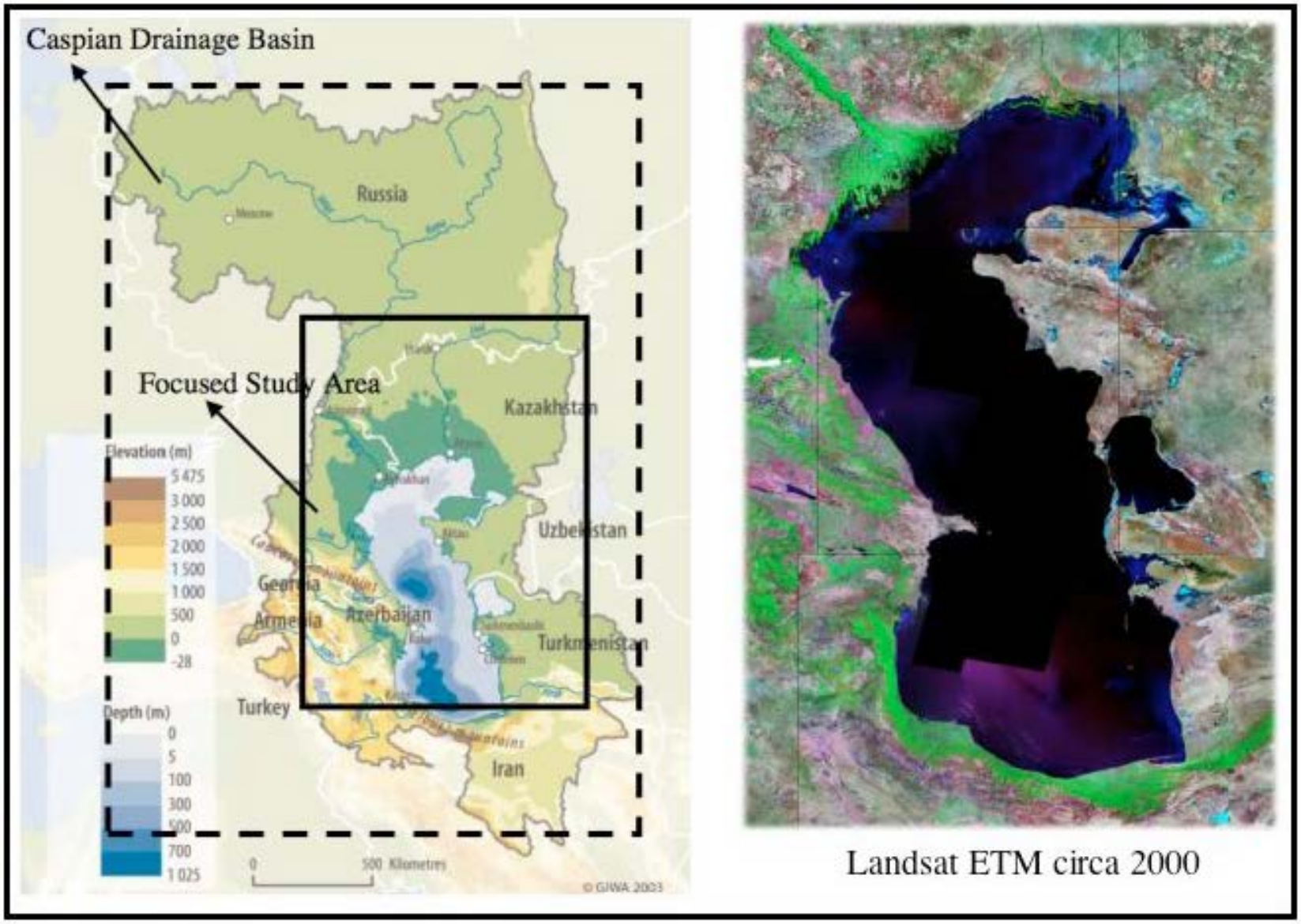


How does the geopolitics of energy interact with these fundamentals of the market?

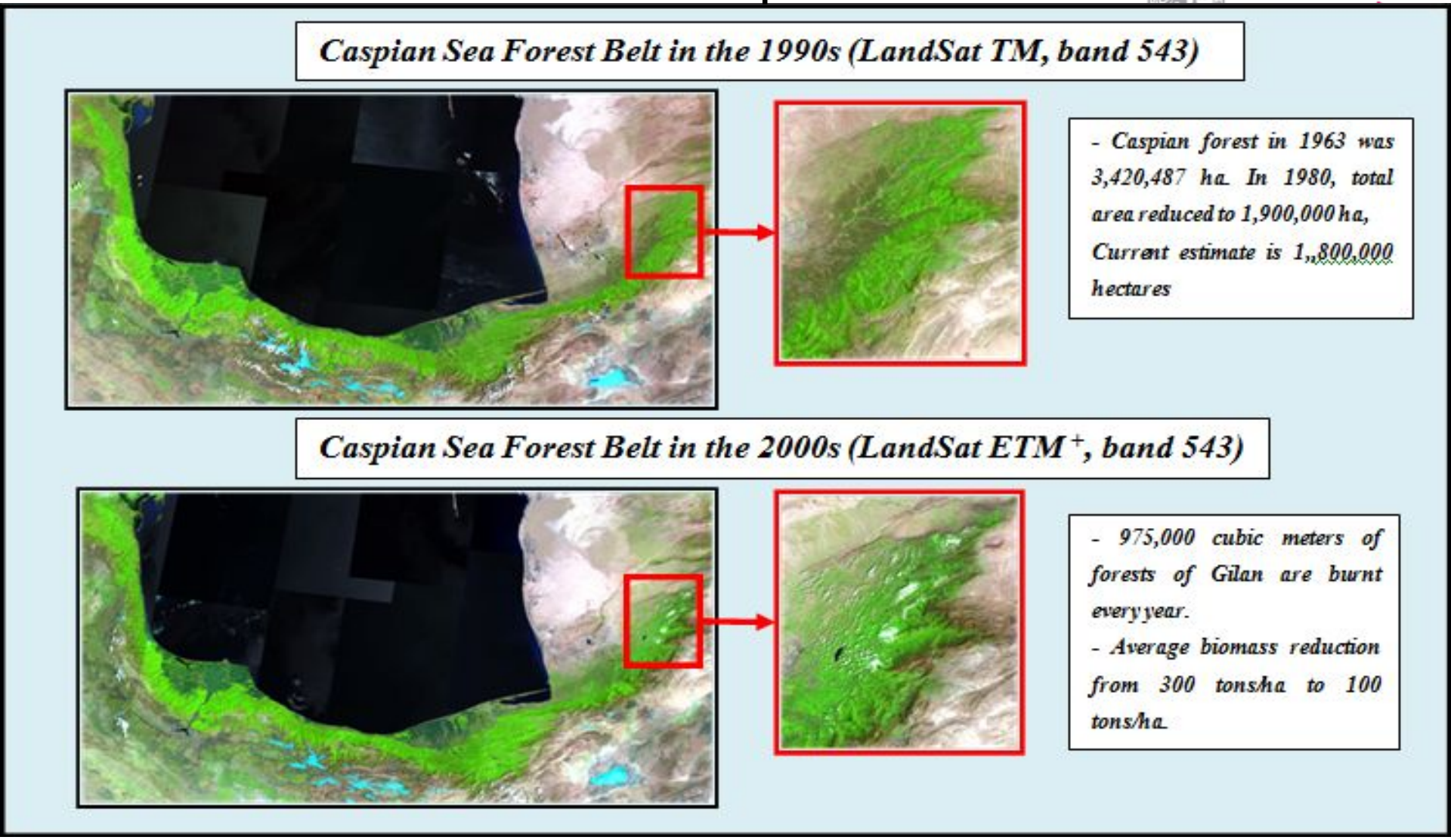


- Supply-induced scarcity, or its anticipation, provoke power projection by military capable and import-dependent nations (US, E.U., Russia, China) aiming at getting control over the stock by either internally engineered regime change or by conquest of territory. (induced by major power, by non state actor such as major oil companies, or by producer cartels such as OPEC).

2- Global Environmental Security Connections

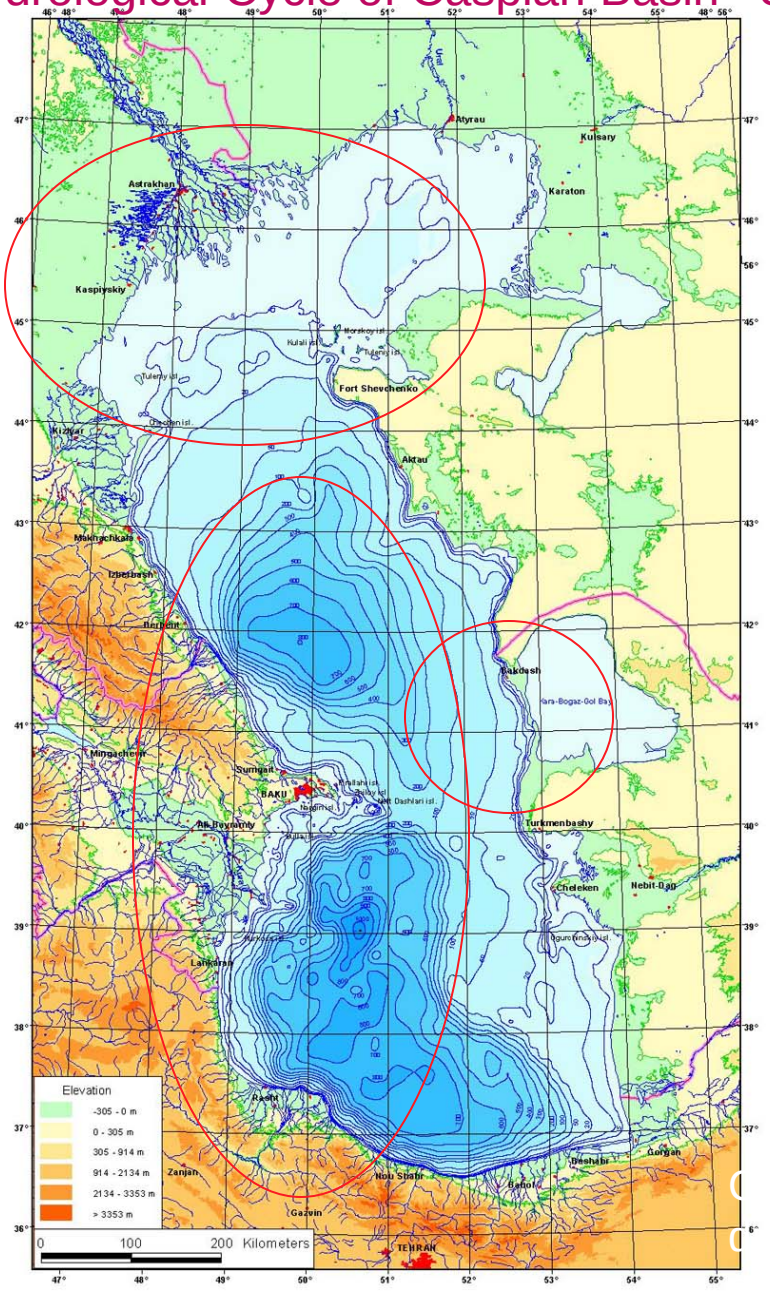


Deforestation of the Caspian Forest



Deforestation added to land cover and land use change are extensive in particular in South Caspian with wide areas of forest being replaced by urban and agricultural land

Hydrological Cycle of Caspian Basin –Shiklomanov et al 1961-2002.



1. Temperature
2. Salinity
3. Evaporative Rate
4. Kara Bogaz Lake Fluctuations
5. River runoff
6. Caspian Bathymetry and warming & cooling cycle
7. Climate fluctuations

1. Annual precipitation change : Wetter north dryer south Caspian
2. Annual Runoff Change Mixed
3. Annual Air temperature change : Warmer
4. Annual Evapotranspiration Change: Mixed increase in north constant in south Caspian

4- Difficulties of triggering change through cooperation

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Objectives of Tehran Convention:

- Despite the progress in the signing and implementation of the Convention and its protocols, the environmental degradation of the Caspian Region is disturbingly increasing jeopardizing the livelihood of many and hindering prospect of long-term growth .

Key challenge 1 : => Lack of Trust

-In the case of managing environmental data, distrust can result in both withholding gathered data and questioning the accuracy of data that partners deliver.

Key challenge 2: ➔ Short term economic and political priorities

Prevailing short-term economic and political priorities of each Caspian State (e.g. with regards to oil extraction) are contributing to long- term environmental volatility of the region.

4- Difficulties of triggering change through cooperation

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Key challenge 3 : => lack of systemic overview of instruments

The instruments need a comprehensive review in order to establish how they can be effectively implemented and developed in the future.

Key challenge 4: => Unified Reporting Format for the instruments, a monitoring system needs to be put in place and a fully functional and operational platform for sound State of the Environment (SoE) reporting needs to be further developed and promoted.

Key challenge 5 : => Gap in coordinated research.

There is neither a holistic approach towards gathering data on environmental performance nor a collective understanding of these data, e.g. in the form of common parameters and methodologies

Key challenge 6: => lack of capacity to link upward (global instruments and action plans) and downward reality on the ground

4- Difficulties of triggering change through cooperation

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. ‘Downward’ and upward linkages inefficient:

-Downward linkages between regional environmental governance of the Caspian Sea and local and national governance (including by civil society, and between the regional governance and

-Upward’ regional and global governance (e.g. with the European Environmental Agency, the International Maritime Organization, the Convention on Biodiversity and other global sustainability initiatives) on the other hand have not been well established .

-A global powerhouse region needs to process the risks of many insecurities. Here the provision of regional energy security have been to the detriment of environmental and human security dimensions of regional integration.

3- Socio-political/ Human security connections

•In the Caspian Sea region, pipeline diplomacy, as stated earlier, required the US government's involvement as the driving force of its main component, the **Baku-Ceyhan-Tbilissi** pipeline (BTC) as well as the much heralded Trans-Caspian Gas Pipeline (TCGP). The project was endorsed by the US as it evaded Iran and Russia and aspired to move Azerbaijan and consecutively Turkmenistan and Kazakhstan away from the Russian and Iranian sphere.

•The world class $3 billion BTC pipeline project was strongly supported for economic and geopolitical reasons by its three host countries namely Azerbaijan, Georgia, Turkey and its international sponsors the United States and European Union on the ground of its centrality to economic and territorial security of host countries.

-

-For Azerbaijan : BTC as a rare opportunity to inject petro-dollars in its ailing economy. Foreign firms' access to capital and modern technology has already assisted the country in the modernization of some of its failing infrastructures, opening prospects of capitalizing on its only asset, hydrocarbons, while limiting further risk of catastrophic environmental disasters of the same magnitude as Aral Sea in the Caspian.

- For Turkey: At the other end of the pipeline in Turkey, nation-wide expectations of economic and geopolitical gains by becoming the hub of Caspian energy transit added to the promise of greater integration of marginalized Kurdish minority in the national economy raised and galvanized population's many expectations of the project.

- For Georgia: BTC plays a central role in securing the country's economy and development. (60 percent of total foreign investments over the past 10 years have been associated with BTC which illustrates the strategic place of the BTC pipeline in Georgia's development.

. For Iran and Russia: BTC perceived of intended intentions of western powers to exclude both country from the Caspian energy development

1)The legal frame test:

A general concern that the agreements between EMNCs and host governments insulate the former from the jurisdiction of national laws including environmental regulation and protection of rights of citizens.

•In the case of the BTC pipeline, two related components constitute the project's legal frame:

- **Inter-Governmental Agreement (IGA) signed between the three involved countries.**
- **Host Government Agreements (HGAs) between each state and pipeline's consortium led by BP.**

  - **The first HGA was signed between the Azeri national oil company SOCAR and a consortium of eleven EMNCs (AIOC). According to the Azeri legislation, the 30-year international agreement PSA take precedence over domestic laws, insulating EMNCs from domestic legislation and administrative accountability in Azerbaijan.**
  - **The HGA signed between the Georgian government and the consortium seals extra guarantees on the part of the government by adding a "no-nationalization" clause, extensive land and water use rights for the consortium, and a pledge not to obstruct the pipeline's operation (Water 2004). The non-interference provision (which could apply to environmental, social, or political concerns) establishes the frame of state intervention only if the level of "threat is unreasonable"**

1)The legal frame test:

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•**HGA: no reference to international or regional human rights principles and instruments when they enshrine in the agreement governments' obligation to "take all reasonable and prudent measures" to provide security for the project (Host Government Agreement between and among the Government of Georgia and MEP participants 2004).**

•**In addition, the HGAs request that states do not incorporate any future international commitment, for example in regard to environmental standards and safety, taken by the country into the pipeline regime as long as they are more stringent than the environmental standards practiced by the industry at the time of ratification (HGA 2004).**

Dgvari case : BTC pipeline construction damaged a few villages on its route. Dgvari landslides vs. $1m humanitarian aid to the government to help resettle the villagers elsewhere, a measure which has been called derisory by the locals.

HGA freezes the BTC's pipeline legally binding standards of present day for the next forty years. BTC-HGA is the facto the regional potent legal frame of development in a region where national citizens rights and environmental regulatory obligations are randomly met. The lack of adequate governmental capacity to impartially and objectively regulate such projects and mitigated new risks is more acutely illustrated in respects to questions such as adhesion to international principles of human security and environmental standards.

1)The Baku-Tbilisi-Ceyhan (BTC) Test.

The community inclusion aspect: Javakheti:

The choice of the pipeline's route ; Despite the option of a less environmentally sensitive Javakheti region available for the pipeline's route. Besides being less environmentally hazardous, shorter, and thus less costly, the Javakheti option had the advantage to integrate an isolated ethnically Armenian community with the rest of the country.

The only employer in Javakheti region is the Russian military base. Considering the tense relation between Russia, and the increasingly pro-western Georgia, and Russia's close relation with Armenia, authorities in Tbilisi as well as BTC investors were fearful that Javakhetis will be co-opted by Russia to disrupt the pipeline's works. Both the government and EMNCs wanted to minimize such risk.

2) The Caspian Environment Test.
The Borjomi Case:

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- **Borjomi-Kharagauli National Park (unique ecosystems) prized for its mineral water springs is only 10 miles from the BTC pipeline. Given the highly seismic nature of the ground, any earthquake activity could, given the proximity of the pipeline, cause massive environmental and economic damage to this ecologically unique region --which is also economically significant for the country.**
  - **Integrate an isolated ethnically Armenian region with the rest of the country. (the only employer in Javakheti region is the Russian military base). Considering the tense relation between Russia, and the increasingly pro-western Georgia, and Russia's close relation with Armenia, authorities in Tbilisi as well as BTC investors were fearful that Javakhetis will be co-opted by Russia to disrupt the pipeline's works. Both the government and EMNCs wanted to minimize such risk.**

- **The choice of Borjomi for the BTC route looks logical considering the military (territorial) security risks and its consequences on regional stability and investment security. But the routing choice is a poor one considering the lost opportunity to save money by avoiding an environmentally sensitive area, and the potential to connect the neglected and isolated Javakheti region to the rest of the country and adding a new elements to hisotrical ethnic grievance in a sensitive region.**

Energy Security and Regional Security

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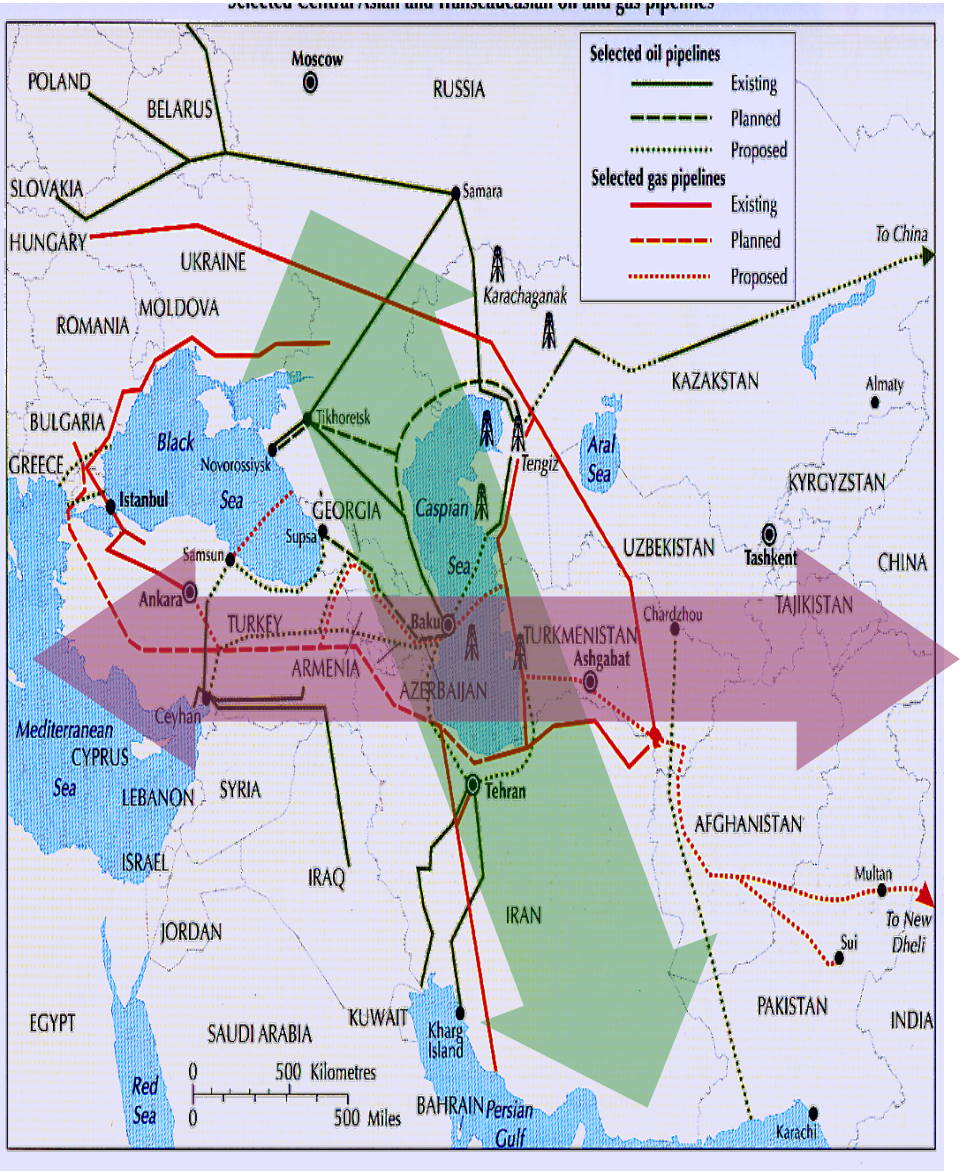

- The result of these competitions is an “axial regionalism” of the Caspian Oil: East-West pipelines sponsored by the United States and endorsed by Azerbaijan (TCGP, BTC, Aktau-Baku) and North South pipelines (Turkmenistan, Armenia, Iran’s virtual pipeline Caspian/Persian Gulf, Baku-Novorossiysk-CPC).

- The double East-West and North–South axis cooperation with old and new global powers (Russia and the US) has misrepresented emerging threats and insecurities and distorted priorities of regional countries.

- Energy security has failed in providing state, societal and environmental security. As for energy security, Georgia's reputation as a safe transitory route for Caspian energy is now history

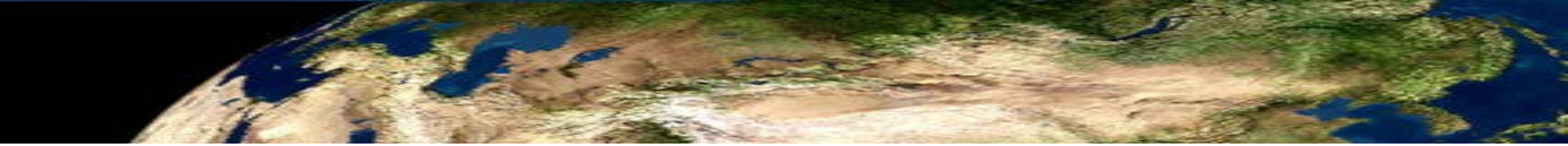

Figure 1: Conflicts Between Components of Energy Security

Sovacool and Brown (2009)

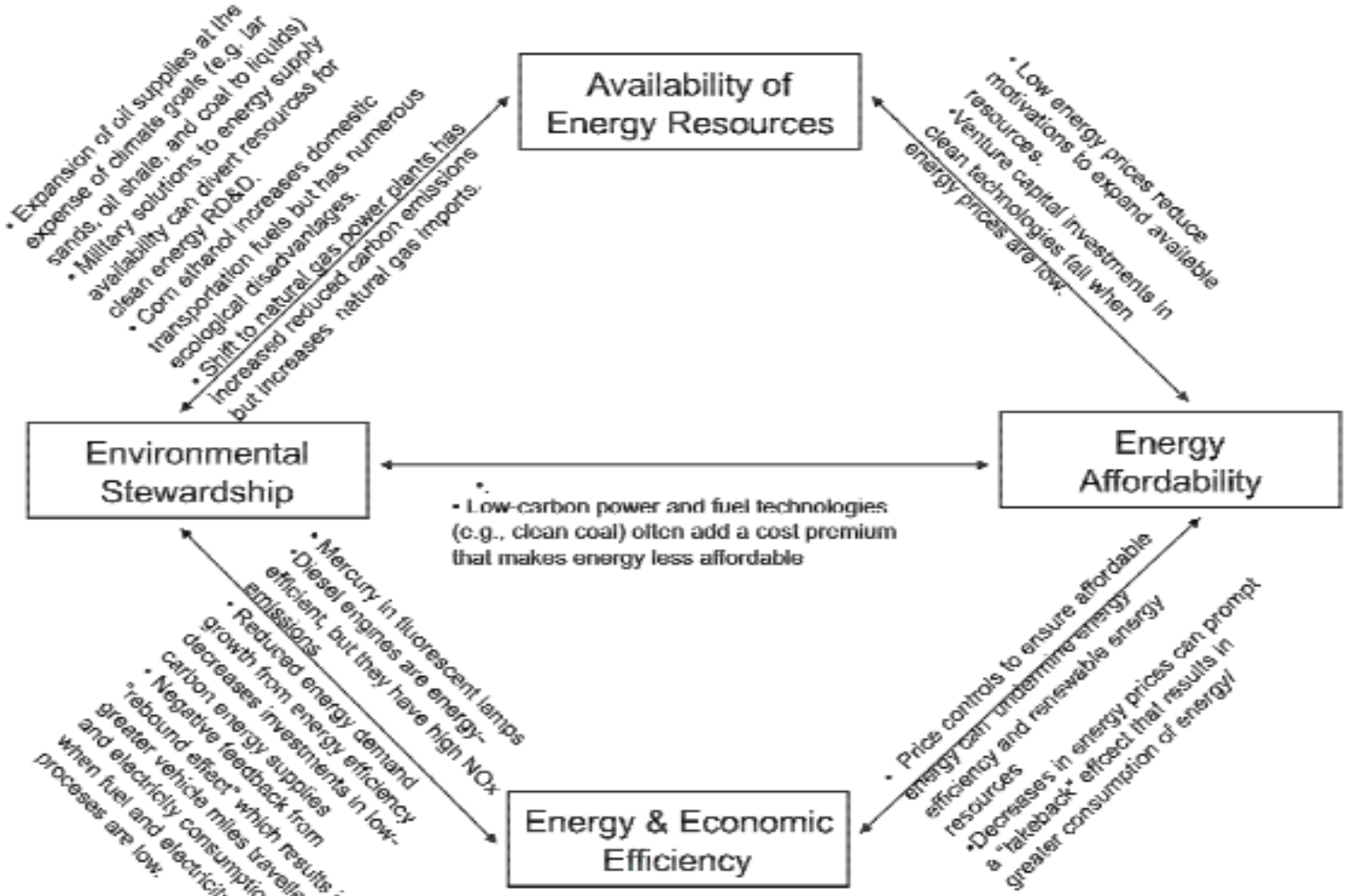

Table 4: Energy Security Performance Score, 1970 to 2007

	Oil import dependence (%)	Alternative fuels (%)	Fuel economy (new passenger vehicles mpg-e)	Energy intensity (thousand BTU/US$GDP)*	Electricity use (kWh/capita)	Natural gas import dependence (%)	Nominal electricity retail prices (US¢/kWh)	Nominal gasoline prices (US$/liter)	SO_2 emissions (million tons)	CO_2 emissions (million tons)	Final Score
Australia	+1	-1	+1	+1	-1	0	-1	-1	-1	-1	**-3**
Austria	-1	-1	+1	+1	-1	-1	-1	-1	+1	-1	**-4**
Belgium	+1	+1	+1	+1	-1	-1	+1	-1	-1	+1	**+2**
Canada	+1	-1	+1	+1	-1	+1	-1	-1	+1	-1	**0**
Denmark	+1	+1	+1	+1	-1	0	-1	-1	+1	+1	**+3**
Finland	+1	-1	+1	+1	-1	+1	-1	-1	+1	-1	**0**
France	+1	-1	+1	+1	-1	-1	-1	-1	+1	+1	**0**
Germany	-1	-1	+1	+1	-1	-1	-1	-1	+1	+1	**-2**
Greece	0	+1	+1	-1	-1	-1	-1	-1	-1	-1	**-5**
Ireland	-1	-1	+1	+1	-1	-1	-1	-1	+1	-1	**-4**
Italy	+1	+1	+1	+1	-1	-1	-1	-1	+1	-1	**0**
Japan	+1	0	+1	+1	-1	-1	+1	-1	+1	-1	**+1**
Netherlands	+1	-1	+1	+1	-1	-1	-1	-1	+1	-1	**-2**
New Zealand	+1	-1	+1	+1	-1	0	-1	-1	0	-1	**-2**
Norway	+1	-1	+1	+1	-1	0	-1	-1	-1	-1	**-3**
Portugal	+1	-1	+1	-1	-1	-1	-1	-1	-1	-1	**-6**
Spain	+1	-1	+1	-1	-1	-1	-1	-1	-1	-1	**-6**
Sweden	+1	-1	+1	+1	-1	-1	-1	-1	+1	+1	**0**
Switzerland	+1	-1	+1	+1	-1	0	-1	-1	0	-1	**-2**
Turkey	-1	+1	+1	+1	-1	-1	+1	-1	-1	-1	**-2**
UK	+1	+1	+1	+1	-1	-1	-1	-1	+1	+1	**2**
United States	-1	-1	+1	+1	-1	-1	-1	-1	+1	-1	**-4**
Mean	0.5	-0.4	1.0	0.7	-1.0	-0.6	-0.7	-1.0	0.3	-0.5	-1.7

Further research remarks

The energy security landscape of the future will depend on :
1- Both the direction of national strategies and the nature of international energy institutions. In the scenario where national strategies focus on sovereignty concerns and international institutions are weak, one can expect centralized but not internationally integrated energy infrastructure and fragile markets subordinated by resource nationalism and geopolitics.

2- In the opposite scenario, when the national strategies focus on resilience under strong international institutions, it may be possible to support transitions to more secure energy systems even in those countries that lack the capacity to do it on their own.

3- The energy security landscape will change so significantly that many of the current energy security threats may disappear and new ones may emerge. To assess energy security in the future, it is important to know how diverse and geographically concentrated the future global energy supply will be, what the diversity of fuels used in key end-use sectors will be, and whether some regions will continue to be seriously dependent on imported energy sources

Further research remarks

4- Energy Security needs to be viewed in the context of a networks of emerging threats and insecurities. A network based security reading provides interdisciplinary approach to emerging threats and vulnerabilities while connecting one debate such as energy security with analytical elements of other disciplines such as environmental and societal security. (extreme weather events / terrorism/ resource scarcity: security is directly confronted to the complexity of shifting patterns of threats).

5- Whether dealing with malevolent threats such as terrorism or energy insecurities, the common characteristic lies in their dispersed nature and thus the fact that they can be encouraged and/or amplified based on distinct and sometimes colliding rationales and motivations across the network. For instance in the case of climate change, factors such as social, economic and environmental determinants dictate a consumer's choice of energy use which in return impacts the demand for energy.

These individual behaviours are interrelated and translational and constitute an informal web capable of inducing global scale phenomena such as climate change or demand based scarcity of natural resource with uneven impact across the world. Being induced by dispersed factors, causes of energy security can not be tackled and its impacts be mitigated based on a unique policy model which would modify the behaviour of only one node of the network.