



Energy and Geopolitics:

Understanding the Energy-Security Nexus in Europe and the Arctic

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Europe's Energy Challenges

Declining Production and Market Share:

- 2002-2012 petroleum production in the EU-27 decreased 54%; gas production fell 35%
- 10% of European refinery plants will be closed within the decade
- European demand for fuel has dropped to a 19 year low due to its ongoing economic crisis
- Demand will continue to decrease due to demographic declines
- EU-27 import dependency rose 10.6% from 1995-2011; in 2010, over 54% of EU total energy consumption was imported from outside the EU
- International Energy Agency reports Europe will lose a third of its global market share of energy exports in the next two decades

Rising Prices:

- European gas import prices are roughly three times higher than in the U.S. and industrial electricity prices are twice as high

Divergence Between Climate and Energy Policy

Renewables:

- In 2010, renewable energy sources accounted for 8.7% share of EU-27's gross energy consumption
- EU 2020 Climate Framework set goal that 20% of energy would be derived from renewables by 2020
- German consumers pay on average an extra €260 a year to subsidize renewables
- In 2013, Germany's brown coal use was over 25% of total electricity generation due to high costs of renewables

EU 2030 Climate Framework:

- Renewables target of 27% but only applies at a regional level
- Will develop individualized energy strategies to address renewables and energy efficiency
- Keep the "policy door open" to shale gas development

Energy and the Transatlantic Relationship

Transatlantic Trade and Investment Partnership (TTIP):

- TTIP would allow U.S. natural gas exports to Europe. European negotiators pushing for inclusion of an energy chapter in TTIP
- Natural gas prices are now 2.5 times higher than in the U.S.
- U.S. oil exports would require a change in U.S. legislation
- U.S. is uncertain about its energy exports due to pricing concerns

Energy Insecurity:

- In 2011, 35% of EU-27 oil imports, 30% of natural gas imports, and 26% of solid fuel imports were from Russia
- Russia cut off gas to Ukraine and Europe in 2006 and 2009
- Strategic vulnerability of energy dependence



Europe's Energy Options

- Embrace unconventional oil and gas
- Increased coal use
 - Germany is the world's largest miner of brown coal
- Nuclear renaissance
 - Nuclear energy accounted for only 14% of the EU-27's 2012 gross energy consumption
- Seek new energy partners (i.e. Iran, Qatar, etc.)
- Postpone climate targets
 - EU 2030 Climate Framework gives equal weight and consideration to competitiveness and energy security



Key Facts: Arctic Environmental Change

ICE MELT: Since 1980, the Arctic has lost 40 percent of its sea ice cover and 70 percent of its ice volume. IPCC estimates that the Arctic could be free of summer ice between 2050 and 2100.

COASTAL EROSION: 34% of the world's coastlines are covered in permafrost, but as these buffer zones disappear, coastal erosion accelerates, threatening critical infrastructure and coastal communities.

PERMAFROST THAW: Permafrost comprises 24% of the land in the Northern Hemisphere and as it thaws, this poses serious infrastructural challenges, particularly to existing as well as the creation of new pipelines.

Key Facts: Arctic Environmental Change

OCEAN ACIDIFICATION: Since the start of the industrial revolution, rising carbon dioxide levels have led to a 26 percent increase in the acidity of the ocean. This has a detrimental impact on marine life and on those dependent on fishing.

FOOD SECURITY: Indigenous communities are witnessing a decline in animal availability due to environmental change, affecting their nutrient intake from these traditional foods.

ANIMAL POPULATIONS: Two-thirds of the world's polar bears could disappear by 2050 due to the melt in the Arctic's sea ice.



Economic Drivers in the Arctic

Oil and Gas

Potential of 13% of world's undiscovered oil resources and 30% of its undiscovered gas. This equates to about 90 billion barrels of oil and 1,669 trillion cubic feet of natural gas.

Mineral Resources

Contains vast amounts of nickel, iron ore, plutonium and rare earth minerals.

The Arctic may supply 25% of the global demand for rare earth elements. The estimated value of Arctic minerals is \$1.5-2 trillion.



Future of Arctic Oil and Exploration

- Shtokman Field is one of the world's largest natural gas fields in the South Barents Basin. In 2012, the project was put on hold for “future generations” as LNG was destined for North America.
- Cairn Energy has been exploring for oil and gas offshore Greenland since 2007 and drilled 8 wells between 2010-2011 but has not identified commercially viable quantities.
- After spending \$4.5 billion in permits and exploratory drilling in the Chukchi Sea, it is unclear whether Shell will continue to pursue development.
- January 2014, Statoil was awarded interests in 10 production licenses on the Norwegian continental shelf. However, Norwegian Arctic exploration is slowing due to high costs, unfruitful exploration results, and pressure from environmental groups.
- Novatek's \$27 billion onshore Yamal LNG project is expected to annually produce 16 million metric tons of natural gas and should be operational by 2016.
- April 2014, Gazprom plans to retrieve the first load of oil from its offshore Prirazlomnaya Arctic field, which began production December 2013.