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Afghanistan Reconnected

Linking Energy Supplies
to Consumers in Asia

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Afghanistan Reconnected: Linking Energy Supplies to Consumers in Asia

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Afghanistan's social and political development is at a critical juncture—and in a bit of a conundrum. On the one hand, we are witnessing how negative domestic security developments affect the country's economic development. On the other hand, there are concerns that internal peace and stability are impossible to achieve without stable economic growth. Peace and stability should be based on economic projects of common interest that will create a positive sum game for key political and business actors, as well as for the country's average citizens.

Stable economic growth depends on access to stable and affordable energy supplies. The Energy Sector Strategy (ESS) for Afghanistan—part of Afghanistan's National Development Strategy—highlighted the importance of energy for reconstructing its national economy. Energy is also a fundamental pillar of any welfare strategy. For example, access to energy, especially in rural areas, is essential for meeting all of the Millennium Development Goals (MDG) in Afghanistan.

Afghanistan's energy challenges are somewhat different than that of its neighbors. Despite a power deficit and relatively low rates of electricity access (circa 65 percent of total population), the major issue in India and Pakistan is power shortages, which affect large-scale industrial enterprises. This trend alone depresses average GDP growth in these countries by 3-4 percent. Despite electricity shortages in these countries, public services have minimal daily access to the power supplies. On the contrary, in Afghanistan general level of access to electricity is unacceptably low in the countryside, up to 85 percent of local population still does not have permanent daily access to electricity supplies. For Kabul, access to affordable and uninterrupted electricity and primary energy supplies is of vital importance for the survival of its public services and infrastructure, including hospitals, schools, police and the armed forces.

In order to meet its energy demand, Afghanistan can develop its indigenous hydrocarbon and renewable energy resources or import energy resources from abroad. A set of concrete policy measures—to be implemented in Afghanistan and at the regional level—is a crucial pre-condition for the success of the trans-Afghan energy corridor and the transformation of the national energy sector. On the domestic front, Afghanistan's government should proceed with a concrete energy planning process, which will create a level playing field and regulatory stability for domestic and foreign investors. At the regional level, there is an urgent need to overcome the atmosphere of mistrust and mutual suspicion to build an energy governance regime. The region already has a set of multilateral frameworks dealing with energy issues. However, only a few of them have a proper mandate.

There is no appetite for new energy organization in Southwest Asia, and the reshuffling of existing cooperation mechanisms might be time consuming and not the most efficient solution. The best option is to choose existing mechanisms on the basis of their practical suitability for a specific energy or infrastructure project. The South Asia Association for Regional Cooperation (SAARC) Energy Centre could serve as the secretariat for such initiatives, while the practical implementation could be done by the private sector. The Energy Charter Treaty (ECT) could provide a necessary legal and regulatory basis for such initiatives. More importantly, regional energy trade could serve as a catalyst for economic integration and peace building at the regional level, contributing to the settlement of violent conflicts. The examples of the Barents Sea, Northern Iraq and the Southern Caucasus have recently shown that trade pays more than conflict when all shareholders discover that cooperation, in the framework of a specific project or a policy initiative, helps reap tangible economic benefits for all.

Introduction: The Key Energy Challenges in Afghanistan and Southwest Asia

Indigenous Production and Domestic Consumption in Afghanistan

Theoretically, domestic energy resources may allow Afghanistan to become energy self-sufficient in the mid-term future, as there are good prospects for developing existing petroleum reservoirs and finding new ones. The country's renewable energy potential is also quite important. It is, nevertheless, too early to predict whether Afghanistan could also become an energy exporter.

The energy elasticity of Afghanistan's GDP will remain high in the foreseeable future.¹ This trend would not allow, at least at the initial stage, a decoupling of economic growth and a parallel increase in energy consumption. Therefore all potential mid-term increase in domestic energy production is likely to be consumed in the country.

To secure necessary indigenous supplies, Afghanistan's government should proceed with a concrete energy planning process, which will create a level playing field and regulatory stability for the domestic energy market. Both domestic and foreign investors would benefit. A proper set of regulations is essential for providing investment guarantees and tax incentives, and for creating adequate energy price signals, which will ensure affordable supplies. The energy sector reforms should promote electrification of the remote rural areas based on off-grid and renewable energy sources (RES), while the country in general should move away from an expensive and environmentally unfriendly energy mix based on traditional biofuels and fuel oil/diesel generation. Afghanistan's energy policy should also include pricing and subsidies reform.

A differentiated use of energy prices, depending on the consumption level, consumer group and time of the day, will allow increased

¹ Energy elasticity is the percentage change in energy consumption to achieve one percent change in national GDP. The lower energy elasticity, the more energy efficient is the economy.

energy efficiency/energy savings and help attract investment in the power generation and upstream sector, as well as through using contract for difference practices (CFD).² The pricing reform should include "energy welfare" with subsidized tariffs for basic services, which could be jointly financed by Afghanistan's government and international assistance programs. Last but not least, the energy sector reform should enhance resilience and include contingency planning tailored for local conditions.

Energy Imports and Trans-Afghan "Energy Bridge"

With the predicted surge in energy demand, the country will need new energy supplies even before its domestic energy supplies become fully accessible. The country is well located, in close proximity to major producers of gas (Turkmenistan) and hydroelectricity (Kyrgyzstan and Tajikistan). Afghanistan could also become an "energy bridge" for the energy flows transiting from Central Asia to South Asia—a scenario with a win-win potential for all stakeholders. India and Pakistan, willing to pay premium prices for energy supplies are evidently reachable markets with significant and rapidly growing energy demand (see 2012 report: *India and Pakistan's Energy Security: Can Afghanistan Play a Critical Role?*)

Until now, trade within South Asia has remained stagnant and the regional powers did not manage to take advantage of numerous synergies between a rapidly industrializing South Asia and a resource-rich Central Asia. An Afghan "energy bridge," as part of a larger "Silk Road," could unite these complimentary sub-regions and bring new investment opportunities to Afghanistan, especially in the area of trade, infrastructure, mining and energy.³

A Trans-Afghan energy corridor requires mu-

² Here, a contract for difference (or CFD) is understood a contract between two parties, typically described as "buyer" and "seller", stipulating that the seller will pay to the buyer the difference between the current (energy) price and the price at contract time. If the difference is negative, then the buyer pays instead to the seller.

³ For more details, please see S. Frederick Starr, Andrew S. Kuchins, *The Key to Success in Afghanistan: A Modern Silk Road Strategy*, Silk Road Paper, May 2010, Central Asia – Caucasus Institute, Silk Road studies Program, SAIS, Washington, D.C.

Until now, trade within South Asia has remained stagnant and the regional powers did not manage to take advantage of numerous synergies between a rapidly industrializing South Asia and a resource-rich Central Asia.

tual trust among key players and functioning energy governance frameworks. A set of concrete policy measures—to be implemented in Afghanistan and at the regional level—is a vital pre-condition for the success of the trans-Afghan energy corridor and a successful transformation of Afghanistan’s energy sector.

Tackling security challenges is an indispensable step in building the trans-Afghan energy corridor. The security situation on the ground may delay and even prevent the implementation of the infrastructure projects. In light of these concerns, special attention should be paid to mitigating local transit risks. There is a need to involve local stakeholders in any major project planning and implementation process. Local actors should also become key beneficiaries of investment in infrastructure projects, such as gas pipelines and electricity transmission networks. When that happens, local communities will develop a natural interest in protecting energy infrastructure as a major source of their income.

Building a regional energy governance regime is a prerequisite for the trans-Afghan energy corridor. Effective regional cooperation needs to be promoted to overcome the atmosphere of mistrust and mutual suspicion. The region has a set of multilateral frameworks dealing with energy issues; however, only a few of them include a set of sufficient energy cooperation and investment protection mechanisms. There is no political will to set up new mechanisms at this point. States in Southwest Asia could instead pursue ad hoc cooperation on projects such as the TAPI gas pipeline or the CASA–1000 network. Regional government agencies and the private sector could also explore the possibility of joint energy trans-national undertakings.

The Energy Charter Treaty could provide a legal and regulatory “umbrella” for such projects to secure transit, assist in dispute settlement, provide investment guarantees and address pertinent regional efficiency and environmental issues. South Asia’s Association for Regional Cooperation (SAARC) Energy Centre could serve as the secretariat for such initiatives. A regional fund set up by the regional governments and supported by international donors could provide financial assistance.

The Energy Corridor as a Peace Building Mechanism

The trade in energy could become a useful tool for both economic integration and peacebuilding in Southwest Asia. Bilateral or multilateral joint ventures may contribute to the settlement of conflicts when all stakeholders recognize that such cooperation can bring tangible economic benefits. Project-based energy cooperation in Southwest Asia might even mirror the positive spillover effect of the European Coal and Steel Community, which laid the foundation for the European Union.

Recently, developments in the South Caucasus, the Barents Sea and in Northern Iraq proved how mutually beneficial trans-border energy initiatives are leading the conflicting sides to put aside their disagreements and start cooperating. Recent examples of energy trade and conflict settlement include the area in the Barents Sea that was disputed by Norway and Russia, the Southern Energy Corridor (concerning Georgia⁴) and Turkish participation in upstream projects in Northern Iraq, governed by the Kurdistan Regional Government (KRG).

Building a regional energy governance regime is a prerequisite for the trans-Afghan energy corridor.

4 The construction of gas and oil pipelines transiting via Georgia significantly improved the ties between Baku and Tbilisi. Although Georgia and Azerbaijan have never been engaged in an open conflict, the two countries are still disagreeing on the border delimitation in the Davit Garegi area in eastern Georgia. Existing energy cooperation with Azerbaijan, however, allows an easing of existing tensions and helps to focus on common economic, energy and infrastructure projects.

CHAPTER I

Afghanistan's Energy Security: Internal Aspects

The social and economic reconstruction of Afghanistan is impossible without stable, affordable access to energy for the population, the business sector and government services. The country's energy sector has been negatively affected by decades of war and political instability, and it is in dire need of a large-scale upgrade. The lack of investment in production, transmission and distribution of energy has led to the overall insufficiency of available domestic or imported energy supplies.

Afghanistan's energy situation can be described as a prolonged "energy poverty," defined as "lack of access to modern energy services." This situation is likely to persist after 2014, and it will negatively affect the overall socio-economic development.⁵

The level of power access in Afghanistan is still low, although it has considerably improved in the last few years with power supply almost tripling between 2006 and 2011. According to estimates of the Ministry of Energy and Water of Afghanistan, only 30 percent of Afghanistan's population has access to power, with the level of electrification reaching 70-75 percent in Kabul.⁶ Approximately 85 percent of the rural population is without basic access to electricity required for numerous daily activities.⁷

Access to energy is not only a key for economic growth, it is also essential for any strategy to improve the health and social welfare of a nation. The reduction of energy poverty is essential for meeting practically all of Afghanistan's Millennium Development Goals (MDG), especially those related to the eradi-

⁵ For more detailed explanation, please see <http://www.iea.org/topics/energypoverty/>. Accessed on 20 October 2013.

⁶ Data compiled by the World Bank <http://www.worldbank.org/en/country/afghanistan/overview>. Accessed on 10 October 2013.

⁷ Data is provided by National Area-Based Development Programme (NABDP) of the UNDP. See http://www.undp.org.af/whoweare/UNDPinAfghanistan/Projects/psl/prj_nabdp.htm. Accessed on 20 October 2013.

cation of extreme poverty.⁸

To meet its energy demand, Afghanistan can develop indigenous hydrocarbon and energy resources or import supplies. If efficiently managed, local resources might suffice to satisfy Afghanistan's mid-term (2014/15 – 2024/25) primary energy demand. In theory, domestic energy resources may allow Afghanistan to become energy self-sufficient in the not-too-distant future. Different estimates based on already-discovered hydrocarbon deposits suggest that Afghanistan can meet up to 80 percent of its demand for petroleum products from its domestic production.⁹ There are also good prospects for finding new petroleum reservoirs. According to the United States Geological Survey (USGS), undiscovered petroleum resources include 15.687 trillion cubic feet (tcf) of natural gas, 1,596 billion barrels (bbl) of oil and 0.562 bbl of natural gas liquids. If these reserves are proven commercially viable for development, they can satisfy the internal energy consumption for years to come.¹⁰

Most of the undiscovered oil reserves are located in the Afghan-Tajik basin, while most of the undiscovered natural gas is located in the Amu Darya basin.¹¹

The country's renewable energy potential is also significant. According to U.S. National Renewable Energy Laboratory (NERL) data, the wind energy potential in Western Afghanistan alone may reach 158,000 MW and national hydropower potential is in excess of

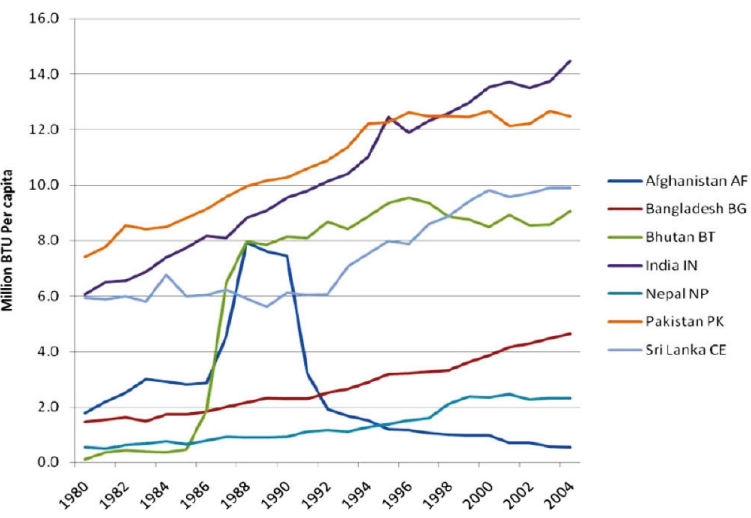
⁸ See <http://www.afghanconnection.org/downloads/toolkit.pdf>. Accessed on 11 October 2013.

⁹ *Afghanistan Economic Updated*, World Bank Report, Washington DC April 2013 http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/05/02/000333037_20130502161223/Rendered/PDF/770830REVISED0box377289B00PUBLIC00.pdf. Accessed on 1 November 2012.

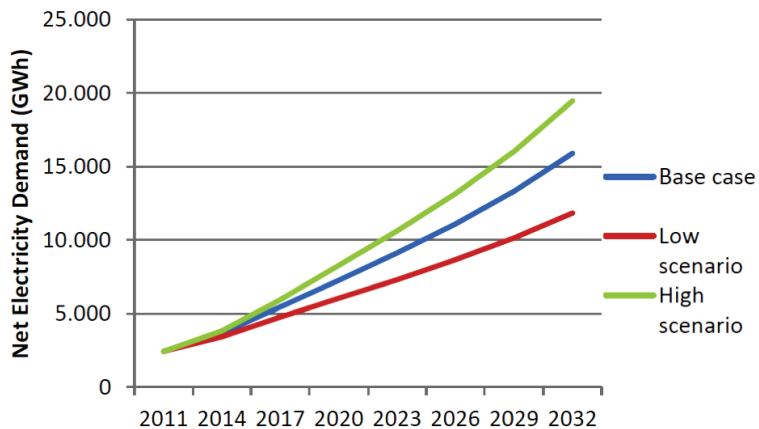
¹⁰ Assessment of undiscovered oil and gas resources of the Amu Darya Basin and Afghan-Tajik Basin Provinces, Afghanistan, Iran, Tajikistan, Turkmenistan, and Uzbekistan, 2011, the U.S. Geological Survey Fact Sheet, 2012. <http://pubs.er.usgs.gov/publication/fs20113154>. Accessed on 30 October 2013.

¹¹ Here by "undiscovered reserves" we understand recoverable economic reserves (oil and natural gas), yet undiscovered, that are estimated to exist in favorable geologic settings.

Afghanistan's energy situation can be described as a prolonged "energy poverty," defined as "lack of access to modern energy services."



Per capita energy consumption in the SAARC countries (million BTU equals 293 kilowatt hours)¹⁵



Net Electricity Demand in Afghanistan¹⁶

23,000 MW.¹²

It is, nevertheless, too early to claim that Afghanistan could become soon an energy exporter. Already in 2014, the Asian Development Bank (ADB) predicts that Afghanistan’s GDP growth will reach 4.8 percent, which would lead to an even higher increase in energy consumption.¹³ This trend would not allow, at least at the initial stage, a decoupling of economic growth and a parallel increase in energy consumption.

Developing Afghanistan’s energy sector is impossible without relevant specific policy frameworks. Legal and regulatory directives are essential for providing incentives and guarantees to investors. This will help to resolve non-payment issues, and will provide access to affordable energy supplies. The

regulation will also help Kabul build contingency and resilience capacity, increase energy efficiency and firmly integrate Afghanistan into the regional and international energy cooperation frameworks.

This fact is fully acknowledged in the Energy Sector Strategy, the key energy policy document of Afghanistan.¹⁴ The document also rightfully emphasizes the need to focus on the efficient use of energy and expanding the availability of energy resources throughout the country. This paper will add another important point to the plan for the reform of Afghanistan’s energy sector. Changing the structure of the energy mix is also a critical undertaking for Afghanistan’s energy security.

¹² For more details, please see Dennis Elliott, “Wind Resource Assessment and Mapping for Afghanistan and Pakistan,” *National Renewable Energy Laboratory*, Golden, Colorado, USA, June 2007.

http://www.nrel.gov/international/pdfs/afg_pak_wind_june07.pdf Accessed on 26 August 2013.

¹³ For GDP growth estimates please see *World Economic Outlook*, International Monetary Fund, Washington DC, April 2013, p. 62. <http://www.imf.org/external/pubs/ft/weo/2013/01/pdf/text.pdf>. Accessed on 2 November 2013.

¹⁴ Islamic Republic of Afghanistan. Afghanistan National Development Strategy. Energy Sector Strategy (2007/08 – 2012/13).

¹⁵ Source: Islamic Republic of Afghanistan. Afghanistan National Development Strategy. Energy Sector Strategy (2007/08 – 2012/13), p 33.

¹⁶ Source: “Islamic Republic of Afghanistan: Power Sector Master Plan.” The World Bank Report, May 2013, p. 42

The action plan for the reform of Afghanistan's energy sector

The action plan for the reform of Afghanistan's energy sector should be implemented in the following sequence, from the most important to less essential elements:

Pillar I: Efficient use of energy, which includes the following actions:

Improve energy-saving practices

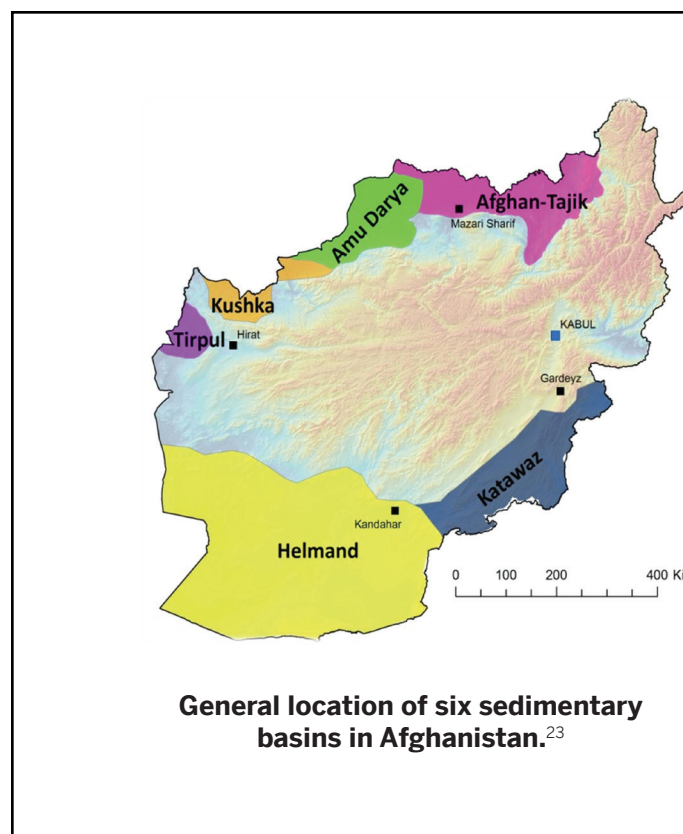
Network losses, housing and lighting are the key issues to be addressed. Currently up to 30 percent of gas is lost in transmission networks, mostly due to leakage and theft.¹⁷ At this stage, improving energy efficiency in Afghanistan is low hanging fruit—these policies will be inexpensive to implement, cost-effective and will yield immediate results. The practical recommendations are also available immediately from various sources. For example, the World Bank's report "Energy Efficient Lighting Options for Afghanistan" (2009) suggested concrete steps in order to increase energy efficiency in lighting.¹⁸ The publication also identified the best options for specific market segments in off-grid and grid-connected areas.

Going forward with pricing and subsidies reform

Low tariffs and non-payment continue to undermine Afghanistan's energy sector. There is a clear need for reform that will both attract investment in the energy sector and provide the local population with affordable access to energy. Gas prices are still too low to cover costs of rehabilitation, operation and maintenance. Trends in the electricity sector are similar. The Asian Development Bank (ADB) noted in its technical assistance consulting report that the current tariff level between 4-7 U.S. cents/kWh for residential customers

¹⁷ Numbers quoted in "Afghanistan's Environment 2008" UNEP/NEPA Report, 2008, p. 26. http://postconflict.unep.ch/publications/afg_soe_E.pdf. Accessed on 3 November 2013.

¹⁸ "Afghanistan - Energy efficient lighting options for Afghanistan", The World Bank Report, June 2009. <http://documents.worldbank.org/curated/en/2009/06/16422289/afghanistan-energy-efficient-lighting-options-afghanistan>. Accessed on 2 November 2013.



General location of six sedimentary basins in Afghanistan.²³

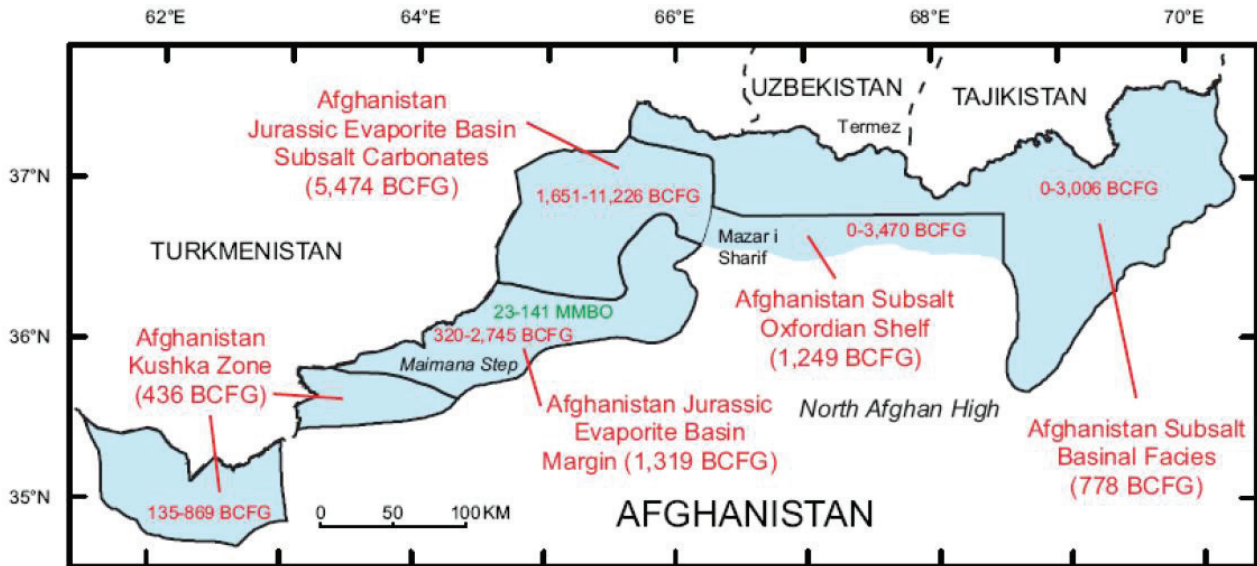
in large cities (e.g. Herat, Kabul) is far from enough to cover generation costs.¹⁹ The ADB study suggests "a value of 15 U.S. cents/kWh might be a very rough estimate to reflect a possible cost-covering tariff."²⁰ In an ideal energy market setting, it is a question of relying on the price signals and having the resources to pay the market price.²¹ But the market does not always deliver a price level that is affordable to all. A simple prescription to increase tariffs would not work in this low-income society. On the contrary, it would lead to more socio-economic tensions. In this situation, the state has a responsibility to ensure "energy welfare," providing access to energy for the poor population.

¹⁹ "Islamic Republic of Afghanistan: Power Sector Master Plan." The World Bank Report, May 2013. <http://www.adb.org/sites/default/files/projdocs/2013/43497-012-afg-tacr.pdf>. Accessed on 30 October 2013.

²⁰ Ibid.

²¹ A price signal is information conveyed, to consumers and producers, via the price charged for a product or service, thus providing a signal to increase supply and/or decrease demand for the priced item. Definition is taken from Boudreaux, Donald J. "Information and Prices." The Concise Encyclopedia of Economics, Library of Economics and Liberty (econlib.org) <http://www.econlib.org/library/Enc/InformationandPrices.html>. Accessed on 22 November 2013.

Currently up to 30 percent of gas is lost in transmission networks, mostly due to leakage and theft.



Map showing undiscovered petroleum resources. The means of estimates are stated next to the assessment unit name and the ranges are given within the assessment unit boundaries. BCFG is billion cubic feet of natural gas and MMBO is million barrels of crude oil (USGS).

“Energy welfare” in Afghanistan should include:

- Subsidized social tariffs for population for a limited amount of basic services. In the future, these tariffs should be gradually removed.
- Guaranteed tariffs for the utilities that will allow them to have a secured return on investment. This can be shaped along the lines of the UK Government’s agreement with the French utility EDF, which is expected to build a set of nuclear power plants in Great Britain. A so-called contract for difference (CFD) will mean EDF can count on a set price for its electricity, but will have to repay the state if the market price rises above this level.²² The issue of targeted subsidies can be addressed via a well-shaped subsidies program, co-financed by international donor assistance.

²² Guy Chazan, Sylvia Pfeifer and Jim Pickard, “UK agrees nuclear power deal with EDF”, FT, 21 October 2013.

²³ Map from “Afghanistan as Energy Importer and Producer,” presentation by Abdul Razique Samadi, CEO of DABS, Islamabad, Pakistan, Wednesday, September 03, 2013.

Pillar II (Expanded/New Supply and changing the structure of the energy mix)

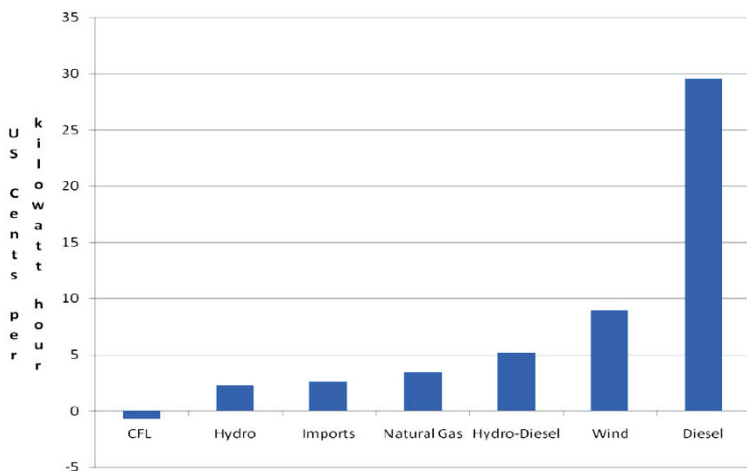
This pillar includes the following actions:

Changing the country’s energy mix and developing domestic energy resources

Afghanistan’s energy sector is dominated by expensive fuel oil and diesel generation, which can cost up to 35-40 U.S. cents per kWh or 6-7 times the price of the electricity imported from Central Asian countries. There is an urgent need to move away from the unsustainable use of biomass and oil in power generation to small and mid-scale hydropower projects and local gas- and coal-fired electricity plants.²⁴ Initiatives such as the USAID-funded project in the area of Sheberghan, capable of producing electricity from the locally-extracted gas at low costs (3.5 U.S. dollars per kWh), could become the backbone of this initiative.

²⁴ Large hydropower projects are unlikely to present an adequate solution due to internal and external challenges linked to the water flow problems, unpredictable and rising construction costs, and a lack of necessary infrastructure.

Source: USGS, “Islamic Republic of Afghanistan: Power Sector Master Plan.” The World Bank Report, May 2013, p. 94.



Cost of Power Supply in Afghanistan²⁸

S/N	Type	Average Estimated Unit Price (USc/kWh)
1	Hydro	2.29
2	Thermal (NW Kabul)	27.115
3	Imported	2.62
4	Diesel (all provinces)	29.53
5	Hydro and diesel	5.19
6	Hydro, thermal and diesel	6.473
7	Natural gas	2.8 to 3.5
8	Coal (1MW = 4.5 ton)	1 ton = Afs 2,200

Electricity generation costs (kWh), 2007. The estimated cost of power is based on Sheberghan power plant; no estimate of cost of coal fired capacity is available at this moment (source: DABM).²⁹

Focusing on the “off-grid” and improving transmission and distribution networks

Lacking a fully developed power transmission and distribution network, Afghanistan should focus on the development of the “off-grid” or regional low-cost power generation with diverse regionally-produced energy mix. This is particularly relevant for remote areas in the central and southern parts of Afghanistan that lack transmission networks and do not benefit from electricity supplies from Central Asia. Off-grid solutions also provide local access—independent of problems with long-distance electricity supply such as security issues, technical faults and illegal access to transmission networks. Furthermore, micro-generation projects require less investment and contribute to local economic development and employment. For example, only a few large towns are connected to the North-East Power System (NEPS) in northern Afghanistan.²⁵ The NEPS should be extended to the provinces of Baghlan, Balkh and Samangan. The NEPS connection is a good example of a donor-funded project. It is financed by the German Ministry for Economic

Cooperation and Development (BMZ) and implemented by KfW Development Bank.²⁶ In order to become an electricity transit bridge, Afghanistan should put in operation several transmission networks such as the Turkmenistan–Pul-e-Khumri (TKM-AFG) 500 KW interconnection and an additional Salang pass 500 KW line, as well as synchronize domestic power generation with imported supplies.²⁷

²⁶ <http://www.ez-afghanistan.de/publikationen/pressemitteilungen/aktuelles/article/improving-the-living-conditions-for-65000-citizens-in-khulm.html>. Accessed on 5 November 2013.

²⁷ Data provided in “Afghanistan as Energy Importer and Producer,” presentation by Abdul Razique Samadi, CEO of DABS, Islamabad, Pakistan, Wednesday, September 03, 2013.

²⁸ Source: Islamic Republic of Afghanistan. Afghanistan National Development Strategy. Energy Sector Strategy (2007/08 – 2012/13), p 37.

²⁹ Ibid., p. 36.

²⁵ Please see the NEPS status <http://www.afghanec.org/neps.php>. Accessed on 10 November 2013.

Pillar III: Specific Policy Reforms

Developing national resilience and contingency planning

The country still lacks crisis prevention/crisis management mechanisms for securing energy supplies. Most existing, functioning contingency plans at the national level offer no guaranteed coverage at the local or provincial levels. Often, it is unclear who is responsible for local contingency and resilience plans. For Afghanistan, the inclusion of international best practices (including emergency response system on oil reserves) in its national energy resilience and contingency planning will be extremely useful.

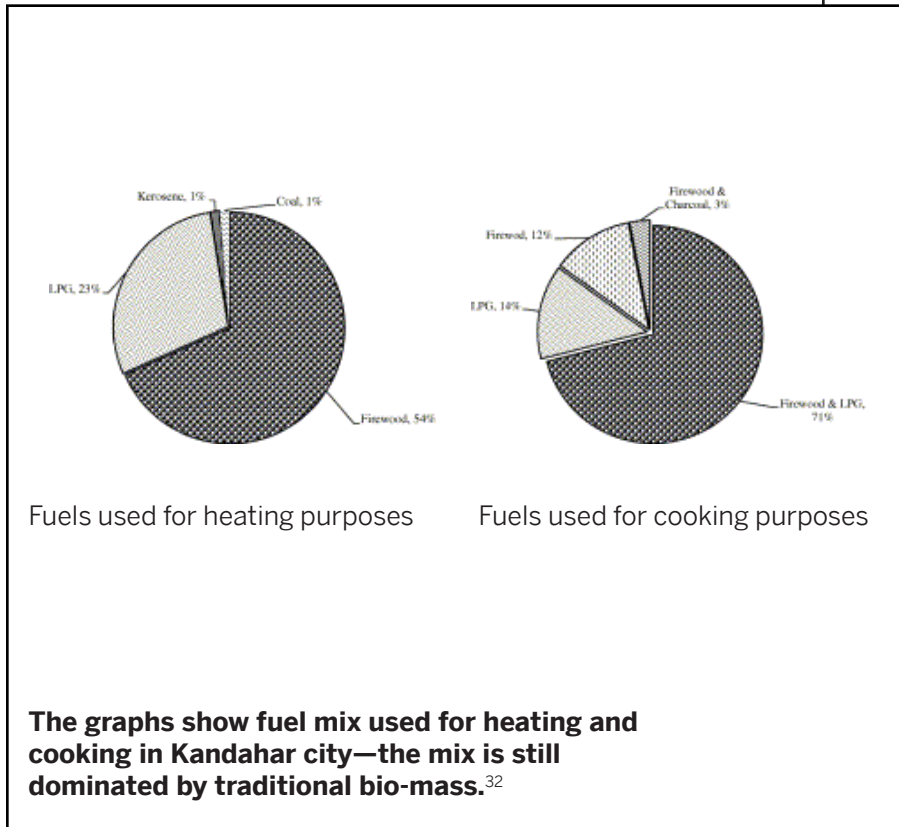
Chapter II Afghanistan: An Energy Bridge

With the predicted surge in energy demand, Afghanistan needs new primary energy and electricity imports, before its indigenous energy resources become accessible for residential and industrial consumers. The country's geographic location, in close proximity to the major producers of gas (Turkmenistan) and hydroelectricity (Kyrgyzstan and Tajikistan), allows an easy access to adequate volumes of energy supplies. The arrival of Central Asian electricity, gas, and oil will also contribute to upgrading Afghanistan's energy infrastructure, making it suitable for transit and also attractive for foreign investments—but only if the security situation improves.

Turkmenistan has an estimated 17.5 trillion cubic meters (tcm) of natural gas.³⁰ Despite some difficulties with the development of the super-giant Galkynysh gas field, Turkmenistan would have, with proper investment incentives, enough natural gas for its existing and potential clients.³¹ Turkmenistan can also sell electricity produced from its gas-fired power stations to Afghanistan and further to Pakistan. At present, the installed capacity of all power stations in Turkmenistan is 4,104 megawatts (MW), of which 40 percent (1,643 MW) is produced by gas-fired turbines.

30 BP Statistical Review of the World Energy 2013. BP, London, June 2013.

31 In 2012, Turkmenistan produced 64.4 bcm of natural gas (BP Statistical Review of the World Energy 2013).



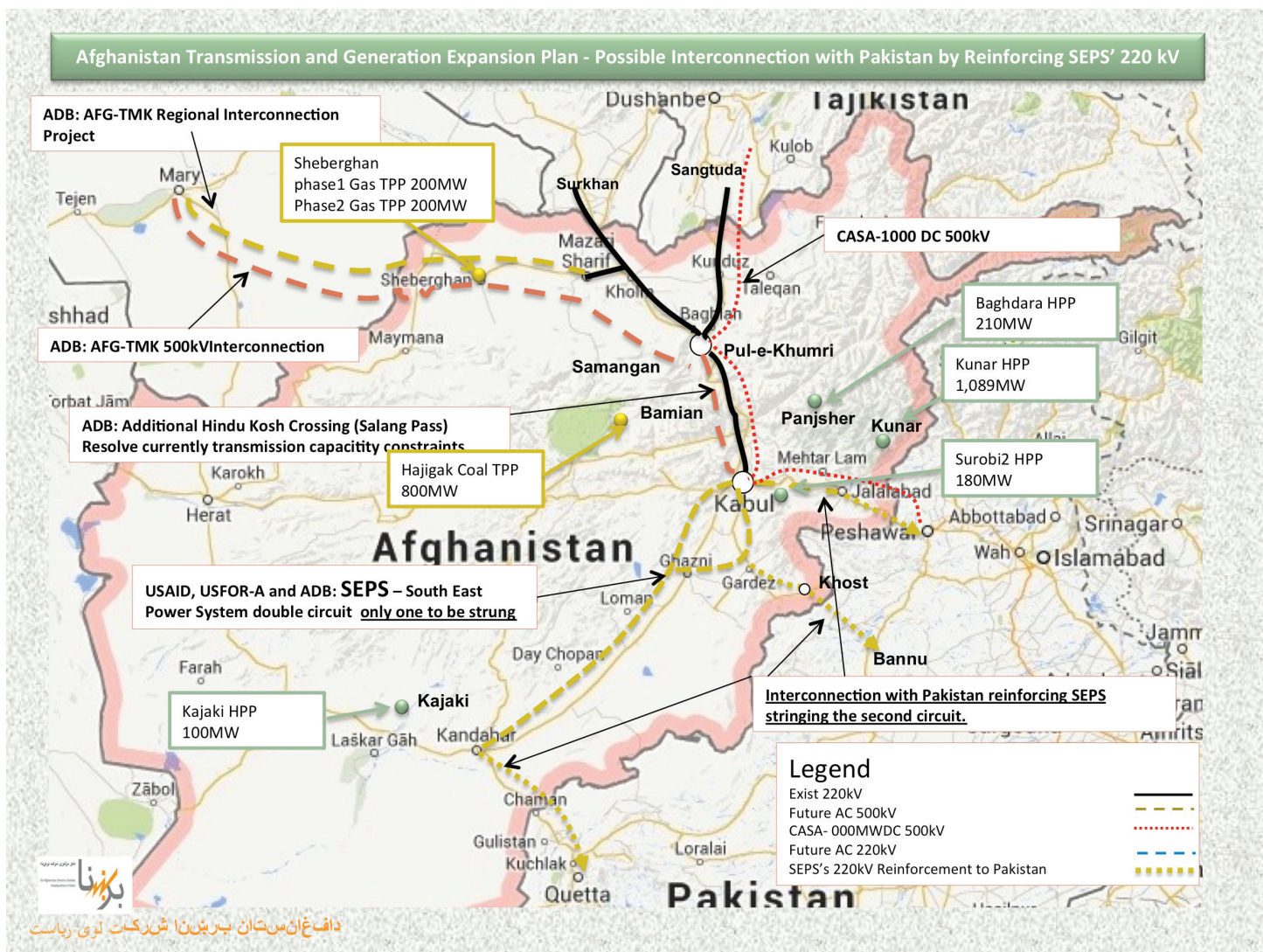
An additional 1,122 MW of gas-fired capacity is expected to be built soon in the near future.

With regard to hydroelectricity, Kyrgyzstan and Tajikistan are the most important sources of potential supplies to Afghanistan as well as to Pakistan. Tajikistan alone could produce 527 billion kWh/year of electricity from its natural hydropower potential, which is still significantly underutilized.³³ It is expected that Tajikistan's hydroelectricity production will only reach 26.4 billion kWh by 2015. Even with such "modest" output, it will allow Dushanbe to export up to 5 billion kWh / year by 2015.³⁴ Tajikistan is a seasonal power supplier with peaks of up to 400 MW of constant electricity flow in spring and summer. According to "Barq-i Tajik," Tajikistan's electricity company, over 156 million kWh (or 10.7 % of Tajik electricity production) has been supplied from Tajikistan to neighboring Afghanistan in

32 Agha Mohammad, Pujan Shrestha, S. Kumar, "Urban residential energy use in Kandahar, Afghanistan", Cities, Volume 32, June 2013, pp. 135 – 142.

33 Tajikistan's already existing hydroelectricity generation capacity of 4037 MW is only a small fraction of its hydropower potential.

34 Data provided by Rustam Rakhimov, Head of Investor and International Relations at Barki Tochik, Tajik Sate Energy Company.



Afghanistan power transmission system³⁸

July 2013.³⁵ Uzbekistan is supplying 300 MW of capacity year-round and Turkmenistan supplies electricity to northern Afghanistan. In January 2012 alone, Turkmenistan sold 16,267 MWh to Herat province.³⁶ Kyrgyzstan has the 3rd largest hydropower potential (142 billion KWh) of the former Soviet Republics after Russia and Tajikistan. Hydropower largely dominates the electricity mix in the country and also provides numerous opportunities for export to Afghanistan and Paki-

stan.³⁷ Kyrgyzstan's export of electricity is expected to rise from 1.47 billion KWh in 2010 to 6.9 billion KWh by 2020.

³⁵ <http://news.tj/en/news/tajikistan-exported-afghanistan-over-10-percent-produced-electricity-july>. Accessed on 10 October 2013.

³⁶ Data provided by Afghan Energy Information Center (AEIC). http://www.afghaneic.org/database/view_monthly_all.php. Accessed on 5 October 2013.

³⁷ Hydropower accounts for 3070 MW out of 3786 MW of Kyrgyzstan's installed power generation capacity.

³⁸ Map from "Afghanistan as Energy Importer and Producer," presentation by Abdul Razique Samadi, CEO of DABS, Islamabad, Pakistan, Wednesday, September 03, 2013.

³⁹ Map from "Pakistan Energy Sector & the Engagement of the Private Sector," presentation by Muhammed Danish, CEO of PIP, Islamabad, Pakistan, Wednesday, September 03, 2013.



The boundaries and names shown and the designations used on maps included in this publication do not imply official endorsement or acceptance by the IEA.



Above: Natural Gas Infrastructure in Central Asia and Major Gas Fields (World Energy Outlook 2010, OECD/IEA 2010)

Left: The TAPI gas pipeline and Pakistan's natural gas network³⁹

Energy Transit via Afghanistan

Trade within South Asia has remained stagnant. Regional powers have not managed to take advantage of the numerous synergies between the rapidly industrializing South Asia and the resource-rich Central Asia. An “energy bridge” could unite these two complimentary sub-regions while bringing new investment and trading opportunities to Afghanistan. This trade will, in turn, increase trust, political stability and security in Southwest Asia, and contribute to the internal stabilization of Afghanistan.

As a result, living standards will improve, local business will grow and new revenues will be generated. The “energy bridge” approach will reconnect Afghanistan with its neighbors and help Kabul to promote joint undertakings, including interconnections with Central Asia’s electricity grids or power generation projects in the gas-rich countries such as Turkmenistan. Afghanistan could, therefore, follow the example of Georgia in the South Caucasus and start extracting financial benefits from its position as a transit country.

Regional and international actors should also expand the scope of their activities beyond the energy infrastructure and contribute to developing upstream and midstream energy projects in Afghanistan. Some projects are already underway. For example, Pakistan supports Afghanistan in developing the Kunar dam with a 1,500 MW hydropower generation capacity. China National Petroleum Corporation (CNPC) has been awarded three hydrocarbon exploration licenses, and by the end of 2012, was already producing oil in the Angot oil field. USAID supports the implementation of the Sheberghan Gas Development Project (SGDP) in northern Afghanistan.

Building a trans-Afghan “energy bridge” should go in parallel with creating the transport corridor (the Peshawar-Kabul Road and the Chaman-Kandahar railway line) where both initiatives complement each other, like in the case of the BTC and BTE pipelines in the South Caucasus.⁴⁰ Indeed, a functioning regional transport network is not only a prerequisite for the development of trade, but also for the proper functioning of energy and mining sectors. In this context, the implementation of the Afghanistan-Pakistan Tran-

sit Trade Agreement (APTTA) signed in 2010 is a critical step forward.⁴¹

Tackling security challenges is an indispensable step for building the trans-Afghan energy corridor. The security situation may indeed delay and even prevent the realization of the infrastructure projects. In light of these concerns, special attention should be given to mitigating transit risks in the trans-Afghan energy corridor. The following measures could be implemented to ease existing tensions: providing access to the (subsidized) energy supplies along the transmission routes, increasing employment of the local workforce, both as infrastructure projects employees and security guards, and distributing the transit rent among local communities. The domestic security challenges could be overcome as long as all key local stakeholders are positively involved in a specific infrastructure project, for example such as the TAPI gas pipeline and the CASA-1000 power transmission network.

Towards A New Regional Energy Governance?

Regional energy governance represents another significant political challenge, and insufficient multilateral and bilateral cooperation is an obstacle to the timely implementation of infrastructure projects. The Trans-Afghan energy corridor is a cross-border regional project, depending on mutual trust among key players and functional energy governance. Several multilateral frameworks deal with energy issues in Southwest Asia; however, only a few have a sufficient set of tools for energy cooperation and investment protection. Effective regional cooperation needs to be promoted and pursued in order to overcome the decade-old atmosphere of mistrust and suspicion. Against this backdrop, and in the absence of a developed multilateralism, it is unlikely that progress could be achieved by setting up a new energy framework.

The governments of Turkmenistan, Tajikistan, Afghanistan, Pakistan and India should instead promote ad hoc cooperation on specific bilateral or multilateral projects such as the TAPI gas pipeline or CASA-1000 network. Regional governments and the private sector could also explore the possibility of joint electricity generation in at least two countries

40 See chapter IV.

41 <http://www.commerce.gov.pk/Downloads/APTTA.pdf> Accessed on 21 November 2013.

The Trans-Afghan energy corridor is a trans-border regional project, depending on mutual trust among key players and functional energy governance.

as a pilot project, promoting trans-border energy cooperation. The Energy Charter Treaty (ECT) can provide the necessary legal and regulatory “umbrella” for such projects in order to secure transit, assist in the settlement of disputes, provide investment guarantees and address pertinent regional efficiency and environmental issues. ECT membership is relevant in Southwest Asia. All Central Asian countries and Afghanistan are full members of the ECT. Pakistan is an observer, while India is considering joining the Energy Charter Treaty. Given the strong interest in the TAPI gas pipeline and recent meetings between the Energy Charter Secretariat leadership with Indian and Pakistani officials, it is likely that India and Pakistan will soon become full members of the ECT.

The South Asia Association for Regional Cooperation (SAARC) Energy Centre could serve as the vehicle for energy initiatives undertaken by international energy companies and regional enterprises. A regional trust fund set up by regional governments with the support of international financial institutions (IFI’s) and/or international donors could collect funds for such joint energy projects.

New regional energy governance will also help reform Afghanistan’s internal energy policy framework. New legal and regulatory directives are essential for providing investment incentives and guarantees for upstream and power generation projects. The new energy framework will create adequate price signals; deal with non-payment; improve the taxation regime, thus improving access to affordable energy supplies inside Afghanistan.⁴² The new energy regulation will also help Kabul build local contingency and resilience capacity, improve energy efficiency/energy savings and firmly establish the country in the regional and international energy cooperation frameworks.

CHAPTER IV Energy Cooperation and Conflict Resolution in Southwest Asia

Although no major war has been exclusively related to the control of oil or natural gas reserves (with the notable exception of the 1932-35 Chaco War between Bolivia and Paraguay in the Chaco Boreal region), disputes over hydrocarbon reserves or over energy transportation routes have consistently played a significant role in many regional conflicts. For example, last year’s South Sudan Border War was over the control of the Heglig oilfield. The conflict ended with an agreement on border limitation and natural resources management.

Whatever their origins, armed conflicts can have a highly damaging effect on fuel transportation. The “Tanker War” between Iran and Iraq is one of the most well-known examples of conventional warfare against energy infrastructure.⁴³ In fact, over 61 percent of the ships that came under attack were oil tankers. Approximately 239 tankers were attacked and 55 were actually sunk.⁴⁴ Another example was what happened to the Arish–Ashkelon pipeline, which provided Egyptian gas to Israel. This pipeline was attacked 13 times after the fall of Egypt’s President Hosni Mubarak. Iraq’s Kirkuk–Turkey Northern oil pipeline was also constantly under attack during the summer of 2013, cutting exports by almost 40 percent.

The control of energy resources is also a very frequent component of domestic conflicts, especially in energy-rich developing countries such as Nigeria. The current conflict in the Niger Delta started 20 years ago over tensions between international oil companies (IOCs) and the local population, who felt that they were disenfranchised from energy profits. Ethnic and political unrest persist even though major concessions have been made to these local groups. As a result, Nigeria’s oil production, despite quite significant investment in upstream production capacities, decreased

⁴³ The “Tanker War” is an anti-shipping campaign during the Iran-Iraq War (1980-1988) started by Iraq in 1981 initially to prevent military supplies reaching Iran. Iran retaliated by attacking commercial ships belonging to Iraq’s economic partners.

⁴⁴ For more details, please see <https://strauss-center.org/hormuz/tanker-war.html> Accessed on 12 October, 2012.

⁴² Afghanistan’s Product Sharing Agreement (PSA) Law adopted in 2009 is a big step ahead – CNPC oil investment in the northern Afghanistan’s oil fields is made under the PSA regime.

The new energy regulation will also help Kabul build local contingency and resilience capacity, improve energy efficiency/energy savings and firmly establish the country in the regional and international energy cooperation frameworks.

In recent years, trans-border energy co-operation in various conflict environments helped secure a vibrant energy trade and also reduced tensions. This was the case in the Barents Sea region, the South Caucasus and the Kurdistan Regional Government (KRG)-Turkey relationship.

from 118.2 million tons per year in 2011 to 116.2 million tons per year in 2012.⁴⁵

The control of oil-rich provinces in Western Libya might lead to a violent conflict and even a full-scale civil war. For example, much of the oil export facilities and production were shut down in August 2013 due to strikes and security threats, while war lords attacked several oil pipelines inside the country.

But energy resources can also serve as a “peace catalyzer,” through trans-border energy joint ventures based on shared interest and an understanding of win-win situations. Once conflict is put aside, all actors involved can experience tangible economic and social benefits. Over time, these benefits may also generate political improvement, a “peace dividend” that gains more importance for stakeholders, as cooperation and stability bear fruit.

In recent years, trans-border energy cooperation in various conflict environments helped secure a vibrant energy trade and also reduced tensions. This was the case in the Barents Sea region, the South Caucasus and the Kurdistan Regional Government (KRG)-Turkey relationship.

The Barents Cooperation, combining regional and international cooperation, has proved the power of political will in resolving conflict. After decades of disagreement between Russia and Norway over the delimitation of maritime borders in the Barents Sea, both countries came to agree on a demarcation line in 2010, when technical progress and the discovery of new reserves in the disputed area pushed the two parties back to negotiations. The region now has a dense web of multilateral cooperation frameworks with an efficient governance regime, including, among others, the Barents Euro-Arctic Council⁴⁶ and the Arctic Council.⁴⁷

The United Nations Convention on the Law of the Sea (UNCLOS) is the key legal document, governing cooperation in the Arctic and Barents Sea region. It covers all segments of the ocean space and regulates the area on a broad range of issues. Enacted in November 1994, the Convention has been ratified by over 150 countries to date, including all Arctic na-

45 For data, please see *BP Statistical Review of World Energy*, BP, London, June 2013, p.10.

46 <http://www.beac.st/in-English/>
Barents-Euro-Arctic-Council.

47 <http://www.arctic-council.org/index.php/en/>.

tions, with the exception of the United States. UNCLOS also provides for a delimitation and extension of continental shelf boundaries and for a specific dispute settlement mechanism. Furthermore, all the Arctic-Barents Sea nations are participating in the work of the Energy Charter, which has specific multilateral energy cooperation provisions.

The region has some efficient political fora, such the Barents Euro-Arctic Council and the Arctic Council working on a wide range of political and technical issues, and their positive experience could be replicated in Southwest Asia. These organizations are efficient in promoting cross-border regional and interstate cooperation, coordinating development and environmental programs, and developing specific regional regulations, for example such as the Arctic Search and Rescue Agreement, the first binding treaty concluded under the Council's auspices.⁴⁸

The existing multilateral frameworks in the High North offer new opportunities for mutually beneficial trans-border energy projects. Furthermore, regional cooperation was already used as a mechanism for conflict prevention. For example, global economic crisis and unconventional hydrocarbon revolution in the U.S. led to the oversupply of natural gas and lower energy prices. These trends drastically changed the regional energy landscape in the Barents Sea. On the one hand, the development of the super-giant gas/condensate Shtokman field located in the Russian sector of the Barents Sea became unprofitable due to increased development and operational costs. On the other hand, smaller oil and gas fields located in shallow waters in disputed areas in the Barents Sea were seen as more commercially viable for development than deep offshore drilling.

Mutual interest in developing these energy reserves triggered the Norwegian-Russian rapprochement and led to the resolution of 30-year long dispute on seabed delimitation. In September 2010, Moscow and Oslo successfully settled their territorial disagreements by drawing a delimitation line in the Barents Sea and agreeing on the joint development of hydrocarbon resources in the formerly disputed area.⁴⁹ The signing of the agreement was fol-

48 <http://www.arctic-council.org/index.php/en/>.

49 See Andrew E. Kramer, “Russia and Norway Agree on Boundary,” *The New York Times*, September 15, 2010.

lowed by concrete practical steps made by the major oil firms of the two countries.

On May 5, 2012, Russia's Rosneft and Norway's Statoil entered the strategic partnership on the joint offshore hydrocarbon exploration in the Barents and Okhotsk Seas, covering 102,000 square kilometers. The joint capabilities of the two companies will "allow future exploration in underexplored areas and we look forward to working together on these projects," said Statoil CEO Helge Lund.⁵⁰ Rosneft and Statoil will be working in the Perseevsky field in the Central Barents Sea in PL713 reservoir in the Norwegian Sea.

The conflict-ridden South Caucasus offers another recent example of the positive impact of trans-border energy projects. The construction of the Baku-Tbilisi-Ceyhan (BTC) pipeline, transporting oil and gas condensate from Azerbaijan to the Eastern Mediterranean, required long-term engagement on the part of the three major actors: Azerbaijan (energy producer), Georgia (transit state) and Turkey (consumer-transit state). The BTC project is one of the very few examples of a successful project based on multilateral inter-state cooperation in the post-Soviet era. This pipeline went beyond its initial economic rationale: it allowed rapprochement and cooperation between three countries, helping to overcome historically antagonistic relations in the South Caucasus. The cooperation on the BTC also had a positive impact on trade and transport. The South Caucasus Pipeline (Baku-Tbilisi-Erzurum/BTE), a natural gas pipeline running from the Shah Deniz field in Azerbaijan to Turkey, was built in parallel to the BTC pipeline, which allowed for a significant reduction of construction costs. It also brought additional benefits to Georgia, the transit state.⁵¹ In turn, the construction of the BTE pipeline was followed by the decision to build the Trans-Anatolian pipeline (TANAP) delivering natural gas from Azerbaijan to Europe.

The realization of Baku-Tbilisi-Kars Railway also could be considered as a spillover from the BTC. This project, expected to be completed by the end of 2014, will open a new

transport corridor connecting Azerbaijani, Georgian and Turkish railways. It will open a new rail-only corridor from the Caspian Sea to Europe via Turkey and, consequently, contribute to the regional economic development and prosperity of local communities. All this progress is remarkable. Although Georgia and Azerbaijan have never been engaged in a violent conflict, the two countries still disagree on the border delimitation in Davit Garegi area in Eastern Georgia. Existing energy cooperation with Azerbaijan, however, allows an easing of existing tensions and a focus on common economic undertakings.

Last but not least: the current energy cooperation between Turkey and the Kurdistan Regional Government (KRG) is a development that would have been unthinkable just a few years ago, when Ankara was fighting Kurdish insurgents in Turkey. However, Turkey's dependence on energy imports has led to important shifts in Ankara's policy towards Erbil. In November 2013, Kurdistan's Prime Minister Nechirvan Barzani and Turkey's Prime Minister Recep Tayyip Erdoğan finalized important bilateral energy deals with annual exports of up to 10 bcm of natural gas and up to 2 million barrels per day (bpd) of oil from Northern Iraq to Turkey and other markets.⁵² This deal proved that both Turkey and the KRG had learned how to make interdependence work to their mutual advantage. In this case, the economic rationale, coupled with political will on both sides, prevailed over historic grievances and discord.

These examples demonstrate that the benefits of the trans-border cooperation may outweigh political disagreements and intra-state territorial disputes—if there is sufficient political will and an available framework for cooperation. Afghanistan and other South-west Asian countries could learn from these best practices as well. In practice, the TAPI gas pipeline and the CASA-1000 power transmission network could promote regional energy cooperation and contribute to trust building and conflict settlement in Southwest Asia.

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⁵⁰ See http://www.statoil.com/en/NewsAndMedia/News/2013/Pages/21Jun_Rosneft.aspx. Accessed on 16 October 2013.

⁵¹ As a transit country, Georgia has rights to take 5% of the annual gas flow through the pipeline in lieu of tariff and can purchase a further 0.5 bcm of gas a year at a discounted price.

⁵² See Humeysra Pamuk and Orhan Coskun, "Turkey, Iraqi Kurdistan clinch major energy pipeline deals," *Reuters*, Ankara, 6 November 2013. <http://uk.reuters.com/article/2013/11/06/uk-turkey-iraq-kurdistan-idUKBRE9A50HN20131106>. Accessed on 9 November 2013.

ACRONYMS

ADB	Asian Development Bank
APTTA	Afghanistan-Pakistan Transit Trade Agreement (APTTA)
Bbl	billion barrels
Bcm	billion cubic meters
BMZ	German Ministry for Economic Cooperation and Development
BTC	Baku–Tbilisi–Ceyhan Pipeline
BTE	Baku–Tbilisi–Erzurum Pipeline
BTU	British thermal unit
CASA-1000	Central Asia South Asia Regional Electricity Trade Project
CFD	contract for difference practices
CNPC	China National Petroleum Corporation
ECT	Energy Charter Treaty
ESS	Energy Sector Strategy for Afghanistan
IFI	international financial institution
IOC	international oil companies
GW (GW/h)	Gigawatt (Gigawatt/hour)
KW (KW/h)	Kilowatt (Kilowatt/hour)
KRG	Kurdistan Regional Government
Mcm	thousand cubic meters
MDG	Millennium Development Goals (MDG)
MW (MW/h)	Megawatt (Megawatt/hour)
NEPS	North-East Power System of Afghanistan
NERL	U.S. National Renewable Energy Laboratory
RES	renewable energy sources
SAARC	South Asia Association for Regional Cooperation
SGDP	Sheberghan Gas Development Project
TAPI	Trans-Afghanistan Gas Pipeline
Tcf	trillion cubic feet
TOE	tons of oil equivalent
tcm	trillion cubic meters
UNCLOS	United Nations Convention on the Law of the Sea
USGS	United States Geological Survey



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