

## ENERGY ON THE NEW SILK ROAD

The land stretching from Kazakhstan to India boasts vast energy resources, including Kazakh oil fields, Turkmen gas fields, powerful rivers in the Kyrgyz Republic and Tajikistan, and coal deposits in India. The region has the potential to be an energy hub, supplying not only its own inhabitants with power, but also supplying fast-growing East Asian economies, Russia, Europe, and beyond with energy resources. Alas, disparate and inward-focused energy policies have led to deteriorating regional infrastructure and cooperation. While some countries do reap the economic benefits of selling energy abroad (for example, Turkmenistan pipes natural gas eastward to China), the lack of intra-regional linkages prevent the region from reaching its energy potential.

For example, the Central Asian Power Grid, a product of the Soviet era, has been a source of dispute rather than an emblem of cooperation in Central Asia since independence. Rather than face distorted energy markets with antiquated pricing schemes, the Kyrgyz Republic and Tajikistan, both endowed with significant hydropower resources, opted to use their natural resources to develop domestically. This fueled political tension among Central Asian countries, and much of the cooperation across the region on energy issues was abandoned in the name of energy security.<sup>1</sup> Many households and businesses in Afghanistan and Pakistan do not have reliable access to electricity, citizens of the Kyrgyz Republic and Tajikistan suffer from winter electricity shortages when hydropower plants are not functioning at full capacity, and India's growing population will require significant upgrades to its power grid. The region currently lacks the necessary infrastructure to meet its own current and future needs.

Proven Fossil Fuel Reserves and Reserves-to-Production ratio						
Top 4 Regional Producers						
Country	Oil		Coal		Gas	
	mill. tonnes	R/P	mill. tonnes	R/P	tr. cubic ft.	R/P
India	763.5	18.0	60,600	89.5	52.6	50.9
Kazakhstan	3,931.8	49.3	33,600	315.5	33.1	75.7
Turkmenistan	82.2	6.3	-	-	617.3	241.4
Uzbekistan	81.4	25.3	1,900	480.7	38.3	18.8

\*R/P is calculated by dividing reserves at the end of a year by the total production in that year, providing an estimate of the length of time that the reserves would last at current production rates.  
Source: BP

The United States' "New Silk Road" initiative aims to further the economic integration of the region, including in the energy sector. The United States Government provides direct assistance to countries in the "New Silk Road" region on energy issues, and it also supports massive infra-

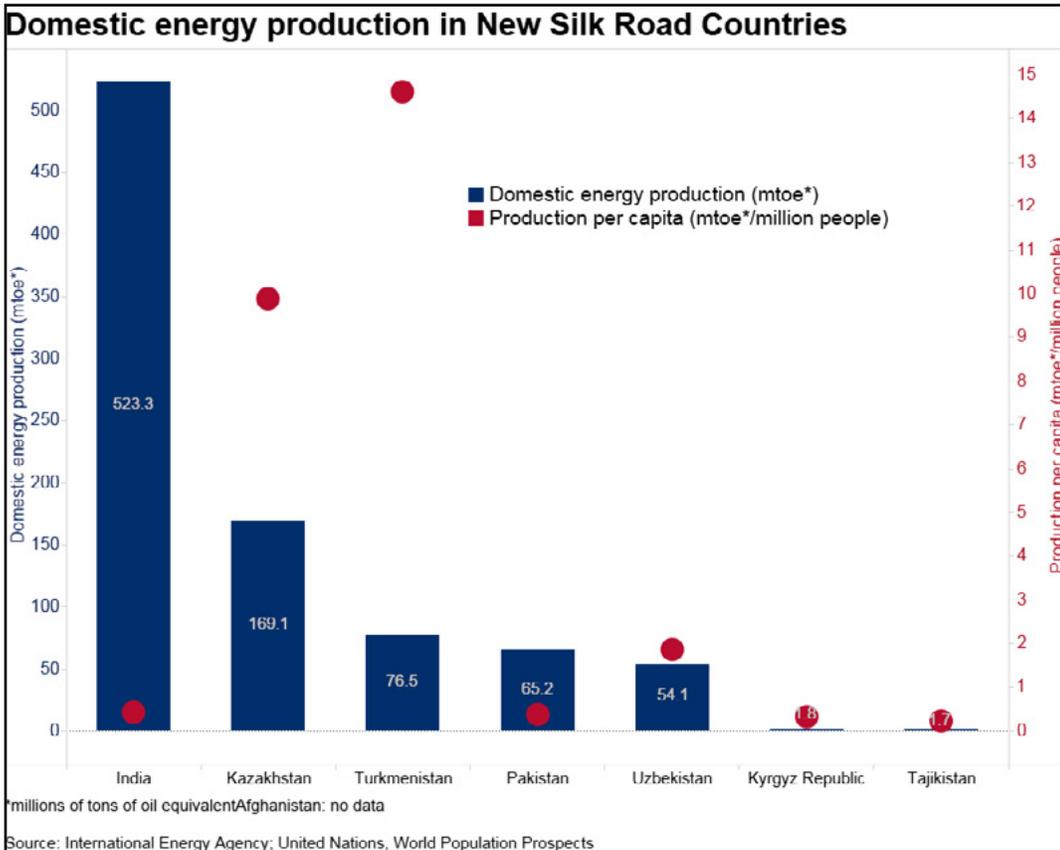
structure integration projects led by multilateral institutions like the World Bank and Asian Development Bank. Together, these projects aim to build the infrastructure necessary to enhance intra-regional energy and electricity trade, boost revenues, and diversify markets for energy exporters.

This analytical brief summarizes the energy situation in the region, focusing on (1) energy supply; (2) energy trade; (3) energy consumption and access to electricity; and (4) foreign assistance to the region in the energy sector. The countries analyzed in this report are Afghanistan, India, Kazakhstan, the Kyrgyz Republic, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan.



## ENERGY SUPPLY ALONG THE NEW SILK ROAD

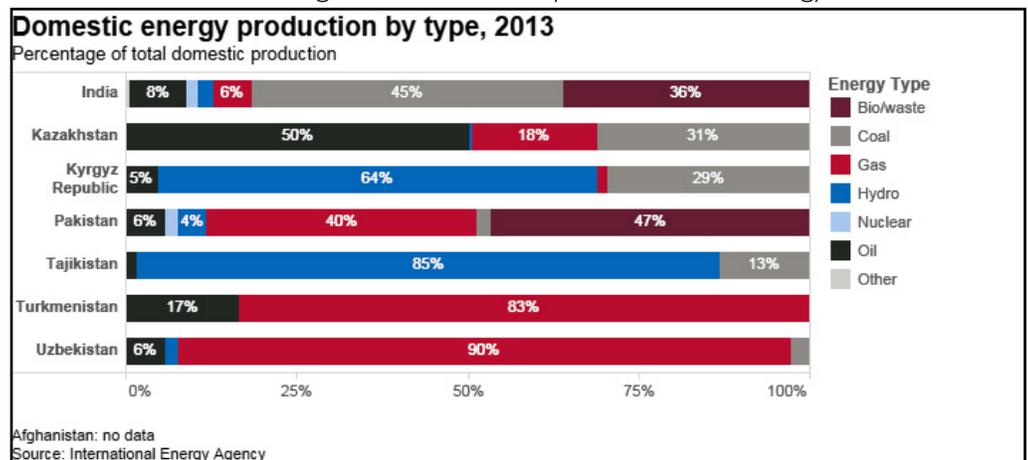
Energy-producing natural resource endowments vary dramatically across the region. Much of the power produced in the region comes from non-renewable sources: oil, coal, and gas. Kazakhstan, the second largest country in the region by land area, has large reserves of all three; notably, it has the largest proven crude oil reserves in the region by a significant margin. Turkmenistan, Uzbekistan, and India also have large natural gas reserves, and India has the largest proven coal reserves of the eight countries.<sup>2</sup>

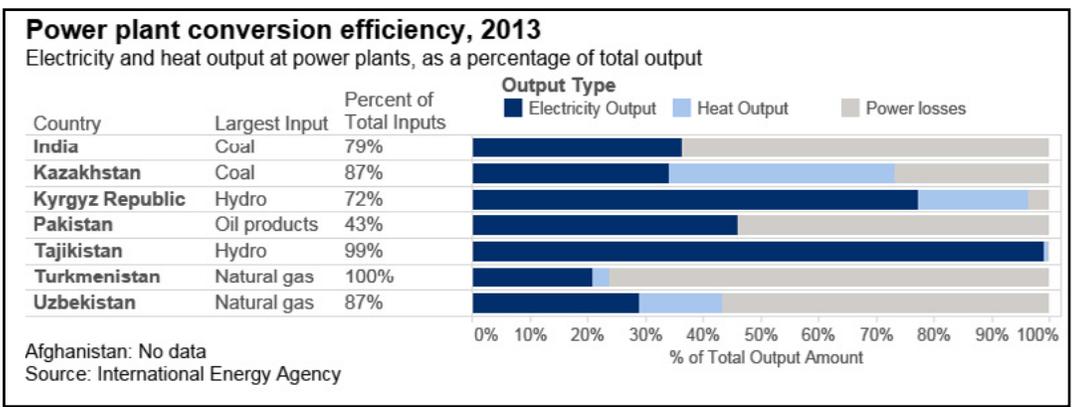


On the other end of the spectrum, the Kyrgyz Republic, and Tajikistan have limited endowments of these traditional energy sources, and therefore rely on imports and other energy sources, including hydropower. Because of climate patterns and variable water levels, hydropower production varies throughout the year; it is generally highest in the summer in Central Asia.<sup>3</sup>

According to data published by the International Energy Agency (IEA),<sup>4</sup> regional gross domestic energy production in 2013 was highest in India at 523.3 million tons of oil equivalent (mtoe), followed by Kazakhstan (169.1) and Turkmenistan (76.5). When looking at energy production per capita, however, Turkmenistan, Kazakhstan, and Uzbekistan produce the most energy domestically relative to the size of their populations. In fact, Turkmenistan’s energy production in 2013 (mostly of dry natural gas) outpaced that of Pakistan, a country with a population more than 30 times larger. Countries that produce more energy relative to their populations may be more likely to be left with, and subsequently export, surplus energy.

In most countries in the region, non-renewable fuel sources dominate domestic production, especially in Kazakhstan (crude oil) and Turkmenistan and Uzbekistan (gas). In India, coal and biofuels/waste represent the largest energy sectors.

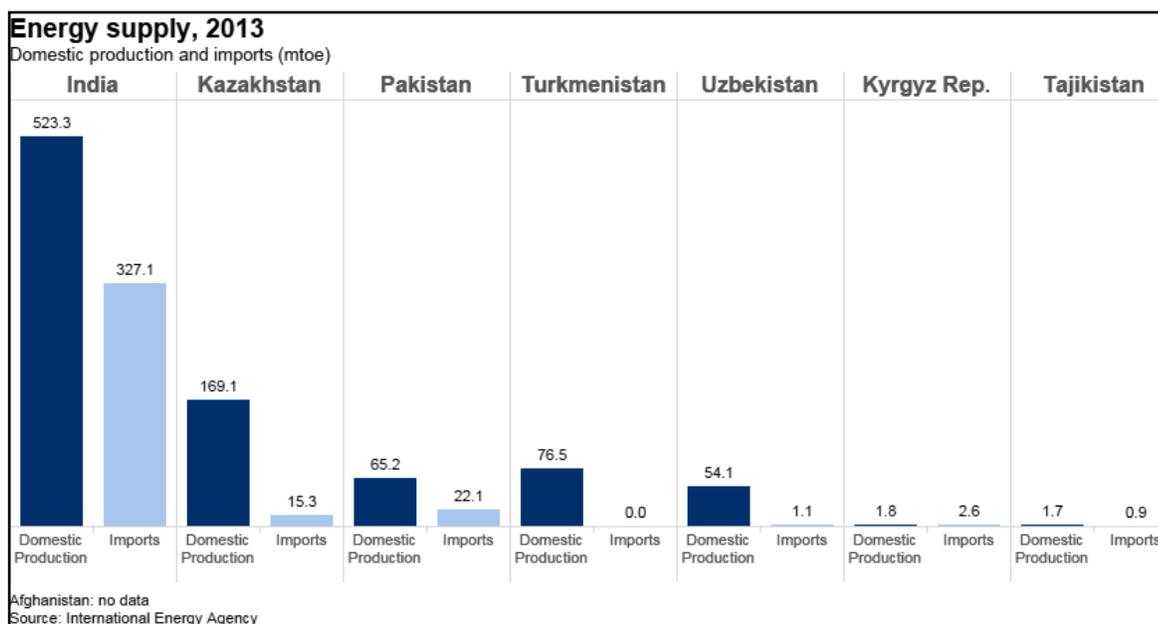




Despite the focus on non-renewables across the region, some countries rely on renewable resources, and others have established ambitious renewable energy goals. The domestic energy sectors in the Kyrgyz Republic and Tajikistan are heavily focused on hydro-power; 85 percent of energy produced in Tajikistan and 64 percent in the Kyrgyz Republic comes from hydro power plants. India and Kazakhstan have prioritized renewable energy in the medium- to long-term. In January 2015 the Indian government set a target of 175gw of renewable energy capacity by 2022.<sup>5</sup> In addition to managing its vast non-renewable energy resources, Kazakhstan developed a “Green Economy Concept” that sets a target of 50 percent of energy consumption and power generation coming from renewable resources by 2050.<sup>6</sup>

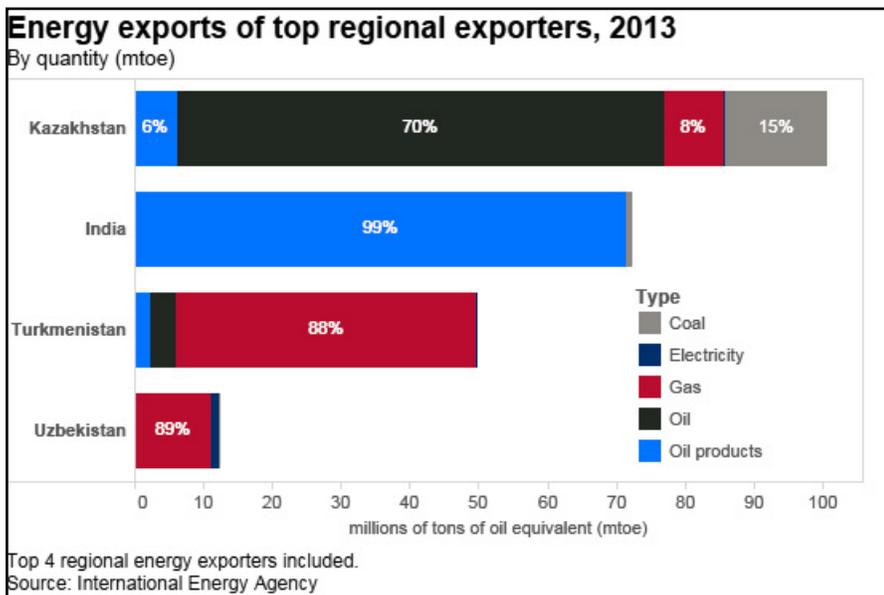
The overall energy supply in Turkmenistan, Uzbekistan, and Kazakhstan comes mostly from domestic production from their large mineral deposits; imports made up less than 10 percent of the energy supply in each country in 2013. On the other hand, imports made up 59 percent and 34 percent of the energy supply in the Kyrgyz Republic and Tajikistan, respectively. Despite producing the most energy in the region, India still relied on imports for more than one-third of its energy supply in 2013, with some electricity imports coming from neighboring Bhutan, with which India has collaborated on energy issues for decades.<sup>7</sup> The IEA does not publish figures for Afghanistan, but figures reported by the Asian Development Bank suggest that Afghanistan imported more than 80 percent of its total power supply in 2014.<sup>8</sup>

The overall energy supply in Turkmenistan, Uzbekistan, and Kazakhstan comes mostly from domestic production from their large mineral deposits; imports made up less than 10 percent of the energy supply in each country in 2013. On the other hand, imports made up 59 percent and 34 percent of the energy supply in the Kyrgyz Republic and Tajikistan, respectively. Despite producing the most energy in the region, India still relied on imports for more than one-third of its energy supply in 2013, with some electricity imports coming from neighboring Bhutan, with which India has collaborated on energy issues for decades.<sup>7</sup> The IEA does not publish figures for Afghanistan, but figures reported by the Asian Development Bank suggest that Afghanistan imported more than 80 percent of its total power supply in 2014.<sup>8</sup>



Given the varying domestic energy resources among New Silk Road countries, it follows that electricity-producing power plants rely on different inputs and achieve different levels of conversion efficiency across the region. The Kyrgyz Republic and Tajikistan rely on hydropower, which has a high conversion efficiency ratio for electricity generation. Turkmenistan and Uzbekistan, on the other hand, rely on natural gas to generate electricity, and as a result, have much lower conversion efficiency ratios.<sup>9</sup>

## ENERGY TRADE AMONG NEW SILK ROAD COUNTRIES

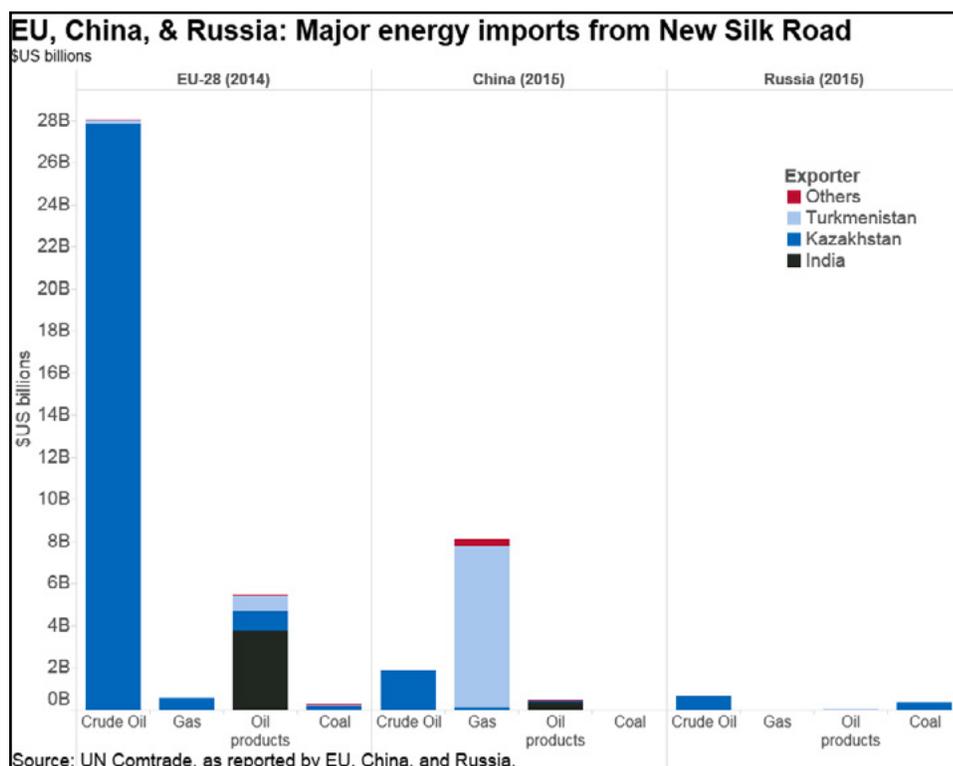


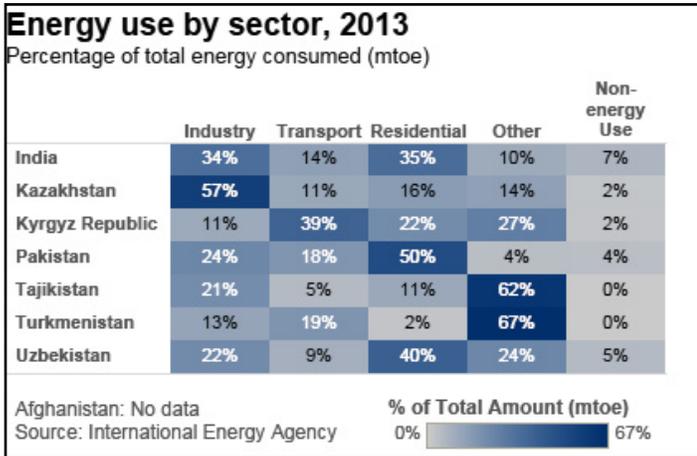
For many countries in the region, trade in fuels is a crucial component of trade policy. Unfortunately, fully comprehensive and comparable energy trade data from the region is not always available. For example, the United Nations' Comtrade database, which relies on individual economies to report detailed commodity trade data, is a useful and widely cited resource, but is rarely comprehensive across developing regions. Among countries in the region, Tajikistan, Turkmenistan, and Uzbekistan have not reported to Comtrade in recent years, and Afghanistan's data is not sufficiently detailed. In this context of disparate and often incomparable trade data, this section highlights key trends in regional

energy trade rather than attempting to create a full, clear picture of regional flows.

As suggested in the previous section, the three countries with the highest energy production per capita (Turkmenistan, Kazakhstan, and Uzbekistan) are the region's largest energy exporters in terms of quantity, along with India, which exports mostly refined oil products. Kazakhstan's exports, while somewhat diversified, are dominated by oil exports. Turkmenistan and Uzbekistan export mostly natural gas.

Intra-regional trade is limited, as existing infrastructure is mostly designed for exports to Russia, Europe, and China.<sup>10</sup> For example, given Kazakhstan's oil supply and India's oil refining capacity, one might expect Kazakhstan to export considerable amounts of crude oil south to India. In reality, a lack of infrastructure linking the two meant that Kazakhstan exported more than \$26 billion worth of crude oil in 2015, but only around \$200 million worth ended up in India.<sup>11</sup> Kazakhstan's main oil pipelines take oil into Russia (and on to Europe), or eastward to China.<sup>12</sup> Similarly, much of India's \$72 billion in crude oil imports in 2015 came from Middle East oil hubs. In 2015, India imported more crude oil originating from Chad (\$359b, 1.1b kg), a





landlocked African country, than from Kazakhstan (\$234b, 0.5b kg).<sup>13</sup>

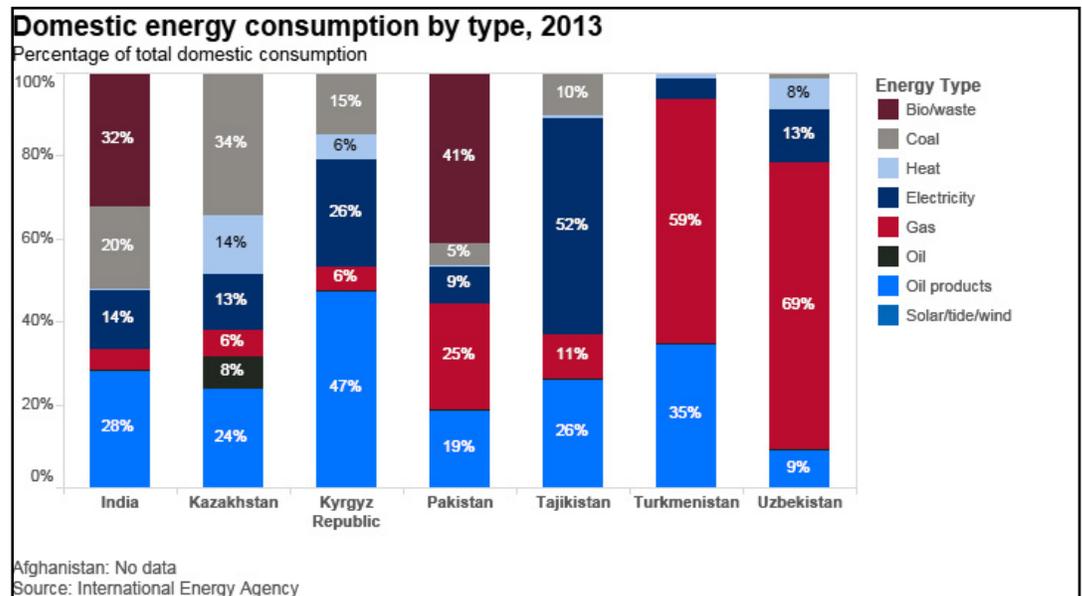
Similarly, the majority of Turkmenistan’s natural gas exports are destined for China,<sup>14</sup> especially after Gazprom, Russia’s majority-state-owned natural gas company, cut commercial ties with Turkmenistan in January 2016 following years of deteriorating relations.<sup>15</sup> Turkmenistan is China’s largest source of imported gas, accounting for \$7.7 billion (or 31 percent) of \$25.0 billion worth of imported gas in 2015, according to Chinese figures reported to UN Comtrade.<sup>16</sup>

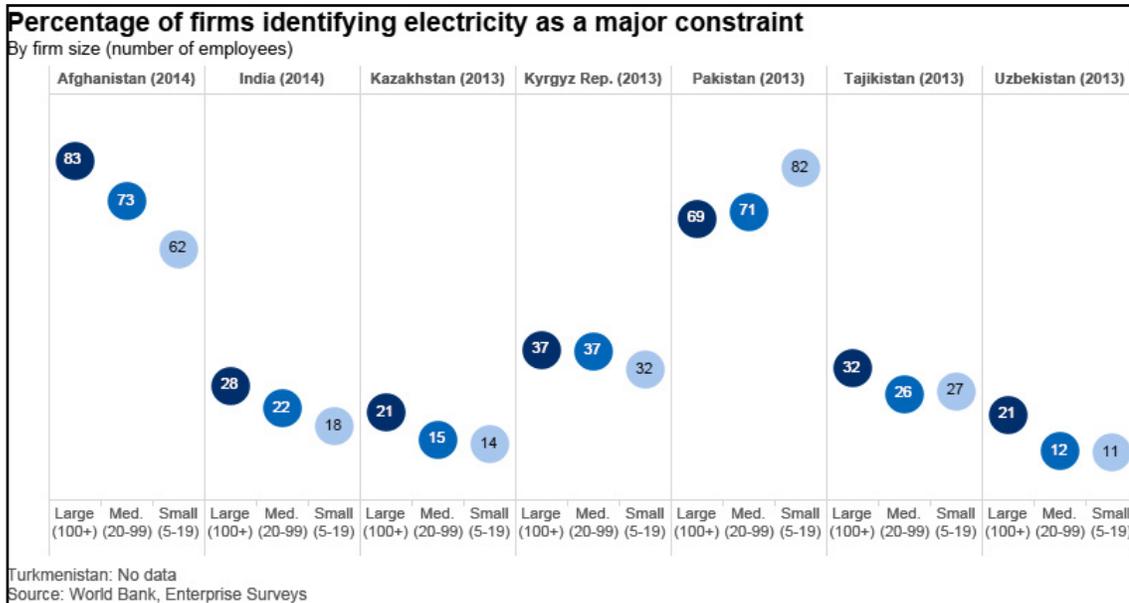
India exports mostly gasoline and other refined oil products, but again, most of these oil products are shipped outside of the region. In 2015, the largest markets by value for Indian oil products<sup>17</sup> were the UAE (\$3.8b), Singapore (\$2.9b), and the United States (\$2.1b), together accounting for nearly 30 percent of the total. India also trades in energy and energy products with its eastern neighbors, exporting \$747m to Nepal, \$148m to Bangladesh, and \$92m to Bhutan, and importing \$43m (mostly electricity) from Bhutan and \$20m from Bangladesh.<sup>18</sup>

According to the Asian Development Bank, Afghanistan’s energy imports in 2014 came from four major sources: Uzbekistan (27 percent), Tajikistan (25), Iran (16), and Turkmenistan (12).<sup>19</sup>

## ENERGY USE IN NEW SILK ROAD COUNTRIES

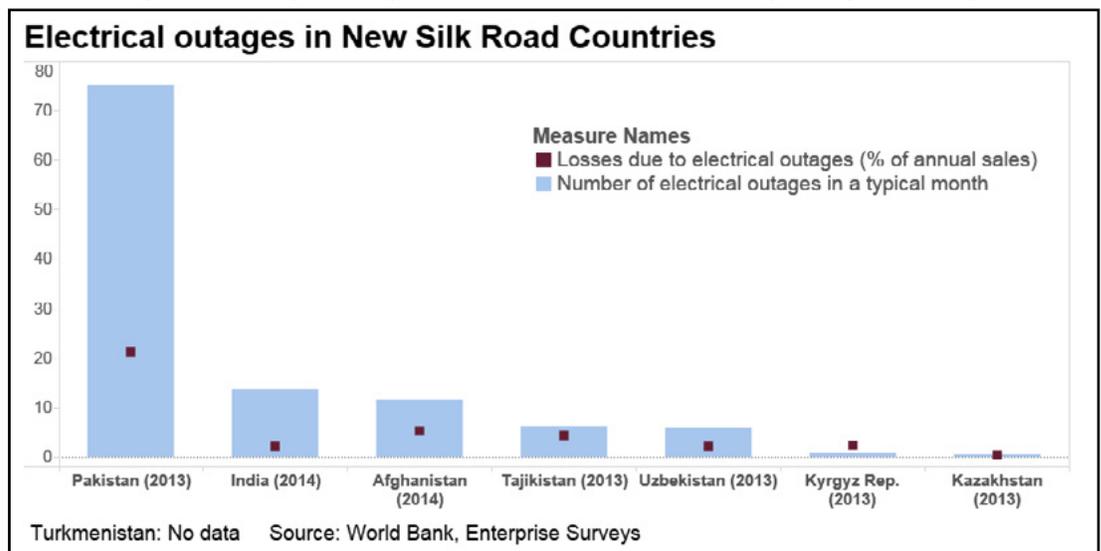
Energy use varies significantly across the region, both in terms of the types of energy consumed and the end use. IEA data show that in 2013, much of the energy supply (including both raw energy and electrical power) in Pakistan (50 percent), Uzbekistan (40 percent), and India (35 percent) was directed toward residential use; in Pakistan and India, much of this comes from biofuels, while in Uzbekistan, natural gas is used to power homes. In Kazakhstan, 57 percent of energy for consumption was drained by industry, with the iron and steel industry accounting for nearly one-third of industry’s energy consumption. Thirty-nine percent of the Kyrgyz Republic’s energy consumption consisted of oil products used for road transportation. In Tajikistan, electricity accounted for approximately one-half of all energy consumed; much of this was consumed by the non-ferrous metals sector, the agriculture/forestry sector, and residential buildings. In Turkmenistan, consumption of natural gas by the commercial and public services sector accounted for more than one-third of all energy consumption in 2013.





Access to electricity is a major constraint to businesses across the region, but the struggles are most acute in Afghanistan and Pakistan. According to the World Bank's Enterprise Surveys, 66 percent of businesses in Afghanistan (data from 2014) and 75 percent of businesses in Pakistan (data from 2013) identify electricity as a "major constraint." In

Afghanistan, large firms (83 percent) are more likely to identify electricity as a major constraint, while small Pakistani firms (82 percent) struggle more than their larger counterparts with access to electricity. In Afghanistan, it can take nearly four months for small- and medium-sized firms to obtain an electrical connection upon application. In Pakistan, 45 percent of firms declared that electricity is the biggest obstacle for their establishment, out of a list of fifteen options including access to finance, corruption, tax administration, and licensing. They reported an average of 75 electrical outages per month (compared to a regional average of 16), and estimated that, on average, they lose 21 percent of annual sales due to electrical outages (regional average of 5 percent).

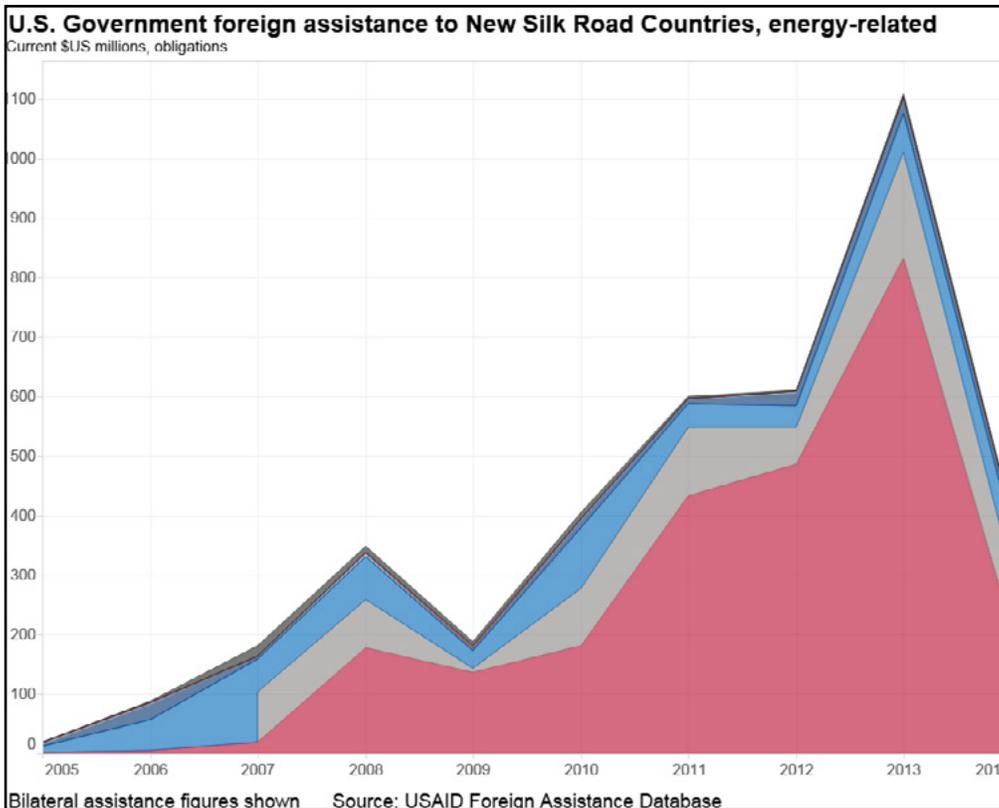


Households' access to electricity is strong across most of the region, with a few exceptions. According to 2012 data from the World Bank, only 43 percent of Afghanistan's population has access to electricity, including only 32 percent of the rural population. While 98 percent of India's urban population has access to electricity, only 70 percent of its rural population does. Despite its struggles getting electricity to businesses, nearly 94 percent of Pakistan's population (91 percent of rural) has access to electricity. In the other five countries, access to electricity is nearly universal.

Despite its struggles getting electricity to businesses, nearly 94 percent of Pakistan's population (91 percent of rural) has access to electricity. In the other five countries, access to electricity is nearly universal.

## ENERGY-RELATED FOREIGN ASSISTANCE IN NEW SILK ROAD COUNTRIES

Despite vast natural resources in many parts, the region suffers from disjointed energy policies and an overwhelming lack of intra-regional infrastructure. Many of the region's energy exporters have energy policies that are outward-facing and one-dimensional, built to facilitate exports to Europe, Russia, and China rather than engaging in intra-regional energy trade. Many countries' policies are focused on energy efficiency gains, infrastructure development,



and investment attraction.<sup>20</sup> As a result of this dynamic, many energy sector projects supported by the U.S. Government (USG) and other international donors focus on improving regional connectivity and communication on energy issues. This section highlights USG efforts in the region, including the New Silk Road initiative, as well as the World Bank-led CASA-1000 project and the Asian Development Bank's (ADB's) pipeline projects.

### ***National Investment Strategies***

Countries in the region recognize the need for improved energy infrastructure and increased energy efficiency, especially those countries with aging power grids and rapid growth in energy consumption.

This problem is especially acute in India; the International Energy Agency estimates that India's power system will need to approximately quadruple by 2040 in order for it to match economic growth in the country.<sup>21</sup>

New Silk Road countries, in particular, have focused on investment attraction since independence, but weak regulatory structures and investor protections have limited their success. While fiscal liberalization initially took place on a case-by-case basis, however, many New Silk Road countries are moving toward more widespread reforms. Optimism is high; the Kyrgyz Republic plans to increase coal production through privatization of the coal sector, and Tajikistan is attempting to attract investment for its massive Rogun hydropower project.

### ***US Government Foreign Assistance***

Much of the USG energy-related assistance to the region since 2008 has been concentrated in Afghanistan and Pakistan, the two countries in the region with the least access to electricity for businesses and households, but USG initiatives such as the New Silk Road recognize the crucial role that energy exporters in Central Asia could play in providing energy security to Afghanistan and Pakistan.<sup>23</sup> In addition to USAID funding, mostly in Afghanistan and Pakistan, other major sources of energy-related USG foreign assistance include Department of Defense energy infrastructure investments as part of reconstruction efforts in Afghanistan and nonproliferation work by the Department of Energy across the region.

USAID's efforts in the region include both country-specific and regional approaches. Overall, USAID supports the USG's New Silk Road initiative, which supports the economic integration of these South and Central Asian countries. One focus of the New Silk Road is the enhancement of regional energy markets, including support for the CASA-1000 project, described in the next section.<sup>24</sup> In conjunction with New Silk Road goals, USAID works in Afghanistan and Pakistan in the areas of energy infrastructure, electricity generation, electricity distribution, and energy policy and

management.<sup>25</sup> Another USAID project, South Asian Regional Initiative for Energy (SARI/E), focuses on enhancing cooperation on energy security in South Asia including Pakistan, India, and India's eastern neighbors. The current phase of the program focuses on promoting cross-border electricity trade in the region.

As a result of USAID projects, Afghans and Pakistanis have access to more reliable energy under more efficient and sustainable regulatory environments. USAID's Central Asia Regional Office works to improve energy policymaking, regulation, and management of national electric utilities, focusing on the Kyrgyz Republic and Tajikistan, the more energy-insecure countries in Central Asia that rely on seasonal hydropower production.<sup>26</sup>

## CASA-1000

In the Kyrgyz Republic and Tajikistan, hydroelectricity generation follows a seasonal trend due to variable river water flows; in the summer months, both countries typically generate electricity surpluses. The CASA-1000 project, a nearly \$1B project heavily financed by the World Bank<sup>27</sup> and also supported by the USG and other donors, aims to build the necessary infrastructure to send surplus electricity generated in the summer months south to Afghanistan and Pakistan.<sup>28</sup> This presents a mutually beneficial scenario for both the exporters and importers. Especially during hot summers, Afghanistan and Pakistan often struggle to meet the electricity needs of their populations and businesses, slowing down economic growth. An additional source of electricity during the summer could boost economic growth, and in years when Afghanistan has more than

electricity than necessary, it could re-export any surplus to Pakistan. The Kyrgyz Republic and Tajikistan, on the other hand, suffer from electricity shortages in winter, when hydroelectric plants are not as productive. They could use the revenues from exports of surplus electricity in the summer months to alleviate energy shortages in winter. This is particularly critical for Tajikistan and Kyrgyzstan, which lost access to Turkmen electricity during winter months when Uzbekistan pulled out of the regional Central Asian Power System (CAPS) in 2009.<sup>29</sup>

In addition to developing physical infrastructure, the CASA-1000 project also maintained goals of regional institutional, legal, financial, and risk mitigation framework that would enable international electricity trade. Between 2010 and 2012, USAID's SARI/E project provided technical assistance to the Pakistan CASA-1000 working group, focusing



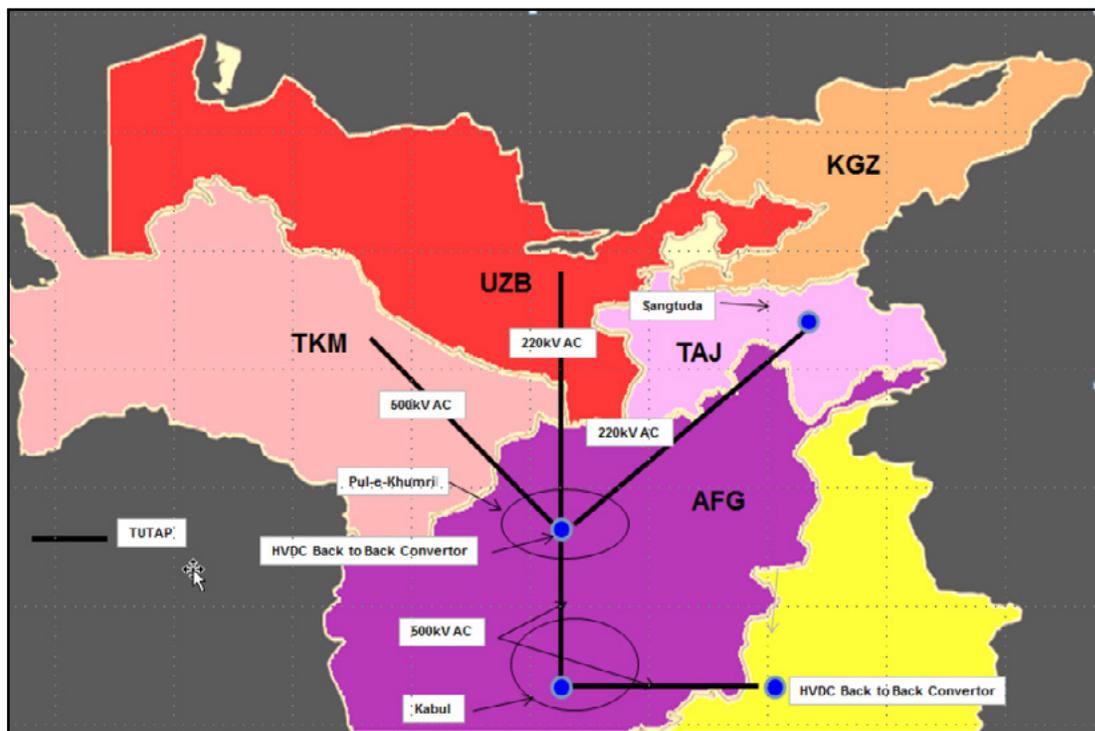
on the technical issues related to negotiations and Pakistan's plans to integrate the power into its network, including legal and financial advisory services.

### Asian Development Bank Initiatives

Many Asian Development Bank (ADB) energy initiatives in the region are designed to enhance and develop intra-regional energy infrastructure alongside CASA-1000. Supported in part by USG funding through the Afghanistan Infrastructure Trust Fund, the Asian Development Bank's TUTAP (Turkmenistan-Uzbekistan-Tajikistan-Afghanistan-Pakistan) project seeks to further boost regional electricity trade by linking the power grids of the regional partners referenced in the project's

name. This would help to direct surplus power to Afghanistan and Pakistan, which suffer from low electrification rates, as well as to improve energy efficiency and security within the region. The project aims to set Afghanistan up as a regional hub by unifying the country's power grid, thereby allowing it to receive and integrate power from the asynchronous systems in Tajikistan, Turkmenistan, and Uzbekistan for its own use or for re-exports to Pakistan.<sup>30</sup> TUT-

### TUTAP



AP is being completed in tranches; an Afghanistan-Uzbekistan transmission line was commissioned in 2009, an Afghanistan-Tajikistan transmission line was commissioned in 2011, and the final phase is part of ADB's

Afghanistan: Energy Supply Improvement Investment Program multitranchise financing facility, approved in December 2015.<sup>31</sup>

The ADB's \$10B TAPI (Turkmenistan-Afghanistan-Pakistan-India) Natural Gas Pipeline project seeks to construct a 1,600 km pipeline that will transmit 33 billion cubic meters of Turkmen natural gas per year from its gas fields to its southern neighbors (5 billion cubic meters to Afghanistan and 14 billion cubic meters each to Pakistan

### TAPI



and India).<sup>32</sup> TAPI would further boost Afghan, Pakistani, and Indian energy security while allowing Turkmenistan to diversify its gas exports away from only China, Russia, and Iran.<sup>33</sup> Afghanistan and Pakistan would also stand to earn substantial revenues from transit fees as gas is piped through their territory.<sup>34</sup> In April 2016, project shareholders maintained optimism for the project, investing \$200M in studies and engineering for TAPI while recognizing the clear challenges of routing a pipeline through some of Afghanistan's most violence-plagued provinces.<sup>35</sup>

## CONCLUSION

Through policy guidance and infrastructure projects such as CASA-1000, TUTAP, and TAPI, the USG and other donors working in the region seek to augment regional cooperation in the energy sector in order to meet the region's ever-growing energy needs. Shortages in Afghanistan and Pakistan can be filled with surplus electricity generated in Tajik and Kyrgyz hydro plants and from Turkmen gas, if only the infrastructure is developed. Regional pipelines could not only power the region, but they could also generate valuable revenues for both exporters (e.g. Turkmenistan) and transit countries (e.g. Afghanistan). Perhaps just as importantly, energy connections could also boost regional cooperation on other issues. To borrow a fitting term from the realm of physics, the potential energy of the New Silk Road countries is quite high when it comes to the energy sector, and the region has certainly begun to get the ball rolling.

---

For questions or more information, please contact the author of this publication, Jeff Schlandt, at [jschlandt@usaid.gov](mailto:jschlandt@usaid.gov).

To access the data, please visit the EADS International Data & Economic Analysis (IDEA) website at [idea.usaid.gov](http://idea.usaid.gov).

**DISCLAIMER:** The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development (USAID) or the United States Government

### Sources:

1 International Energy Agency, "Eastern Europe, Caucasus and Central Asia", 2015, p.20, [https://www.iea.org/publications/freepublications/publication/IDR\\_EasternEuropeCaucasus\\_2015.pdf](https://www.iea.org/publications/freepublications/publication/IDR_EasternEuropeCaucasus_2015.pdf).

2 British Petroleum, BP Statistical Review of World Energy 2016, <http://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>.

3 Casa-1000 Brochure, <http://www.casa-1000.org/Docs/CASA1000Brochure.pdf>.

4 International Energy Agency, "Statistics", accessed online during July 2016, <http://www.iea.org/statistics/>.

5 Economic Times, "India's renewable energy targets catch the attention of global investors, still need ground work," July 2, 2016, <http://economictimes.indiatimes.com/news/politics-and-nation/indias-renewable-energy-targets-catch-the-attention-of-global-investors-still-need-ground-work/articleshow/53015707.cms>.

6 International Energy Agency, "Eastern Europe, Caucasus and Central Asia", 2015, p.173, [https://www.iea.org/publications/freepublications/publication/IDR\\_EasternEuropeCaucasus\\_2015.pdf](https://www.iea.org/publications/freepublications/publication/IDR_EasternEuropeCaucasus_2015.pdf).

7 The Diplomat, "India and Bhutan: Cross-Country Power Connectivity," June 30, 2016, <http://thediplomat.com/2016/06/india-and-bhutan-cross-country-power-connectivity/>.

8 Asian Development Bank, Report and Recommendation of the President to the Board of Directors- Proposed Multitranchise Financing Facility Islamic Republic of Afghanistan: Energy Supply Improvement Investment Program, November 2015, <http://www.adb.org/sites/default/files/project-document/176563/47282-001-rrp.pdf>.

9 United States Energy Information Administration, Annual Energy Review 2011, Appendix F, <http://www.eia.gov/totalenergy/data/annual/pdf/sec17.pdf>.

10 United States Energy Information Administration, "Caspian countries are developing new oil and natural gas export capacity, September 12, 2013, <http://www.eia.gov/todayinenergy/detail.cfm?id=12931>.

11 UN Comtrade online query, using data for HS2709 as reported by Kazakhstan.

12 United States Energy Information Administration, "Caspian countries are developing new oil and natural gas export capacity, September 12, 2013, <http://www.eia.gov/todayinenergy/detail.cfm?id=12931>.

13 UN Comtrade online query, using data for HS2709 as reported by India.

14 Natural Gas Europe, "Turkmenistan: The Diversification of Gas Export Market, December 2015, <http://www.naturalgaseurope.com/turkmenistan-the-diversification-of-gas-export-market-27160>.

15 "Gazprom Putting the Squeeze on Turkmenistan", <http://oilprice.com/Energy/Gas-Prices/Gazprom-Putting-The-Squeeze-On-Turkmenistan.html>.

16 UN Comtrade online query, using data for HS2711 as reported by China.

17 UN Comtrade online query, using data for oil products falling under HS2710 as reported by India.

18 UN Comtrade online query, using data for HS27 as reported by India.

19 Asian Development Bank, Report and Recommendation of the President to the Board of Directors- Proposed Multitranches Financing Facility Islamic Republic of Afghanistan: Energy Supply Improvement Investment Program, November 2015, <http://www.adb.org/sites/default/files/project-document/176563/47282-001-rrp.pdf>.

20 International Energy Agency, "Eastern Europe, Caucasus and Central Asia", 2015, [https://www.iea.org/publications/freepublications/publication/IDR\\_EasternEuropeCaucasus\\_2015.pdf](https://www.iea.org/publications/freepublications/publication/IDR_EasternEuropeCaucasus_2015.pdf).

21 International Energy Agency, "India Energy Outlook 2015", 2015, p.12, [https://www.iea.org/publications/freepublications/publication/IndiaEnergyOutlook\\_WEO2015.pdf](https://www.iea.org/publications/freepublications/publication/IndiaEnergyOutlook_WEO2015.pdf).

22 International Energy Agency, "Eastern Europe, Caucasus and Central Asia", 2015, p.270, [https://www.iea.org/publications/freepublications/publication/IDR\\_EasternEuropeCaucasus\\_2015.pdf](https://www.iea.org/publications/freepublications/publication/IDR_EasternEuropeCaucasus_2015.pdf).

23 U.S. Department of State, "U.S. Support for the New Silk Road", <http://www.state.gov/p/sca/ci/af/newsilkroad/index.htm>.

24 U.S. Department of State, "U.S. Support for the New Silk Road", <http://www.state.gov/p/sca/ci/af/newsilkroad/index.htm>.

25 U.S. Agency for International Development, <https://www.usaid.gov/afghanistan/infrastructure>, <https://www.usaid.gov/pakistan/energy>.

26 U.S. Agency for International Development, Central Asia: Regional Development Cooperation Strategy 2015-2019, <https://www.usaid.gov/sites/default/files/documents/1861/RDCSCentralAsia.pdf>.

27 The World Bank, "Central Asia South Asia Electricity Transmission and Trade Project (CASA-I000)", <http://www.worldbank.org/projects/PI45054/?lang=en&tab=overview>.

28 Casa-I000 Brochure, <http://www.casa-1000.org/Docs/CASA1000Brochure.pdf>.

29 World Bank, "Tajikistan's Winter Energy Crisis: Electricity Supply and Demand Alternatives, November 2012,

[http://siteresources.worldbank.org/ECAEXT/Resources/TA/winter\\_energy\\_27112012\\_Eng.pdf](http://siteresources.worldbank.org/ECAEXT/Resources/TA/winter_energy_27112012_Eng.pdf).

30 Center for Strategic & International Studies, The TUTAP Interconnection Concept and CASA-1000, Presentation from June 6, 2014, <https://www.csis.org/events/tutap-interconnection-concept-and-casa-1000>.

31 Asian Development Bank, Report and Recommendation of the President to the Board of Directors- Proposed Multitranches Financing Facility Islamic Republic of Afghanistan: Energy Supply Improvement Investment Program, November 2015, <http://www.adb.org/sites/default/files/project-document/176563/47282-001-rrp.pdf>. ADB \$1.2 Billion Grant to Support Afghanistan's Energy Security, December 7, 2015, <http://www.adb.org/news/adb-12-billion-grant-support-afghanistan-s-energy-security>.

32 Asian Development Bank, "TAPI Gas Pipeline Infographic", 8 April 2016, <http://www.adb.org/news/infographics/tapi-gas-pipeline>.

33 Asian Development Bank, Technical Assistance Report- Turkmenistan-Afghanistan-Pakistan-India Natural Gas Pipeline Project, Phase 3, May 2012, <http://www.adb.org/sites/default/files/project-document/73061/44463-013-reg-tar.pdf>.

34 Asian Development Bank, "TAPI Gas Pipeline Infographic", 8 April 2016, <http://www.adb.org/news/infographics/tapi-gas-pipeline>.

35 Reuters, "TAPI gas pipeline through Afghanistan 'doable' – ADB official", <http://in.reuters.com/article/pakistan-gas-pipeline-idINKCN0X51MN>.

\*Photo: Inter State Gas Systems (Pvt) Ltd., "Turkmenistan-Afghanistan-Pakistan-India Gas Pipeline (TAPI)," accessed August 29, 2016, <http://www.isgs.pk/images/projects/turkmenistan-afghanistan-pakistan-india-gas-pipeline-tapi-887.jpg>.