

Afghanistan's energy security

Tracing Central Asian countries' contribution



Farkhod Aminjonov

- Around 70 percent of consumers in Kabul enjoy a nearly uninterrupted supply of electricity, while up to three quarters (67–75 percent) of the Afghan population are still cut off from the power grids. While customers connected to the power grids enjoy equal access to electricity, not everyone can afford to use it.
- Seventy-eight percent of total consumed electricity in Afghanistan in 2015 was imported from neighbouring Tajikistan, Turkmenistan, Uzbekistan, and Iran. Having physical access to power supplies from Central Asian countries, the primary challenge before the Afghan government is now to secure the stability and reliability of the supplies.
- With the support of external actors, Afghanistan has made certain progress in building the country's energy sector almost from scratch. Until recently, Afghanistan's energy policy priority was to provide access to as many consumers as quickly as possible. Now, the primary energy policy priority is to establish a self-sustaining energy system. Yet, the new energy policy objectives by no means diminish the importance of Central Asian supplies for the energy security of Afghanistan. What appears to be stable power and fuel deliveries to Afghanistan from Central Asia may not be sustainable in the medium to long-term.
- The discourse emphasising security risks needs to be replaced by economic prosperity-oriented objectives in the energy sector development initiatives. Economic prosperity can hardly be achieved without energy security. In turn, a stable economy is a guarantor for greater energy security in the country.

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Foreword

Lights, water pumps, heaters, boilers, chargers for phones and laptops – nothing symbolizes technological progress and development more than accessible electricity and energy.

Over the last 15 years, since the fall of the Taliban, Afghanistan has experienced a dramatic leap forward in granting its citizens access to power and light. The number of Afghans with access to grid electricity rose from 5 percent of general population in 2002 to 30 percent in 2015. However, as these numbers clearly show, the full electrification of the country still remains a paramount task of the Afghan government and the international community.

Access to energy concerns Afghan households and business owners across the country nearly as much as security. On 23 July 2016, in the worst terrorist attack since 2001, the Islamic State targeted a peaceful rally by the Hazara. All the Hazara demanded was access to electricity in Bamyan. Despite the security threats more demonstrations are announced, showing the willingness and resolution of people to stand for continued development -- a just distribution of services amidst a civil war-like situation.

After 2001 Afghanistan has stepped out of international isolation and has significantly strengthened its ties to adjacent countries, especially to the energy-rich northern neighbors in Central Asia. Many transnational projects like TAPI, CASA-1000 and OBOR are supposed to break the historic reclusiveness of the region and bring development and progress by addressing energy insecurity of the country.

A strong mutual partnership is needed for Afghanistan and Central Asia to continue their development and to diversify their economies. Knowledge gaps and factual misunderstandings can present severe obstacles for this partnership. Empirically rooted research – like this paper – can help overcome these problems.

The paper at hand has been conceived and created through essential input by the Afghanistan Policy Group – a Track-2-Diplomacy group consisting of former and current politicians, researchers, journalists and civil society activists from Afghanistan

It takes a sharp look on the compatibility and contradictions of energy politics and policies between Afghanistan and countries of Central Asia to suggest recommendations in the field of energy security.

The country offices of Friedrich-Ebert-Stiftung have been involved in building trust and lasting networks among key stakeholders in this region riven by histories of military conquest and empires. The regional work on peace and security strives to strengthen the ties of regional cooperation by bringing together key figures in both Afghanistan and the region. We assist Policy Groups, like APG and its counterparts in Pakistan, India, Central Asia and Iran, in advising decision-makers and government representatives through policy recommendations that are designed to support a peaceful and prosperous Afghanistan.

On behalf of the Friedrich-Ebert-Stiftung I thank Dr. Farkhod Aminjonov for his commitment and readiness to travel to Afghanistan, thus tremendously enhancing the quality of this research endeavour. A special thanks goes to the research assistants and project coordinators Mr Fraidoon Sekander (FES Afghanistan Office) and Mr Aryaman Bhatnagar (FES India Office) who have made the research trip and the visit of the author to Afghanistan possible and successful through their invaluable contributions to organization, concept, logistics and revision of the final study.

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Introduction

Central Asian countries are not only rich in energy resources, but also possess considerable energy production and power generation capacity, which could potentially be sufficient to meet their own domestic demands, and to some extent, external demands. The disintegration of the Central Asian energy system (CAES) caused intra-Central Asian energy trade to be compromised, forcing regional producers to look for alternative energy markets. Afghanistan, neighbouring Tajikistan, Turkmenistan, and Uzbekistan, has turned into an attractive new energy market and a transit territory to transport gas and power to Pakistan and India. Currently, all three of these Central Asian countries (i.e. Tajikistan, Turkmenistan, and Uzbekistan) export electricity to Afghanistan. Turkmenistan and Uzbekistan are also potential suppliers of gas.

This paper traces the extent of the Central Asian energy exporters' contribution to improving the level of energy security in Afghanistan. It analyses the stability and reliability of the energy trading dynamics within the framework of the following primary energy policies: a) Afghanistan as an end-consumer of Central Asian energy supplies, which also evaluates the challenge for all countries to enjoy energy security simultaneously; b) Energy self-sufficient Afghanistan, with a particular focus on the development of indigenous hydropower resources, which could potentially escalate water-energy nexus tensions with its Central Asian neighbours; c) Obstacles preventing Afghan authorities from taking full advantage of the country's energy potential, in order to determine Afghanistan's dependence on Central Asian energy supplies; and d) Afghanistan as an energy transit hub with limited contribution to the energy security of the country.

Energy insecurity and primary energy policy priorities for Afghanistan

There is no consensus among scholars and decision makers on the essence of the energy security concept. In this paper, energy security is defined as a condition states enjoy when they are confident that they will have adequate and sustainable energy supplies for their population and their economic needs in the foreseeable future. Adequate energy supplies indicates that states have sufficient energy resources to meet their needs. Sustainability of energy supplies implies that present energy needs can be met without compromising the energy supplies of future generations. At the regional level, energy security is a condition in which all states enjoy sufficiency and sustainability of energy supplies simultaneously.¹

Hypothetically, by developing its energy potential, Afghanistan will be capable of ensuring its own energy self-sufficiency to a considerable extent. Looking at its energy potential, Afghanistan currently has around 80 million barrels of proven oil reserves in the Amu Darya Basin.² In addition to this, already identified natural gas deposits account for 75 billion cubic meters (m³), with yet undiscovered reserves accounting for over 440 billion m³.³ Coal reserves amounting to 73 million tons,⁴ mainly located in the northwest of Bamyan province, are projected to be one of the major sources of energy for domestic thermal power generation in the Aynak and Hajigak power plants.⁵ The largest contribution to Afghanistan's energy potential, however, is expected to come from renewable energy sources (RES). Solar potential in Afghanistan accounts for 220 gigawatts (GW),⁶ wind potential 66 GW, and hydropower 23 GW. However, it is not the potential, but the production capacity, availability of transport infrastructure, and good energy governance that will ensure the energy security of the county.

Major energy security concerns for Afghanistan

Over the last 14 years, Afghan authorities, with the support of international donors, have considerably increased the Afghan population's access to electricity. The connection rate to the power supply grids in the country increased from 5 percent in 2002 to 30 percent in 2015.⁷ However, Afghanistan is still a long way from achieving energy security, as it suffers from a lack of sufficient and reliable electricity supply, as well as underdeveloped domestic power and fossil fuel production. Some of the major energy security challenges for Afghanistan are as follows:

- a) Afghanistan is not an energy self-sufficient country. Its domestic power generation capacity accounted for only 22 percent of its total consumption balance in 2015, equalling just over 1000 gigawatts/hour (GWh).
- b) Afghan consumers suffer from an uneven distribution of energy within the country. While currently around 70 percent of consumers in Kabul enjoy a nearly uninterrupted supply of electricity, up to three quarters (67–75 percent) of the Afghan population are still cut off from the power grids.⁸
- c) Afghanistan has an extremely low level of rural electrification. While 75 percent of the population live in rural areas and contribute 67 percent to the gross domestic product, these areas enjoy only 10 percent of the electricity distributed within the country.⁹
- d) Afghanistan has a limited domestic power transmission network, which needs to be extended in order for the country to enjoy greater energy security. As of March 2015, the number of Afghans connected to the electricity grid was 1,176,030.

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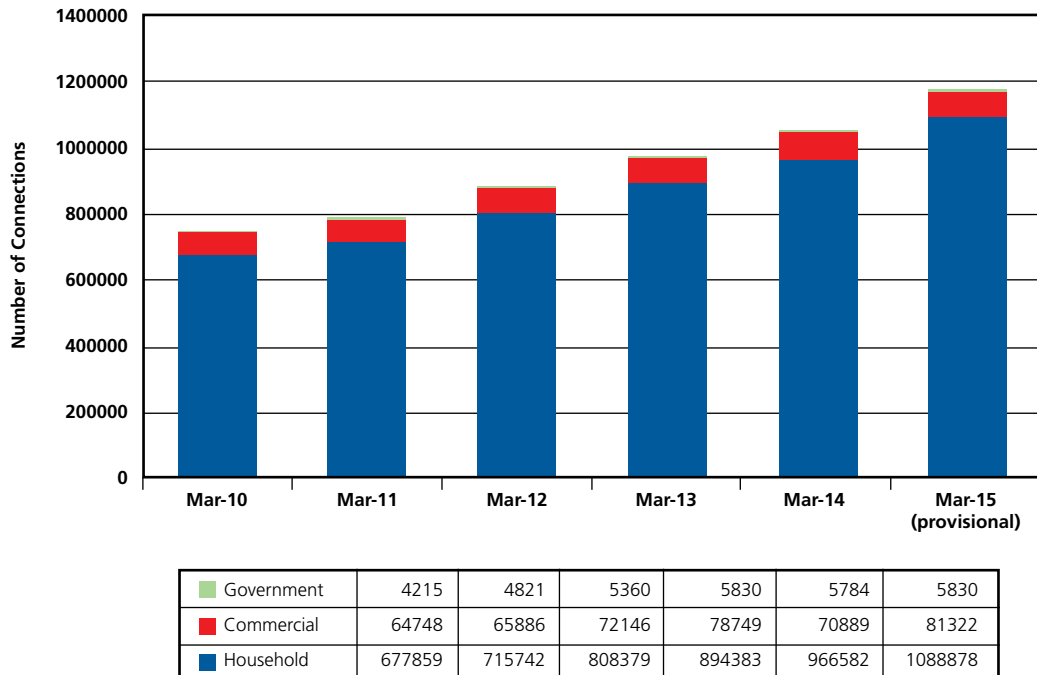
In the last few years, there has been approximately an 11 percent year-on-year increase in electricity connections. The Afghan government's power extension policy will require a considerable increase in the length of transmission lines inside the country from 2261 km to 6907 km to considerably increase the number of consumers.¹⁰

e) Until recently, the government's goal in regards to supplying electricity was to meet individuals' basic electricity needs. As a result, households currently account for over 90 percent of the total power consumption balance (Figure 1). Such a large consumption rate by the population implies that there is either almost no industrial production in the country or that this sector receives an extremely low amount of the electricity supplied.

f) The Afghan government is struggling to keep up with the rapid growth of energy demand in the country. Even without large-scale industrialisation, power demand in major cities increased by 25 percent from 2014 to 2015.¹¹ The Afghanistan Investment Support Agency (AISA), which is responsible for managing industrial parks, has demarcated 30 areas in 18 provinces for the construction of industrial parks. Twelve industrial parks in major cities such as Kabul, Herat, Kandahar, Jalalabad, and Mazar-i-Sharif have already been completed. However, Afghanistan's lack of power supply remains a major concern for these cities as none of them enjoy stable and reliable power.¹²

g) Tarakhil thermal power plant (TPP) has the largest thermal power production capacity in the country, capable of producing 105

Figure 1: Electricity connections (by consumer)



Source: Inter-Ministerial Commission for Energy, "Connections," ICE, last modified March 2015, <https://sites.google.com/site/iceafghanistan/electricity-supply/connections>.

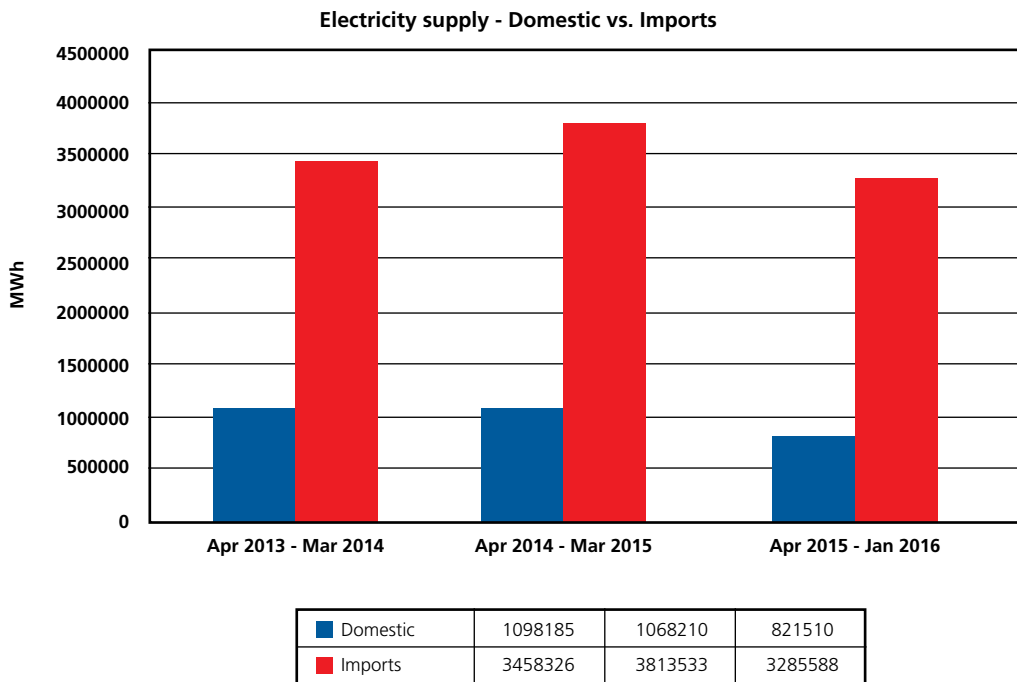
megawatts (MW) of electricity. However, it is not being used efficiently as it currently operates at less than 1 percent of its total capacity.¹³

h) Eighty-five percent of Afghanistan’s energy demand is met through the consumption of environmentally damaging sources of energy (biomass), which also has negative health impacts. Because biomass is used for heating and cooking, women and children are generally more exposed, and most vulnerable to its effects.¹⁴ In a personal conversation on February 18, 2016, Samim Hoshmand from Environmental Watch Afghanistan highlighted that the government and development agencies have, to a considerable extent, failed to address the environmental and health-related impacts excessive use of biomass energy has had on the population.

i) Excessive dependence on imported energy, which is not projected to diminish in the near future, makes Afghanistan vulnerable to unilateral supply cuts from the providers’ side:

- Seventy-eight percent of total consumed electricity in Afghanistan in 2015 was imported from neighbouring Tajikistan, Turkmenistan, Uzbekistan, and Iran.¹⁵ In an environment of extremely low levels of trust and cooperation, such dependence can be perceived as a threat to energy security (Figure 2).
- In the absence of gas and oil production and refining capacities, Afghanistan imports around 10,000 tons of oil products (97 percent of country’s needs)¹⁶ daily from Turkmenistan, Uzbekistan, Russia, Pakistan, and Iran, at a cost of approximately US\$1.5 billion per year.¹⁷

Figure 2: Power consumption balance



Source: Inter-Ministerial Commission for Energy, “Electricity Supply Yearly Trend,” ICE, last modified February 2016, <https://sites.google.com/site/iceafghanistan/electricity-supply>.



Energy security policy priorities for Afghanistan

In an attempt to address the above-mentioned energy security challenges, Afghan authorities have prioritised the following energy sector development policies, counting on international donors' support to a considerable extent:

- a) Ensuring stable, sufficient, and environmentally clean energy supplies for all in Afghanistan;
- b) Developing indigenous energy resources to reduce dependency on fuel and electricity imports from neighbouring countries;
- c) Harnessing renewable energy resources to improve energy security;
- d) Extending power transmission lines to connect all provinces to a unified power grid, particularly the North East Power System (NEPS) with the South East Power System (SEPS);
- e) Developing Afghanistan's coal and gas potential for thermal power generation to meet its year-round, but especially winter, energy needs;
- f) Attracting private investment into the energy sector as part of the broader strategy of transitioning from a donor-driven economy to a market-driven economy;
- g) Introducing transparent and accountable energy governance mechanisms;
- h) Establishing an environment for all relevant agencies and organisations (both domestic and international) to take a coordinated approach towards implementing energy initiatives;
- i) Transforming Afghanistan into a strategically important energy transit hub;
- j) Securing the stability and reliability of Central Asian energy supplies.¹⁸

Institutional capacity

To effectively implement its energy initiatives, Afghan authorities have developed a comprehensive institutional apparatus including: primary agencies responsible for

preparing and managing national energy policies – the Ministry of Energy and Water (MEW) and the Ministry of Mines and Petroleum; a national power utility company that manages electricity generation (units of over 100 kW) (import, transmission, and distribution) throughout Afghanistan – the Da Afghanistan Breshna Sherkat (DABS); an agency working on establishing a business-friendly environment for the private sector to ensure sustainable economic growth, including through reliable and sufficient energy supplies in the country – AISA;¹⁹ and international organisations such as the Asian Development Bank (ADB), the World Bank, the United Nations, the United States Agency for International Development (USAID), German cooperation agencies (the German Development Bank (KfW) and the German Federal Enterprise for International Cooperation (GIZ)), the Japan International Cooperation Agency (JICA), and the government of India. In 2006, the Inter-Ministerial Commission for Energy (ICE) was established to provide a platform to better coordinate the energy sector activities among all these actors.

Agencies responsible for energy sector development are operating within the framework of the National Energy Supply Program (NESP), which encompasses the Power Sector Master Plan (2012–2032) and the Gas Development Master Plan (2015–2035). Among its primary energy sector development initiatives the NESP envisages to: a) increase the electrification rate from 30 percent to 83 percent by establishing an electricity ring; b) boost domestic energy generation from 20 percent to 67 percent; and c) extend the capacities of the power transmission lines from the Central Asian suppliers.²⁰

Within the NESP, along with its energy policy priorities, there is also a comprehensive institutional framework (with substantial external support, i.e. financial and

technological support, along with qualified personnel) to address associated energy security challenges. Afghanistan is still one of the least secure countries in terms of the sustainability, sufficiency, and stability of its energy supplies. Because electricity and oil product supplies in Afghanistan are highly dependent on imports from other Central Asian countries, and this dependency is unlikely to significantly decrease in the near future, it is important to study the potential challenges that could compromise the reliability of those supplies. This way, Afghan authorities will have the capacity to prevent sudden supply cuts or mitigate the consequences of potential disruptions.



Central Asian energy for Afghanistan: a blessing or a curse?

There are three major components of Afghanistan's energy strategy that the government is interested in equally promoting, and in which Central Asian suppliers play a decisive role:

- a) Ensuring sufficiency and stability of energy supplies from Central Asian producers to Afghanistan as an end-consumer;
- b) Transforming Afghanistan into an energy self-sufficient country by utilising its domestic energy potential. Along with RES, the government is counting on taking full advantage of its hydropower potential, which may lead to a water-energy nexus conflict between Afghanistan and its northern neighbours, Uzbekistan and Turkmenistan.
- c) Turning the country into a transit hub between Central Asian producers and South Asian consumers, which might contribute little to Afghanistan's energy security in the initial stages.

Afghanistan's electric power system

Over the past decade, Afghanistan's power sector has undergone serious transformation. In an attempt to solve the problem of uneven distribution of power supply within the country, the government has prioritised establishing countrywide electricity transmission lines by connecting isolated grids within a single unified power network. In 2006 there were nine isolated electric grids, now there are only three:

1. NEPS (with Kabul as the major load centre) consisting of a grid linking 17 load centres (Kabul, Mazar-i-Sharif, Jalalabad, etc.) with Uzbekistan and Tajikistan (220 kV, 110 kV, 35 kV);
2. SEPS consisting of Kandahar and Helmand, which are linked to Kajaki hydropower plant (HPP) (110 kV);

3. West Power System (with Herat as the major load centre), which is divided into:

- Herat system, linking the Herat Zone with Iran and Turkmenistan (132 kV, 110 kV);
- Turkmenistan system, linking Herat, Faryab, Jawojan, Sar-e-Pul, and Andkhoy (110 kV).²¹

The next step is to establish a centralised national power grid—an electricity ring—by connecting the three major systems via the following transmission lines:

1. 500 kV line Turkmenistan–West Kabul;
2. 500 kV line West Kabul–Kandahar (NEPS–SEPS interconnector);
3. 500 kV line Andkhoy–Herat;
4. 220 kV line Herat–Kandahar.²²

Establishing countrywide transmission lines, however, is not reasonable unless authorities can secure sufficient power supplies, either by enhancing the capacity of the regional transmission infrastructures or by boosting the domestic power production capacity. The NEPS delivers electricity to the north-eastern regions and the capital city Kabul from Uzbekistan and Tajikistan. To meet country's growing demand for electricity, Afghan authorities are counting on the yet unexploited potential of Turkmenistan. Turkmenistan currently supplies electricity only to the western Herat region. However, when the transmission lines of the West Power System are connected to the NEPS, Turkmen electricity will reach Kabul. Power for the SEPS on the other hand, is entirely generated from diesel thermal plants in Kandahar and hydro generation at Kajaki HPP. Yet, the power production capacities of these facilities are far below the demand level. RES development in the southern regions is progressing slowly. Since major hydropower resources are located

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in the northeast of Afghanistan, authorities have to extend the power transmission network from the NEPS to meet the energy demands in the southern regions. But first the Afghan government needs to secure power availability either through the development of indigenous resources or through guaranteed power supplies from its northern neighbours to equally distribute it within the country. As the analysis shows, however, both tasks will be quite challenging to accomplish if Afghanistan's energy demand increases rapidly in the near future.

TUTAP – Afghanistan as an end-consumer for Central Asian resources

Until recently, Afghanistan's primary energy sector development policy priority was to establish energy infrastructure connecting Central Asian producers to the energy market in the country. The breakdown of the Central Asian Power System (CAPS) in 2009 left Central Asian countries, particularly Uzbekistan and Tajikistan, with extra electricity supplies that could be exported to Afghanistan. At the time, the construction of power transmission lines was deemed to be the fastest way of delivering electricity to the Afghan power market. Since the completion of these energy infrastructure projects was feasible within a shorter time frame, international agencies supporting the development of Afghanistan's energy sector allocated funds to achieve tangible and almost immediate results to improve the energy security of the country.

Taking into account the sensitivity of the water-energy nexus initiatives in regards to the development of hydropower projects on all trans-boundary waters, regional transmission lines had the added benefit of securing power supplies without escalating tensions with neighbouring states.

While the demand for energy in Afghanistan is currently somewhat limited, if the government succeeds in accelerating the country's economic growth, this will push demand higher. The Turkmenistan-Uzbekistan-Tajikistan-Afghanistan-Pakistan (TUTAP) power supply initiative, with energy sourced from Turkmenistan, Uzbekistan, and Tajikistan going to Afghanistan and Pakistan, is currently implemented in a way that leaves Pakistan out of the supply chain, thus turning Afghanistan into an end-consumer for Central Asian energy supplies. The TUTAP initiative is financed through the Afghanistan Infrastructure Trust Fund (AITF) and supported by the governments of Japan, the United Kingdom, and the United States. The project has already received around US\$550 million for its initial phases. It is expected that another US\$450 million will be allocated by 2020.²³

Currently, the total capacity of the regional power transmission lines accounts for 1000 MW. Table 1 and Figure 3 clearly show that the largest contribution of energy comes from Uzbekistan and Tajikistan.

Table 1: Installed capacity of transmission lines

	Installed capacity of transmission lines (max. in MW)	% of total installed capacity
Uzbekistan	326	33
Iran	164	16
Tajikistan	433	43
Turkmenistan	77	8
Total	1000	100

Source: "Overview: Access to Electricity," World Bank, last modified April 8, 2016, 1-2, <http://www.worldbank.org/en/country/afghanistan/overview>.



Having physical access to power supplies from Central Asian countries, the primary challenge before the Afghan government is now to secure the stability and reliability of the supplies, which might not be an easy task to accomplish.

Despite the fact that Tajikistan enjoys the largest transmission capacity, so far Uzbekistan accounts for the largest share of the overall balance of Afghanistan's electricity imports (Figure 3).

International organisations, including ADB, the World Bank, and USAID, along with the Central Asian and Afghan authorities, have prioritised the speed of imports over guarantees for power supply stability. The goal was to bring Central Asian electricity to Afghanistan as soon as possible. Having physical access to power supplies from Central Asian countries, the primary challenge before the Afghan government is now to secure the stability and reliability of the supplies, which might not be an easy task to accomplish.

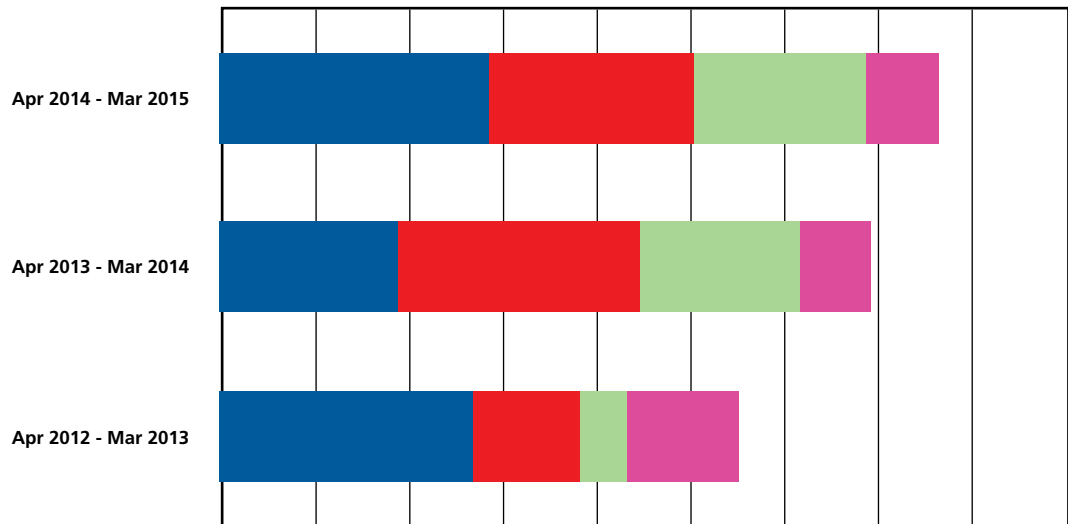
supply cuts from the Uzbek side, since the stability of supplies at the moment are dictated by three main factors: First, the breakdown of the intra-Central Asian electricity trade resulted in the availability of a limited amount of power for export to Afghanistan. Second, no alternative source of power supplies currently exists for Afghanistan to replace Uzbek power imports during the cold winter months, forcing Afghan authorities to agree on the terms of electricity trade with Uzbekistan that may not be in the country's best interests. Third, Afghan authorities pay the highest price for Uzbek electricity, which determines Uzbekistan's interest in exporting electricity to Afghanistan, even at the expense of its own domestic consumption.

Reliability of power supply from Uzbekistan

So far there have been no unilateral power

Uzbekistan and Tajikistan boosted electricity supplies to Afghanistan from 2009 and 2011 respectively, through the extension

Figure 3: Electricity imports in MWh (by origin)



	Apr 2012 - Mar 2013	Apr 2013 - Mar 2014	Apr 2014 - Mar 2015
■ Uzbekistan	1335348	952029	1425530
■ Tajikistan	587888	1260416	1102676
■ Iran	223596	849642	888741
■ Turkmenistan	586417	396239	396586

Source: Inter-Ministerial Commission for Energy, "Electricity Imports," ICE, last modified March 2015, <https://sites.google.com/site/iceafghanistan/electricity-supply/electricity-imports>.

of the power transmission lines connecting the power systems of the former with the electricity market of the latter. Without actually boosting their power production capacity, these countries succeeded in increasing the volume of exports to Afghanistan. The CAPS was designed in a way that turned the region's power sectors into highly interdependent entities within the system. The resource-sharing mechanism ensured the security of the CAPS. The mechanism was quite simple: the upstream countries (Kyrgyzstan and Tajikistan) ensured a continuous flow of water and a certain amount of electricity during the summer months to the downstream countries (Kazakhstan, Turkmenistan, and Uzbekistan), which channelled thermal power, gas, and light oil products to them in return. Over the past decade however, Central Asian governments have been pursuing energy policies that stress self-reliance and self-control, without achieving self-sufficient national energy systems. As a result, intra-Central Asian electricity trade was compromised. With the collapse of the CAPS, both Uzbekistan and Tajikistan ended up with extra electricity to export to Afghanistan. However, the question now is to what extent these extra supplies are sustainable.

The relationship between Uzbekistan and Afghanistan can be characterised as stable but not reliable, as the Afghan government struggles to do business with its Uzbek counterpart. As a result, neither side perceives the other as a trustworthy partner. Despite many attempts from the Afghan side to establish a closer relationship with Uzbekistan, Wahid Waissi, Director General for Economic Cooperation at the Ministry of Foreign Affairs of Afghanistan, during a personal conversation on February 17, 2016, conceded that cooperation with Uzbekistan in almost all areas of interaction remained problematic. During an interview on February 25, 2016, Hashim Alimi, Projects Coordinator at the Inter-Ministerial Commission for Energy, revealed that Afghanistan purchases Uzbek electricity

for around 10 cents per kWh, while the cost of imports from Tajikistan and Turkmenistan ranges between 4 to 6 cents per kWh. The high price for electricity paid by the Afghan government keeps its Uzbek counterpart incentivised to sustain at least the current level of supplies (Figure 4). Expensive Uzbek electricity may not be an issue for the Afghan government while the energy budget is being subsidised by the external donors. However, with no guarantee of assistance from donors in the future, cost will most likely turn into one of the major factors determining energy trading dynamics between Afghanistan and potential suppliers, including Uzbekistan.

Uzbek electricity is attractive in the absence of alternative external sources of supply and because of the domestic environment of cost-inefficient diesel generation. Projected expansion of thermal power supplies from Turkmenistan, however, will change the extent of Afghanistan's energy dependence on Uzbekistan. In its foreign energy policy, the Afghan government has refrained from taking steps that could create or escalate tensions with its neighbours. However, if Afghanistan is to pursue a policy of indigenous resource development with a particular focus on large hydropower projects in the north-eastern regions, the national interests of the country will come into conflict with those of Uzbekistan.

Most importantly, Uzbekistan's power production capacity will not allow it to significantly increase electricity exports to Afghanistan and, in the best-case scenario, will remain at the same level just above 300 MW. Uzbekistan generates electricity mostly in gas-fired TPPs (11 GW out of 12.3 GW total production capacity).²⁴ Over the past decade, there was no single major gas field discovered or developed in the country and the gas production rate has remained within the same range of 60–65 billion m³ per year.²⁵ Highly inefficient energy production, transportation, and consumption facilities

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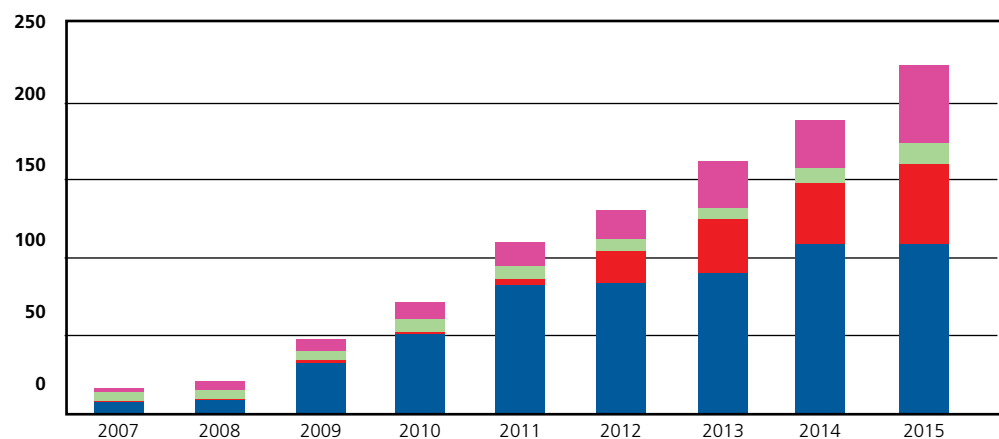
account for 60 percent of primary energy loss in the country.²⁶ Energy efficiency initiatives could potentially save energy for export, but the implementation of these initiatives is progressing slowly. While Uzbekistan lacks power production capacity, Tajikistan suffers from seasonal variations in electricity generation.

Seasonal power supply variations from Tajikistan

Tajikistan possesses huge potential for hydroelectricity production (more than 527 billion kWh annually—4 percent of worldwide hydropower potential). Yet, Tajikistan currently generates only 16.5 billion kWh per year (just above 3 percent of the potential reserves) with an installed capacity of 5190 MW and an operating capacity of around just 3000 MW.²⁷ More than 98 percent of Tajikistan's electricity is generated by HPPs, mainly in the spring and summer months.²⁸ Figure 5 illustrates the way in which Tajikistan successfully complements Uzbek power supplies to Afghanistan.

Due to seasonal variations of power production, Tajikistan enjoys excessive electricity generation capacity in summer and experiences power shortages in winter. This does not only limit its capability to supply power to Afghanistan, but also makes it hard to meet its own domestic power needs; Tajikistan itself suffers from a critical shortage of electricity supply in the winter months, during which electricity demand exceeds supply capacity by around 25 percent. The World Bank estimated the number of people suffering from electricity shortages during winter to be as high as 70 percent (just over 5.5 million people) of the total population in 2013.²⁹ Under the CAPS, Tajikistan exported power in summer in return for Uzbek electricity imports in winter. Currently, however, Tajik authorities supply electricity to external markets without the possibility of offsetting winter shortages with imports. This implies that any attempt by Tajikistan to meet domestic power needs by restoring intra-Central Asian energy trade will consequently compromise the stability of electricity supplies to neighbouring Afghanistan.

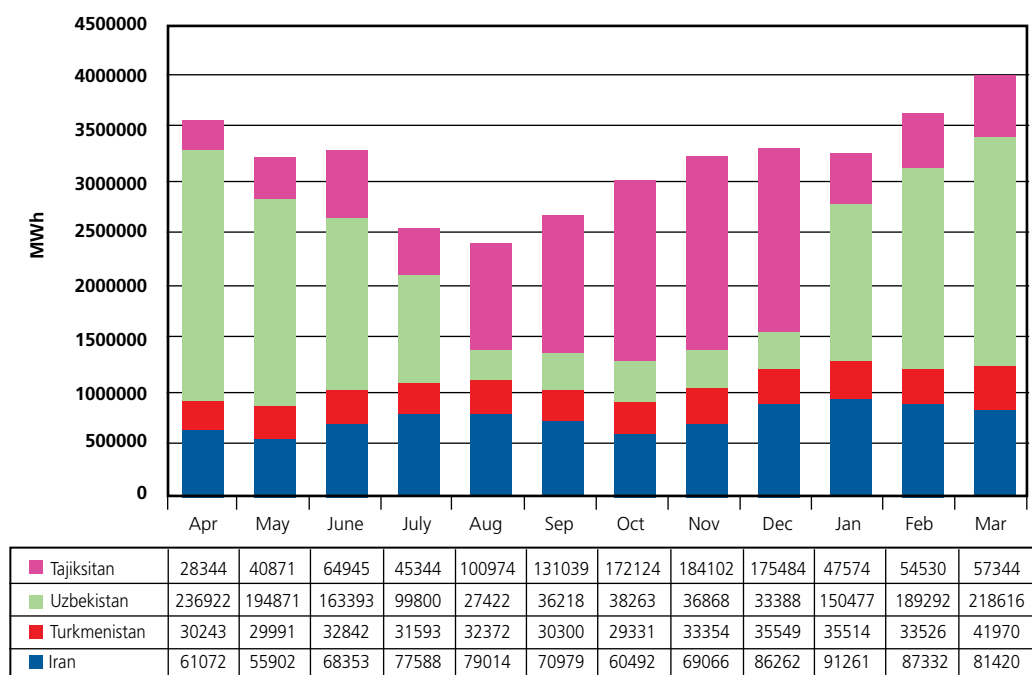
Figure 4: Cost of imported energy (million US\$)



	2007	2008	2009	2010	2011	2012	2013	2014	2015
Iran	3	6	7	11	16	20	30	33	52
Turkmenistan	5	6	6	7	8	8	8	8	12
Tajikistan	1	1	1	2	4	20	33	39	52
Uzbekistan	7	8	33	51	82	83	91	109	108

Source: Da Afghanistan Breshna Sherkat, "Progress in the Energy Sector of Afghanistan," September 2, 2015, http://aeic.af/assets/presentation_files/f81759ede542a29c6e8f060dc202ff6b.pdf.

Figure 5: Imported electricity supply (April 2014–March 2015)



Source: Inter-Ministerial Commission for Energy, "Electricity Imports: Monthly Trend," ICE, last modified March 2015, <https://sites.google.com/site/iceafghanistan/electricity-supply/connections>.

Turkmenistan – a reliable energy partner

In contrast to its Central Asian counterparts, Turkmenistan is both capable of considerably increasing its power exports and supplying power all year round. Turkmenistan left the CAPS in 2003 and has since been continuously increasing its gas-fired thermal power production capacity. Currently, Turkmenistan has 11 active power plants and a total of 40 turbines. Turkmenistan exports around 15 percent (2.8 billion kWh) of its overall electricity production annually.³⁰ The availability of natural gas to run gas-fired TPPs and the introduction of new generation capacities (1643 MW have been introduced since 2010)³¹ not only ensured self-sufficiency but also turned the country into a net exporter of electricity to Iran and Afghanistan. Confident of Turkmenistan's rapidly growing power production capacity, Afghanistan signed a power purchase and sales agreement (PPSA) with Turkmenistan on November 6, 2015, for the period of 2015–2028 with an initial power supply of 300 MW.³²

Under the PPSA, three lines (500 kV/220 kV/110 kV) at the Atamyrat substation are to be connected to the 500 kV Afghan power transmission line. The current existing 110 kV line is not sufficient to extend the supply network. The 220 kV line would be able to deliver the recently agreed upon 300 MW electricity supply. However, it is the 500 kV line, which is expected to reach the Afghan border by 2018, that would considerably increase Afghanistan's power supply.³³ The problem with extending power transmission lines to the Pul-e-Kumri substation is that Turkmen authorities signed a PPSA with DABS to supply only 300 MW until 2028. However, Hashim Alimi, Projects Coordinator at the Inter-Ministerial Commission for Energy, in a personal conversation on February 25, 2016, explained that the agreement would need to be revised as a 500 kV transmission line would be able to supply up to 1000 MW of power, a significantly greater amount than the agreed upon 300 MW. In this case, Turkmenistan would be able to take over Uzbekistan's



position as a major supplier of electricity to Afghanistan during the winter months.

At the same time, the reliability of Turkmen power supplies to Afghanistan could be threatened by the amount of gas required to run TPPs and to take full advantage of rapidly increasing thermal power generation capacities. While Turkmenistan's natural gas reserves account for 17.5 trillion m³, the country is struggling to keep up with its external demands for gas. It is likely to take several years for the Turkmen government to build up its gas export capacity to meet its obligations to its Chinese customers, let alone provide gas to existing Russian and Iranian corridors or the projected Turkmenistan-Afghanistan-Pakistan-India (TAPI) and Trans-Caspian pipelines (European corridor). In this regard, Turkmenistan might face certain challenges in finding more gas to allocate to run gas-fired TPPs dedicated to boosting electricity exports to Afghanistan. Yet both Turkmenistan and Afghanistan perceive energy trade as mutually beneficial and energy supplies reliable.

Hydropower in Afghanistan: a source of energy security or a source of conflict?

The upcoming decade (2015–2025), labelled Afghanistan's 'Transformation Decade',³⁴ which includes boosting economic development as part of its objectives, will result in a rapidly growing energy demand. According to Afghanistan's Power Sector Master Plan (2012–2032), it is anticipated that the level of power consumption will increase to 3500 MW by 2032. The peak power demand in the high scenario for 2032 is forecasted to reach 4300 MW.³⁵ Guided by the belief that projected economic growth would require even more power supplies, the President's Office decided to push the target level to 5000–6000 MW by 2032, as indicated in the draft Afghanistan National Renewable Energy Policy.³⁶ While Afghanistan currently meets only 300 MW of the total electricity demand from its own power

generation, the production volume will need to be increased by 10 times this amount to reach the estimated demand of around 3000 MW by 2020 and by 20 times to meet the targeted goal by 2032.³⁷ According to its new energy policy, the Afghan government has set an ambitious goal to achieve 95 percent of the total consumption from RES.³⁸ To achieve this objective the government is planning to utilise its RES potential, which currently accounts for 222,000 MW from solar power, 600 MW from micro and mini hydropower (out of 23,000 total hydropower potential),³⁹ 67,000 MW from wind power, 4000 MW from biomass, and 4–100 MW from geothermal in 70 locations.⁴⁰ Afghanistan has achieved some progress in the development of over 5000 RES projects, which have either been completed or are on-going. These 5000 projects, consisting of mostly micro HPPs and solar panels, account in total for a capacity of only 50 MW.⁴¹ Thus, many experts and government officials doubt the energy sector development agencies' ability to achieve the target.

A dominant view among Afghan policy makers is that energy insecurity can be resolved and energy self-sufficiency achieved by developing Afghanistan's hydropower potential.⁴² Most of the power generation capabilities in the country are currently run-of-the-river type HPPs. However, low river flows in the wintertime affect the level of electricity production.⁴³ Thus, only medium and large HPPs could have enough of an impact to lead to energy self-sufficiency (Table 2). In addition to the obvious advantages of having considerable hydropower generation capacity, large HPPs are also capable of accumulating and storing enough water in summer to produce electricity during winter.⁴⁴ Unfortunately, five out of six rivers in Afghanistan are trans-boundary. Without coordinated regulations, water accumulation in the upstream countries may (and usually does) impact the availability of water for downstream countries' agricultural needs.

Table 2: List of hydropower plant options

	Project	River	Province	Capacity (MW)	Commencement date	Annual energy (GWh)	Estimated cost (m US\$)
1	Bghdara	Panshir	Kapisa/Parvan	210	2021	968	600
2	Surobi 2	Kabul	Lagman	180	2021	891	700
3	Kunar A (Shal)	Kunar	Kunar	789	2022	4772	2000
4	Kajaki Addition	Helmand	Helmand	100	2021	493	300
5	Kukcha	Kukcha	Badakhshan	445	2022	2238	1400
6	Gulbahar	Panshir	Panshir/Baghlan	120	2021	594	500
7	Capar	Panshir	Panshir	116	2021	574	450
8	Kama	Kunar	Nangarhar	45	2021	223	180
9	Kunar B (Sagal)	Kunar	Kunar	300	2021	1485	600
10	Kajaki Extention	Helmand	Helmand	18.5	2015	91	90
11	Olambagh	Helmand	Uruzgan	90	2021	444	400
12	Kilagal		Baghlan	60	2021	297	250
13	Upper Amu	Amu Daria		1000	2023	4955	2500
14	Dashtijum	Pyanj		4000	2023	19819	8000

Source: Asian Development Bank, "Islamic Republic of Afghanistan: Power Sector Master Plan," May 2013, 6-2, <http://www.adb.org/sites/default/files/project-document/76570/43497-012-afg-tacr.pdf>.

Thus, in the absence of water sharing treaties, the construction of large HPPs will most likely lead to conflicts with neighbouring countries, including Central Asian states.

The hydropower projects with the largest energy contribution but with the highest impact on the water-energy nexus between Afghanistan and Central Asian states are the Upper Amu and the Dashtijum HPPs on the Pyanj River. The Dashtijum HPP is located on the Pyanj River, around 280 km southeast of the Tajik capital, Dushanbe.⁴⁵ The facility requires a water reservoir to produce electricity and irrigate large areas of land. This facility is not only too expensive for Afghanistan (US\$3 billion), but could also lead to conflict with downstream Uzbekistan and Turkmenistan. Even though the Pyanj River does not flow directly into Uzbekistan and Turkmenistan, it is a tributary of the Amu Darya River – Turkmenistan's largest source of water from abroad. For the Amu Darya River, the share of water allocated to Uzbekistan according to the existing quotas constitutes 48.2 percent, followed by Turkmenistan

(35.8 percent), Kyrgyzstan (0.6 percent), and Tajikistan (15.6 percent).⁴⁶ Afghanistan has never claimed its share in the total trans-boundary water in the Amu Darya Basin or engaged in projects that could seriously jeopardise its relationship with its neighbours, especially its northern neighbours. Naheed Farid, a Member of Parliament, in a personal conversation on February 16, 2016, revealed that she believes that there are prospects for greater stability within the security context in which Afghanistan is linked to the Central Asian states.

At the same time, many experts and government officials believe that the time has come for Afghanistan to be guided by its own national interests in its foreign energy policy and its pursuit of new hydropower projects. The water-energy nexus challenges that have become a major source of conflict between Central Asian upstream countries and Central Asian downstream countries should serve as a cautionary tale for Afghanistan in its development of large hydropower projects.

Many experts and government officials believe that the time has come for Afghanistan to be guided by its own national interests in its foreign energy policy and its pursuit of new hydropower projects.



Around 80 percent of water in Central Asia is sourced from upstream Tajikistan and Kyrgyzstan. More than 85 percent of it however, is consumed downstream by Kazakhstan, Turkmenistan, and especially Uzbekistan. During a conversation on May 25, 2014, Senior Research Fellow at the University of Central Asia in Tajikistan, Sunnatullo Jonboboev, highlighted that while such a distribution of water suits the downstream countries' interests, Tajik and Kyrgyz authorities believe it is unfair and advocate for the non-interference of their energy/water policy in an attempt to increase their water accumulation and electricity production capacity. In order to increase electricity production, upstream countries need to accumulate more water in the summer and release it in winter, as well as reduce the amount of water to be released until dams are filled up. The Tajik government argues that the construction of large HPP facilities, particularly the 335 metre high Rogun Dam and HPP with a capacity of 3600 MW, is the sovereign right of the state and will be in full compliance with international law.⁴⁷ Uzbekistan has strongly opposed the construction of the facility, which almost caused relations with its once closest neighbour to break down. The projected hydropower development on the Kunar River (shared with Pakistan) or the Amu Darya Basin will depend on the willingness of the countries to sign water-sharing agreements and to adhere to them. So far, the only existing water-sharing agreement, signed in 1977 between Iran and Afghanistan on the Helmand Water Basin, is proving difficult for both countries to comply with.⁴⁸

Afghan authorities may be counting on the World Bank to facilitate the dialogue between riparian states to solve the water-energy nexus issues on trans-boundary rivers. Yet, several attempts by the organisation to resolve the conflict between Uzbekistan and Tajikistan over the construction of Rogun HPP (the projected largest HPP in Central Asia) resemble a failure rather than a success. The

World Bank initiated a series of negotiations and attracted independent international experts to conduct economic, social, technical, and environmental impact assessments of the Rogun HPP project so that parties could have an understanding of potential risks of the project, as well as potential benefits for the region. According to the final report, which was released in July 2014, the option with the highest wall for the Rogun Dam (335 m) was found to be the most economically viable, with environmental and social impacts that could be satisfactorily mitigated.⁴⁹ Tajik authorities were hoping to attract investors, including assistance from the World Bank and ADB, after the report came out supporting the construction of the highest dam. The assessment, however, did not bring expected results; Uzbekistan continues to oppose the project and Tajikistan suffers from insufficient funds to continue with the construction of the Rogun Dam. The results of this assessment could be used if any of the parties decide to build the dam, but security risks over the project imply that such an engagement would entail unacceptable conditions for Tajikistan. As it stands, the World Bank's efforts to bring Central Asian states closer to finding a resolution to the conflict have failed.

A self-sustaining energy sector in Afghanistan: already too late or still too early?

Despite the fragile nature of relations between Central Asian countries and Afghanistan, the asymmetrical interdependence between these countries will remain largely unchanged due to obstacles preventing Afghanistan from taking full advantage of its domestic energy potential.

Ineffective monitoring mechanisms, coupled with high levels of corruption

International donors attempting to contribute to the development of Afghanistan's energy sector are trapped by their own principles of engaging in the reconstruction and rehabilitation process of the country, while

limiting their interference in domestic regulations. International donors take full responsibility for the implementation of the projects, from their conception until their completion, and have a complex and quite effective monitoring mechanism for the implementation of projects. Along with providing financial and technical support and attracting qualified personnel, project-executing agencies closely collaborate with government agencies. However, in a conversation with Asad Aleem, Energy Sector Expert for ADB, on February 21, 2016, he explained that once a project is completed, ownership is passed over to the Afghan government without any further monitoring from the donors' side of the efficient management of energy facilities. Such a process can be effective in a country with low levels of corruption and high indicators of transparency and accountability. However, these are hardly characteristics descriptive of Afghanistan's energy sector in its current stage of development. There are criteria for the selection of projects; throughout the process of intergovernmental negotiations the KfW, for instance, collects submissions from the Afghan government and selects projects based on security (projects that have a lower security risk) and region (northern regions) criteria.

Humayoon Alami, Project Coordinator for the Energy and Water Sector at KfW, during a conversation on February 24, 2016, pointed out that the international agencies are now also providing support on a conditional basis, asking for a detailed project concept for the implementation process, as well as the security and monitoring (from land allocation to security provisions) before they approve support for a project. While having a detailed project concept proposal increases the chances of a smoother implementation of the project, it by no means guarantees its effective management once the project is in operation. The main source of distrust towards the government's policy as well as of

donors' support is due to the fact that funds are sometimes channelled in ways that are ineffective and feed corruption. Transparency International ranked Afghanistan 166 out of 168 countries in its 2015 Corruption Perceptions Index.⁵⁰ Mirwias Yasini, a Member of Parliament, in a personal conversation on February 17, 2016, described the problem of corruption as a cancer that has spread throughout the country. The energy sector development strategy seeks to address the problem of corruption by limiting the role of the government in the energy sector. However, governmental institutions still exert significant control and influence over the energy sector.⁵¹

Unrealistic energy policy goals

The lack of communication between state agencies and non-governmental organisations in the designing of energy policies also affects the successful implementation of energy projects and the ability to achieve ambitious goals. The MEW (responsible for the development of energy policies) initially set a target to deliver 350–450 MW of renewable energy by 2032, a feasible target of around 15 percent of the overall power production. The draft Renewable Energy Policy was handed over to the President's Office in October 2014 for revisions and approval.⁵² The President's Office reportedly returned the document with substantial amendments, with the new policy objective reflecting the targeted goal of 4500–5000 MW, marked as 95 percent of the overall power generation to come from RES by 2032.⁵³ Such unrealistic energy policy goals are a distraction rather than a secure way of achieving greater energy security in Afghanistan.

Lack of financial resources

The Afghan government will be incapable of allocating sufficient funds for energy projects, especially those designed to develop indigenous resources, once the external support starts receding. More than US\$4 billion has been spent on power infrastructure in Afghanistan since 2002. From 2002 to

International agencies are now also providing support on a conditional basis, asking for a detailed project concept for the implementation process, as well as the security and monitoring (from land allocation to security provisions) before they approve support for a project.

The main source of distrust towards the government's policy as well as of donors' support is due to the fact that funds are sometimes channelled in ways that are ineffective and feed corruption.



In the post–2025 period, Afghanistan's self-financing capability will be a major factor determining the stability of energy supplies and the extent to which the Afghan market will be dependent on external energy and power supplies.

2013, the Afghan energy sector received financial support amounting to almost US\$3 billion from USAID and the United States Department of Defense, and US\$330 million from the World Bank. The German government's financial aid providers such as KfW and GIZ also contributed substantially to the energy sector's development.⁵⁴ Afghanistan's largest on-budget development partner—ADB—has provided slightly less than US\$1 billion over the past 14 years.⁵⁵ There is still a commitment on the part of international donors to support security, as well as economic and social development initiatives during the 'Transformation Decade' (2015–2025).⁵⁶ However, in the post–2025 period, Afghanistan's self-financing capability will be a major factor determining the stability of energy supplies and the extent to which the Afghan market will be dependent on external energy and power supplies. The issue of financial self-sufficiency is important because, according to the Power Sector Master Plan (2012–2032), the largest expenses are expected to fall during the last stage (Stage D) of energy sector development: Stage A until 2015; Stage B until 2020; Stage C until 2025; and, Stage D until 2032 (Table 3).⁵⁷

Lack of trust in the government's energy reforms

As part of this new strategy to establish a self-sufficient energy sector, the Afghan government is attempting to attract private

sector investment in RES development to relieve the burden from the authorities and energy agencies. The government is providing favourable conditions and benefits, including: land at specific locations in each province near the grid for the project; tax incentives; a 25 percent subsidy rate to reduce costs for producers; security assistance for project implementation; licence generation based on the Energy Services Law; long-term power purchase agreements (PPAs); and attractive tariffs.⁵⁸ The overall economic downturn and growing distrust of the Afghan government by the population are indicators that it might be more difficult to implement the initiative. Considering that Afghan authorities have failed to attract private investment in energy initiatives during periods of high economic growth and stability, it is doubtful they will succeed now. No major contribution to the energy sector can be expected from small and medium-sized businesses, despite government expectations. According to the Asia Foundation's 2015 Survey of the Afghan People, 57.5 percent of Afghans believe their country is moving in the wrong direction.⁵⁹ This could imply that Afghans might refrain from risking investing their money in the development of RES.

A deficient power sector

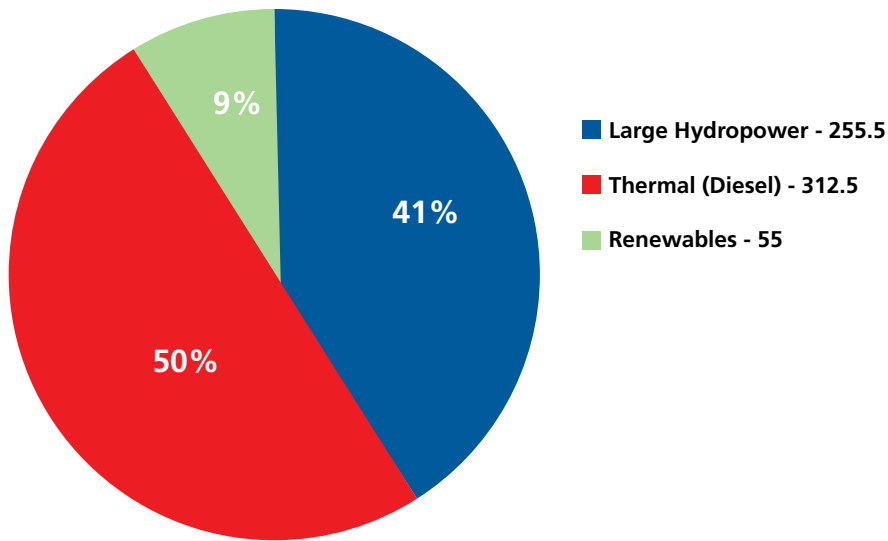
DABS will struggle to improve the efficiency of electricity distribution because Afghanistan's power sector operates at a

Table 3: Total investment required in power sector development

Overview of investment type	Subtotal by project	Stage A	Stage B	Stage C	Stage D
Generation development	7,329.50	327.60	348.50	981.50	5,671.90
Major transmission projects	1,725.90	595.00	676.00	212.90	242.00
Transmission development within the provinces	1,041.00	291.10	439.80	215.10	95.00
Total (in million US\$)	10,096.40	1,213.70	1,464.30	1,409.50	6,008.90

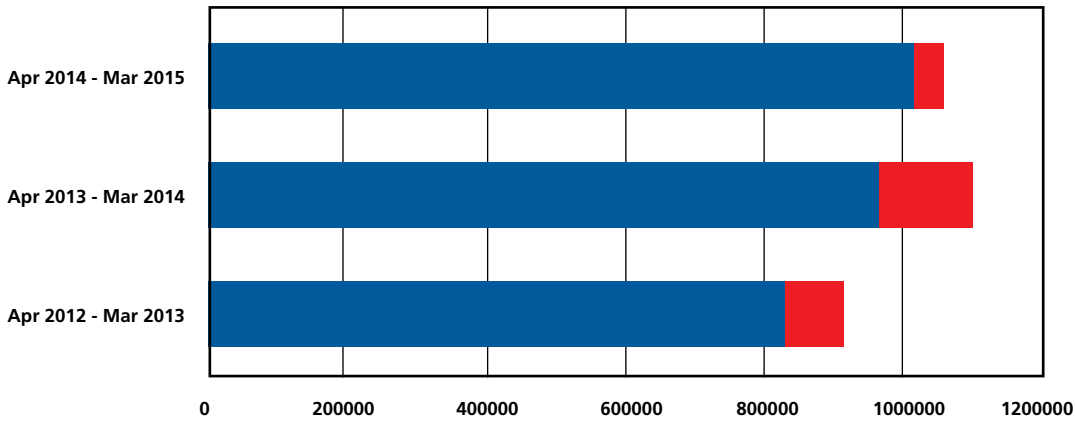
Source: Asian Development Bank, "Islamic Republic of Afghanistan. Power Sector Master Plan," May 2013, 1-2, <http://www.adb.org/sites/default/files/project-document/76570/43497-012-afg-tacr.pdf>.

Figure 6: Total installed domestic power generation capacity in MW (March 2015)



Source: Inter-Ministerial Commission for Energy, "Total installed domestic power generation capacity," ICE, last modified March 2015, <https://sites.google.com/site/iceafghanistan/electricity-supply/domestic-generation-1>.

Figure 7: Domestic generation in MWh (large hydro and thermal power)



	Apr 2012 - Mar 2013	Apr 2013 - Mar 2014	Apr 2014 - Mar 2015
Hydro	1098185	1068210	821510
Thermal	3458326	3813533	3285588

Source: Inter-Ministerial Commission for Energy, "Domestic Generation," ICE, last modified March 2016, <https://sites.google.com/site/iceafghanistan/electricity-supply/domestic-generation-1>.



While customers connected to the power grids enjoy equal access to electricity, not everyone can afford to use it.

loss. The current average electricity tariffs of US\$0.08–US\$0.12 per kWh are insufficient to cover electricity import costs (that range between US\$0.06–US\$0.10), as well as transmission and distribution costs (that range between US\$0.07–US\$0.10). In addition, insecurity further increases the operation and maintenance costs of power facilities.⁶⁰ DABS no longer receives any government subsidies for its operations, and since it is a commercial entity, it eventually decided to discard the subsidy system for consumers as well. As a result, the amount given in subsidies in the energy sector has dropped from US\$40 million in 2009 down to zero in 2014.⁶¹ While customers connected to the power grids enjoy equal access to electricity, not everyone can afford to use it. The fact that 90 percent of Afghanistan's power is consumed by households and 70 percent of the population still live on less than US\$1.75 a day⁶² considerably limits DABS's ability to supply power to ordinary customers and still make a profit.

Limited contribution from thermal power generation facilities

Domestic thermal power potential could be an alternative source of electricity supply, which would decrease Afghanistan's dependence on external suppliers. However, currently operating thermal power generation facilities are designed to meet peak electricity demand and are too cost inefficient to be used in the base load mode. Out of 623 MW installed capacity, 50 percent accounts for thermal power (Figure 6). However, thermal power only constitutes around 10 percent of the total electricity production (Figure 7).

Diesel power generation plants are easy to operate and maintain, but they are run on expensive fuel (US\$0.25–US\$0.35 per kWh – nearly four to five times the cost of imported electricity), which has to be imported from Iran, Central Asian countries, and Pakistan. Tarakhil TPP was designed to meet peak power demand or to be an emergency power

plant for Kabul. While this plant can operate on a base load, the high cost of diesel makes it economically inefficient to run the plant on this mode. Thus, power supply indicators showed that the plant supplied less than 9000 MW/h of power to the Kabul power grid between February 2014 and April 2015, which was less than 1 percent of the plant's production capacity. During this period, the plant contributed only 0.34 percent of the total power on the Kabul grid.⁶³

Afghanistan – an energy transit hub

The above-mentioned analysis indicates that Afghanistan will most likely remain dependent on Central Asian resources for its internal energy consumption and benefit from its transit status. There are two major regional energy projects that are designed to turn Afghanistan into a transit country: a) the TAPI pipeline; and b) the Central Asia–South Asia (CASA-1000) power transmission line. Afghan authorities are highly interested in promoting these projects mostly for economic, political, and to a lesser extent, energy security reasons. While there are a number of concerns for the construction and exploitation of both the pipeline and transmission line, this section looks at the major challenges coming from the Central Asian side.

TAPI gas pipeline

The TAPI gas pipeline has been on the agenda of the concerned parties since the beginning of the 1990s. Because it has taken so long to move from the planning stage to the construction stage, many experts doubt its feasibility. ADB recently carried out a feasibility study of the project and found it economically viable, even showing willingness to financially support the construction of the pipeline. The TAPI pipeline is one of the priority regional projects for the Afghan government. Given its underdeveloped economy, Afghanistan plans on keeping 0.5 billion m³ out of a total 33 billion m³ of gas for its own consumption. As a transit country, Afghanistan is expected to benefit from US\$470 million of transit fees

annually.⁶⁴ Ahmad Fawad Farzad, Project Coordinator at Friedrich-Ebert-Stiftung Afghanistan, during a personal conversation on February 20, 2016, indicated that the transited gas will be distributed almost equally between Pakistan and India and will give Afghanistan leverage to reduce its asymmetrical dependence vis-à-vis Pakistan. Yet there are two major concerns, in addition to general insecurity along the route, in regards to the probability of the realisation of the TAPI pipeline project in the near future.

Firstly, even though Turkmenistan has agreed to cover more than half of the project's construction costs, Turkmen authorities may have trouble meeting its 51 percent commitment due to dropping gas prices, which constitute the lion's share of Turkmenistan's budget. The companies—Turkmengaz, Afghan Gas Enterprise, Inter State Gas Systems (Pakistan) Limited, and GAIL (India) Limited—representing the four participating states endorsed Turkmengaz as the project's consortium leader in August 2015. Parties agreed that a 51 percent stake in the project belongs to Turkmenistan, 15 percent is equally shared by Afghanistan, Pakistan, and India, while the remaining 34 percent is reserved for external investors.⁶⁵ Having finally agreed to cover the construction costs of the US\$7.6–10 billion pipeline,⁶⁶ leaders of all four participating countries took part in the ceremony of laying the Turkmen section in December 2015.⁶⁷ However, their true commitment has yet to be tested.

Secondly, in an environment of excessive dependence on demand from the Chinese market and no guarantee of the reliability of demand from both Russia and Iran, Turkmen authorities have started promoting energy cooperation within other corridors, including South Asia. Despite the fact that such cooperation could be mutually beneficial for revenue generation, energy security, and economic prosperity, there are serious doubts regarding Turkmenistan's physical capability

to boost its gas export capacity to meet external demand. Turkmenistan's current gas export capacity to external markets does not exceed 45–50 billion m³ per year.⁶⁸ Even though Turkmenistan is not supplying gas in all five directions (as is the case of some corridors) due to financial, geopolitical, and security reasons, there are already signs that the regional exporter may not be able to keep up with even the Chinese demand, let alone external demand with other already connected corridors:

- Central Asia–China gas pipeline: 65 billion m³ per year;
- Central Asia–Russia via Central Asia Centre gas pipeline: up to 50 billion m³ per year;
- Turkmenistan–Iran pipeline: up to 20 billion m³ per year;
- TAPI pipeline: 33 billion m³ per year (planned);
- Trans–Caspian gas pipeline: around 30 billion m³ per year (planned).

CASA-1000 power transmission line

CASA-1000 is another major energy project that was initially designed to partially contribute to Afghanistan's energy security. Possessing a surplus of electricity production in the summertime with no possibility of exporting it to neighbouring Uzbekistan as a result of the CAPS collapse, the Tajik and Kyrgyz governments decided to redirect its extra electricity to Afghanistan. Tajikistan and Kyrgyzstan supported the Central Asia–South Asia Regional Electricity Market (CASAREM) initiative to move surplus electricity to South Asia. In the first phase of this initiative, CASA-1000 is expected to supply electricity to Afghanistan and Pakistan from the current surplus in Tajikistan and Kyrgyzstan. Both Kyrgyzstan and Tajikistan have already established North–South power transmission lines so that it would be easier to connect the power grids of these countries to a single transmission network if CASA-1000 were implemented. However, the project's contribution to Afghanistan's energy security

Security costs are one of the major concerns for governmental agencies, private sector investors, and international donors promoting energy sector development initiatives in Afghanistan.



is limited because exporting countries will supply electricity only in the summer months, during which most of the electricity will go to Pakistan.

South Asian countries are hungry for winter electricity supplies. Uninterrupted electricity supply to South Asian countries can be achieved only with large TPPs operating to export thermal electricity. However, neither Tajikistan nor Kyrgyzstan have any large TPPs. CASA-1000 was initially relying on electricity generated by Uzbekistan's TPPs to supply electricity to South Asian countries 295 days of the year. However, Uzbekistan did not sign onto the project and Tajikistan and Kyrgyzstan will only be able to supply electricity 70 days of the year.⁶⁹ Recent negotiations raised the projected CASA transmission line's capacity another 300 MW, which physically makes the line CASA-1300. In 2015, DABS started negotiations to sign an agreement according to which, once constructed, Afghanistan would only receive 100 MW and sell the rest to Pakistan in the early stages of the project.⁷⁰ On May 11, 2016, Energy and Water Minister Ali Akhmad Usmoni announced that Afghanistan would not purchase electricity through the CASA-1000 line, turning the project into a purely economic and political project with zero contribution to the energy security of the country.⁷¹

The Taliban threat to regional energy projects

Security costs are one of the major concerns for governmental agencies, private sector investors, and international donors promoting energy sector development initiatives in Afghanistan. Security concerns have risen tremendously since insurgents in an area of heavy fighting in Baghlan province blew up a key transmission line connecting Uzbekistan—Afghanistan's largest supplier of electricity—to Kabul. The explosion cut off power supplies to Kabul on January 27, 2016. Subsequent attacks by the Taliban have caused the disruption of power lines delivering Tajik

electricity to Kabul, causing Kabul's power supply to be cut by about 80 percent.⁷² While the Taliban clearly poses a security threat to energy projects, it is uncertain to what extent the Taliban targeting energy projects is a trend.

Despite the fact that government officials blamed the Taliban for the first attack, there is no clear evidence that they were responsible for the attack, or carried it out intentionally. A Taliban spokesman also denied the Taliban's involvement in the attack. Criminal groups, who previously benefited significantly from selling both generators and diesel fuel to run the generators, could also be responsible for the destruction of the lines. Thus, in an attempt to create a demand for their product, there are rumours that they could have brought the pylons down.⁷³ Another possibility is that the transmission line was destroyed by accident, as the area sees a lot of active fighting. The Taliban could also have blown up the pylons in reaction to an operation launched by Afghan forces to clear insurgents from the Baghlan area.⁷⁴ The Taliban was however, responsible for destroying the line connecting Tajik electricity to the Afghan market in February 2016, which is clear evidence of their capability to cause serious damage to the country's energy infrastructure. If destruction occurs in an area with no active fighting, governmental agencies can quickly repair the lines within a few days. But the Taliban can also destroy them again as quickly. While the 2016 winter attacks once again highlighted the issue of security, the incidents were unprecedented. Until recently there had been no such attempts to destroy the transmission lines and perhaps the attacks on energy infrastructure may not turn into one of the main tactics used by insurgents to fight the government, provided that electricity is equally distributed throughout the country, so that territories controlled both by the government and Taliban can benefit from it. Both Tajik and Uzbek lines transporting electricity are connected to the Kabul area via

If destruction occurs in an area with no active fighting, governmental agencies can quickly repair the lines within a few days. But the Taliban can also destroy them again as quickly.

the Pul-e-Kumri substation. In winter, Uzbek electricity feeds the Kabul power grid, while limited Tajik electricity reaches consumers in the north, and vice-versa in the summer months. When the Uzbekistan–Afghanistan transmission line was damaged, authorities redirected power supplies from Tajikistan to Kabul to strengthen the operational capacity of the capital city where central government institutions are located. Country Director of the Friedrich-Ebert-Stiftung in Afghanistan, Alexey Yusupov believes that the Taliban is no longer in a position to control the country in the way that it once was. However, in a

personal conversation on February 20, 2016, Alexey Yusupov stressed that the Afghan government was also losing the trust of the people, meaning that both sides should now more than ever be interested in gaining the support of the populations residing in their respective territories. It would be problematic for both the government and the Taliban to count on such popular support if the Taliban were to blow up the infrastructure designed to bring power to the Afghan people or if the government sacrificed power supply to provincial regions to add it to the Kabul power grid.



Conclusion and Recommendations

The essence of Afghanistan's energy security can be derived from the state's confidence in current and future reliable energy supplies in the necessary quantities to meet both population demand and the country's economic needs. With the support of external actors, Afghanistan has made certain progress in building the country's energy sector almost from scratch. Until recently, Afghanistan's energy policy priority was to provide access to as many consumers as quickly as possible. Now, the primary energy policy priority is to establish a self-sustaining energy system. Yet, the new energy policy objectives by no means diminish the importance of Central Asian supplies for the energy security of Afghanistan. This analysis has shown that what appear to be stable power and fuel deliveries to Afghanistan from Central Asia may not be sustainable in the medium to long-term.

Recommendations:

- a) In designing and promoting regional energy initiatives, decision makers need to seriously consider the potential impact on conflict dynamics of Afghanistan's desire to be guided by its national interests in pursuit of energy projects, as these may not be in line with Central Asian countries' primary foreign energy policy objectives. In evaluating the extent of Afghanistan's vulnerability in regards to power supplies from the Central Asian producers, Afghan authorities are encouraged to closely study the water-energy nexus challenges between Central Asian upstream and downstream countries that have lasted for over a decade and adjust Afghanistan's policies accordingly.
- b) While the Central Asia–Afghanistan energy trading dynamics are not reliable, they are at least stable for the moment. The primary energy security policy objective of

the Afghan government is to strengthen its relationships with Central Asian countries. It is imperative that the Afghan government position itself as a leading actor in promoting dialogue without overreliance on external mediators. The Afghan government has never engaged in projects that could seriously jeopardise its relations with its neighbours, especially its northern neighbours. However, taking into account the fact that the largest contribution to Afghanistan's energy security may come from the development of its hydropower potential, authorities should actively promote dialogue over the terms of the water sharing agreements with its northern neighbours. In the absence of water sharing treaties, the construction of large HPPs without the prior consent of all riparian states will most likely lead to conflict with downstream Central Asian countries. The Afghan government should take full advantage of the World Bank's assistance and experience in conducting assessment studies on the economic, social, and environmental impacts of large hydropower facilities. However, it is important that either the Afghan government or the Central Asian countries accelerate the process and encourage its counterparts to engage in a more active dialogue on these issues.

- c) The discourse emphasising security risks needs to be replaced by economic prosperity-oriented objectives in the energy sector development initiatives. Economic prosperity can hardly be achieved without energy security. In turn, a stable economy is a guarantor for greater energy security in the country. This does not imply, however, that the threat of an insurgent attack on strategically important energy infrastructure should be underestimated. To reduce the threat of Taliban attacks on energy infrastructure, the energy system

needs to be designed in such a way that insurgents are incorporated into the system and thus incentivised to keep it running. As a first step, authorities should prioritise establishing power transmission lines connecting all regions of the country including those under Taliban control (the NEPS–SEPS inter-connection). Currently, the government is the official beneficiary of existing energy in the country, with the capital Kabul receiving priority. However, once the countrywide electricity ring is established, southern regions will directly benefit from imported power, making insurgent groups more likely to refrain from targeting energy infrastructure.

- d) At the country level, Afghan authorities should focus on designing holistic and feasible energy policies. They should not be distracted by illusionist policies of achieving 95 percent of domestic consumption from RES, and instead focus their efforts on implementing major energy projects that have feasibility studies, and which are currently unfunded. These projects (Baghdara HPP, Sarobi 2 HPP, Shal HPP, Kajaki 2 HPP, Qala e

Mumaee HPP, Ghor mini HPP, Sheberghan gas turbine, Drara e Ajar TPP, and Haji Gak TPP) are projected to have the largest contribution to Afghanistan’s energy security. These projects are not only costly, but also time-consuming, which means the implementation process would need to begin immediately.

- e) A more effective conditionality mechanism should be introduced to increase the contribution of energy projects to Afghanistan’s energy security. For instance, international donors should have a commitment to provide financial and technical support only after the MEW, DABS, or other relevant agencies have presented an assessment of the successful operation of energy facilities that had previously been commissioned. Transparency and accountability of the energy sector, which would make it difficult for officials to engage with informal and corrupt mechanisms, could be a good starting point for winning the trust of the population again and engaging them in the process.



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