

**An Institutional Analysis of the Power Sector in Afghanistan –Barriers to
Achieving Universal Access to Electricity**

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1 Abstract

Afghanistan is one of the poorest countries in the world with 35% of its people live below the poverty line. 70% of Afghans have no access to electricity, and 90% of those without electricity live in the rural areas. Since 2002, more than \$4 billion have been spent on Afghanistan's power infrastructure and electrification, yet there are considerable deficiencies in the sector and this investment only increased the rate of electrification by 22%, which is phenomenally below expectations. This indicates institutional, policy and planning problems in the energy sector which need to be carefully considered. Given that only 9% of the rural population and 30% of the urban population have access to electricity, what policy and sector reforms are required to facilitate universal access to electricity in Afghanistan? What are policy and institutional constraints that restrict the electrification rate? This study attempts to find answers to the above research questions by using the Institutional Analysis and Development (IAD) framework.

The findings of the study reveal that because of ambiguity, overlaps and contradiction in scope of work and mandates of five government ministries exacerbated the current challenges. The lack of a unified, harmonized and coordinated development agenda of more than ten international development partners in the power sector have led to inadequate and inaccurate prioritization of investments. This outcome resulted in low electrification rate and diminished institutional capacity. The study also unveils that the institutional capacity, despite enormous investment on its capacity building and training, did not improve and the key component for the sector i.e. the regulatory framework is not in place until today. Consequently, it delayed the private investment in the power sector for a decade.

2 Introduction

Afghanistan is a mountainous land-locked country located in South-Central Asia. The population is 32.5 million (2015 World Bank estimates) with more than 70% living in rural areas. Decades of instability and conflict have constrained the country's development, especially energy infrastructure. In recent years, development progress has been substantial but large challenges still persist. One-third of the population lives below the poverty line (earning less than \$2 a day) and more than 50% are vulnerable to becoming poor. The country is among the poorest in the world; in 2016, per capita gross domestic product was US\$595 (World Bank, 2016).

Afghanistan's energy sector is in a precarious and undesirable situation, with roughly 81% of its power being imported from neighboring countries (Uzbekistan provides 35.2%, Tajikistan 30.5%, Iran 20.9%, and Turkmenistan 13.4%) (DABS, 2016). The cost of imported energy has increased by 14 times from \$16 million to nearly \$224 million during 2007 to 2015 (ADB, 2015). The 2004 Power Sector Master Plan described the disadvantages of an import strategy as unreliable in the long run, because of the politically unstable neighbors, ambiguity in future prices trends and limited enforceability of commercial contracts. Of the total 519 MW of installed domestic capacity, 51% is thermal (diesel and furnace oil) with a generation cost of \$0.25–\$0.35 per kilowatt hour (KWh), nearly 4 to 5 times of the imported power. Remaining 49% (254 MW) is from hydropower, which is seasonal with a capacity factor of less than 40%. No new hydropower, gas or coal generation has been added since the 1980s (ADB, 2015).

Currently, Afghanistan's power system is quite complex. It operates in nine different 'islands' – power grids – depending on power supply sources. This means that different regions are supplied by different sources, and due to technical limitations, these regions are not interconnected – or synchronized. (Amin, 2015. P. 3). This nine-island mode resulted in a situation

where a significant proportion of the population disconnected from the national grid. This has adverse impacts on the development process. The quality of power distributed is also weak with fluctuating voltages, frequent power cuts and so on, forcing industries and commercial units to maintain backups in the form of diesel generator sets. This further raises the cost of energy.

Currently, up to 85% of primary energy use is from traditional biomass (such as wood and dung), which contributes to deforestation (RAGA Report, 2015, p. 20). Traditional biomass is supplemented by the use of diesel generators in off-grid areas as well as to compensate for power outages. Lack of access to affordable energy is limiting economic, social and educational opportunities, particularly for the poor and those in rural areas. Over 97% of the rural population is estimated to use solid fuels for cooking, with the result that Afghanistan is among the top 10 countries most affected by indoor (household) air pollution and Particulate Matter (PM) Pollution. UNEP estimates that at the current rate of wood consumption and deforestation, Afghanistan's forests will disappear within 30 years (RAGA Report, 2015, p. 22). Given the low levels of energy production and access, Afghanistan's contribution to global CO₂ emissions is small; however, the Global Environment Facility (GEF) has determined that Afghanistan is highly vulnerable to the effects of climate change (RAGA Report, 2015, p. 24).

Since 2002, more than \$4 billion have been spent on Afghanistan's power infrastructure and electrification, yet there are considerable deficiencies in the sector and this investment only increased the rate of electrification by 25%, which is phenomenally below expectations. This indicates institutional, policy and planning problems in the energy sector which need to be carefully considered. Given that only 9% of the rural population and 30% of the urban population have access to electricity, what policy and sector reforms are required to facilitate universal access to electricity in Afghanistan? What are policy and institutional constraints that restrict the

electrification rate? This study attempts to find answers to the above research questions by using the Institutional Analysis and Development (IAD) framework. The approach of this study is qualitative examination that looks at various components of the IAD framework such as action arena, actors, rules in use, patterns of interaction, etc. Secondary data analysis is used as my method in the study; secondary data includes government policies, sector reports, national budget, and third party analyses.

The findings of the study reveal that because of ambiguity, overlaps and contradiction in scope of work and mandates of five government ministries exacerbated the current challenges. The lack of a unified, harmonized and coordinated development agenda of more than ten international development partners in the power sector have led to inadequate and inaccurate prioritization of investments. This outcome resulted in low electrification rate and diminished institutional capacity. The study also unveils that the institutional capacity, despite enormous investment on its capacity building and training, did not improve and the key component for the sector i.e. the regulatory framework is not in place until today. Consequently, it delayed the private investment in the power sector for a decade.

This paper is structured in four sections. The literature review section starts by underscoring the concepts of energy poverty and energy security. The section will also consider the institutional restructuring and power sector reforms adopted by developed and developing countries with an in-depth look at Central American countries and Nicaragua. The methods section discusses the Institutional Analysis and Development (IAD) framework of Elinor Ostrom and its application in deconstructing the institutional and policy gaps of energy sectors. The analysis section examines Afghanistan's energy sector and applies IAD framework on the specific context chosen for this study. After applying the IAD framework, outcomes of the framework will be

discussed at the end of the section. Finally, the policy implications and recommendations section will provide a set of policy recommendations to the Afghan government and relevant actors.

3 Literature Review

The purpose of the literature review is to find answers how developed and developing countries addressed the power sector challenges and obstacles, including barriers to universal access to electricity, implementing power sector reforms, bottlenecks for an independent regulatory framework etc. The literature review of this study first explains the concepts of energy poverty and energy security. Secondly, it touches upon the theory of power sector reforms and restructuring approaches adopted by developed and developing countries. Section three describes power sector reforms and the history of electricity market in Central American countries. Section four looks into the electricity sector of Nicaragua in detail. Section five summarizes the takeaways from the literature for the Afghanistan's context.

3.1 Energy Poverty and Energy Security

The United Nations (UN) member countries agreed on the Sustainable Development Goals (SDGs) initiative in 2015 as a successor to the Millennium Development Goals (MDGs) under the title “Transforming our world: the 2030 Agenda for Sustainable Development.” The aim of the SDGs is to address and overcome pivotal challenges faced by the world in 21st century, namely, poverty, hunger, health, climate, environment, etc. (UN, 2015). Goal 7 of the SDGs is about ensuring access to affordable, reliable, sustainable and modern energy for all. The International Energy Agency (IEA) states in its World Energy Outlook 2016 Report that “1.2 billion people are without access to electricity and more than 2.7 billion people rely on the traditional use of biomass for cooking, which is associated with the approximately 3.5 million deaths annually from indoor air pollution” (IEA, 2016).

Kaygusuz asserts that besides, lack of access to electricity, the energy poor is in short of supply of clean fuels for cooking and household use. Low income families cannot afford the efficient solutions include liquid petroleum gas (LPG) and kerosene for cooking. Kaygusuz argues that households in rural areas want to use gasoline and diesel fuel for small generators, water pumping and transporting goods to local markets, but affordability remains a roadblock (Kaygusuz, 2011).

A report submitted to Practical Action South Asia by Dhanushka Tennakoon characterized energy poverty as a person who does not have access to at least: (a) the equivalent of 35 kg LPG for cooking per capita per year from liquid and/or gas fuels or from improved solid fuels and cook stoves; and (b) 120 kWh electricity per capita per year for lighting, access to most basic services (drinking water, communication, improved health services, education improved services and others) plus some added value to local production (Dhanushka, 2008). As discussed in the introduction section, 70% of Afghanistan population does not have access to on-grid or off-grid electricity and the annual per capita consumption varies between 100 to 150 kWh. This puts Afghanistan in an extreme energy poverty position.

With regards to energy security, the International Energy Agency (IEA) defines energy security as “the uninterrupted availability of energy sources at an affordable price”. The literature shows that three components are quintessential in characterizing energy security: (a) Reliability; (b) affordability; and (c) accessibility (IEA, 2016). Yergin further elaborates that energy security and its concerns are not limited to oil or hydrocarbons in general. Power blackouts in the United States, in Europe, and in Russia, coupled with chronic shortages of electric power in China, India, and other developing countries are equally important concerns. Blackouts and electricity shortages have raised worries about the reliability of electricity supply systems (Yergin, 2006).

The Asia Pacific Energy Research Centre (APERC, 2007), classified the essential elements of energy security into the following four components:

1. Availability – geological considerations.
2. Accessibility – geopolitical elements.
3. Affordability – economical elements.
4. Acceptability – or environmental and societal elements. (APERC, 2007; Kruyta et al, 2009)

As has been alluded to in the introduction section, Afghanistan's energy sector lacks all four components proposed by APERC. 70% of the population does not have access to electricity. The 30% that consume electric energy is not reliable and undergoes severe load-shedding and blackouts. Moreover, electricity is not affordable in Afghanistan. Diesel generators in provinces cost up to 50 cents/ kWh, compare to the average price (6 cents/ kWh) in grid-connected provinces.

3.2 Power Sector Reforms in Developed Countries

Power sector reforms consist of multifaceted propositions pertaining to restructuring the sector in terms of functions and operations. These propositions include market liberalization, deregulation, privatization of state-owned enterprises and unbundling monopolistic nation-wide utilities. Adaptation of power sector reforms in developed countries has been documented and the literature highlights that the results have been desirable and successful (Zhang et al 2008; Pollitt, 1995). In developing countries, however, diminished institutional capacity has restrained from achieving a similar outcome of developed countries and had associated economic and political ramifications (Zhang et al 2008; Parker, 2002).

Unlike other sectors and industries, the power sector proved to be more challenging in adopting reforms, because the electric network effects of large power grids coupled with vast economies of scale in the overall power system, this has created high barriers to entry that had made electricity the embodiment of natural monopoly (Victor and Heller, 2007). Challenges such as high capital costs, political influence and manipulation, ramifications of network monopoly, technological stagnation and difficult regulatory applicability persisted, yet power sector reformers maneuvered ways to introduce and adopt market frameworks in the sector. (Victor and Heller, 2007 p. 4).

Power sector reforms in Organization for Economic Co-operation and Development (OECD) countries have been an attempt to deregulate or restructure the electricity industry and as a result facilitate competition, which is perceived a means to achieve higher efficiency (Millán, 2006, p.1). However, two models became mainstream in the mid 20th century. One model was adopted and still exists in some of the markets in the United States is the second model was implemented by the United Kingdom. The first model adopted was called regulated franchises (Victor and Heller, 2007) and basically allowed private firms to operate the entire power system based on a guaranteed return on investment subject to their performance where the firms are kept under regulators oversight. This model had some regulatory deficiencies such as incomplete information of regulators on firms' operations and could not function independently (Victor and Heller, 2007. P 5). Similarly, guaranteed return on investment tempted firms to over-invest and prevented innovation and cost efficiency. Later, reformers modified the model and introduced performance-based regulations (Victor and Heller, 2007).

The second model opted for greater efficiency through market competition; it started first with generation and distribution. These two functions of the power system opened market

competition and allowed private investors to enter the market, especially in the generation side which is less prone to monopoly – barriers to entry and exit are not solidified. On the contrary, the transmission system was prone to monopoly where control resides with one operator. Britain was first to adopt this model that unbundled the state-owned utility into several generators and created twelve distribution companies with pre-determined territories. The transmission network operated and managed by a state-owned enterprise. The generators and distribution companies traded power through long term power purchase agreements and sometimes, when desired, through a common pool spot market (Victor and Heller, 2007).

Along with sector restructuring, an efficient regulatory framework is necessary for sustainability. Levy and Spiller (1994) coin the term “regulatory governance” as a regime required for attracting long-term private investment than the specific choice of industrial structure. To support Levy and Spiller’s point, Holburn and Spiller argue that the utilities sector is different from rest of the economic sectors because of three distinctions: specific investments, economies of scale and widespread domestic consumption. These features are at the core of the contractual problems that have traditionally raised the need for governmental regulation of utilities. As a result, they make the pricing of utilities inherently political (Holburn & Spiller, 2002, p. 2).

Financial viability is a must for energy sector sustainability, recognizing that electrical utilities, whether publicly or privately held, must operate on a basis of financial capability. Thus, the utilities could not be expected to act in a way contradictory to their financial viability, although they could become part of the solution through appropriate public policy (Schubert, 2004, p. 5). Moreover, consumers cannot be expected to pay more for their electricity than they can realistically afford. However, certain classes of consumers can be expected to pay more than the true cost of their service in order to make the overall electrical system financially viable. More

importantly, subsidies from the state are also key to achieving universal access, they are sometimes applied on a one-time basis and are used to pay some or all the investment in a rural electrification program or as source of capital in setting up revolving funds (Schubert, 2004, p. 6).

For a government to motivate private investment, it will need to devise institutional arrangements that will limit its '*own ability to behave opportunistically*' once the private investors brought in their capital and initiated their projects. In other words, the government cannot act in its own self-interest while overlooking the interest of private companies. According to Holburn and Spiller, such institutional arrangements are essential prerequisites for the design of a regulatory framework that will set prices, stipulate procedures, and resolve conflict between the parties, to name a few. The authors argue that regulation does not imply a 100% guarantee of profit for utilities or assurances of a rate-of-return, or to receive exclusive licenses. In the case of other countries, Holburn and Spiller assert that such assurances may be conceived as the only method to limit the '*government's discretionary powers*'. Unless such a regulatory framework is credible, though, investments will not be undertaken or, if undertaken, will not be efficient (Holburn & Spiller, 2002, p. 5).

The decision to privatize state-owned electricity assets naturally raises a series of questions about the optimal organizational approach to transferring assets to private owners. Should all asset types, whether generation plants, high voltage and distribution networks, be privatized or should private ownership be limited to the sectors where competitive markets can be feasibly implemented? And, if markets are small, should competition be attempted? In the former case, what is the optimal degree of vertical integration between privately-owned generation, transmission and distribution activities, bearing in mind that investments or operational decisions in one sector can have important consequences for operational efficiency in other sectors?

Similarly, given the need for investment and real-time operational coordination between, as well as within geographic regions, what is the optimal level of horizontal fragmentation? (Holburn & Spiller, 2002, p. 10).

3.3 The Electrification Process in Developed Countries

Through the mid 20th century, electrification was generally implemented in two phases: Phase 1: An initial decentralized approach during which the bigger cities and towns were electrified, each with its own sources of generation (with very little rural electrification). Phase 2: Integration of the above by means of high voltage interconnections to create an integrated system (still with low levels of rural electrification) (Schubert, 2004, p. 3).

Schubert argues that electrification in most developed countries first happened in urban centers, mostly because it was profitable for the system operator, then it ran into a barrier and stopped, when the cost of providing service to the next potential consumer to be electrified, exceeded the amount that the consumer could afford to pay. He explains in his paper that this happened in Canada at about a 50% level of access where the villages were far apart and farms had been settled by means of farmsteads on individual farms. Similar barriers were encountered at a given level of access in all countries (Schubert, 2004, p. 4).

From an economic point of view, electrification had stopped due to market equilibrium having been achieved, i.e. when private investors were electrifying the urban centers and at a point where marginal cost of electrifying another consumer is higher than marginal revenue, thus, the electrification process stops before reaching rural areas. The same phenomena occurred concerning access to all basic services (education, health care, transportation, potable water, communications, access to markets, access to credit, etc.). Europe ran into market equilibrium at a higher relative level of access, as compare to North America. European rural areas were more

densely populated than in the U.S. and Canada, and electrification was economical. In the U.S., universal access to electricity was not achieved because of market-based reforms but largely influenced by the strong political will that formed by social pressure and eventually resulted in enacting the Rural Electrification Act in 1935 and the Tennessee Valley Authority (TVA) in 1933 (Brown, 1980; Wolman, 2007). In the U.S. case, large corporate utilities could not contribute to rural electrification, but small scale and local nonprofit cooperatives did boost the electrification rate in rural areas of the country (Wolman, 2007).

In the late 20th century, the choice for government executives was to push for market-based reforms in electricity, due to the tremendous success market-based economies had in general that led to a reduction in costs of goods and services and increased efficiency. In the market-based economies, universal access was generally achieved through pressure by the masses, exercised democratically and in other ways (Schubert, 2004, p. 9). The literature explains that without state support and cross subsidies, rural electrification would have not been possible, regardless of how a country is developed or economically prosperous. Schubert (2004) asserts that consumers cannot be expected to pay more for their electricity than they can realistically afford, but that certain classes of consumers can realistically be expected to pay more than the true cost of their service in order to make the overall electrical system financially viable; therefore, carefully balanced cross-subsidies through electrical tariffs are key for universal access to be achieved. (Dorkenou, 2014; Barrens, 2007; Schubert, 2004). In addition, subsidies from the state are key to universal access, however, Schubert asserts that they should be applied in a sustainable way that results in self-sufficient rural electrification and act as a revolving fund (Schubert, 2004).

3.4 Power Sector Reforms in Developing Countries

In the case of Brazil, power sector reforms first became part of the discussions in the late 1980s; reforms in general faced political oppositions. It was not until 1993 that actual decisions were made vis-à-vis restructuring the power sector. The National Privatization Program was devised by President Collor and pursued and accelerated by President Franco (Oliveira, 2007). In 1993, the government established SINTREL (the National Power Transmission System) with a mandate to have an open access policy, this was part of the anticipation to attract private investment from independent power producers (IPPs). The government also enacted a law stipulating that power companies can no longer have a binding guaranteed return for their investments; this regime was replaced by tariffs and prices would be regulated (Oliveira, 2007; Victor and Heller, 2007). In 1995, the government invalidated all previous hydropower plant concession and encouraged public private partnership method to bridge the gap between state-owned enterprises and the private sector. Power sector reforms progressed well until they peaked in 1998, where sixteen distribution and four generation companies were 100% privatized. State-owned vertically integrated companies of many states partially privatized (Oliveira, 2007; Victor and Heller, 2007). Moreover, Licenses for new hydropower plants and transmission lines were auctioned in public at premium prices. In conclusion, Oliveira asserts that democracy and political stability played an important role in increasing the electrification rate in Brazil and facilitated the gradual adaptation of power sector reforms. Moreover, before going in full swing for privatization, strong regulatory foundations acted as a precursor to attracting private capital. Finally, according to Oliveira, privatization of the power sector in Brazil did not limit government's responsibility in assuring reliability and fair prices, in fact efficient regulation became more demanding (Oliveira, 2007; Victor and Heller, 2007).

In India's case, the Electricity Supply Act was passed in 1948, a year after independence. Through the act, State Electricity Boards (SEB) were created and assumed the responsibility of the respective state's generation, transmission and distribution. When the Indian constitution was enacted in 1950, the federal government and respective states both assumed responsibility for supplying power to the citizens (Tongia, 2007; Victor and Heller, 2007). The central government encouraged creating more state-owned enterprises (SOEs) to help them in achieving their socialistic goals, creating jobs and providing incentives to society. However, with the emergence of more SOEs, the situation worsened in terms of financial sustainability. The power sector lost \$5 billion (the losses were technical and commercial, including electricity theft) per year and indicated a poorly managed and unsustainable financial situation. In the 1970s, the Indian power sector experienced widespread blackouts, poor commercial performance and was on the verge of collapse. To respond to these crises, the central government created two new state-owned corporations for generation and transmission (Tongia, 2007; Victor and Heller, 2007).

By the end of the 1980s, states in India could not further offset financial losses of SEBs in their territories. This fiscal imbalance forced the new elected government in 1991 to devise reforms for the sector. Tongia (2007) categorizes Indian power sector reforms in three phases. The first phase of reforms that were adopted in 1991 focused on attracting and increasing private investment in power generation and opened the gateway for Independent Power Producers (IPPs). This first phase did not encompass restructuring the sector or privatizing the distribution companies. The second phase of reforms paved the way for the establishment of independent electricity regulatory commissions (ERCs). Several states preemptively created their own ERCs in the mid 1990s and the central government also then enacted the ERC Act and created a central regulatory commission (Tongia, 2007; Victor and Heller, 2007).

The third phase of reforms emerged to address the growing distribution network losses, both technical and commercial. The move started in the late 1990s and grew with the Electricity Act of 2003. The Accelerated Power Development and Reform Program (APDRP) also played a vital role in power sector reforms adaptation. APDRP assisted in the overall improvement in the power system, adopting institutional reforms and concentrating on the commercial viability of distribution companies. During the third phase of reforms, some states in India privatized their distribution companies and some states unbundled their SEBs. States had the free hand in customizing and adopting different types of reforms. However, Tongia (2007) argues that the fiscal imbalance remained an unresolved issue, because tariffs were lower than the actual cost of production. Regulators could not increase the tariff because of political and social pressures (Tongia, 2007; Victor and Heller, 2007).

3.5 Power Sector Reforms in Central American Countries

The Central American countries undertook reforms, a little different in each country, but generally characterized by using a market based approach to the provision of electricity, with privatization of existing power stations and distribution facilities. This has generally resulted in the elimination of technical and commercial losses that were intractable in the past and has drawn in considerable private sector investment in new facilities. Workers' rights have generally been well handled with little negative reaction on the part of the unions. Taking advantage of the improved efficiencies achieved through these reforms, the increased access to investor based financing and the monies realized through privatization, rural electrification strategies are being developed and implemented through the use of trust funds, coupled with funds from donors and borrowed from International Financing Institutions (IFIs) in order to increase the level of access to electricity (PREEICA, 2012).

In the Central American context, Guatemala has been making the most progress recently and has an initiative underway with a total of \$330 million in funding, intended to raise its total level of access to 90%. Approximately half of the funding comes from the privatization of its existing distribution systems, the remainder are funds provided by the state or which have been borrowed by the state. The funds are being used to build the primary and secondary distribution systems and resulting needed reinforcements in the transmission system. The distribution systems are transferred to a private operator. Those electrified do not have to repay the cost of the investments made, but only the cost of the electricity transmitted, the losses incurred in the system and the cost of operating and maintaining the transmission and distribution systems. The approach is similar in El Salvador and Panama. (Millán, 2006, p. 15).

In Honduras and Nicaragua, in addition to state funding, donor funding is also involved. Nicaragua has put significantly less funding to date into its rural electrification program and currently is losing ground as its rate of population growth exceeds its rate of electrification (Schubert, 2004, p. 12). The electrical utilities in the Central American countries were state owned. Like many state-owned operations, they were inefficient and operated with high losses, except for Costa Rica. This made it extremely difficult for the Central American Countries to pay their high debts, which had resulted from earlier investments in generation and transmission. This situation delayed pushing ahead with rural electrification (Schubert, 2004).

However, this was not the case with Guatemala, El Salvador and Panama. They adopted horizontal restructuring in 1996, in which the state electrical utilities were separated into different business units. Generation became a series of companies, as did the distribution system. The transmission system became the backbone for a competitive electrical market, with the generation companies competing to sell electricity to distribution companies and other major purchasers such

as factories or mines (Schubert, 2004). The distribution networks were owned and operated by private companies, like generation facilities. All three countries thus implemented a market-based approach that benefited them in three ways: large inflows of capital opened ways for building new assets; the power system gained higher efficiency because of pressure from competition; and government were able to pay off sovereign debt and avoid acquiring new debt. The success of these reforms provided the technical and financial basis for proceeding with rural electrification, the countries having taken the needed political decisions. (Schubert, 2004).

In Central American countries as is the case for most developing countries, the needed investments make huge demands on financial, technical and managerial resources. As it has been widely recognized around the world for most developing countries, debt based financing has not been able to provide the needed funds and tended to push sovereign debt to unsustainable levels. In addition, most of the existing electrical utilities operated with high technical and non-technical losses, making it even more difficult to provide access to electricity to a greater percentage of the population. (PREEICA, 2012).

3.6 Power Sector Reforms in Nicaragua

Since 1990, the country has made progress in achieving economic stability and controlling inflation. Change has primarily occurred in ending price controls, liberalizing markets and privatizing utilities, such as electricity and telecommunications, as well as financial services. Nicaragua has a small, open economy that depends heavily on trade, with exports representing 28% and imports 58% of GDP. (Nicaraguan Electrification Project, CIDA, 2008).

Its most important economic sectors are (a) manufacturing industries, (b) agriculture, livestock and fisheries, which render the country vulnerable to commodity price fluctuations, (c) minerals and (d) commerce. Nicaragua's private sector is dominated by a small number of large

formal companies that benefit from technological development, and a large number of small informal enterprises that lack access to technology, capital and investment. Approximately 70% of private sector operators in the agricultural sector hold merely 10% of land, whereas the largest 6% own 55% of agricultural land. Nicaragua's most important trading partner is the United States (accounting for one-third of total exports and imports), followed by other Central American countries. (Nicaraguan Electrification Project, CIDA, 2008, p. 5).

Nicaragua's low level of electrification has been identified as a major impediment to social and economic development. Approximately 31% of the population lacks access to electricity and it is estimated that more than 66% of the rural population lives without electricity. (Nicaraguan Electrification Project, CIDA, 2008, p. 6). Nicaragua's electricity sector combines public and private participation in a market arrangement that is facing major challenges. Until 1992, when Law 271 introduced the possibility of contracting independent power producers, the Instituto Nicaragüense de Energía (INE) - Nicaraguan Energy Institute - was responsible for policy, planning, and operation of all links in the electricity supply chain. As in other countries, initial reforms to the sector in Nicaragua, which were driven by technological advances and the difficult financial situation of public companies, were followed by competition-driven reforms to separate functions within the industry. (Electricity Sector Support Program IDB, 2007, p. 8)

Nicaragua's power sector was transformed from a system entirely dominated by one public monopoly to a competitive, market-oriented system with private sector participation. This transition began in the mid-1990s when Nicaragua introduced a series of reforms that sought to separate the operational functions in the sector from the regulatory and policy-making functions, while splitting various operational functions into separate firms to achieve greater financial

transparency and to facilitate private sector participation. (Nicaraguan Electrification Project, CIDA, 2008, p. 16).

The electricity market started operations in 2000, with a power generation and distribution structure that was very different than originally conceived. From the start of market operations until 2004, a rate transition period was established, by the end of which market prices would enter into force and transmission rates would be at levels sufficient to recover all costs. This transition period was extended, with negative consequences for the transmission company in particular. In the distribution segment, the private company has been unable to lower the 34.2% energy loss rate. In 2006, the rate was 26.6%, which is very high by any industry standard and constitutes a financial problem for the distribution company that has repercussions throughout the electricity supply chain. (Electricity Sector Support Program IDB, 2007, p. 9).

A World Bank policy note states that the results of the 1998 reforms have been disappointing. The report further explains that the sector performance was below expectations and could not attract private investment in generation. In 2006, the Nicaraguan electricity sector faced severe energy crises that led to blackouts across the country; the weakness of the sector's institutions was evidenced early on by their difficulty in implementing measures required by the Electricity Law. This led to confrontation between the authorities and the private operators, which escalated due to the unwillingness of the regulator to transfer to consumers the rise in oil prices experienced until mid-2006 (World Bank – Energy Sector Policy Note Nicaragua, 2012, p. 8).

In 2007, the Nicaraguan power sector underwent a new set of reforms primarily addressing the repercussions of the 2006 energy crisis. A new law was passed that created Ministry of Energy & Mines (MEM) and replaced National Energy Commission (CNE). MEM took responsibility of

policy making for the energy sector and devising overall development strategies, and INE was mandated to implement the policies and the law and undertake the tasks of regulation.

3.7 Takeaways from the Literature Review

Considering the above literature, we reach to this conclusion that achieving universal access to electricity cannot be attained by merely adopting power sector reforms or making the electrification model commercially viable. Universal access to electricity required government intervention in the form of cross-subsidization, this was evident from the U.S. and Canadian example. Power sector reforms are essential to make the operation of the power system sustainable, equitable and efficient, however, rural electrification will be a challenge until tariffs are structured in way that accommodates ‘the rich support the poor’ or ‘the strong supports the weak’ model.

In the process of building transmission lines and distribution network in rural areas, or designing and building a renewable energy distributed generation with mini grid in very remote areas, government subsidies and incentives to local cooperatives and communities are deemed to be inevitable. Local community’s engagement in the process of rural electrification is proven to be an effective method and expedites the process to a great extent. The notion of revolving funds for rural communities’ electrification also had positive ramifications, it kept the wheel moving and allowed system sustainability to be institutionalized.

It also seems that the adaptation of power sector reforms occurred in different phases and most countries have undergone through a transitive process. Power sector reforms were not implemented in one phase or pushed for results instantaneously, it was a gradual process based on a buildup approach. This also applies to achieving universal access to electricity. It took the United States 40 years to fully implement the rural electrification program since its inception in 1935. It can be inferred from the literature that the first phase of power sector reforms has been enabling

private sector investment in electricity generation through IPPs. This raised the debate of pricing and tariffs and led to establishing an independent regulatory body which is the second phase of adopting reforms. An independent regulatory body ensures fair prices for producers and consumers. Thirdly, privatizing or commercializing state-owned distribution networks. Privatization of distribution networks did not only play a pivotal role in bringing greater efficiency into the system by reducing technical and commercial losses, it also enhanced and expanded the electrification process.

4 Methods

To understand and institutionally analyze Afghanistan's power sector, the study will utilize Elinor Ostrom's Institutional Analysis and Development (IAD) Framework. The IAD framework is useful in deconstructing Afghanistan's power sector components and gives a tool of analysis to the researcher to uncover the complexity that has existed in the sector and allows researchers to comprehend the policy situation. According to Ostrom, IAD is a tool that can be used to analyze and devise policy interventions in a broad variety of political-economic situations (Polski & Ostrom, 1999). The IAD framework is a comprehensive and systematic method for forming policy analysis activities that is compatible with a wide variety of more specialized analytic techniques used in the physical and social sciences.

Ostrom states that it does not replace other techniques, but provides a means to synthesize the work of multiple participants, including those who are directly involved in the policy situation and have an interest in policy outcomes. The IAD framework helps analysts comprehend complex social situations and break them down into manageable sets of practical activities. When applied rigorously to policy analysis and design, analysts and other interested participants have a better chance of avoiding the oversights and simplifications that lead to policy failures. Thus, the

elements contained in a framework help analysts generate the questions that need to be addressed when they conduct an analysis. (Polski, Ostrom, 1999, p. 5)

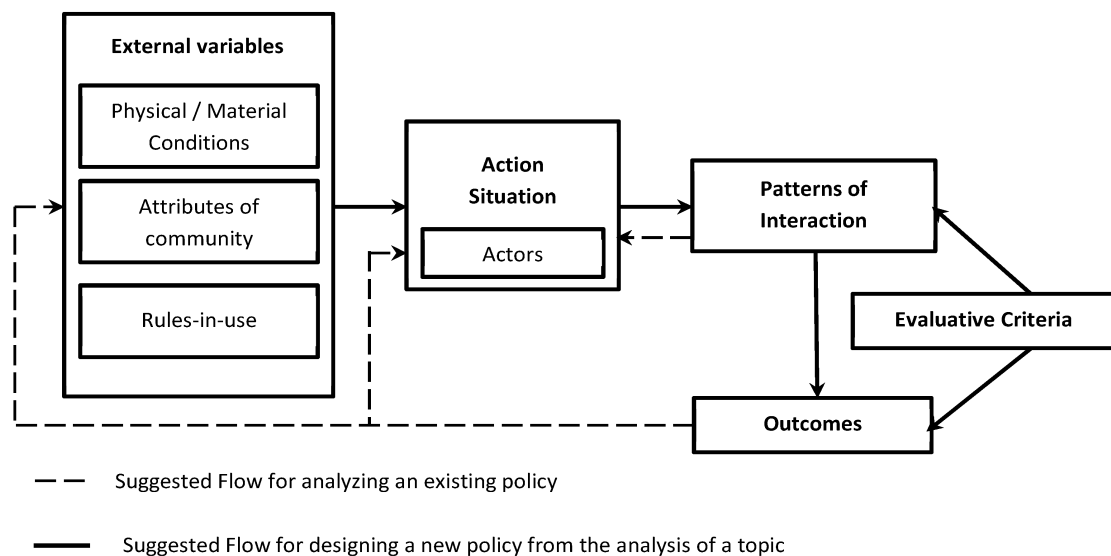
Ostrom defines a theory, that is used by an analyst to specify which working parts of a framework are considered useful to explain diverse outcomes and how they relate to one another. Micro-level theories including game theory, micro-economic theory, transaction cost theory, and public goods/common-pool resource theories are examples of specific theories compatible with the IAD framework. She further explains ‘Models’ that make precise assumptions about a limited number of variables in a theory. Scholars use models to examine the formal consequences of specific assumptions about the motivation of actors and the structure of the situation they face. (Ostrom, 2009).

The IAD framework helps to organize diagnostic, analytical, and prescriptive capabilities (Ostrom, 2011). The IAD framework provides mechanisms to disaggregate the complexity of activity in the state. By applying framework components accurately to a study area, the role of state institutions, social interactions, and the decision-making process come into focus for outcome analysis (Ostrom, 2009). The IAD framework has been applied as a research method and as a tool for policy analysis (Polski & Ostrom, 1999). Ostrom prefers calling it a framework rather than a theory or a model. A framework, according to (Ostrom, 2011), is a first step of theoretical analysis; it helps the researcher to identify, categorize, and organize the factors that influences policies. (McGinnis, 2011, p. 4; Ostrom, 2011, p. 8). Moreover, this framework equips the researcher with a set of categories for analyzing a policy situation. It identifies four relevant components as described by Ostrom: the context, the action situation, the patterns of interaction, and the outcomes. For Gibson et al (2005), the IAD deals with a policy as an action situation which is

surrounded by a specific context where actors communicate and interact to achieve a predetermined outcome.

The IAD framework (Shown in Figure 1) is intended to contain the most general set of variables that an institutional analyst may want to use to examine a diversity of institutional settings including human interactions within markets, private firms, families, community organizations, legislatures, and government agencies. Ostrom asserts that the IAD provides a meta-theoretical language to enable scholars to discuss any particular theory or to compare theories. (Ostrom, 2009)

Figure 1: Components of the IAD framework (Adapted from E. Ostrom, 2011, p.10)



To scrutinize and evaluate existing policies, the researcher and analyst have the liberty to start the framework from any of the four components. However, it is recommended to start from the action arena that explains the context and action situations. (Polski & Ostrom, 1999). This characteristic makes the IAD framework flexible. Polski and Ostrom (1999, p. 9) suggest analyzing each component in the order that best fits to the situation.

4.1 The Action Situation or Action Arena

According to Ostrom's explanation of IAD, the action arena component is the starting point of discovery from which research actions originate. It is the focal unit for analysis. Here, the analytical study of the situation begins in order to describe the structure of the situation. In effect, an action arena is like a dependent variable affected by other interests. Defining the scope is up to the research effort. (Ostrom 2007).

In IAD, the action situation refers to *"the social space where participants with diverse preferences interact, exchange goods and services, solve problems, dominate one another, or fight"* (Ostrom, 2005, p. 14). The action situation has seven key components: Participants in the situation; Participants' positions; Outcomes of participants' decisions; Payoffs or costs and benefits associated with outcomes; Linkages between actions and outcomes; Participants' control in the situation; Information. The Actors can be thought of as a group of stakeholders that may or may not be specifically aware of one another, or have distinct relationships. Their inclusion in a study is based on shared impacts in the action arena framework.

Starting the institutional analysis from the action situation component is more common, it gives the first glance of the overall policy environment. According to Polski and Ostrom (2005), analyzing the action situation from the outset helps the researcher and analyst to identify possible patterns of relationship and communication among actors and their positions of discretion. McGinnis asserts that action situation is the core component of the IAD framework, in which individuals (acting on their own or as agents of organizations) observe information, select actions, engage in patterns of interaction, and realize outcomes from their interaction. (McGinnis, 2011, p. 29).

From a practical point of view, the action situation box answers questions like: What are the positions or roles that actors play in a situation? What actions can participants take, and how are actions linked to outcomes? What is the level of control that each participant has over action in this situation? What outcomes are possible in this situation? What information does the actor know about the situation? What costs and benefits do participants incur when they act in a certain situation? (Polski and Ostrom, 1999). The framework underscores the importance of actors while they make decisions. Actors can be individuals or organizations. Some decisions will be made based on the rational choice theory while others will be the outcome of bounded rationality. The behavior of actors and how they view their beliefs, preferences and values play a critical role in their decision-making process (Polski and Ostrom, 1999).

4.2 External Variables

In the IAD framework, Ostrom and Gibson refer to the external or exogenous variables as a preset or context of the situation. The identification of rules in use, material conditions and attributes of community help in disaggregating the existing or predetermined context from actions undertaken by stakeholders in the action arena box (Ostrom, Cox and Schlager, 2014). Let us consider these three subsets of external variables in details.

4.2.1 Rules-in-Use

In the IAD framework premise, Rules-in-Use is referred to a certain type of institutionalized and accepted laws, manners, behaviors, attitudes, legislations and regulations by the actors of institutions. These rules are the integral part of the context of those institutions which the IAD wants to study (Crawford and Ostrom, 2005). For a researcher who undertakes institutional analysis as a method, understanding these rules become essential, without it, the

researcher cannot uncover or reach to the depth of problems existing in institutions (Ostrom, Cox and Schlager, 2014).

The IAD framework categorized rules by their impact on actors and action situation, which are divided into seven sub-categories (Ostrom, Cox and Schlager, 2014):

- Entry and Exit Rules: These rules affect the number of actors, resources and characteristics of entry and leave.
- Position Rules: These rules determine the position of actors in the situation.
- Scope Rules: These rules identify the boundaries of actions that affect outcomes.
- Authority Rules: These rules fix a certain number of actions that the actors can perform.
- Aggregation Rules: These rules have an impact on the level of control that participants possess while exercising an action.
- Information Rules: These rules are related to the actor's knowledge while making decisions.
- Payoff Rules: These rules assist the actors to perform cost and benefit analysis and determine incentives and tradeoffs.

4.2.2 Physical and Material Conditions

Vincent and Elinor Ostrom in 1977 defined the notion of 'public goods' in a way that made it easy for public policy stakeholders to deal with the matter in a comprehensible way. They also discussed the term 'common pool resources' which holds an important role in policy making process. According to Ostrom (1977), public goods are goods that can benefit people without anyone being excluded and the quantity of the good is not subtracted by its consumption (Non-excludable and non-rivalrous). Moreover, common pool resources are goods that can benefit

people without excludability, however, by more consumption of the good, the quantity is subtracted (Ostrom, Cox and Schlager, 2014).

Economists assert that the public provision of a public good or a common poor resource entails the free rider problem that becomes difficult to manage and leads to under investment in the capital and also creates hurdles in operation and maintenance (Ostrom, Cox and Schlager, 2014). Providers can address the tragedy of the commons problem by analyzing the revealed preferences of consumers; however, this is only possible when exclusion is of low cost to the supplier. On the contrary, when excludability is of high cost or impossible, then it becomes difficult to address this problem. Subtractability is equally difficult to manage in common pool resources, e.g. goods or services, that provided by the government. For instance, electricity is a subtractive service, one individual's consumption implies that some kWhs is subtracted or consumed from the overall quantity of energy produced. In other words, energy consumption is non-excludable but rivalrous. (Ostrom, Cox and Schlager, 2014).

4.2.3 Attributes of Community

Various norms, behaviors and attitudes adopted by a community affect the structure of an action situation in the IAD framework (Polski and Ostrom, 1999). Understand the accurate cultural context of a certain geography or community helps the researcher avoid overlooking important pieces or missing links related to actors and action situations because, according to Ostrom (1997), it has a direct impact on the action arena. Generalization of norms and cultural behaviors create misconception in analyzing situations pertaining to institutional analysis; thus, it is advised that researchers and policy analysts pay greater attention to disaggregating and differentiating among various grounded norms and cultures (Ostrom, Cox and Schlager, 2014).

4.3 Patterns of Interaction

Pattern(s) of interaction among actors in a certain action situation is described as a logical flow of policy information and structural characteristics stemming from external variables, i.e. physical conditions of the infrastructure, rules-in-use and attributes of community. Researchers and policy analysts are required to synthesize the information available – between action arena and the external variables – and draw logically possible patterns of interaction (Polski and Ostrom, 1999). For instance, in the case of universal access to electricity, if the electricity law stipulates that access to electricity is a right of every citizen, the government is mandated to provide it in a certain timeframe. The researcher looking at the physical/ material condition of the infrastructure and in this case, limited resources that cannot meet the demand of all citizens. The researcher hence draws a pattern of interaction that identifies demand outweighing supply and actors within the government will be pressurized to meet the growing demand (Polski and Ostrom, 1999). Also, Ostrom argues that institutional analysts may predict outcomes that are less likely because of weak inferences from more open and less constrained situation, thus, researchers are required to pay close consideration in distinguishing between constrained and ambiguous situations and inferring outcomes accordingly (Ostrom, Cox and Schlager, 2014).

4.4 Outcomes

In the IAD framework, outcomes are emerging through a logical flow from the patterns of interaction of actors in action situations, while considering physical conditions, attributes of community and rules-in-use (Polski and Ostrom, 1999). In this step, outcomes are not judged or evaluated based on the adopted policy objectives. Rather, the evaluation process is undertaken in the next step called ‘Evaluative Criteria’. Regardless of the evaluation of outcomes, the researcher tends to either predict forthcoming outcomes that will result from patterns of interaction or

highlight existing achieved outcomes that emerged from actors and action situation through patterns of interaction (Kwami, 2014; McGinnis, 2011).

4.5 Evaluative Criteria

Ostrom (2011) asserts that emergent outcomes can be evaluated based on a variety of criteria, however, in the IAD framework, she gives more weight to the following six: (1) economic efficiency, (2) equity through fiscal equivalence, (3) redistributive equity, (4) accountability, (5) conformance to general morality, and (6) adaptability (Ostrom, Cox and Schlager, 2014). Ostrom, Cox and Schlager argue that it is difficult to establish institutional arrangements that can wholly attain the mentioned group of evaluative criteria. The notion of trade-offs does exist in this context as well, equity-efficiency trade-offs are well-grounded and acknowledged facts that persist in institutions, and are accepted by bureaucrats and policymakers. Knott and Miller (1987) also look into the trade-offs between efficiency and accountability. They assert that organizations with more bureaucratic controls and monitoring tend to be less efficient. On the contrary, fewer control measures lead to efficiency, but less values and goals for citizens (Ostrom, Cox and Schlager, 2014).

4.6 IAD's Application in Afghanistan

Ostrom and Polski (1999) underscore the flexibility of IAD's application in various institutional arrangements or policy situations. The framework does not specify a single method for researchers to follow, rather, it gives a free hand to the researcher to apply it to the respective policy context and facilitates the ability to analyze the situation in a comprehensive way. Ostrom and Polski assert that analysis should be undertaken "in the order that makes the most sense" (Polski and Ostrom, 1999).

In this study, components of external variables like physical/ material conditions and attributes of community will not be given as much weight compared to rules-in-use. Given that the study focuses on institutional and policy constraints pertaining to universal access to electricity, hence, the action arena component will be studied in detail coupled with patterns of interactions and outcomes. However, a brief description about Afghanistan's power sector related to physical conditions of the infrastructure and attributes of the community will be highlighted in the study as well. Additionally, it is acknowledged that variables such as physical conditions and attributes of community are perceived to be important and can affect the action arena and patterns of interaction. However, these variables are not studied in depth compared to rules-in-use, action arena and patterns of interaction. It is recommended to study the effects and impact of both variables in future research.

5 Analysis

5.1 Afghanistan's energy sector – Current Situation

As have been said earlier, the current situation in Afghanistan demonstrates a poor electrification rate (with only 30% access to electricity nationally, and with the rural areas only at 9% access). More importantly, 75% of Afghans live in rural areas and 70% of the GDP comes from the same areas, where people don't have access to electricity, besides other basic needs such as standard classrooms, health care, food etc. (SIGAR, 2016). Afghanistan is rebuilding its energy sector and the country has made providing sustainable energy to its population a focus of its development efforts with the support of the international community. The average per-capita electricity consumption is between 100 to 150 kilowatt-hours (kWh) per person per year, ranking it among the lowest worldwide. It is estimated that the per capita energy consumption is expected to reach 220 kWh in the near future (RAGA Report, 2015). However, this energy consumption is far below

consumption rates when it is compared with countries in the region, such as Pakistan (~ 450 kWh), India (~ 700 kWh) and Sri Lanka (~ 500 kWh). With such low per-capita level of electricity access, the electrification inequality between urban and rural areas further signifies the challenge. (RAGA Report, 2015).

5.2 Rules-in-Use

5.2.1 Electricity Law

It took seven years for the Afghan government to draft, endorse and enact the electricity services law. The final version of the electricity law has been enacted by a presidential decree by President Ashraf Ghani on August 30th, 2015 (Electricity Law, 2015). The law stipulates that the citizens of Afghanistan should be provided access to electricity for a fair price and a “non-discriminatory access of the electric energy service providers to the market”. The law also makes MEW the custodian and the prime implementing actor of the law and asks for the establishment of the Energy Regulatory Authority (ERA) under MEW’s structure (Electricity Law, 2015).

The private sector of Afghanistan raised concerns over the independence of ERA and claimed that the electricity law is not investor friendly and requested the government to revise the document (Harakat and ACCI, 2014). Moreover, in terms of the content, the electricity law gives a broad mandate and scope of work for ERA, even a planning role like the preparation of the ‘national development program to provide access to electricity to rural areas of Afghanistan in collaboration with MRRD. This also overlaps with the scope of work of the Renewable Energy Department (RED) of MEW and MRRD ((Electricity Law, 2015). Statements like (Item 3 in Article 7: *Preparation of the National Development Program, rural electricity provide and the use of renewable sources in collaboration with the Ministry of Rural Rehabilitation and Development.*) create confusion and blur the role of ERA between a regulating body and a planning body. Chapter

8 (Support of Electrical Consumers) in Article 38, item 3, says there is a “right to use electricity”, but how does it deal with the cases where there is no access. Finally, Article 46 says that “MEW is required, to provide step by step access to the energy services in terms of quality and quantity in accordance with the objectives set forth in this Law and National Development in the country” but does not say what this means or how it would be implemented (Electricity Law, 2015).

5.2.2 National Integrated Energy Policy

The national energy policy outlines a broad scope for the energy sector in Afghanistan and makes MEW the prime custodian of the policy and mandates MEW implement the policy in the sector. Like the electricity law, the policy also underscores the provision of universal access to electricity to all Afghan citizens, the policy “ensures energy access to all in Afghanistan in an economically viable, reliable, socially equitable and environmentally sustainable manner” (NEP, 2016). However, the policy is formulated as intentions rather than decisions to be taken by the line ministries and neither specifies scope of work for the ministries. The policy recognizes that subsidies will be needed but does not indicate how and from where. It also recognizes the importance of rural electrification but suggests that the solution for provinces with low access to the grid lies in renewable energy (with no recognition of the absence of firm energy in trying to depend on renewable energy alone and the challenge this pose coupled with high upfront cost) (NEP, 2016).

In the ‘Pricing and affordability’ section, the policy highlights that lifeline tariffs and cross subsidization “would go” a long way to making electricity affordable without saying how this should work or where the needed funds would come from. It does recognize the importance of income generating activities in poor communities, without saying how this should be achieved. Furthermore, regulations and involvement of the private sector are greatly emphasized in the

policy, it highlights that the importance of independently operating energy utilities and mobilization of private sector investment, both require a strong regulatory function that controls the tariff setting. The electricity Law also says that the regulatory function will be “strong”, however, it could be highly politicized through the MEW and government because of not being independent, and could potentially become unable to protect the interests of both consumers and those providing the electricity (NEP, 2016).

In the taxation and subsidies section, the policy suggests that subsidies “may still be needed” and puts forward the pertinent example of needing to connect poor or remote communities and suggests the pertinent example of the importance of providing tax and duty exemptions for investors as one subsidy mechanism. However, the policy only sets a “medium priority” for two key elements in achieving universal access to electricity, namely “pricing and affordability” and “taxation and subsidies” (NEP, 2016).

5.2.3 National Renewable Energy Policy

The national renewable energy policy underlines the significance of renewable energy’s role in Afghanistan’s electrification. The policy underscores that Afghanistan has enormous renewable energy resources with approximately 318 GW installed capacity if all renewable resources are harvested. The policy mandates the RED in MEW implement the policy (NERP, 2015). The policy is categorized in two phases. Phase one runs from 2015 to 2021. This term is a preparatory phase for building institutions and enabling the environment for private sector investments. Phase two starts from 2022 to 2032. The policy calls this phase the deployment of renewable energy resources in full commercialization mode. (NERP, 2015).

Under the tariffs section, the policy says that “For Renewable Energy - diesel hybrid projects - tariffs will be based on replacement cost of diesel and/or prevailing tariffs whichever is

less”. This clause seems open for interpretation in many ways and could potentially cause confusion for the private sector, the utility and the ERA. Furthermore, in clause four, the policy says that “For off-grid stand-alone project- Tariffs will be on a mutually negotiated basis with an oversight provided by the Zonal Renewable Energy Center (ZERC) to ensure that vulnerable communities are not burdened with high and unaffordable tariffs for basic and essential electricity services” (NERP, 2015). It is unclear and doubtful that consumers in a grid based or off-grid projects will be able to afford tariffs that would allow a developer to make the needed investments and recover the investment and operation and maintenance costs, without subsidies coming from elsewhere (NERP, 2015). This issue, however, is not addressed in the policy under the tariffs sector or elsewhere.

Additionally, the policy under the ‘Regulatory Department’ explains that “the appropriate regulatory department shall have exclusive jurisdiction on those provisions of this policy”. It seems the policy has overlooked the enactment of the electricity law and the creation of the Energy Regulatory Authority (ERA). Perhaps the policy is being drafted before the electricity law’s approval and left the regulatory department section somehow ambiguous. The policy also states the creation of a mechanism called ‘basket-funds’ as a proper financing tool and in term two as an evolved financing institution to ensure the availability of adequate funds for renewable energy projects.

5.2.4 National Infrastructure Plan (NIP)

The National Infrastructure Plan (NIP) was presented to the international community at the Brussels Conference on Afghanistan in October 2016. Presentation of this plan is considered a sequel to the National Priorities Programs (NPPs) for the infrastructure cluster that was laid out in 2010 in the Kabul Process and which was later reaffirmed in the Tokyo Conference on Afghanistan

in 2012. The international community (i.e. development partners and donors) and the government of Afghanistan agreed upon what is called the ‘Tokyo Mutual Accountability Framework (TMAF)’. TMAF set out the foundation for Afghanistan’s vision for self-reliance and affirmed the international community’s long term partnership and commitment vis-à-vis Afghanistan (MoF, 2016).

The TMAF was updated in 2015 at a Senior Officials Meeting (SOM) as the Self-Reliance through Mutual Accountability Framework (SMAF). NIP, besides the ten other NPPs has been updated and refreshed through SMAF and Afghanistan’s National Peace and Development Policy Framework (ANPDF) in the Brussels conference. ANPDF is the government’s five-year strategy for achieving self-reliance goals and objectives, and provides high-level guidance to the government and stakeholders (MoF, 2016).

In the NIP under the energy sector section, the plan outlines several generation, transmission, substation and distribution projects. The plan states that ‘the grid network integration will be achieved through synchronizing the separate power supplies and linking the isolated transmission systems and islands’. The plan further states that national energy generation will be achieved through strategic investments in prioritized feasible hydropower/ multipurpose dams and in renewable solar energy plants. However, it seems that the NIP overstated the existing situation with regards to the regulatory landscape. The plan says, ‘efficient operating energy companies (DABS, Afghan Gas Enterprise), working in a regulated environment’. So far, the Energy Regulatory Authority, foreseen in the electricity law, has not been established yet. The plan further states that an ‘Electricity Board’ - for tariffs and licensing – should be established to act as the regulatory agency, which contradicts the first point that DABS and AGE are functioning in a regulated environment.

Under the new projects section, the NIP underlines the importance of having a unified national grid, the plan also states that besides, existing regional energy connectivity projects such as CASA 1000 and TAPI, new projects e.g. Turkmenistan-Afghanistan-Pakistan (TAP) 500 kV and The Kabul-Kunar River Basin (KKRB), which is a major potential source of hydropower in Afghanistan, have been added in the NIP.

5.3 Physical/ Material Conditions

As stated in the Rules-in-use section, the Electricity Law and the National Integrated Energy Policy define universal access to electricity as an important goal for the government, hence the discussion of electricity provision becomes essential. Bernell and Simon (2016) call energy a marketable good though it is perceived as a public good in the eyes of the public (Bernell & Simon, 2016). However, Schulze et al. (2008) state that some components of the electric system e.g. reliability, voltage, frequency are considered as a public good. The authors argue that power quality and reliability are prone to the free rider problem, because consumers vary in their preference for valuing reliability, and this results in a market effect that will have the tragedy of the commons.

Consumers can respond in two ways: one is to not free ride, second to install their own emergency standby generation. If adopting a standby generation is efficient and least cost solution, then it is likely that the consumers disconnect themselves from the grid (Schulze et al, 2008). If the solution is not least – cost, then a central regulatory authority’s role is inevitable to ensure cost-effective reliability, voltage, and frequency for the grid, all of which are called public goods by Schulze et al. Furthermore, the literature describes the reactive power as a necessary private good to produce public goods (e.g. voltage and reliability). Schulze et al (2008) argue that reactive power

in an electric network is sometimes ‘mistakenly described as a public good’ because it is used in the production of voltage and reliability, but actually it is a private good (Schulze et al, 2008).

In the case of Afghanistan, DABS – the 100% state owned company - is the sole power generator, transmitter and distributor thus far. However, with the enactment of the electricity law, Independent Power producers (IPPs) can invest in the generation and distribution companies and can invest in distribution network. With regards to Afghanistan’s grid (shown in Figure 2), it operates in nine different ‘islands’ – power grids – depending on power supply sources. This means that different regions are supplied by different sources, and due to technical limitations, these regions, are not interconnected – or synchronized. For instance, Turkmenistan’s network supplies power to the northern provinces of Faryab, Jowzjan and Sar-e Pol and, on a separate network, partly to Herat. Uzbekistan supplies Parwan, Samangan and partly Kabul. Tajikistan supplies Baghlan, Balkh, Kunduz and Takhar provinces and, in summer, it transmits power to Kabul (in winter, Tajikistan faces electricity shortages itself), while Uzbekistan additionally feeds Balkh province in summer. Iran supplies electricity to partly Herat and Nimruz provinces. The south of Afghanistan, that is, Kandahar and Helmand provinces, are supplied partly by the Kajaki hydropower plant and by diesel generators. Other domestic hydropower generation covers some of Kabul’s needs.

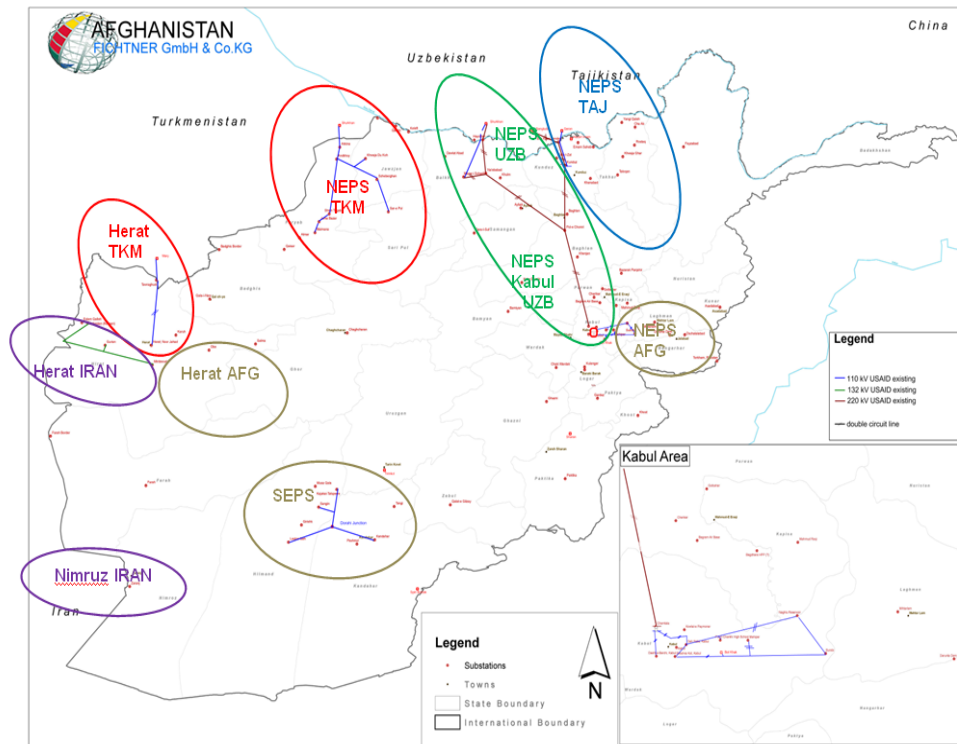


Figure 2 Afghanistan Power System - Nine Islands. Source: Power Sector Master Plan (PSMP)

5.4 Attributes of Community

Afghanistan has experienced constant conflict since 1978 when the Saur Revolution took place and resulted in the assassination of Mohammad Daud Khan. This assassination triggered the USSR invasion of Afghanistan that lasted for ten years and 1.5 million Afghans lost their lives, the infrastructure of urban centers and rural areas were also affected by this long war. After the Soviet Union withdrawal, the Afghan civil war started and ended with 60,000 lives being lost. The Taliban emerged in the mid 90s and the chaos continued until late 2001. The U.S. invasion of Afghanistan started in October 2001 after the September 11 attacks. War and conflict persist, but only in rural districts of Afghanistan. The Afghan community with a forty-yearlong conflict history has been deprived of many basic services, one of them is electricity. In 2001, it was reported by DABM (previous version of DABS – a government enterprise) that about 5% of Afghanistan's population had access to electricity with less than 100,000 households connected to the grid

(NESP, 2013). In 2016, 30% of Afghans have access to electricity with 1.2 million households are connected to the grid, yet 70% of the population have no access to electricity.

We have applied the external variables box of the IAD framework, as shown in (Figure 3).

The next step is to apply the Action Situation and Actors boxes.

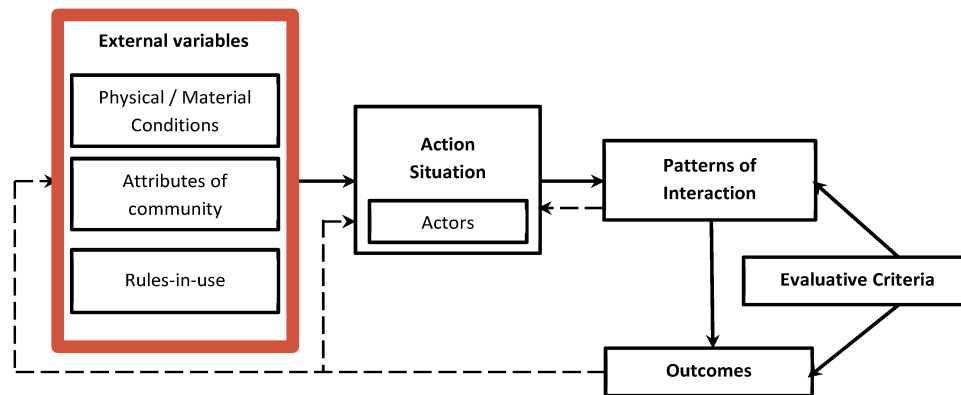


Figure3 External Variables Box in the IAD Framework

5.5 Action Situation

The institutional framework for Afghanistan's energy sector is constituted of five government ministries and one national power utility. At the top, there is the Ministry of Energy and Water (MEW) in charge of the overall energy sector, including electrical and thermal energy. The MEW is responsible for framing of policies, implementation of regulation and oversight on the energy sector. Da Afghanistan Breshna Sherkat (DABS) is a 100% state-owned – monopolist - power utility that is mandated to generate, transmit and distribute electric energy in the country. The scope of Renewable energy is shared by Ministry of Rural Rehabilitation and Development (MRRD) and MEW. While MEW has the overall policy, master planning and oversight on the energy sector, MRRD is in charge of off-grid projects and all other initiatives in the renewable energy sector up to the threshold of 200 kW and located within the jurisdiction of the MRRD. Especially, the projects' handover process that will be discussed in the upcoming sub sections have several challenges (RAGA Report, 2015).

Engagement of line ministries like the Ministry of Agriculture, Irrigation and Livestock (MAIL), Ministry of Urban Development Affairs (MoUD) and other ministries are envisaged for specific activities such as solar home lighting and solar thermal based water heating projects, or for agricultural pump-set programs. These ministries complement MEW and MRRD efforts on development of the energy sector. Involvement of Ministry of Economy and Ministry of Finance are required to ensure that energy sector development is mainstreamed within the national planning processes (RAGA Report, 2015). The Inter-Ministerial Commission for Energy (ICE), which is chaired by the Minister of Economy, plays a strategic role in stakeholder coordination and the determination of action plans, programs and policy recommendations on all aspects of the energy sector in Afghanistan. (ICE, 2015).

5.6 Actors

5.6.1 Ministry of Energy and Water (MEW)

MEW is responsible for policy, planning, renewable energy and for the time being, the regulatory framework of the energy sector. Preparing feasibility studies on hydro power plants is also a core component in MEW's scope of work. In collaboration with Ministry of Mines and Petroleum (MoMP) MEW provides estimates on the overall natural resources available for energy production e.g. coal, gas, oil, hydro, solar, wind, biomass, geothermal etc. Before the establishment of DABS, MEW was the key agency for project implementation such as hydro power plants, transmission lines, substations and distribution networks.

When DABS established and start functioning, some of the development partners e.g. the Asian Development Bank, USAID, the World Bank signed agreements with DABS as a project executor for the power sector. However, the German development bank (KfW) and GIZ currently undertake project implementation with MEW. The scope of work of MEW that outlined in its

official website encompasses the survey and design of generation, transmission and distribution projects. This scope of work largely overlaps with the scope of work of DABS, especially in surveying and detailed planning of distribution network.

In the previous organization structure of MEW, a department called WAPECA, which meant an engineering, surveying and designing consulting department. This department had the expertise of surveying and designing distribution networks with voltage levels from 20 kV to 0.4 kV. Before the creation of DABS, WAPECA was the primary source for designing distribution networks for the Afghanistan grid. In the new organizational structure of MEW, the WAPECA department has been embedded in the engineering department retaining most of the survey and design tasks. MEW is also responsible for updating the Power Sector Master Plan (PSMP), the final report of PSMP completed in 2013. PSMP outlines demand forecast, generation and transmission network expansion and optimization results for the most optimally feasible projects.

5.6.2 Ministry of Mines and Petroleum (MoMP)

The MoMP is responsible for effective and efficient governance and utilization of natural resources (all minerals and hydrocarbons in and on earth) that can contribute in growing the economy, as well as enabling private investments in minerals and hydrocarbon sectors, and raising the level of revenue and improving the capacity of the Government. Thus far, the minerals law, hydrocarbons law and hydrocarbons regulations have been drafted, approved and enacted by the government. Both laws mandate the Ministry of Mines and Petroleum (MoMP) to be the implementing agency and prime custodian and decision maker of Afghanistan minerals. Additionally, the two laws envisage a creation of Inter-Ministerial Commission to oversee the process of tendering, and endorse or reject licensing and royalty proposals by MoMP (Minerals Law, 2014; Hydrocarbons Law, 2009).

With regards to energy, it is ambiguous and apparently not specified anywhere that how MoMP and MEW should coordinate and work together on making plans for coal, natural gas and oil. Currently, it seems it is based on ad hoc bases and when certain project concepts brought to the discussion table. Moreover, the national integrated energy policy stipulates that coal, natural gas and oil come under the scope of work of MEW, and on the other hand the minerals law and hydrocarbons law state that it's the scope of work of MoMP. This distinctive overlap perhaps could create complexity and confusion vis-à-vis projects' planning and implementation.

5.6.3 Ministry of Rural Rehabilitation and Development (MRRD)

The MRRD has been mandated with planning, implementation and oversight of all non-farm programs in rural Afghanistan. Part of MRRD's scope of work and responsibility includes supporting energy infrastructure in rural areas. Through its provincial offices, MRRD has a point of liaison with provincial governments. It manages the National Solidarity Program (NSP), through which traditional local Jirga and shuras are formed into local Community Development Councils (CDCs), and are trained and empowered to undertake local development. MRRD has been the principal arm of the Government in promoting rural electrification through its programs: NSP has supported energy access to rural areas through the installation of micro-hydropower plants, solar home systems and diesel generators. MRRD launched Energy for Rural Development in Afghanistan (ERDA) under the National Area-Based Development Program (NABDP) in 2008 to address sustainability issues related to rural energy projects. ERDA is currently a stand-alone component of the Agriculture and Rural Development Cluster National Priority Program, 'National Water and Natural Resources Development' (MRRD, 2012).

One important issue that the MRRD has struggled with is the sustainability and longevity of energy projects implemented in rural areas of Afghanistan. It has been reported that 70% of the

installed micro hydro and solar projects are no longer operational, because after completion, these projects were handed over to the community without adequate operation and maintenance (O&M) capacity and could not last long. Ostensibly, MRRD has no practical solution to this challenge as of now, because unlike DABS, MRRD does not have the technical manpower to operate and maintain small scale projects i.e. less than 100 kW, where it is also economically not viable to deploy technicians at numerous sites in remote areas of the country. DABS are only interested in taking over renewable projects that are profitable or at least not running at loss and which are close to urban centers. Hence, this challenge is currently under discussion among MEW, MRRD and DABS to find out ways to address it. One of the potential models that are under discussion is engaging a combination of the private sector and the community.

5.6.4 Ministry of Finance

The Ministry of Finance (MoF) is mandated to devise, manage and execute the national budget, collect taxes, organize and control public expenditure, process payments and disbursements and manage Customs. The national budget of Afghanistan for FY 2017 is \$6.659 billion, 63% of the budget is funded by development partners, this comprising 100% of development budget and 70% of ordinary/operations budget (MoF, 2016). This indicates that Afghanistan is heavily reliant on external financial resources and underscores the importance of MoF's role in dealing with international development partners. MoF is the prime liaison for donor governments, Multilateral Development Banks (MDBs) e.g. World Bank, Asian Development Bank (ADB) and other development partners to negotiate and sign grant and loan agreements.

One issue that is pressing with regards to the role of MoF in dealing with grant and loan agreements with development partners, is the selection and prioritization of various projects, including energy projects. Due to multiple factors, there is a lack of technical capacity in MoF to

synthesize and prioritize energy projects and make sure they are consistent with the master plan requirements. Other factors include political influence from Members of Parliament (MPs) that have vested interests in pushing forward certain projects and donor agencies sometimes push their list of projects without considering the technical ramifications. The list of budget requisition and allocation is sent by respective ministries to MoF, and then MoF along with development partners decide which projects to select and prioritize.

5.6.5 Ministry of Economy (MoEc)

MoEc is responsible for economic development planning and policy. MoEc is mandated to coordinate development plans among all ministries and undertake Monitoring and Evaluation (M&E) measures during and after project implementation. MoEc also provides estimates and data on poverty reduction, education, and infrastructure sector indicators. Energy sector line ministries send their list of proposed projects before every fiscal year for MoEc's review and at the end of the year, ministries submit their projects' progress report and performance to MoEc.

Minister of Economy is appointed as the chairman of the Inter-Ministerial Commission for Energy (ICE) by a presidential decree in 2008 to oversee the energy sector as a whole and create the coordination mechanism among several actors that comprises government agencies and international development partners.

5.6.6 Da Afghanistan Breshna Sherkat

Da Afghanistan Breshna Sherkat (DABS) is a 100% state owned company established under the 'Corporations and Limited Liabilities Law' of Afghanistan. DABS is a limited liability company with all its equity shares owned by four ministries: Ministry of Finance (45%), Ministry of Energy and Water (35%), Ministry of Economy and Ministry of Urban Development, each 10% (DABS AoA, 2008). The company was corporatized on 4th May 2008 and replaced Da

Afghanistan Breshna Moassassa (DABM) – government enterprise - as the national power utility. DABS' headquarters (DABS Corporate) is located in Kabul and it maintains regional departments in Kabul, Parwan, Kunduz, Balkh, Herat, Nangarhar, and Kandahar provinces, as well as 10 sub-regional offices, including an office in Helmand. DABS main responsibilities and duties as per its articles of associations (AoA) are: To provide its customers with cost-effective, reliable, and safe electricity supply; To purchase and procure cost-effective electricity from sources within and outside Afghanistan; To sell electricity to foreign [countries] when necessary; and, To design, establish, manage, maintain and oversee power generation facilities, transmission and distribution systems, including substations, transformers, cable networks, and dispatch and control systems (DABS AoA, 2008).

5.6.7 Inter-ministerial Commission for Energy (ICE)

The Inter-Ministerial Commission for Energy (ICE) was established by a Presidential Decree on 7 November 2006 to provide a platform for coordination for energy sector activities in Afghanistan (President's Office, 2006). The ICE is chaired by the Minister of Economy and includes all the major energy sector stakeholders in Afghanistan (government ministries/agencies and development partners). ICE brings together 40 to 50 representatives from various government agencies, embassies, Multilateral Development Banks (MDBs), private sector, environmental organizations and NGOs to talk about pressing issues of the energy sector in Afghanistan. This setting is perceived to be vital for coordination and harmonization of agendas and plans of the stakeholders, however, from a practical point of view, no executive decisions are made during the ICE meetings. ICE meetings are meant to share information with a wide array of participants and update each other on progress reports and exchange portfolio performances.

5.6.8 International Development Partners

Several International development partners are engaged in Afghanistan's energy sector; I will briefly mention them and their role below:

1. The US Government – USAID, US Army Corps of Engineers (USACE): The US Government has been involved in funding energy projects in Afghanistan since 2003. USACE had a separate portfolio until 2016 and implemented all its projects off-budget. Off-budget implies funds not being channeled through Afghanistan treasury system and projects are neither selected nor approved by the Afghan government, however, USACE had consultation with the Ministry of Energy and Water to coordinate the implementation of the projects. For instance, issues such as land acquisition and resettlement, choosing location for substations and agreeing upon transmission line routes. Similarly, USAID's portfolio was off-budget until 2014, and then aligned its projects through the national budget of Afghanistan. The US congress appointed 'Special Inspector General for Afghanistan Reconstruction' (SIGAR), which reports that the US government spent nearly \$3 billion in the energy sector since 2002 (SIGAR, 2016).
2. Asian Development Bank (ADB): ADB is the largest on-budget donor in the energy sector. ADB has a portfolio of \$1.1 billion in the energy sector that includes projects implemented, ongoing and approved by the board of the bank. Moreover, ADB assisted MEW through a Technical Assistance (TA) project to devise the Power Sector Master Plan (PSMP) in 2013, besides numerous other TA projects (ADB, 2016).
3. The World Bank (WB): The WB has an energy portfolio more than \$330 million in Afghanistan that is comprised of completed, ongoing and approved projects. The WB

assisted the Afghan government in rehabilitating some of old inactive hydropower plants (The World Bank, 2016).

4. Other development partners such as KfW (The German Development Bank), GIZ (The German Federal Enterprise for International Cooperation), Government of India, Japan International Cooperation Agency (JICA), Department for International Development (DFID) of the UK, and French Development Agency (ADF), United Nations Development Program (UNDP) and United Nations Environment Program (UNEP) have contributed to the sector as well, on projects ranging from rehabilitating old hydropower plants to building transmission lines, substations, distribution networks. They provided technical assistance in energy efficiency, renewable energy, rural electrification, climate change adaptation etc.

5.6.9 Private Sector

Private investments in the energy sector were largely absent until 2009 and 2010. The Afghanistan National Development Strategy (ANDS) in 2008 highlighted that “The ANDS strategic objective is to enable the private sector to lead Afghanistan’s development within a competitive market-based economy in which the Government is the policy maker and regulator of the economy, not its competitor.” The ANDS further clarified that “the establishment of a strong enabling environment for a competitive private sector is an on-going effort by both the Government and donors.” (ANDS, 2008). This government strategy document underlined that privatization and corporatization of state owned enterprises is an on-going program that is on schedule. The ANDS, which was an agreed upon document by all development partners in 2008 and asserted that the private sector development strategy attempts to encourage increased private

sector investment by creating investor friendly regulatory frameworks for private sector operations in the development of natural resources and infrastructure, including the energy sector.

As it is explained in the next section (Patterns of Interaction) that while the private sector could not participate in investing in the energy sector of Afghanistan, the first efforts that made was outside of the regulatory framework was for the Sheberghan IPP. Then in 2011 and 2012, private companies started to approach MEW directly asking for a generation license. MEW could not issue the generation license because the electricity law was not approved and there was no legal basis for MEW to proceed without a regulatory framework. A number of generation licenses were issued exceptionally prior to the approval of the electricity law by MEW getting instruction from a cabinet meeting decision in 2014. However, Electricity Regulatory Authority (ERA), that was stipulated in the electricity law, is still not established by MEW and the private sector has not made a significant contribution to the sector thus far. I will explain the reasons in the next section and in the outcomes section. It is worth mentioning that in late 2016, the Afghan government approved the Public-Private Partnership (PPP) policy that was conceived as a welcome step towards enabling private sector participation. The PPP department just started its activities in Ministry of Finance in 2016.

Figure 4 demonstrates that we have applied the Action Situation and Actors boxes of the IAD framework on Afghanistan's power sector. In the next step, we will analyze the Patterns of Interaction box.

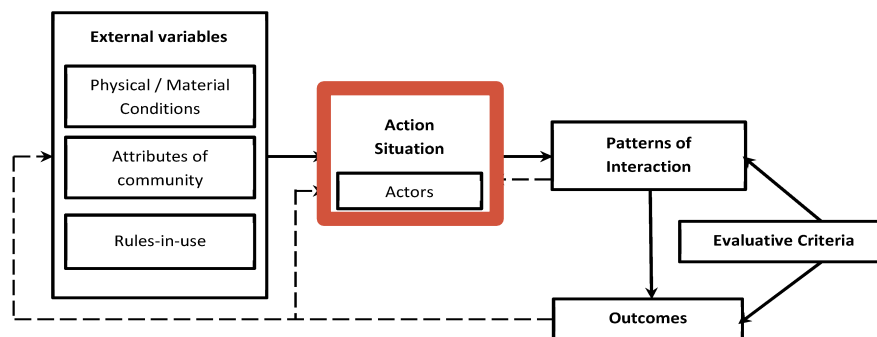


Figure 4 The Action Arena Box of the IAD Framework

5.7 Patterns of Interaction

5.7.1 Overlap and Contradiction in Mandates and Jurisdictions

As has been alluded to in the Actors section, there are overlaps and in some occasions contradictions in mandates, jurisdictions and scope of work of the Ministry of Energy and Water (MEW) and Ministry of Mines and Petroleum (MoMP); MEW and DABS – the national power utility; MEW, Ministry of Rural Rehabilitation and Development (MRRD) and DABS. This pattern of interaction pinpoints the characteristics of these overlaps, duplications and possible misperception of roles of the actors that interact with each other:

With regards to MEW and MoMP, policies, laws and Terms of Reference (ToR) for both ministries are not drafted in harmony and consolidation. The national integrated energy policy stipulates that coal and hydrocarbons are within the scope of MEW and, on the contrary, the minerals law and hydrocarbons law, limit both components to MoMP's scope of work. For instance, the hydrocarbons law stipulates that “the Ministry of Mines and Petroleum (MoMP) shall be the competent authority for granting a license for oil and gas operations, provided for in this Law.” (MoMP, 2013). Moreover, the National Integrated Energy Policy (ANEP) states that “the scope of ANEP, covers all forms of energy including mechanical, thermal, chemical and nuclear, and all fuels that are used to generate these forms of energy, including fossil based and renewable.”

The policy further asserts that all inter-sectoral policy issues such as extraction, generation, transmission, distribution, and usage are also within the scope of this policy. ANEP or the national integrated energy policy makes MEW the custodian and the prime implementing agency of the policy, but the Minerals law and the Hydrocarbons law, totally overlooks the role of MEW in the sector.

The real concern arises when the following questions are on the table: how and when should resources like coal, oil and gas be utilized? Similarly, who should devise the plan and which agency is more appropriate to make the final decision? If it is not a single ministry decision, then, based on what coordination framework the planning and project prioritization should be streamlined? This ambiguity had created problems and will continue to create more challenges in the future. Similarly, the Minerals and Hydrocarbons Laws exclude the Ministry of Energy and Water from the Inter-Ministerial Commission of Minerals and Hydrocarbons. A commission that makes all of its decisions on mining concessions and licenses, including coal and hydrocarbons. Surprisingly, ministries like commerce and departments such as national environmental protection and standards authority are members of the commission, but ministry of energy and water are excluded. This is conceived to be a policy and an institutional gap in the sector.

One instance of the above is the Sheberghan Gas Development Project. This was a USAID initiative that started in 2005 by mobilizing a consulting firm (Advanced Engineering Associates International (AEAI)) to undertake a feasibility study of a possible gas fired power plant scenario in Sheberghan Gas fields that are located in the north west of Afghanistan. The AEAI, in its 2006 feasibility study concluded that “the project is an excellent opportunity to gain high impact results consistent with the strategic objective of USAID/Afghanistan and other donors in Afghanistan.” (USAID, AEAI, 2005). The study further asserted that “sufficient indigenous and proven gas

reserves are likely to exist to fuel the planned 100 MW power plant for its 20-year design life and the Sheberghan Project is the most expedient and least cost option for generating electricity. The technology is reliable, allowing for flexibility and providing critically needed system stability.” (AEAI, 2006). Surprisingly, this feasibility study prepared for the MEW and was not addressed to the Ministry of Mines and Petroleum.

After five years in 2010, the USAID again mobilized AEA I to conduct yet another set of studies to evaluate the feasibility of Sheberghan Gas project, however, this time, the USAID proposed changes in the model, the project instead of being donor funded, should be private investor funded and increase the capacity from 100 MW to 200 MW. The AEA I in its 2010 ‘Gas/Power and Related Infrastructure Assessment’ report asserted that “the main objective of the Sheberghan project is to design a roadmap for the development of Sheberghan gas fields and to attract a private investor to construct and operate a 200 megawatt (MW) gas-fired power plant in Sheberghan in the form of an Independent Power Producer (IPP).” (AEAI, 2010). The report anticipated that Afghan Gas Enterprise (Afghan Gas – A government enterprise) will play a major role in supplying gas to the IPP, and undertake the development of the gas fields. AEA I, an American consulting firm, further elaborated in the report that “since coordination and collaboration among all stakeholders is essential to the success of this project, Sheberghan Gas Field Development Project (SGFDP) has established the Sheberghan Project Management Unit (PMU) at the Afghan Geological Survey in MoMP to track Sheberghan gas and power related activities and associated infrastructure.” (AEAI, 2010). This time, all reports have been addressed to MoMP and MEW have been overlooked by USAID and AEA I.

The AEA I report gives us the impression that the situation looks easy and manageable, but it is not. Twelve years have passed since the USAID, MoMP, MEW, DABS, Afghan Gas and ADB

started their hard work to implement a 200 MW gas fired power plant in Sheberghan, but the project has not started yet. It is still on paper. The question is why did it take nine years for a simple 200 MW gas fired power plant to be built in Afghanistan, especially when you have the full support of development partners like USAID and ADB? The Special Inspector General for Afghanistan Reconstruction (SIGAR) carried out an investigation and highlights the following in its reports to the US Congress, Department of State and Department of Defense: SIGAR found that the U.S. government did not have a unified strategy for the development of Afghanistan's extractive industries. Instead, Task Force Business Stability Operations (TFBSO) (a US Department of Defense Division) and USAID pursued divergent approaches to guide their initiatives. Furthermore, SIGAR found that the USAID consultants had not adequately communicated their development strategy and goals to all the relevant stakeholders at MoMP. SIGAR's report further criticizes TFBSO and USAID's strategy vis-à-vis Afghanistan's hydrocarbon sector. The report asserts that the USAID and its consultants have not created plans to ensure the sustainability of programs like the Sheberghan Gas and its capacity building initiatives for the Ministry of Mines and Petroleum. The report highlights that this is contrary to the USAID 2011-2015 Policy Framework, which states that building in sustainability from the start of a program is an operational principle and calls for building skills, knowledge, institutions, and promoting incentives that can make development processes self-sustaining (SIGAR, 2015).

The second overlap and contradiction is between MEW and DABS. As have been discussed in the Actors section, there is twofold confusion between the jurisdiction of MEW and DABS. Power system planning and project implementation are part of the scope of work of the two organizations. MEW surveys, designs and implements transmission lines, substations and distribution networks, and DABS also does the same thing. The electricity law and the national

integrated energy policy or other policies that relate to energy do not stipulate project implementation or surveying or designing of power system projects e.g. transmission lines, substations and distribution network for MEW. It is mainly because these projects will eventually be operated and maintained by DABS. Another challenge that emerged from this confusion is the proper handover of energy projects.

Transmission lines, substations and distribution networks that were implemented by MEW faced delayed handover and logistical problems while transferring them to DABS. All the transferred projects are supposed to be registered as DABS assets and should be reflected in DABS balance sheet, for instance, the Afghanistan – Tajikistan Regional Power Transmission Interconnection Project (ADB, 2011) that was funded by ADB and whose grant and project agreements were signed with Ministry of Finance in 2011 and which made MEW the executing agency. Given that the project initiated in 2007 (ADB, 2007) and DABS was not established and its predecessor, DABM, operated the power system, DABM was assigned to undertake the O&M responsibility when the projects are completed.

The line was officially energized in October 8th, 2011. It was commissioned on October 27th, 2011 and taken over by DABS for commercial operation (ADB, 2014). However, because of the urgency of the matter, DABS took over the three transmission lines with a total length of 157 km from the Sherkhan border with Tajikistan to the Puli-Khumri substation and the three substations at Kunduz, Baghlan and Puli-Khumri all at once in order to provide electricity to its customers. The transfer of the proper documentation and assets registry did not take place as it was supposed to and be properly reflected in the DABS balance sheet, according to the project completion report by ADB. (ADB, 2014). The transfer of spare parts and O&M manuals are all important and did not happen properly due to two separate organizations with different mandates

communicating with each other. The Afghan – Tajik regional power transmission interconnection is just one instance, almost all power system projects that are implemented by development partners through the off-budget process (money disbursement is not channeled through the Afghan national budget, rather contractors and consultants are directly hired and paid by donors and development partners) or through MEW have experienced similar problems.

Another facet of overlap and contradiction in mandates between MEW and DABS is the role of both organizations in designing distribution networks. As has been stated in the Actors section, a department called Water and Engineering Power Company of Afghanistan (WAPECA) is part of MEW's organizational structure. WAPECA is an engineering, surveying and designing consulting firm for the government. WAPECA, in the 1970s and 80s offered its electrical engineering services to MEW and DABM, which at that time was all a government owned and government run system. This department had the expertise needed for surveying and designing distribution networks with voltage levels from the medium level voltage to 0.4 kV. WAPECA supported DABM (Pre-version of DABS, a government enterprise) in undertaking the technical design tasks. However, when DABS was established in 2009, it had its own departments for designing distribution networks, and WAPECA remained under MEW's structure. WAPECA with its full personnel of engineers and designers still exist in MEW and its existence basically duplicates of the skills within DABS. It has not been discussed between MEW and DABS to transfer the WAPECA department to DABS and it seems that MEW wants to retain it under its structure (MEW, 2016). It is an important institutional and policy question needing resolution on whether WAPECA should remain in MEW's structure given that MEW has no role in distribution networks and existing and forthcoming distribution networks will be operated by DABS. Can

WAPECA be an independent government owned consulting firm in the energy sector? If yes, then MEW should rethink its organizational structure.

The second confusion in the mandates of MEW and DABS is whom international development partners should work with. ADB signed agreements with DABS from the beginning, USAID and World Bank joined later. KfW and GIZ still have power system projects with MEW. This split among the development partners further confuses the mandates. Apart from development partners, the ministry of finance receives budget requisitions for transmission lines, substations and distribution networks from MEW and DABS at the same time. Since the creation of DABS in 2008, the development budget of both agencies has kept the number of different transmission lines, substations and distributions almost equal. The national budget example in the energy sector will be explained in projects prioritization and selection's section.

The third overlap and contradiction is among DABS, MEW and MRRD with regards to renewable energy projects implementation and operation and maintenance. The Renewable Energy Policy stipulates that projects with more than 200 kW installed capacity is the jurisdiction of MEW. However, MEW does not have the required staff to operate and maintain those projects. Unlike DABS, MEW and MRRD do not have the technical manpower to operate and maintain projects greater than 200 kW in the case of MEW nor less than 200 kW in the case of MRRD, including deploying technicians at numerous sites in remote areas of the country. As I alluded to in the Actors' section, MRRD through its rural development programs has approximately implemented 4,549 off-grid renewable energy projects in Afghanistan. Out of this number, 2,186 are mini hydropower, 2,358 are solar and 5 are wind energy projects. These small scale off-grid projects added 50 MW to Afghanistan rural areas (ICE Report, 2016). The off-grid projects less than 100 kW in installed capacity are intended to supply power to local communities. Because of the

conflict in mandates, DABS cannot extend its scope of work to remote areas to operate and maintain projects less than 100 kW in size which are dispersed across the country. The National Solidarity Program (NSP) intended to engage the community and that all projects after completion be handed over to the local people. As mentioned, 70% of the off-grid renewable energy projects are no longer operational because the community did not have adequate O&M skills to take care of them and also because of some other technical irregularities. DABS is only interested in taking over renewable projects that are profitable or at least not running at a loss and which are close to urban centers. Hence, this challenge is currently under discussion among MEW, MRRD and DABS to find ways to overcome it. One of the potential models that are under discussion is a private sector approach with community involvement.

5.7.2 Role of International Development Partners

Since 2002, energy sector planning efforts have been undertaken by the international development partners, either directly or by providing technical assistance. The role of the Afghan government was minimal. Besides funding energy projects, international development partners invested heavily in institutional and personnel capacity building, however, the outcome seemingly looks not to meet expectations, despite fifteen years of consistent spending on capacity building. SIGAR, RAGA, ADB and World Bank assessments and evaluation reports assert that the institutional and personnel capacity of the Afghan energy sector is still weak and incapable of carrying out all the sector tasks e.g. policy, regulatory, planning, project implementation, and operating an electrical utility among others alone by Afghans. The sector is not only predominantly reliant on foreign aid, but it requires technical assistance in all facets of the sector.

The important issue with regard to international development partners' role in Afghanistan's energy sector is the lack of a unified and agreed upon development agenda. Each

development partner (donor) pursued its mission and development mandate in Afghanistan and perhaps in many occasions gave priority to its own mission instead of to the Afghanistan government's development goals, plans and priorities. I refer to the trajectory of the past fifteen years where most of the foreign aid was spent off-budget by donors and the on-budget funding was also non-discretionary. Non-discretionary funding was allocated for specific projects endorsed by the development partner. The government of Afghanistan has minimal or almost zero influence and role in off-budget projects' planning, design and implementation. The on-budget package is also divided into two sections: discretionary and non-discretionary. The discretionary portion is the smallest in the budget and it is the only part where Afghan ministries can propose a long list of projects and the Ministry of Economy and Ministry of Finance choose a set of projects to be included in the budget, based on ambiguous criteria. On the other hand, in the non-discretionary budget, the Afghan government is obliged to follow the international development partner's agenda, the only difference with off-budget model is that non-discretionary on-budget is channeled through MoF's Public Financial System.

One could argue that the Afghan government did not have a clear and agreed upon agenda for its development and reconstruction, and hence, development partners had their own plans. However, the Afghanistan National Development Strategy (ANDS) existed and was endorsed by all stakeholders in 2008. More importantly, the counter argument is that the development partners should have first assisted the Afghan government to devise a development agenda and then invested in projects that could have met Afghan needs and not spent money just to demonstrate progress on portfolios and pursue their own development agenda.

Concerns over aid effectiveness in least developed countries is a global phenomenon, including Afghanistan. Various literature explains that provision of aid in the development sector

did not achieve the expected outcomes, rather it exacerbated and complicated the problems. Moyo asserts that \$1 trillion in development assistance to Africa for the past several decades could not overcome the chronic challenges and did not make the African people better off. (Moyo, 2009). Additionally, aid effectiveness is strongly correlated with political stability, policy landscape and institutional capacity (Islam, 2005; Burnside & Dollar, 2004). Furthermore, Moyo argues that when governments receive aid, they sense less accountability to citizens as dependence on taxation diminishes (Moyo, 2009).

One instance of how development partners devised plans and spent money contrary to ANDS and Afghanistan development agenda is the Tarakhil 105 MW diesel power plant. The US government spent \$335 million on the Tarakhil Power Plant, which was initially budgeted \$95 million by USAID (SIGAR, 2015). According to a SIGAR report, the USAID entered into a contract with Louis Berger Group/Black & Veatch Joint Venture to build the 105 MW Tarakhil Power Plant on the outskirts of Kabul in July 2007 for several reasons, including to help mitigate concerns about potential shortfalls in available power resulting from natural disasters or neighboring country decisions to reduce power exports. However, assessments performed by other USAID consultants (Tetra Tech Inc.) highlight that the Tarakhil power plant was designed to be a base load plant, operating 24 hours, 7 days/ week, but was being operated to support peak load only (SIGAR, 2015).

USAID, MEW and DABM thought that the power plant would significantly reinforce the power available on Afghanistan's national power grid through the continuous operation of 18 diesel engines generating power. The SIGAR report states that the project was plagued by cost overruns, poor contractor performance, and delays, the power plant was ultimately handed over to DABS in June 2010 (SIGAR, 2015). SIGAR found that between July 2010 and December 2013,

the plant only produced about 63,000 MWh of energy, just 2.2% of its production capacity during that period. SIGAR's analysis also shows that from February 2014 through April 2015, the plant exported just 8,846 MWh of energy to the Kabul grid, which is less than 1% of Tarakhil's production capacity during that period and only 0.34% of the total energy consumption on the Kabul grid. The report further says that the underutilization of the plant has apparently resulted in the premature failure of equipment which will raise O&M costs significantly. Today, seven years after the Tarakhil power plant's completion and considering the huge amount of \$335 million that was spent on the project, one could ask the question, was it worthwhile to build a diesel power plant of 105 MW outside of Kabul that cannot produce more than 1% energy from its production capacity? Was this plant aligned with the ANDS? Was building this plant helping Afghans to have access to electricity? ANDS proposed building four hydropower plants, among others the Baghdara and Sorobi II hydropower plants on the Kabul River with. Ten years ago, Baghdara hydropower plant with an installed capacity of 210 MW could have been built with \$335 million from the US government and some contributions from other development partners.

Another example of mismanagement among development partners and the government of Afghanistan is forecasting the demand and planning Afghanistan's grid. The initial planning for Afghanistan power grid in general was not performed in a coordinated fashion. Different development partners picked different locations of Afghanistan and built transmission lines and substations without cross-checking and cross-referencing the design and criteria for the selection of the number of circuits, the size of conductors, taking into account the demand of the load centers, the type of substations and transformers etc. For instance, the upper north of Afghanistan was picked by the Asian Development Bank and Germany, the middle north was selected by the

Government of India, the World Bank worked on the Kabul metropolitan area transmission system and the US took care of the South of Afghanistan.

In 2005, the government and international development partners decided to go for a fast-track solution to immediately bring power to the major cities – apart from Kabul, mainly Mazar-e Sharif, Pul-e Khumri and Kunduz – choosing 220 kV over 500 kV lines. These however, are technically not efficient for transmitting power over distances of more than 450 km (in this case from the substation of Uzbekistan to Chimtala Substation at Kabul) because of the voltage drop, power losses and other technical difficulties. Specifically, the transmission capacity of the Pul-e Khumri-Kabul line, funded by the government of India and implemented by KEC (an Indian contractor), has already been exhausted by Kabul's energy demand – Kabul has to load shed up to 200 MW during peak time in winters and applies scheduled load shedding over 15 hours daily, which affects 80% of the households in the city. (Amin, 2015) This line crosses various difficult terrains including the most rugged and narrow one with the highest altitude (12,800 feet), the Salang Pass. This line passes through that corridor and greatly underestimated the demand in Kabul. The Puli-Khumri to Kabul transmission line is the only means to feed Kabul – the largest load center in Afghanistan – from the power exporting countries in the north – Uzbekistan, Tajikistan, and Turkmenistan. This shortage of power, i.e. demand exceeding supply by this specific transmission line, was not supposed to occur for at least 15 to 20 years. There was a mistake either in the power system planning – or the decision makers at that time had no choice but to align the design and construction cost with available funding (Amin, 2015).

With regard to institutional and manpower capacity building, a lot of efforts have been undertaken by various development partners, especially by the US government. The U.S. government invested nearly \$88 million on DABS commercialization projects since September

2009. The goals of these projects were to equip DABS with different tools for corporate governance, to reduce losses, to increase billing and revenue collection efficiency and allow DABS to function as a self-reliant and sustainable commercial utility. The SIGAR report on the DABS commercialization projects states that USAID disbursed almost \$61 million in Economic Support Funds through two contract task orders and one grant for commercialization efforts in Kabul and Kandahar. For the Kabul-based efforts, USAID awarded a \$53 million task order to support the commercialization of DABS-Kabul through the Kabul Electricity Services Improvement Project (KESIP) and a grant to Etisalat for more than \$670,000 to support DABS-Kabul's revenue collections via mobile bill payment. For the Kandahar-based efforts, USAID awarded a contract to Louis Berger Group Inc./Black & Veatch Special Projects Corp Joint Venture (LBG/B&V) for more than \$6.8 million to support various commercialization activities—such as developing a customer meter installation plan, installing boundary meters, and performing baseline studies related to revenues and losses—for DABS-Kandahar.

The SIGAR report on DABS commercialization highlights that the US Forces for Afghanistan (USFOR-A) and USACE purchased equipment worth \$12.8 for Kandahar and Helmand to assist DABS in reducing losses and increasing revenue, but that set of equipment was left unused in warehouses (SIGAR, 2013). The report further states that the USAID required its contractor to implement a billing system in Kandahar that was consistent and coordinated with systems in Kabul, however, USAID did not enforce these contractual requirements, allowing a different system to be installed in Kandahar that was later deemed a failure by USAID and DABS. As a result, USAID spent nearly \$700,000 to implement the system in Kandahar, which will ultimately be replaced by the same system originally installed in Kabul (SIGAR, 2013). There is no doubt that DABS has improved significantly since 2009, however, the impact of \$88 million

on its commercialization did not bring the desired outcome and USAID decided in 2013 to provide \$157 million more for the purposes of DABS commercialization and utility corporate governance. The second \$157 million project is planned to be implemented on an on-budget basis while the previous \$88 million project was implemented on an off-budget basis. The high salaries of international experts and expensive contracts to international consulting firms, international staff travel to Afghanistan and the high cost of their security increased the cost of these projects, and it took eight years for the commercialization processes to become institutionalized in Kabul first and later spread out to other provinces. Technical and commercial losses, billing and revenue collection performance is in a more challenging situation in the provinces than Kabul.

Before the DABS commercialization program, USAID implemented three other capacity building programs in the sector too, namely, the Afghanistan Energy Assistance Project (AEAP) from 2004 to 2008, this project implemented by an American consulting firm (AEAI), with the contract worth \$74 million. AEAI provided technical assistance to the energy sector government agencies in gas, renewable energy, and institutional and capacity building (AEAI, 2016). Another USAID program entitled ‘Afghan Energy Capacity Building Program’ under the theme of ‘Human and Institutional Capacity Building for Afghanistan Energy and Natural Resources’ was initiated in 2008. The project was awarded to the same American firm – AEAI – to provide technical assistance to MEW, DABS and MoMP, including training- of staff, drafting the electricity law, distribution system planning, assisting university electrical engineering departments in developing curriculum and sending students to India for postgraduate training in hydro power plants and transmission planning. Like the commercialization program, these capacity building programs had similar ramifications. International experts ended up doing most of the work without devising a framework to transfer the knowledge and expertise to their Afghan counterparts. Pathways towards

institutionalization were not achieved and thus outcomes of these programs are questionable now. For instance, the electricity law was drafted by the AEAI consultants in 2009, but it was not approved until 2016, because MEW lacked the adequate institutional and personnel capacity to expedite the approval process. Moreover, the Afghan Energy Information Center (AEIC) was functional from 2006 to 2012 under the USAID capacity building program, but when the program ended, the center's operation halted and the international staff left Afghanistan without proper handover as the Afghan staff did not want to continue working for the proposed government salary scale because they had been paid a ten times higher salary by the USAID consulting firm. Thus, they looked for jobs elsewhere, and the energy information center was shut down after six years of high expenditures that included high cost of international staff and lavish salaries for the Afghan counterparts, way above the market rate. In 2013, the stakeholders decided to transfer AEIC from MEW to DABS, yet AEIC is not as effective and productive the way it was in 2008 and 2009.

Such short-term employment assignments that were created by development partners – donors and their consultants manipulated the Afghan job market, because the Afghan government could not afford paying salaries the way overseas companies paid their local and international staff. Hence, civil servants remained in the back seat of the driving car and the short-term Afghan consultants drove the car and led the process from the front. This has been the case for the past fifteen years. Today, most of the Afghans who worked for the consulting firms are unwilling to work as civil servants. Rather they look for similar opportunities that are short-term but highly paid. The Afghan government employees were, by and large, not part of the planning, implementation and the decision-making processes of development projects compare to consultants hired by the development partners. Consequently, the capacity of the civil servants did not build - which was the ultimate goal of the Technical Assistance (TA) and capacity building

programs, but it was the capacity of the so called ‘specialists’ who were hired to facilitate training and play a role in transferring knowledge from the international experts to the civil servants who ended up receiving most of the training and thus gained the required knowledge and expertise. In other words, the donors’ well-paid consultants trained their own temporary staff and not the permanent government employees. As a result, the short-term consultants who now have the expertise, when offered government jobs, ask for more benefits and higher salary. This situation significantly led to a ‘Diminished Institutional Capacity’ in the energy sector, an outcome that will be discussed in the next section.

5.7.3 Energy Sector Projects Selection and Prioritization

Among the patterns of interaction is the process of selection and prioritization of energy sector projects. There is complication and confusion in this process of among MEW, DABS and development partners. Budget appropriations, also called ‘Budget Allotment’ for various power system projects e.g. generation, transmission and distribution, are sent by DABS and MEW at the same time. Projects without adequate due diligence are reviewed and approved by the Ministry of Finance. The criteria for selection and inserting a project into a national budget by MoF is unclear. For instance, in the national budget for fiscal year 2017, DABS has 22 development projects (ranging from generation, transmission to distribution) and allocated \$450.5 million. The amount that transferred from last year is \$376 million. In other words, DABS could not spend this allocated amount (\$376 million) of the previous year’s budget and thus, transferred to the next year’s budget. Similarly, MEW has 47 development projects that besides water and irrigation projects include, transmission lines, substations and distribution networks. MEW’s allocated budget for FY 2017 is \$145 million and because of the inability to fully utilize its previous year’s budget, \$83.4 million was transferred to FY 2017’s budget (National Budget MoF, 2017).

Development partners interact with and officially sign, grant and loan agreements with the Ministry of Finance. As has been stated earlier, MoF does not have adequate technical expertise to prioritize or select projects for financing. Moreover, this situation positions MoF in a decision making role and other ministries such as MEW, MoMP, DABS act only as executing agencies. This creates a gap in the institutional and policy framework in the energy sector and undermines existing strategies like ANDS, programs like National Priority Programs (NPPs) that was agreed among all stakeholders as a collective development agenda, and plans like the Power Sector Master Plan, Gas Sector Development Master plan. Basically, these documents end up on the shelf and decisions are made mutually or single handedly without following a framework.

As has been discussed in the above subsection, examples like the Tarakhil Diesel Power Plant, USAID capacity building programs and the Puli Khumri to Kabul transmission lines were among many other projects that were implemented in an off-budget mode are examples of what can happen when there is no suitable framework. The government of Afghanistan has minimal or almost zero influence and role in off-budget projects' planning, design and implementation. The on-budget package is also divided into two sections: discretionary and non-discretionary. The discretionary portion is the smallest in the budget and it is the only part where Afghan ministries can propose a long list of projects and the Ministry of Economy and Ministry of Finance choose a set of projects to be included in the budget, based on ambiguous criteria. Moreover, development partners have strong influence over the non-discretionary budget, because they want to achieve their mission objectives as well. For instance, the regional transmission interconnection projects with the neighboring countries i.e. Tajikistan and Uzbekistan are given priority over investment in generation in Afghanistan.

5.7.4 Coordination Among Many Actors

One issue that is typically problematic in sectors with several actors is the coordination and the associated transaction cost. The energy sector has always involved many actors in developing countries, thus, coordination is complex and multifaceted. In 2008, the Afghanistan National Development Strategy (ANDS) recognized this challenge and asserted that “It is essential that the donors themselves improve the way in which they are engaged with the energy sector. At present, there are 25 donors engaged in the sector; in addition, there are 15 different US agencies. Afghan counterpart resources are limited and stretched to the limit. Improved governance will mobilize investment, mitigate corrupt practices and improve the technical quality of energy supply.” (ANDS, 2008). Therefore, the ANDS proposed to use the existing platform of the Inter-Ministerial Commission for Energy (ICE) for coordination and harmonizing planning efforts.

The Inter-Ministerial Commission for Energy (ICE) was primarily established in 2006 by a presidential decree to improve coordination and support the government in harmonization of and collaboration among development partners, as well as provide capacity and analytical support to strengthen energy sector investments in Afghanistan. The commission’s logistical and technical assistance was provided by the Asian Development Bank (ADB) and the US Agency for International Development (USAID) for eleven years – since 2006 - and yet it is not institutionalized in the Ministry of Economy’s structure, who is chairing the commission. ADB spent \$2.3 million from 2006 to 2008 only on remuneration for international and national consultants to conduct ICE monthly meetings and identify energy sector pressing issues (ADB, 2007). The ADB Technical Assistance (TA) Project ended and USAID commenced its project of supporting ICE from 2008 to 2012. USAID awarded the consultancy contract to Louis Berger Group/Black & Veatch (LBG/B&V) – an American Joint Venture - just to organize monthly

meetings among the energy sector stakeholders and discuss policies, planning and project implementation (USAID, 2010).

When the USAID consultancy ended ICE monthly meetings halted for a quarter and the Afghan government requested ADB to finance another technical assistance project to revive ICE. ADB's second TA – a \$1.5 million project – started its work in late 2013 and reconvened monthly meetings. It is 2017 today, and ICE, an important body that facilitates a common platform to exchange information and reports on the energy sector – is literally run and financed by donors' money. There are similar commissions and committees for the renewable energy sector, the mining sector, the transport sector and the agriculture sector that are predominantly operated by international consultants hired by development banks and agencies. This situation – where only international consultants or Afghan short-term consultants are the main players of the scene can further exacerbate the problem and leads to the unsustainability of the sector.

With regards to actual decision making in the energy sector, the Inter-Ministerial Commission for Energy (ICE), because of practical reasons, seems not the right place to make decisions, even on smallest issues. It is a platform where more than 50 representatives of different government agencies, development partners, the private sector, NGOs etc. get together and discuss overarching issues of the sector. They mainly exchange progress reports, provide updates on portfolios and present their role and mission in Afghanistan. Representatives from different agencies do not feel comfortable when a group as big as fifty people become involved in their decision-making process. Reading the original text of the presidential decree that was signed back in 2006 by President Karzai, it had more emphasis on the work of four ministers who are the core members of the commission and four others who are ad-hoc members (Ministers of Economy, Energy, Finance, Mines and Petroleum as core members and Ministers of Foreign Affairs,

Commerce, Urban Development and Rural Rehabilitation as ad-hoc members) to work closely with each other and have focused group meetings and make decisions on behalf of their organizations on energy sector policy, planning and sector prioritization. In 2006, DABS was not established as a corporate entity with legal autonomy until 2008, when it was created, it automatically became a core member of the commission. Nonetheless, that was the concept of the decree in 2006, but what happened in practice is quite far from what had been stipulated in the decree. From theoretically being a decision-making, policy and planning guiding body, it became a platform for information sharing among fifty representatives meeting once a month and listen to presentations.

In this section (also demonstrated in Figure 5), I discussed four main patterns of interaction among actors engaged in Afghanistan's energy sector: Overlaps and Contradictions in Mandates and Jurisdictions; Role of International Development Partners; Energy Sector Projects Selection and Prioritization; and last but not the least, Coordination Among Actors. As has been discussed in the explanation of the IAD framework, these patterns of interaction will lead to certain outcomes that I will outline in the next section.

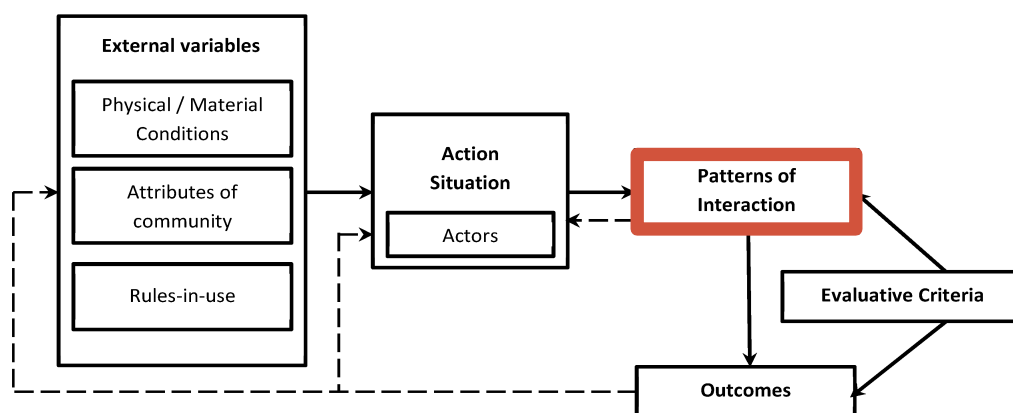


Figure 5 The Patterns of Interaction box of the IAD framework

5.8 Outcomes

In previous sections, I discussed the rules-in-use that have been enacted and the actors and their patterns of interaction in the energy sector of Afghanistan. The IAD framework states that two situations occur when we reach the outcomes section: first, highlighting and evaluating the existing outcomes against the evaluative criteria and second, predicting potential outcomes that will emerge from the patterns of interaction. Here in this section, I outlined the existing and future outcomes of Afghanistan's energy sector that resulted from the application of the IAD framework.

5.8.1 Low Electrification Rate

In 2001 only about 5% of Afghanistan's population had access to electricity with less than 100,000 households – only in major cities – connected to various isolated grids. In 2016, 30% of the country is energized with some 1.3 million household connections per DABS billing data (ICE, 2016). However, reliable power is a pressing issue. Those 1.3 million households do not have access to reliable power; on the contrary, most of them experience prolonged – up to one and half day - load-shedding in the peak load season (For instance, winter in Kabul, summer in Kandahar and Jalalabad). More importantly, 75% of Afghans live in rural areas and only 9% of those areas have access to electricity, and two-thirds of the GDP of Afghanistan comes from those areas where they go to bed without seeing an electric bulb on in their household. Per capita consumption of electricity in Afghanistan is among the lowest, at about 100 kilowatt-hours (kWh) a year, according to an ADB energy financing document (ADB, 2015). SIGAR describes it as the average Afghan's total energy consumption being the equivalent of powering a 50-watt light bulb about five and a half hours a day for a year and not using anything else (SIGAR, 2016). The global average energy consumption is about 3,100 kWh—North America tops 13,000 kWh— while even

in “fragile and conflict-affected situations” the average is about 560 kWh (5.6 times bigger than Afghanistan’s consumption) (SIGAR, 2016). This indicates the severity of the matter.

One could ask, after fifteen years of hard work and consistent struggle by the Afghan government and the international development partners, more than \$4 billion having been spent on the sector, and using highly qualified experts, consultants and professionals, how is it that today we are still in a situation where 91% of rural Afghanistan does not have access to electricity, that for those who have access, service is intermittent and not reliable and where 81% of Afghanistan’s electricity is imported from neighboring countries. If you look at projects like the Tarakhil Diesel Power Plant that cost \$335 million and contributes 0% to electrification, it signals a deep and a severe problem in the sector, which is multifaceted and deeply rooted. This would not have been a drawback if the sector’s institutional and human capacity was in a satisfactory situation, but unfortunately, it is not, and this leads us to the second outcome.

5.8.2 Diminished Institutional Capacity

As I have been alluding to earlier, the reconstruction and reshaping of Afghanistan’s energy sector since 2002 has contributed less to the institutional capacity of government agencies compared to what has been spent in terms of monetary value. Numerous efforts by many development partners have been initiated since 2003 and 2004, but it lacked a coherent and unified agenda for the sector. The Afghan side did not have adequate capacity to devise policy and plans for the sector until 2008, when ANDS was approved by all parties. Hence, development partners devised their own initiatives with their consultants and overlooked or rejected the actual needs of the Afghan ministries. The US government spent more than \$400 million on programs aimed at institutional and manpower capacity building such as DABS commercialization programs, the

Afghan Energy Information Center (AEIC), supporting ICE, the Afghanistan Energy Assistance Project (AEAP) etc. However, the efficiency and effectiveness of these programs were minimal.

As have been described in the patterns of interaction section and in the subsection of the role of international development partners, the expensive contracts awarded to consulting firms did not achieve the desired outcomes, transfer knowledge and expertise to Afghan counterparts and institutionalize frameworks and processes. For instance, an independent auditor who audited DABS' financial statements, stated in their reports that DABS has no reliable information on the existence, accuracy, and completeness of data on property, plant, equipment, and inventories, and that DABS lacks a reliable system for determining amounts receivable (SIGAR, 2016). The problems facing DABS' finance department is just one example; numerous other issues exist in the commercial and operations department and not to mention the lack of capacity in the Ministry of Energy and Water and Ministry of Mines and Petroleum.

The short-term consultants working for the international development partners provided their deliverables (i.e. reports and assessments) in terms of paperwork and left Afghanistan without building the institutions. Today, government employees in the energy sector line-ministries and DABS are incapable of carrying out their tasks without the assistance of international advisors and consultants, including policy analysis, sector planning, project preparation, bidding processes, project implementation, monitoring and evaluation, etc. The irony is that in every technical assistance and capacity building project from 2002 on, it was an integral part of the terms of reference and scope of work to train, advise the Afghan counterpart and institutionalize the process in the respective organization prior to leaving the country. But projects were completed, new projects awarded while institutional and human capacity was not developed to run and operate the system. When you are not in the driver's seat and somebody else is driving your car, then it is up

to the driver to choose the direction or in other words, dictate the rules. This institutional constraint led to our fourth outcome which is inaccurate prioritization of investments.

5.8.3 Inaccurate prioritization of Investments

The United States alone has spent nearly \$3 billion for power-sector projects in Afghanistan since fiscal year 2002 (SIGAR, 2016). ADB has a current portfolio of \$1.2 billion, and more than \$500 million in additional funding for the power sector has come from the World Bank, Germany, India, and other sources. Considering the low electrification rate where only 30% of the population has access to electricity with the rural areas at less than 10%, with no major increase in the installed capacity of hydro generation (except for rehabilitating existing hydropower plants and the 42 MW Salma dam in Herat) and with an 80% dependency on power imports from neighboring countries, obliges us to question whether investments were appropriately spent. The installed capacity of thermal generation increased, but its production cost (\$0.25–\$0.35) per kilowatt hour (KWh) and which is mainly diesel, is 4 to 5 times higher than imported and hydro power, and because of this high cost, power plants with an installed capacity of 105 MW like Tarakhil are shut down. Moreover, the US government investment on two 10 MW diesel generators to provide 24 hours/ 7 days a week electricity to the city of Kandahar was also regarded by several sector specialists as an ‘inaccurate and inappropriate investment decision’. Because, as long as the US troops were based in Kandahar and the US was paying for the cost of fuel, the city had power and residents felt content; however, when the troops started to leave the city and withdraw from their army bases, the supply of fuel by the US to the generators ended and load shedding gradually applied and eventually large portions of the city remained without electricity until a third turbine in the nearby Kajaki hydropower was installed.

Apart from the inefficiency in the infrastructure sector that have been alluded to as the waste of resources in the institutional and capacity building programs; one strong factor that led to the outcome of inaccurate prioritization of investment is the lack of a unified development agenda for Afghanistan by the international development partners. It has been explained in the section, Attributes of Community, that Afghanistan is a post-conflict and ongoing conflict society, having experienced a forty-year long war and with ongoing hardship, chaos and instability in the communities. After the Soviet Union's withdrawal, Afghanistan became a victim of a severe civil war and the aftermath was the emergence of the Taliban. One causative factor among many was the total isolation of Afghanistan by the international community in the early 90s. Post 2001 and the 9-11 tragedy, the international development partners poured in a lot of money to rebuild Afghanistan, but each donor had its own plan and in the case of the energy sector, ten development partners were engaged without harmonizing their plans for the sector. Afghans at that time - in 2003 and 2004, did not have a well thought or well researched plan for the energy sector to present to the international partners for implementation, because as has been said, Afghanistan was undergoing a break from war and conflict, and was busy in drafting the constitution and preparing for the first presidential and parliamentary elections.

Consequently, the international development partners continued to spend money on their self-devised proposals and strategies without carefully considering the actual long-term needs of the Afghans. In 2008, the Afghan government drafted the Afghanistan National Development Strategy (ANDS), however projects proposed in the ANDS, especially on the generation side, were not considered by development partners, who cited various reasons such as water sharing treaties with neighbors, security concerns, high upfront costs etc. According to the completion report on ANDS, from 2008-2013 the total investment on development projects is estimated to be more than

\$15.6 billion. About \$4.9 billion was spent on-budget. The remaining \$10.7 billion was spent off-budget (ANDS, 2014). So, a big portion of the investment – 68.5%, was spent directly by the development partners, using their own agenda, plans, consultants and implementation mechanism. The Afghan government became involved only when projects were completed or issues such as land acquisition and resettlement, or coordination among different government agencies needed to be resolved. Nine years ago, the ANDS described the sector as “a sector that could be generating revenues for government with normal rates of taxation applied to sector activities is, under present arrangements, a major drain on government resources” (ANDS, 2008). Today, one could argue that the situation has hardly changed from the ANDS’s description in terms of prioritizing investments. As I stated earlier, the inaccurate prioritization of investments by development partners and the Afghan government has led to weak institutional capacity and because of diminished institutional capacity and inaccurate investments, the bigger picture has been lost from view by the actors, that is the importance of establishing a proper regulatory framework in the sector.

5.8.4 Lack of Regulatory Framework

It took seven years to draft, approve and enact the electricity law. The Afghan constitution was enacted in January 2004 that provided the legal ground for forthcoming laws and regulations. With regards to the power sector, until 2008 the Afghan ministries were busy in dealing with smaller project management matters linked to the projects proposed and funded by the development partners while the international partners moved forward with the implementation of transmission lines, substation, distribution projects and some capacity building projects. In 2008 USAID engaged Advanced Engineering Associates International (AEAI) – an American Consulting firm - through ‘Afghan Energy Capacity Building Program’ under the theme of

‘Human and Institutional Capacity Building for Afghanistan Energy and Natural Resources’. The project was aimed at providing technical assistance to MEW, DABS and MoMP in various aspects, including training, drafting the electricity law, distribution system planning, assisting university electrical engineering departments in developing curriculums and sending students to India for postgraduate training- in hydro power plants and transmission planning.

Consequently, a group of American consultants along with their Afghan counterparts drafted the electricity law for the Afghan power sector in 2008, and since then, the policy department of MEW made several revisions to the first draft. However, it took MEW five years to make a final version of the law and arrive at a consensus with their experts and send it to Ministry of Justice for formal and legal review. The law was under review and scrutiny for one and half years in the Ministry of Justice before it was presented to the Afghan cabinet. It took six months for it to pass the cabinet review and approval process and finally on August 30th, 2015, President Ashraf Ghani issued a decree enacting the electricity law and sent it to the national assembly for endorsement. Establishing a regulatory framework for the sector was delayed by four years from 2004 to 2008, but one could argue that it was unclear during that time that the power sector was to be restructured by corporatizing DABS from a government entity to a 100% state owned company. However, the seven years long process from 2008 to 2015 is unquestionably raising eyebrows. Even more shockingly, MEW has been unable to establish the Energy Regulatory Authority (ERA), which is stipulated in the electricity law, two years after its enactment and endorsement. This is a manifestation of the severity of the challenges and problems of institutional capacity facing Afghanistan. The absence of an adequate regulatory framework in the sector is a key factor impeding private sector participation.

5.8.5 Delayed Private Sector Investments

One important factor that all stakeholders in the energy sector now agree upon and where there is an absolute consensus is the importance of the participation of the private sector in developing and enhancing the energy sector of Afghanistan. Development partners, government ministries, civil society and NGOs realized that the Afghan public sector together with the donor community cannot bring the desired outcomes about i.e. universal access to electricity in Afghanistan, unless the private sector comes in and participates. Ideally, the private sector should have stepped in when DABS was restructured in 2008, but the electricity law approval took seven years, a key factor in encouraging the involvement of the private sector. Actually, the Afghanistan National Development Strategy (ANDS) envisaged participation of the private sector in 2008 and set a target for it to be achieved by 2009. The ANDS completion report' 6 years later, notes that "the first outcome, an enabling environment for private sector investment in energy sector, is measured by the index on the progress of creating such an environment, which should be investor friendly" (ANDS, 2014). However, this outcome could not be achieved, ANDS stating that "there is a weak legal and regulatory infrastructure in place to support and monitor investments. Potential investors cite unclear policies and corruption as a barrier to investment. The majority of services are provided by the 11 State Owned Enterprises (SOEs) and three budgetary units that support energy operations could be implemented by the private sector in ways that are more cost-effective and technically efficient." (ANDS, 2008. Unfortunately, this vision was not realized by the Afghan government and the international community in nine years.

Various individual efforts took place to engage Independent Power Producers (IPPs); one instance was the Sheberghan Gas IPP that the USAID wanted to initiate since 2005. USAID through its consultants held several promotional conferences in different cities of the world to

attract investors for the Sheberghan IPP, but because of the inadequate and ambiguous regulatory framework in Afghanistan, private investors were not interested. Another reason explaining why USAID could not convince investors is the failure to present an attractive business model for Sheberghan demonstrating a good return on investment. MoMP, Afghan Gas Enterprise, DABS and MEW could not reach an agreement between them on prices. Because independent regulators did not exist, the ministries refused to run the risk of making a decision that had potential negative financial and political ramifications. In late 2013, Afghan cabinet decided to allow MEW to issue electricity generation licenses to a certain number of IPPs. However, with a condition, the decision stated that the enactment of the electricity law will supersede the pre-issued licenses. As a result, in 2014, MEW for the first time awarded a generation license to an Afghan – German consortium for a 4 MW wind power plant in Herat. This was the first instance that allowed private sector participation in energy generation. Moreover, in another example, the 10 MW solar power plant in Kandahar, which was facilitated and partly financed by the USAID, it took around a year to draft a power purchase agreement for DABS and negotiate price among MEW, the USAID consultant and DABS. This is mainly because the regulatory authority was not established in the energy sector, and regulations were undertaken by unauthorized agencies.

Furthermore, the private sector of Afghanistan raised concerns over the independence of Energy Regulatory Authority (ERA), and claimed that the electricity law is not investor friendly and requested the government for a revision of the document (Harakat and ACCI, 2014). Because ERA is currently positioned under the influence of Minister and Deputy Minister of Energy, that could further make Afghan energy sector unattractive for private investors.

6 Policy Recommendations

The policy recommendations for the Afghan energy sector require a revisit back to ANDS of 2008. In a nutshell, implement institutional and regulatory reforms proposed by the ANDS. The ANDS explicitly defined the vision and strategic goal for the sector as “An energy sector that provides drivers of growth in the economy with long term reliable, affordable energy based on market-based private sector investment and public sector oversight”. This vision was outlined nine years ago, and asked to be implemented by 2013, at least with regard to institutional capacity. However, the Afghan energy sector could not achieve the stipulated vision and today after nine years, the same goal should be set out again. Nonetheless, I propose the following policy recommendations:

6.1 Redefining Roles and Scope of Work of Stakeholders

It has been explained in the Patterns of Interaction that there are overlap, confusion and contradiction in the scope of work and the Terms of Reference (ToR) as perceived by the government ministries, national utilities etc. In order to achieve efficiency in the sector and eliminate this challenge, the roles of each ministry should be redefined and a clear blueprint should be determined for every government actor in the sector. This task is especially important in order to measure the indicators linked to accountability. With the mixed-up scope of work and unclear mandates, agencies are not held accountable. Secondly, if there are coordination junctions concerning policy, planning, and at the project implementation level, and of course, there will be plenty, these junctions should be defined and the role and authority of each ministry should be explained. What happens in practice is that political offices such as ministerial and deputy ministerial level positions have different levels of influence and authority, depending on their political affiliation or political personality and career. Hence, when roles of government ministries

are not well defined on paper, scope of work of agencies can get maneuvered by the office holder to gratify his/her constituents.

6.2 Reorganizing Ministry of Energy and Water

The Ministry of Energy and Water (MEW) as a government ministry should adopt the role of a policy maker in the energy sector and not merely a project implementer or regulator. MEW should streamline the planning and investment initiatives by the various actors in the energy sector. As a custodian of the national energy policy and power sector master plan, MEW should provide overall policy and planning direction to the sector and make sure that the sector is heading towards achieving its set out goals. The current electricity law states that the Electricity Regulatory Authority (ERA) will work under MEW. It is recommended that ERA should work independently, because, an ERA under MEW's influence will not attract private investment. As we learned from the literature review, the separation of policy and planning, and regulation is essential for the long-term sustainability of the sector, especially when access to capital and private investment is a dire need. If it is meant to be ultimately independent after five or more years and given a timeframe to build its capacity and emerge as a self-sufficient organization, then the justification is valid. Nevertheless, the timeframe should be shortened to three years and the electricity law requires an amendment or revision accordingly. It is also recommended that implementation of projects like transmission lines, substations and distribution networks should not be part of MEW's scope of work. We learned from the Patterns of Interaction that projects implemented by MEW encountered handover challenges, because the operator of the system is DABS.

6.3 Unbundling Da Afghanistan Breshna Sherkat (DABS)

DABS was established as per the 'Corporations and Limited Liabilities Law' of Afghanistan as a limited liability company with all its equity shares owned the four government

ministries that I mentioned in the Actors' section. It can be suggested that in the long run DABS be unbundled, and could potentially retain the transmission system only and act as system operator in the country. Generation is still open to IPPs; however, a study should be undertaken on whether DABS should retain the existing hydropower plants or they should be privatized. With regard to the distribution networks across Afghanistan, it is recommended that DABS consider two options or both options sequentially in two steps: The first option is to lease the distribution networks in five major regions of DABS (Kabul, Herat, Mazar, Kandahar and Nangarhar) for 15 to 20 years to private companies based on lowest offered prices in an auction. However, with a condition that the current personnel of DABS will be retained by the distribution concession holder. The second option would be to go for full privatization and turn the five distribution networks of DABS into five distribution companies. This will bring in capital and new investments in the sector and will expand the electrification rate, while reducing technical and commercial losses.

6.4 Unified Development Agenda for Development Partners

We learned from the Patterns of Interaction and in the outcomes sections that a lack of a unified development agenda on the part of the development partners for Afghanistan's energy sector created obstacles and did not optimally improve the electrification rate. Hence, it is envisaged that the Afghan government and the development partners agree on one unified development plan for the sector, rather than bilaterally discussing and implementing projects that do not help in realizing the sector's vision. Currently, the Self-Reliance through Mutual Accountability Framework (SMAF) and Afghanistan's National Peace and Development Policy Framework (ANPDF) do exist and act as a gateway and a junction between the Afghan government and the international development partners. The National Infrastructure Plan, which I described in the Rules-in-Use section, and the previous National Priority Program (NPP), also called the

‘National Energy Supply Program (NESP)’, is regarded as the Afghan government development plan for the energy sector. Besides the NIP and NESP, there is the power sector master plan that MEW is responsible for updating every two years. Therefore, the Afghan government should take ownership of the planning efforts and together with the development partners, agree on a unified plan for investments. Similarly, these plans should not exclude technical assistance and capacity building projects. Technical assistance and capacity building should be undertaken based on the requests by the Afghan ministries and consider their assessments.

6.5 Incentives for the Private Sector

The reasons for the delayed private investments in the energy sector have been explained earlier, it is recommended to the Afghan government that redefine policies and mainstream what ANDS called the ‘enabling environment’ vis-à-vis the private sector investment. This includes relaxing to some degree, taxes and duties on renewable energy equipment, energy efficiency appliances, etc. Moreover, the prime concern the private sector faces is land acquisition and the lengthy approval process on the part of the relevant government offices. The government should provide subsidies in acquiring land, and more importantly, protect investments made by the investors. The security situation has been briefly explained in the Attributes of the Community section. In order to attract investments in Afghanistan, the Afghan government should provide security to the staff, field workers, equipment and plants of private investors.

7 Conclusion

It is noted in the takeaways section of the literature review that electrification is a stretched, prolonged and a challenging process. It requires social struggle from the masses, the political will from the politicians and elected officials, and appropriate and timely legislations. It took the United States forty years to electrify its rural areas; India is still experiencing difficulties in implementing

power sector reforms and applying regulatory governance. We learned from the literature review that an efficient regulatory framework is necessary for sustainability and longevity of the energy sector. Moreover, a strong regulatory framework is a prerequisite for the government to motivate and attract private investment.

The Institutional Analysis and Development (IAD) framework was applied on Afghanistan's power sector to identify institutional and policy constraints. The findings of the study reveal that because of ambiguity, overlaps and contradiction in scope of work and mandates of five government ministries exacerbated the current challenges. The lack of a unified, harmonized and coordinated development agenda of more than ten international development partners in the power sector have led to inadequate and inaccurate prioritization of investments. This outcome resulted in low electrification rate and diminished institutional capacity. The study also unveils that the institutional capacity, despite enormous investment on its capacity building and training, did not improve and the key component for the sector i.e. the regulatory framework is not in place until today. Consequently, it delayed the private investment in the power sector for a decade.

It has been recommended that the Ministry of Energy and Water (MEW) would like to see itself in a leadership and policy making position rather than competing with DABS in designing and implementing projects. DABS as a national power utility would like to envision its position as a nation-wide system operator and facilitating competition for Independent Power Producers (IPPs) in generation and ensuring energy management with distribution companies.

The energy sector line ministries may not want to delay the adaptation of power sector reforms that were proposed in the policy recommendations section, namely, reorganizing MEW, unbundling DABS and enabling private sector investments. To achieve these goals, the pre-

requisites are improving the institutional and personnel capacity of government ministries, establishing a sound regulatory system and harmonizing international development partners' investments and portfolios. Creation of a unified development agenda led by an Afghan owned process is vital for the sustainability of the sector; a major lesson Afghanistan can learn from the past fifteen years is to take the ownership and leadership of the electrification process.

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