Electricity is key factor for Uzbekistan’s economy, namely, two most exported commodities: cotton and gold. In addition, the sector has confirmed potential to contribute to export growth, through electricity exports to countries within Central Asia and beyond. Beside economic significance it has strong social impact on the lives and living standards of Uzbekistan. Uzbekistan admitted adherence to the socially oriented development of sustainable energy supply. Uzbekistan is the most populated country of Central Asia. 60% of the population lives in densely populated rural areas. Economic growth was long restrained due to restrictions of foreign currency and centralized structures of the administration and economy, which limited liberalization processes. In recent years the economic structure changed, enabling high growth rates even during the crisis years between 2007 and 2009.

The crisis did not affect Uzbekistan as much as many other countries because of the indepen-
dence of its local financial market from interna-
tional financial markets. This development is supposed to continue thanks to the anti crisis pro-
gram which the Uzbek government decided on. Growing reserves of foreign currencies and state budget surpluses, backed up by increasing invest-
ments, high quality export goods and a stabilized banking sector encourage the growth as well.

Uzbekistan

![Graph showing energy consumption growth rates](image1)

Against this background, in 2009 Uzbekistan achieved a GDP of 33 billion USD. This results in a per capita GDP of 1,180 USD. The economy has been growing at a rate of 7% per annum or more since 2004, while before that the GDP growth rate hovered around 4%. Figure 1 depicts this development.

EXISTING APPROACHES

Uzbekenergo carried out demand forecast studies based on periodical Industry and consumers’ survey. 2009 five years demand forecast analysis shows that gross con-
sumption is expected to grow from 50,27 TWh in 2008 to 56,34 TWh in 2015. Comparison with existing studies show that Uzbekenergo demand forecast are above WB 2005 study estimations and below ADB 2004 Power de-
mand estimation. 

According to Uzbekenergo demand projection Gross demand growth rate will be 1.64% during the period 2009–2015. According author’s assessment, De-
mand growth rate expected is increasing from 0.87% in 2009 to 3.05% in 2015. Gross demand evolution sug-
gest that demand will continue growing at a level of 3% or higher from 2015 on.

METHODS

The objectives of research accomplished by engaging in multiple tasks during the research period. The most important part of author’s work was to create optimal Demand and Supply model (without sufficient data and information), which allowed to find the optimal cor-
relation of investment to modernization of Uzbekistan energy sector from economical view and from social as-
pects based on new EE technology. Author visit numer-
ous institute specializing in the issue of Energy Efficiency and where she works with international and national experts. Detail analysis of current available methodolo-
gies shows the necessities to apply a modified version of an econometric approach. There are a number of reasons that led to the need for applying a modified approach for demand forecasting. Based on this approach, future annual growth of electricity demand will be obtained by multiplying the expected future annual growth rate of GDP of a country by its demand elasticity for that specific year and adjusting it for a possible downward reaction that results from an increase in tariffs. The impact of the latter effect depends on the price elasticity. In addition, author was visited research libraries where the was study research published, methodological literature, and published sources on this issue. Authors test her findings through:

(i) Presentations at professional meetings of academics at the institute,
(ii) Participation in conferences, workshops, and round-
tables available at the research time, and
(iii) Other presentations organized for collaborating at oth-
er centers in developed countries like Japan, Germany, Kazakhstan, and Uzbekistan.

RESULTS

Authors find that consumption average annual growth rate has been 1.6% during the last five years, 2004–
2008, although annual growth rate has evolved er-
ratically during this period. Power Consumption growth has rocketed from -2.4% in 2005 to 7.4% in 2006 coming down to 3.1% in 2007 and to a nega-
tive growth of -1.8% in 2009. In comparison with real GDP growth, power consumption shows even more inconsistent behaviour. In 2004 and 2009 there was a reduction in power consumption of -2.4% and -1.8% against positive real GDP growth rates of 7.1% and 9.0% respectively.

Author finds, that Industry will continue being the most important demand segment although its share in consumption will diminish from 46 to 35%. Agriculture, Household and Others will account for around 20% of consumption share each by the end of the period. Agri-
culture will reduce its share from 25 to 20%, Household will increase and “Other” will remain even, as high growth of SME and commercial sector compensates the reduction of public sector consumption. In the short and medium term (2009–2014), Uzbekener-
geo plans call for increasing power generation capacity to match the projected growth in demand of 3.1%–5.4% per year. To meet this demand, the government plans to build new and efficient combined cycle gas turbine (CCGT) power plants and replace some old and obsolete thermal power plants (TPP), rehabilitate coal-fired power plants, and build small hydropower plants.

DEMAND ELASTICITY

Even when the growth level is going up overall Uzbek-
energo demand forecast runs below than expected. As large industry segment has important weight in their forecasting survey and as large industry GDP demand elasticity is much lower than other sectors, overall fore-
cast demand growth is ever year lower than it could be expected according to Uzbekistan GDP GWP.

Uzbekenergo Planning System has developed two scenarios on which is investment is based: 2% Growth and 3.75% percent Growth. These scenarios show commissioning and decommissioning plans during the 2009-2020 periods. I have considered the high growth scenario only as the 2% is too conservative and does not reply to demand requirements. This adjusted trend is shown in the following table. Industry keeps its share and growth rate and household and commercial seg-
ments are adapted to GWP.

Author found out that this kind of study was never done in the country. Therefore, this study will have big impor-
tance for improvement of level of analysis of economic characteristics on country level. Industry and Gover-
ment recognized, that applying necessary study will be ve-
ry useful for developing exact measures to prevent social and economic risks.

As a first stage, in 2009, the government embarked upon a $42.5 billion, six-year (2009–14) Industrial Modernization and Infrastructure Development Program, of which almost $26 billion, or about 60 percent, is allocated for investments in oil and gas, or $5 billion and 12 percent in electric power, about $21.6 billion or roughly 6 percent each in chemicals and metallurgy, and the remaining $5.8 billion, or about 15 percent, in machine-building, textiles, and transport. The program comprises over 500 large investment projects and aims to increase industry’s share of GDP from 24 percent in 2010 to 28 percent in 2015. Growth is projected to continue around 7.8 per cent annually during 2011–14 and beyond, supported mainly by the above mentioned capital investment pro-
gram and to the author’s research result.

CONCLUSIONS

Due to uncertainties stemming either from inadequate actual data or unpredictable developments over a longer period, we will develop three demand forecast scenarios: Base, Low, High. The Base Scenario will reflect the most likely development. The High and Low Scenarios will reflect developments which could realistically materi-
alize in a favorable and non-favorable environment for electricity consumption, for GDP growth rate, for the de-
v elopment of elasticities applied and other factors. The actual demand is expected to be within the range given by the High and Low Scenarios. This usually described as the Cone of Uncertainty which is also valid for any demand forecast.

Nevertheless, Uzbekistan since 2010 started construction of new upper critical block of CCGT 470 MW at Avarz and 2 new CCGT by 450MW at Talimarjann. Attrac-
tion of foreign investment in the energy sector is stand the na-
tional priority. The government adopted policy and legal frameworks with clear goals to reduce energy intensity and losses, and actions plan covering big investments in to modernization of old and creation new power generation capacity as well as created new account-
ability systems on the basis of SoAEDA ideology .On 30 September 2009, the Law on Electric-Power Industry came into effect, giving the way for private investment in power generation and distribution in the medium–to-
long term. Further institutional and regulatory reforms will create an enabling environment for private sector participation.

As a result of detailed study, governmental development plans covers power sector physical and nonphysical as-
pects directed to ensure (i) uninterrupted and reliable power supply to all customers in Uzbekistan; (ii) security and reliability of the Central Asia Power System; (iii) equal access to the transmission system; (iv) investment in re-
construction, modernization, and expansion of power generation, transmission, and distribution systems; (v) diversification of the fuel mix for power generation; and (vi) improvement of management, operations, and per-
f ormance of utilities based on commercial principles.

Malika Saidkhodjaeva’s experience shows that present a perspective plans for future energy efficiency program based on energy supply and demand model, and identi-
fication of proper role of modern technologies, can respond to the country development.