# ENERGY SECURITY IN KAZAKHSTAN – POWERING THE FUTURE

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# Energy Security in Kazakhstan – Powering the Future

*"Kazakhstan is set to become the fourth largest contributor to global oil production growth"*–
Ulrich Benterbusch, Director, International Energy Agency,
October 12th 2012.

## Introduction

Energy security, broadly defined, concerns the management of energy supply from domestic and external sources, the reliability of energy infrastructure, and the ability to meet current and future demand. On these parameters, the World Energy Council ranks Kazakhstan the sixth most energy secure country in the world.[1]

Accounting for 3 percent of world oil production, Kazakhstan is among the 15 largest oil producers and its 40 billion barrels of reserves position it within the world's top ten.[2] The country has 1.5 trillion cubic metres of proven gas reserves, placing it among the world's 15 largest gas deposits.[3] Kazakhstan is also the world's leading uranium producer, accounting for no less than 38% of the world's output,[4] and has sufficient coal reserves to meet its own energy needs for the next 150 years.[5]

While domestic energy security is a lesser challenge for Kazakhstan, this is not the case globally. Global energy security is one of ten 21st century challenges outlined by President Nursultan Nazarbayev in his Kazakhstan 2050 Strategy[6], and Kazakhstan's endowment of oil, gas, and other minerals makes it an important player in addressing the matter.[7] The *International Energy Outlook 2013* expects world energy consumption to grow by 56 percent from 2010 to 2040 and fossil fuels will continue to account for nearly 80% of the world's energy use to that date.[8]

Responsible management of Kazakhstan's natural resource wealth is key to meeting this growing demand. When asked how Kazakhstan is managing its oil wealth, IMF Chief for Kazakhstan, Ana Lucia Coronel, answered: "prudently…the authorities have done a good job of managing the oil revenue and have brought major improvements in economic development and the population's well-being."[9] While Kazakhstan's oil boom is the most important contribution to global energy security, it is not the only

[1] http://www.worldenergy.org/data/sustainability-index/
[2] http://www.kazakhembus.com/page/energy-sector-of-kazakhstan and http://www.bp.com/statisticalreview
[3] http://www.bp.com/content/dam/bp/pdf/Energy-economics/statistical-review-2014/BP-statistical-review-of-world-energy-2014-full-report.pdf
[4] http://www.world-nuclear-news.org/enf-kazakhstan-tops-uranium-league-2701147.html
[5] http://www.encharter.org/fileadmin/user_upload/Publications/Kazakhstan_ICMS_2013_ENG.pdf
[6] http://strategy2050.kz/en/page/message_text2014/
[7] http://www.kazakhembus.com/document/address-by-kazakhstan-president-nursultan-nazarbayev-strategy-kazakhstan-2050
[8] http://www.eia.gov/forecasts/ieo/
[9] http://www.imf.org/external/pubs/ft/survey/so/2011/int081611a.htm

one. This paper asks: to what extent is Kazakhstan promoting energy security at home and globally? And how green is Kazakhstan's contribution?

## Kazakhstan's Oil Boom

The share of oil and gas in Kazakhstan's GDP has been growing steadily since Independence, increasing from 3.7% in 1997, 14.7% in 2006, to reach 25.8% in 2011. The EIA's *International Energy Outlook* projects that Kazakhstan - next to Brazil, Canada, and the USA - will be among the most important non-OPEC contributors to oil production growth up until 2040. Taken together, these four countries will account for 87% of the total increase in non-OPEC oil supply.[10] Kazakhstan's expanding production will centre on its Tengiz field, containing 7 billion barrels of oil, Karachaganak, holding 8 billion barrels, and the more recently discovered Kashagan field in the Caspian Sea, with an estimated 7 to 9 billion barrels.[11]

Production growth in the medium term will come primarily from Kashagan and Tengiz, which will increase total supply from 1.6 million barrels per day in 2011 to around 3.7 mb/d in 2035.[12] With an estimated 13 billion barrels of oil, Kashagan is the largest known field outside the Middle East, the fifth largest in the world, and the largest oil field discovered in the past three decades.[13] Kazakhstan is already the second largest oil producer in the Asia/Pacific region after China, and by 2035 its production will be three quarters that of China.[14]

In comparative terms, by 2035 Kazakhstan will, hypothetically, be able to sustain more than half of the forecasted oil needs of the entire South Asian subcontinent (6.3 million barrels per day) or nearly all of Southeast Asia's combined oil demand (4.4 million barrels per day).[15]

Kazakhstan along with Russia are the non-OPEC countries that have increased reserves the most since the turn of the millennium, and the International Energy Agency's *World Energy Outlook* considers Kazakhstan "the driver of increased Caspian production".[16] Kazakhstan has also attracted the highest levels of FDI among the former Soviet countries in per capita terms – over $180 billion since Independence.[17]

Kazakhstan's foreign policy is built on diversification of international partners and a similar principle has informed its energy exports. To reduce dependence on any one partner, Kazakhstan has expanded the Russia-bound Caspian Pipeline Consortium (CPC) pipeline from the Tengiz field, established the Kazakhstan-Caspian

[10] *International Energy Outlook 2013*, p. 23.
[11] http://www.kazakhembus.com/page/energy-sector-of-kazakhstan
[12] *World Energy Outlook 2012*, p.111.
[13] http://www.eia.gov/countries/analysisbriefs/Kazakhstan/kazakhstan.pdf
[14] http://www.adb.org/sites/default/files/pub/2013/energy-outlook.pdf
[15] http://www.adb.org/publications/energy-outlook-asia-and-pacific-2013
[16] *World Energy Outlook 2012*, p. 98.
[17] http://www.imf.org/external/pubs/ft/scr/2011/cr11151.pdf and http://www.kazakhembus.com/in_the_news/kazakhstan-has-received-180-billion-in-fdi-since-independence

Transportation System which connects with the Baku-Tbilisi-Ceyhan oil pipeline running from Azerbaijan to Turkey, and increased the capacity of the Kazakhstan-China pipeline which came online in 2005.[18]

These multiple outlets have played a critical role for Kazakh oil to reach foreign markets together with the domestic infrastructure supporting them. As noted by a review of the Energy Charter Conference, "For 20 years, Kazakhstan has made remarkable progress in building a new infrastructure in order to connect previously isolated parts of the country and to pioneer new export routes."[19]

The Strategic Plan of the Kazakh Ministry of Oil and Gas (which has now been reorganized into a new Ministry of Energy) for 2011-2015 pledges to further develop the fuel and energy complex, meet the growing demand, and strengthen the country's scientific and technical potential. For example, Kazakhstan is constructing a $6.3 billion gas and chemical complex near Atyrau, building a major gas processing plant on the Karachaganak field,[20] and modernising the Pavlodar Oil Chemistry Refinery among other multi-billion dollar investments.[21]

Realising its responsibility towards future generations, Kazakhstan has set aside more than $72 billion of its energy and other mining revenues in a National Fund (NFRK).[22] The government is allocated $8 billion from the fund annually, provided that the oil fund does not fall below 20% of GDP, and the Kazakh leadership has according to the IMF, "shown discipline in adhering to the set targets for transfers from the NFRK".[23] At present, Kazakhstan has the 10th largest sovereign wealth fund in the world, behind China, Norway, Qatar, Kuwait, and five others.[24]

While Kazakhstan contributes to the energy security of China, the Netherlands, Italy, France and other major importers of Kazakh oil, it also recognises that this is a finite resource. Kazakhstan has therefore redoubled its efforts to promote greener and renewable energy.

## Green Energy: Wind, Solar, and Hydro Power

To combat global warming and reduce the emission of carbon dioxide and other greenhouse gases, Kazakh President Nazarbayev has pledged that 50% of the country's energy consumption by 2050 will come from green energy sources. Moreover, by spending 1% of Kazakhstan's GDP annually (approximately $2.2 billion) on the development of wind, sun, and hydropower, the share of coal will be cut from 80% in the energy portfolio to less than 50% by 2030.[25]

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[18] http://www.primeminister.kz/page/article_item-109?lang=en
[19] http://www.encharter.org/fileadmin/user_upload/Publications/Kazakhstan_ICMS_2013_ENG.pdf
[20] http://www.kazakhembus.com/page/energy-sector-of-kazakhstan
[21] http://www.primeminister.kz/page/article_item-109?lang=en
[22] http://www.sovereignwealthcenter.com/Article/3329528/Kazakhstans-National-Oil-Fund-Reaches-72-billion.html#.U8JBO_I_vEY
[23] http://www.imf.org/external/pubs/ft/scr/2011/cr11151.pdf
[24] http://www.swfinstitute.org/fund-rankings/
[25] http://www.kazakhembus.com/page/energy-sector-of-kazakhstan and http://www.ieta.org/assets/Reports/EmissionsTradingAroundTheWorld/edf_ieta_kazakhstan_case_study_may_2013.pdf

Kazakhstan is the first CIS country to implement an Emissions Trading System (ETS), which presently caps allowable emissions from 179 energy-producing corporations at 147 million tons.[26] The system is expected to reduce the emission of greenhouse gases by 15 percent by 2050, and IETA notes that Kazakhstan is "unique" in the sense that implementation of ETS "has occurred relatively unhindered".[27] Renewable energy development is also one of the priorities of Kazakhstan's State Program for Accelerated Industrial and Innovative Development for 2010-2014 and its second instalment for 2015-2019.

"Energy innovation is not a nationalistic game," Microsoft founder Bill Gates has said.[28] President Nazarbayev's Green Bridge partnership program, launched at the Rio+20 World Summit on Sustainable Development in 2012, reflects a similar philosophy. The Green Bridge aims to facilitate technology transfers in renewable energy between countries, recognising that the challenge of global warming can only be addressed collectively, through the sharing of knowledge.[29]

The initiative has been appraised by IEA Director Benterbusch as a potential model for regional development in sustainable energy,[30] and since Rio the EBRD, the IMF, the World Bank and partner governments have engaged with Kazakhstan to implement this. For example, the EBRD has invested more than US$ 650 million in energy efficiency projects in Kazakhstan, cutting greenhouse gas emissions by 3,885 kilotons per year.[31] This forms part of a greater Kazakh program to attract around $2 billion of foreign investment into renewable energy until 2020.[32]

Close to 80 percent of the world's projected increase in global renewable electricity generation through 2040 is expected to come from hydropower and wind power.[33] Rising to the challenge, Kazakhstan is presently building 13 wind plants, 14 hydroplants and 4 solar plants[34], and the International Emissions Trading Association concludes that there have been "substantial developments" in a nation-wide feed-in-tariff regime, which will "play a major role" in promoting renewable energy in Kazakhstan."[35]

Estimates suggest that 10-15% of Kazakh territories have average wind speeds of over 6 metres per second, yet wind power has been virtually unexploited as an energy source in the country until recently. Wind power and other renewable energy in Kazakhstan could potentially generate 1 trillion kilowatts-hours of electricity per

[26] http://kzgreenenergy.com/green-energy-projects-in-progress/
[27] http://www.kazakhstanunsc.com/policy-priorities/energy-security/ and http://www.ieta.org/assets/Reports/EmissionsTradingAroundTheWorld/edf_ieta_kazakhstan_case_study_may_2013.pdf
[28] http://voices.washingtonpost.com/ezra-klein/2010/11/bill_gates_energy_innovation_i.html
[29] http://www.astanatimes.com/2013/01/efforts-to-promote-greener-economy-solar-energy-under-way/
[30] http://www.iea.org/newsroomandevents/agencyannouncements/ieaglobalenergypolicychiefaddresseskazakhstanienergyissues.html
[31] http://kzgreenenergy.com/rio20-summit/
[32] http://kzgreenenergy.com/news/
[33] http://www.eia.gov/forecasts/ieo/more_highlights.cfm
[34] http://kzgreenenergy.com/green-energy-projects-in-progress/
[35] http://www.ieta.org/assets/Reports/EmissionsTradingAroundTheWorld/edf_ieta_kazakhstan_case_study_may_2013.pdf

year,[36] which corresponds roughly to the amount used by the entire global textile industry in one year. Kazakhstan's first large scale wind power plant is now being built in the Yereymentau region and will result in large $CO^2$ emissions reductions as this and other projects supplement and eventually replace obsolete coal-fired power stations.[37]

Solar energy has similar potential. Occupying ca. 2% of the earth's land surface, Kazakhstan is the ninth largest country in the world and has approximately 3000 sunlight hours per year.[38] Kazakhstan's first solar power station came into operation in June 2012 in the village of Sarybulak in the Almaty region.[39] Since then, the Astana Solar plant has opened[40] along with a Kazakh-German solar energy project[41] and a similar complex is also being planned in Kyzylorda region.[42]

The construction of the Moinak hydro-electric power station on the Sharyn River east of Almaty is another major green energy project. Launched in December 2012, it is predicted to generate 1.27 billion kilowatt-hours of electricity per year, enough to power over 150,000 homes.[43] Other examples include the hydropower plant launched in Zhambyl Province in May 2013, which has already generated 8 million KW and powers an area the size of a regional district with three months of electricity.[44]

Large scale reforms have also been undertaken throughout the energy sector, which have earned recognition internationally. A recent evaluation report by the Energy Charter's Secretariat concludes: "Kazakhstan has advanced greatly in power sector reforms: the vertically integrated monopolistic sector has been unbundled and most of the generation plants and regional distribution companies privatised, and a competitive wholesale market developed, with a modern grid code."[45]

At present Kazakhstan is responsible for around 0.79% of the world's $CO^2$ emissions, comparable to Taiwan, Spain, and the Netherlands.[46] If effectively utilised, the one trillion kilowatt-hours potential of Kazakhstan's wind, solar, and hydro power could cancel out approximately 76 million tons of $CO^2$ emissions annually, which is more than a quarter of Kazakhstan's total $CO^2$ emissions.[47]

## Uranium and Nuclear Energy: Kazakhstan's Historic Achievements

[36] http://www.astanatimes.com/2013/01/efforts-to-promote-greener-economy-solar-energy-under-way/
[37] http://www.ebrd.com/pages/project/psd/2013/45618.shtml
[38] http://www.astanatimes.com/2013/01/efforts-to-promote-greener-economy-solar-energy-under-way/
[39] http://www.astanatimes.com/2013/01/efforts-to-promote-greener-economy-solar-energy-under-way/
[40] http://www.astanasolar.kz/en/news/development-solar-energy-kazakhstan-reality-and-prospects
[41] http://www.kazakhembus.com/in_the_news/solar-energy-coming-to-kazakhstan
[42] http://kzgreenenergy.com/solar-energy/
[43] http://www.kazakhembus.com/page/energy-sector-of-kazakhstan
[44] http://www.astanatimes.com/2014/01/regions-powerful-hydropower-plant-produces-green-energy/
[45] http://www.encharter.org/fileadmin/user_upload/Publications/Kazakhstan_ICMS_2013_ENG.pdf
[46] http://data.worldbank.org/indicator/EN.ATM.CO2E.KT/countries?order=wbapi_data_value_2010+wbapi_data_value+wbapi_data_value-last&sort=desc
[47] Calculated at http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results

Kazakh uranium production increased from 2,000 to 19,450 tons between 2001 and 2011, and is anticipated to reach 30,000 tons per year by 2018.[48] In 2011 Kazakhstan accounted for almost 35% of world production and its total uranium reserves exceed 1.5 million tons.

The rapid growth of Kazakh uranium production over the past decade was, to quote the most comprehensive publication on the topic to date, "one of the most significant developments in the history of uranium".[49] Not only did Kazakhstan quadruple production within a decade but it also accounted for the vast majority of the net increase of uranium produced in the world.

With 53 nuclear power plants presently under construction in the world and almost 500 others planned to be operating fifteen years from now, uranium demand has soared.[50] Since uranium is the essential ingredient in producing nuclear fuel, Kazakhstan will meet a sizeable share of world demand for this energy source which - it should be emphasised - is the most environmentally friendly means of producing electricity on a large scale. In other words, Kazakhstan is not only promoting global energy security, but significantly reducing $CO^2$ emissions in the process.

At present, Kazakhstan's uranium is exported to Russia, China, Japan, South Korea, and India among others, and it has civil nuclear cooperation pacts in place with the countries mentioned, as well as with Great Britain and several others. For example, an MoU was signed in 2009 between the Kazakh and Indian governments under which KazAtomProm national atomic company supplies uranium for Indian reactors, and nuclear cooperation also forms part of the Kazakhstan-U.K. Strategic Partnership, signed in 2013.

That Kazakhstan has been selected by the International Atomic Energy Agency (IAEA) to host the world's first nuclear fuel bank attests to the international trust that the country enjoys in this area.[51] The bank, planned to be located in Ust-Kamenogorsk, will promote non-proliferation by providing uranium fuel to IAEA member states without individual countries having to acquire uranium-enriching technologies (although there is no such built-in obligation in the founding documents of the bank).[52] This, it is envisioned, will result in fewer countries with a full nuclear fuel production cycle and thereby prevent the dissemination of technologies that could be used to build nuclear weapons.

Kazakhstan's decision upon Independence to voluntarily renounce the world's fourth largest nuclear arsenal inherited from the USSR has been noted as an historic achievement and an example to be followed by others. Kazakhstan's commitment to peaceful nuclear energy, the planned hosting of a world nuclear fuel bank, and meeting the rapidly expanding demand for uranium is a second achievement in the same sphere, both of which promote global energy security.

[48] http://www.kazakhembus.com/page/energy-sector-of-kazakhstan
[49] http://www.uxc.com/products/rpt_kazakhPF.aspx
[50] http://www.washingtonpost.com/wp-dyn/content/article/2010/02/24/AR2010022403242.html
[51] http://www.astanatimes.com/2014/03/talks-iaea-nuclear-fuel-bank-kazakhstan-near-completion/
[52] http://www.astanatimes.com/2014/03/talks-iaea-nuclear-fuel-bank-kazakhstan-near-completion/

## Leading Multilaterally: EXPO-2017 and Other Initiatives

In November 2012, the member states of the Paris-based *Bureau International des Expositions* (BIE) chose Astana to host EXPO-2017 under the theme of Future Energy – a fair devoted to promoting renewable energy alternatives and technologies. More than 100 countries and 10 international organisations are expected to participate in the exhibition which is set to last from June to September 2017. Around 2 million visits are expected during this time. It will mark the first time that a major international exhibition of this kind is held in the post-Soviet space.[53] A Centre for Future Energy, promoting similar issues, is also in the process of being established in Kazakhstan.[54]

In addition, Kazakhstan recently hosted the OSKEMEN EXPO 2014 in Ust-Kamenogorsk, which gathered representatives from 12 countries discussing various aspects of the green economy.[55] In April 2014, three international industrial exhibitions were held at Astana's Korme Exhibition Complex featuring Kazatomexpo, Power Astana and MachExpo Kazakhstan along with representatives from 80 companies from Germany, Israel, Iran, Kazakhstan, Russia, Uzbekistan, Ukraine and the Czech Republic.[56]

From January 1st of this year, Kazakhstan has chaired the Energy Charter Conference, an intergovernmental organisation and the governing and decision-making body for the Energy Charter process. Kazakhstan's chairmanship is the first Presidency in the Charter's history, which dates back to the signing of the Energy Charter Treaty in 1994.[57]

Finally, in October 2013, Kazakhstan was admitted as a compliant member of the Extractive Industries Transparency Initiative (EITI), ahead of such advanced countries as the USA. EITI is a global coalition of governments, companies, and civil society working to improve openness and accountable management of revenues from natural resources. Kazakhstan is set to produce its first EITI report as compliant member by the end of this year.[58]

The EITI status follows a jump in Kazakhstan's business climate overall. According to the World Bank's Doing Business rankings, Kazakhstan now belongs to the 50 most business-friendly countries worldwide.[59] It rose by an impressive 15 places in 2011 alone, and is now ranking higher than some Western European countries.[60]

In sum, while Kazakhstan contributes to energy security at the global level by supplying oil, uranium, and other minerals, it is simultaneously looking to the future and the transition from a hydrocarbon-based economy to one based on renewable energy. Kazakhstan is using its oil wealth to fund green energy and, in that respect,

[53] http://kzgreenenergy.com/expo-2017/
[54] http://en.trend.az/regions/casia/kazakhstan/2238095.html
[55] http://kazworld.info/?p=36851
[56] http://www.powerexpo.kz/en/press-centre/news/104-07-04-2014machexpo-pr
[57] http://en.trend.az/capital/energy/2219545.html
[58] http://eiti.org/Kazakhstan
[59] http://www.doingbusiness.org/data/exploreeconomies/kazakhstan
[60] http://www.doingbusiness.org/rankings

is an immensely valued global energy partner.

## ABOUT

### Kazakhstan's Bid to Secure a Non-Permanent Seat on the United Nations Security Council for 2017/18

www.kazakhstanunsc.com

In September 2013, Kazakhstan announced its bid to secure a seat as a non-permanent member of the United Nations Security Council in the years 2017/18.

As a regional leader and global partner in matters of energy security, and a valuable contributor to international peacekeeping missions, Kazakhstan wishes to bring its unique experience and expertise to bear on some of the pressing challenges currently facing the UNSC.

Its bid is based on four central pillars: food security, water security, energy security and nuclear security.

KazakhstanUNSC.com, its publications, and its occasional newsletters and bulletins aim to set out, in clear and concise terms, the main policy priorities of Kazakhstan's UNSC bid. The multilingual website also supplies details of political, economic and social developments inside Kazakhstan and about its international foreign policy initiatives.

Kazakhstan has the experience, political will and resources to make a valuable contribution to the global challenges faced by the UNSC. It is fully engaged in its commitment to assume such responsibilities on the Security Council.

Home to over 130 different ethnic groups, Kazakhstan is nothing less than a microcosm of the United Nations. In the spirit of a committed and principled partner in the family of nations, the Republic of Kazakhstan has announced its bid to become a non-permanent member of the UN Security Council in the years 2017/18.

*Subscribe here for all the latest news, publications and developments relating to the bid.*