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**NEW MIDDLE EASTERN QUICK STUDIES**

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# **The Iranian Electric Power Industry after the Islamic Revolution: Nuclear Developments and Current Conditions**

DENIS VOLKOV\*

Iran's nuclear activities are prominent in today's media reports. But few reports focus on the relationship between nuclear power and Iran's energy needs. The Iranian government claims that nuclear technologies are vital for the national electric power industry and therefore for the country's economy as a whole. It is common knowledge that the electric power industry is one of the main pillars of every country's economy, directly influencing both state viability and national security. A state's ability to provide and maintain the necessary amount of electricity production is vitally important. So, does Iran really, to such an extent, need nuclear power? My research shows that at the moment, and in the next ten years at least, the production of electricity using nuclear energy will secure an insignificant place in the energy basket of Iran. Its importance can, therefore, be questioned, especially against the backdrop of recently established international sanctions that are likely to have a detrimental impact on Iran's economy. On the other hand, the construction of nuclear power plants can be regarded as an important component the Iranian government policy that aims to reduce the national economy's dependency on fossil fuels. If this is the main goal, its legitimacy is difficult to question. This quick study seeks to identify the real role of nuclear energy in this context through a brief analysis of Iran's electric power industry. The material presented herein is based on official information provided by the Iranian ministries, state organizations (including annual statistics reports issued by the Tavanir Co.<sup>1</sup>), independent international sources, and information derived from my personal, almost 15 years experience of working in this field in Iran. I include an overview of the milestones in the Iranian power industry's development after the Revolution of 1979, and trace the main changes in the technical and financial executive policies pursued by the Ministry of Energy against the backdrop of various forms of sanctions.

In 1979, the overall installed capacity of the Iranian electric power industry reached 8,589 MW including the power plants operating as auxiliaries at large industrial integrated works and plants as well as those affiliated with the Ministry of Defense and others. The

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<sup>1</sup> Iran's Power Generation, Transmission and Distribution Management Company. The Company is also in charge of strategic planning and managing the national electric grid.

overall installed capacity of the power plants under the Ministry of Energy accounted for 7,024 MW of which hydropower plants were 1,800 MW, steam power plants – slightly more than 1,700 MW, gas turbine power plants – about 2,900 MW and finally diesel-engine power plants – slightly more than 600 MW.<sup>2</sup> Therefore, the total installed capacity per capita constituted 243 W. When reviewing the 10 years preceding the Revolution it is necessary to note that the average annual increase in the total installed capacity during the implementation of the last two '5 year plans' before the Revolution was 18% and 20% respectively for the power plants affiliated with the Ministry of Energy.<sup>3</sup> These rates have not been reached since the Revolution. However, despite the rapid pace of industry development during the pre-Revolution period, little was being done to invest in and improve domestic technology. Power plants were constructed only by foreign companies, and the necessary equipment and engineering services were also provided only by foreign nationals. Domestic companies mainly subcontracted with foreign companies who signed the contracts on a *turn-key* or *Engineering, Procurement, Construction* (EPC) basis with the Ministry of Energy,<sup>4</sup> or to be more precise, with Tavanir.

If we take a brief look at the current condition of the Iranian electric power industry, we can state that the overall installed nominal capacity of 61,203 MW is seven times more than the pre-revolution figures.<sup>5</sup> The total installed capacity per capita constitutes 831 W, which is more than thrice the figures of 1978. The energy basket has been considerably diversified: 15,704 MW – the overall capacity of steam power plants, 22,526 MW – gas turbine power plants, 13,984 MW – combined cycle power plants, 8,486 MW - hydro power plants, 503 MW – power plants using diesel fuel and wind energy.<sup>6</sup> Recently the geothermal power plant in Meshkinshahr as well as certain minor capacity bio-fuel power plants in Shiraz and Mashad have been added to the national grid. In addition, in September 2011, the Bushehr nuclear power unit was synchronized with the national grid. First working at 40% capacity, it was planned to reach the full capacity of 1GW by the end of 2011.<sup>7</sup> Due to technical issues the attainment of 100% was postponed until the first half of 2012. According to the statement of FareidunAbbasi-Davani, the head of Iran's Atomic Energy Organization, the intermediary stages of 50% and 75% were passed before the end of February 2012.<sup>8</sup> However, in May, the Russian contractor moved the possible launch of the plant into fully fledged industrial operation to the end of 2012.<sup>9</sup> Recently Mr. Abbasi has been much more

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<sup>2</sup> See Iran's Power Generation, Transmission and Distribution Management Company, *Sanat-iBarg-i Iran*, 1346-1357, p. 6, 8, [www.tavanir.org.ir/info/stat57/epi-t/46-57.zip](http://www.tavanir.org.ir/info/stat57/epi-t/46-57.zip) (accessed 12 June 2012).

<sup>3</sup> *ibid.*

<sup>4</sup> Projects on a *turn-key* or EPC (Engineering, Procurement, Construction) basis involve the contractor being responsible for the full scope of works from designing to commissioning a power plant. The Contractor is supposed to carry out and/or to hire relevant sub-contractors that carry out the necessary engineering services, the procurement of materials and equipment, and the construction. The power plant is handed over to the Client in operating condition. The Contract payments are usually made immediately upon the delivery of each portion of equipment and the execution of each part of works according to the Contract.

<sup>5</sup> See Iran's Power Generation, Transmission and Distribution Management Company, *Amar-iTafsili-iySanat-iBarg-i Iran dar Sal-i 1389*, <http://www2.tavanir.org.ir/info/stat89/tafsili/modiriyati/jeld/Main.htm> (accessed 12 June 2012).

<sup>6</sup> *ibid.*

<sup>7</sup> See RIA Novosti News Agency, 12 September 2011, <http://en.rian.ru/world/20110912/166785925.html> (accessed 12 June 2012).

<sup>8</sup> See The Russian Energy Community (ENSOR), 27 February 2012, <http://www.ensor.ru/discussions/news/2295.html> (accessed 7 April 2012). See also ITAR TASS News Agency, IRAN.RU Portal, 27 February 2012, [http://www.iran.ru/rus/print\\_news.php?news\\_id=78568](http://www.iran.ru/rus/print_news.php?news_id=78568) (accessed 12 June 2012).

<sup>9</sup> See RIA Novosti News Agency, 14 May 2012, <http://en.ria.ru/russia/20120514/173443029.html> (accessed 12 June 2012). See also Xinhua News, 14 May 2012, [http://news.xinhuanet.com/english/world/2012-05/14/c\\_131587468.htm](http://news.xinhuanet.com/english/world/2012-05/14/c_131587468.htm) (accessed 12 June 2012).

reserved, having said that the date of the commissioning in question will be announced only after the routine tests are accomplished and the necessary level of safety achieved.<sup>10</sup>

In the field of more conventional energy sources, by 2009, Iran was producing over 80% of the equipment for its hydraulic power plants and over 90 percent of the equipment for its gas turbine power plants. In July 2010 Tavanir's Vice President announced that 'Iran [was] 100% self-sufficient in the production of its electric industrial equipment.'<sup>11</sup> With the development of design and research institutes, as well as consultant engineering companies such as GhodsNiru, Moshanir and many others, Iran is likely to join the list of countries that produce power plant technology within the next few years. We can therefore, taking into account the information above, point to a steady development in this field that has been meeting the electricity needs of the growing national economy since the end of Iran-Iraq war.

Two key moments played a crucial role for the power industry of Iran during the post-war period. In the late 1980s and early 1990s the Ministry of Energy stressed the need to increase the construction of hydropower plants and further steam power plants as the most durable and efficient (at that time) power generation projects. At the same time, preference would be given to companies that were less dependent on American financing. This move resulted in the commissioning of many large-scale projects, including such power plants as Ramin (6 units of 315 MW with the total nominal capacity of about 1,900 MW) and Shahid Mohammad Montazeri (8 units of 200 MW with the total nominal capacity of 1,600MW implemented by the leading Russian EPC company of the time in Iran, Technopromexport), the Shazand power plant (4 units of 325 MW with the total of 1,300 MW implemented by China) and other projects. At the same time, opportune and farsighted measures were taken to transform steam units to binary fuel operation. The power plants, initially designed to burn mazut (in other words fuel oil), now mainly burn mazut in winter and during gas shortages. This has beneficial environmental effects and saves oil (a vital source of foreign currency).

Then, in the late 1990s the sudden drop in oil prices created a dearth of foreign currency and the Ministry of Energy prioritized meeting the demands of rapidly growing Iranian industry. Completely new contract schemes for Iran such as *project finance*, *Build Operate Transfer* (BOT), and *Build Own Operate* (BOO), along with the simultaneous obligatory transfer of technology (power equipment production technology and plant design) were introduced in dealing with foreign contractors.<sup>12</sup> At the same time, emphasis was placed on the construction of gas turbine power plants and later, combined cycle power plants. Most of the projects were successfully accomplished through the establishment of the company Mapna, a consortium made up of Iranian companies that efficiently accumulated highly skilled EPC services and powerful manufacturing facilities.<sup>13</sup> Thus, in the early 2000s, Iran managed to master the technology for the production of V94.2 gas turbines (licensed by Siemens) and their later modifications, as well as steam turbines. Subsequently, the Ministry of Energy succeeded in installing generating capacities that required considerably less

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<sup>10</sup> IRAN.RU Portal, 22 August 2012, [http://www.iran.ru/rus/print\\_news.php?news\\_id=82498](http://www.iran.ru/rus/print_news.php?news_id=82498) (accessed 2 September 2012).

<sup>11</sup> Ministry of Energy News, 21 July 2010, <http://news.moe.org.ir/vdcamin6.49nao1gtk4.html> (accessed 12 June 2012).

<sup>12</sup> *Project finance* - the financing of the construction of a power plant based upon a non-recourse or limited recourse financial structure where the debt and equity used to finance the construction are paid back from the cashflow generated by the power plant. *BOT* - 'build, operate, transfer' - a model in which a private national or/and private/state foreign company constructs a power plant under a contract to a government agency. The contractor assumes the risks associated with planning, constructing, operating and maintaining the project for a specified time period. *BOO* - a model in which a private national and/or private/state foreign company builds, owns and operates the power plant with some degree of encouragement from the government.

<sup>13</sup> See PressTV, 12 October 2012, <http://presstv.com/detail/204209.html> (accessed 12 June 2012).

national and foreign currency funding and time than would have been necessary for the construction of hydro and steam power plants.

Since the early 2000s, Iran has abandoned the practice of striking “turn-key” contracts with foreign companies, and has been constructing steam and gas turbine power plants by using mostly domestic services and production and domestic private companies that produce the necessary equipment. The Ministry of Energy’s reliance on foreign companies’ services and equipment has drastically declined with each passing year.

This information presents a positive picture. However, there are also difficulties, which have been caused by mainly domestic factors. Ill-planned state funded power projects led to a USD 6 BN. debt crisis in 2010,<sup>14</sup> a consequent dearth of financial resources, and the attempted impeachment of the Iranian Minister of Energy Majid Namju in March 2011. He stood accused of inefficient management and the dilettantism of an individual who had not previously worked in the industry.<sup>15</sup> Furthermore, a lack of coordination between state organizations and institutions hindered the speed and success of many projects in Iran in the absence of unified policies toward private and foreign enterprises and the pursuance of narrow departmental interests by various governmental entities. This can be seen in the obstacles that emerged during the implementation of projects under the schemes of *project finance*, *BOT*, and *BOO* that caused foreign contractors to abandon these projects.<sup>16</sup> Administrative and legislative collisions have considerably increased investment risks in such complex schemes.

A striking example can be found in the experiences of a leading Russian EPC company working in Iran that, after accomplishing several large-scale power projects during several consecutive years, was overwhelmed by groundless financial claims put forward by Iranian ministries and banks, particularly the imposing Organization for Social Security, which attempted to compensate for shortages in dues and fees by targeting foreign contractors. Multiple judicial decisions made by the Court of Administrative Justice in favour of the company and the assistance of the Iranian Ministry for Foreign Affairs failed to solve those problems.<sup>17</sup> The matter was not resolved until the company initiated sharpened expert

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<sup>14</sup> See Payvand News Agency, 02 October 2010, <http://www.payvand.com/news/10/feb/1145.html> (accessed 12 June 2012). See also BBC Persian News Service, 03 January 2011, [http://www.bbc.co.uk/persian/business/2011/01/110103\\_111\\_electricity\\_debt.shtml](http://www.bbc.co.uk/persian/business/2011/01/110103_111_electricity_debt.shtml) (accessed 12 June 2012). See also BBC Persian News Service, 22 January 2011, [http://www.bbc.co.uk/persian/iran/2011/01/110122\\_119\\_minister\\_electricity\\_debt.shtml](http://www.bbc.co.uk/persian/iran/2011/01/110122_119_minister_electricity_debt.shtml) (accessed 12 June 2012).

<sup>15</sup> Majid Namju, who had served in the IRGC (the Islamic Revolution Guards Corps) and as the head of Kerman’s city council before his appointment as the Minister of Energy, avoided impeachment by only four votes in the national parliament, owing his survival mainly to the President’s intervention. There was another attempt to impeach him in October 2011, although the motion did not reach voting. The crisis in the industry has not yet been resolved. However Namju keeps receiving powerful backing from the Presidency. Recently, according to a letter signed by Ahmadinejad on August 15 2012, he was appointed a member of the newly established Country’s Spatial Planning Council (Shaurāi-Āmāyshi Sarzamīn) and praised for his outstanding commitment and excellent records. (See BBC Persian News Service, 23/02/2011, [http://www.bbc.co.uk/persian/iran/2011/02/110223\\_125\\_energy\\_minister\\_impeachment.shtml](http://www.bbc.co.uk/persian/iran/2011/02/110223_125_energy_minister_impeachment.shtml) (accessed 12 June 2012). See also BBC Persian News Service, 06 March 2011, [http://www.bbc.co.uk/persian/iran/2011/03/110306\\_122\\_niroom\\_parliament\\_energy.shtml?print=1](http://www.bbc.co.uk/persian/iran/2011/03/110306_122_niroom_parliament_energy.shtml?print=1) (accessed 12 June 2012). See also Khabaronline News, 07 November 2011, <http://www.khabaronline.ir/print/135349/Politics> (accessed 15 November 2011). See Press TV Channel, 26 October 2011, <http://www.youtube.com/watch?v=gTT8ff3jbeM> (accessed 12 June 2012)).

<sup>16</sup> Iran News Agency, 31 October 2003, [http://www.iran.ru/eng/iran\\_news.php?act=news\\_by\\_id&news\\_id=4419](http://www.iran.ru/eng/iran_news.php?act=news_by_id&news_id=4419) (accessed 12 June 2012).

<sup>17</sup> According to current Iranian legislation, even if dues and fees have been levied groundlessly or incorrectly there is no practical mechanism to make state organisations return financial assets, whereas state organisations are allowed to withdraw money from the accounts of private and foreign entities. Instead, it is stipulated that state organisations should comply with the decisions of the Court of Administrative Justice, a court that has no

discussions on these issues during various sessions of the relevant intergovernmental commission and its subcommittees. Ultimately, the company virtually pulled out of Iran.<sup>18</sup>

In the above context, Nikolay Kozhanov's geostrategic analysis of Russia's politics in the light of the Iranian issue, recently published by the Washington Institute for Near East Policy, can be questioned.<sup>19</sup> Kozhanov focuses on the possible intensification of Russo-Iranian economic cooperation during Vladimir Putin's new presidency term, Russia's current policy toward Iran, its conformity with international institutions, the priority given to the relationships with the United States and European countries, and the absence of unified well-structured coordinated policy toward Iran on behalf of Russian entities.<sup>20</sup> However, I would question the "success stories" and "active penetration" of Russian business in Iran's economy that have allegedly taken place since 2007.<sup>21</sup> The intensification of political dialogue and negotiations in the economic field that has tended to emerge from time to time since the early 2000s is nothing but the echo of the twists and turns of Russo-American relations and has no real tangible economic effect, having remained purely on the level of high-ranking and technical delegations' visits, memoranda of understanding and inter-governmental commissions protocols without further commercial realization. This can be illustrated by the example of Gazprom and Zarubezhneft, which have left no palpable trace in Iran's economy, or by the example of Technopromexport and RAO UES of Russia,<sup>22</sup> which, since the end of the 1990s, have been holding abortive, but sometimes very intensive negotiations on the construction of new power plants and synchronization of the two countries' energy systems. Well-informed representatives of these companies and others acknowledge that the existence and "seasonal" intensification of dialogue were themselves the goal, rather than actual practical activity.

Russian companies like Technopromexport and others do not owe their "success stories" to the Russian foreign policy in the 2000s, but rather to USSR policy in the 1970s and 1980s.<sup>23</sup> In the opinion of the author, both sides have seemed content throughout the last decade with a merely declarative "intensification" of cooperation, the only difference between them being that Russia needs the "intensification" for the foreign policy goal of using Iran as "leverage against the United States",<sup>24</sup> whereas Iran uses the "intensification" for both foreign and domestic politics.<sup>25</sup>

However, let us get back to the share of the nuclear in Iran's power industry and the relevant figures. If we take into consideration the overall installed capacity of power plants in Iran, which according to Deputy Minister of Energy Mohammad Behzad will be 70,000

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right to set the execution term for state organisations. This is the legislative gap usually used by the Organization for Social Security.

<sup>18</sup> A more comprehensive and detailed picture of the obstacles foreign investors encounter in Iran can also be found in Nikolay Kozhanov's *Russia's Relations with Iran* on pp. 24-25.

<sup>19</sup> See Nikolay Kozhanov, *Russia's Relations with Iran: Dialogue without Commitments* (Washington: The Washington Institute for Near East Policy, 2012), pp. xii, 14, 17, 21-23, 29.

<sup>20</sup> Ibid, pp. xi-xiii, 2-3, 5, 8-9, 15.

<sup>21</sup> Ibid, p. 21-22.

<sup>22</sup> The Unified Energy System was an electric powerholding company in Russia. It controlled about 70% of Russia's installed electric capacity, 96% of its high-voltage grid and over 70% of its transmission lines. In addition to the Russian market, RAO UES exported electricity to Scandinavia and to other members of the CIS. The last head of RAO UES was Anatoly Chubais ([http://en.wikipedia.org/wiki/RAO\\_UES](http://en.wikipedia.org/wiki/RAO_UES) (accessed on 2 September 2012)).

<sup>23</sup> This period witnessed the conclusion of a number of large-scale contracts for the construction of various power plants in Iran, not mentioning the cooperation in heavy machinery and weaponry.

<sup>24</sup> See Kozhanov, *Russia's Relations with Iran*, pp. 5-7.

<sup>25</sup> Kozhanov does qualify Putin and Khatami's 2001 politics as "the general intention to continue all-embracing dialogue without stating specific tasks". Ibid, p. 4.

MW by the summer of 2013,<sup>26</sup> and given the fact that the 1,000 MW Bushehr Nuclear Power Unit has been under construction for more than 15 years, then the nuclear project appears relatively insignificant for the Iranian electric power industry. Due to the pilot character of the project and the extreme technical challenges and political ambiguities throughout the whole period of construction (including fears among the Iranian official establishment that Russia would give up the project), the capacity of the Bushehr Power Plant has never been included in the planned annual growth of overall national installed capacity on which the country's economy can feasibly rely.

It would therefore appear, when the relative capacities are compared, that in the context of the electric power industry, nuclear energy is preordained to merely diversify the sources of energy. On the other hand, activities in the nuclear sphere do fall into a trend towards diversification of national energy baskets that applies worldwide. The same principle applies to Iran's construction of two coal burning power units (630 MW) in Tabas, which was initially planned to be carried out by Russians.<sup>27</sup>

What of the ambitious national programme proclaimed in 2005 to construct twenty nuclear power units in other cities of Iran to contribute 20,000 MW to the national electricity grid within a 10-year period? It was knowingly unrealistic for the following reasons. First of all, the Bushehr project had already been being constructed for about 10 years by that time and was still far from commissioning. In the power plant industry it is conventional practice to wait for the complete realization of a pilot project and the results of its operation during several consecutive years, before one is able to seriously design such an ambitious national programme. Even now, after almost seven years, Bushehr has not yet been put into full operation. Secondly, the Russian part of the Bushehr contract signed in 1995 for the price of 800 million US dollars took into account about 70-80 percent of civil works for the project that had already been carried out in the 1970s by the former German contractor, and about 1.4 BN US dollars of Iranian payments to this contractor for works and equipment supplied.<sup>28</sup> However, by the time the new national programme was announced in 2005, the Russian contractor for Bushehr was approximately \$200 M US dollars in the red, and there was subsequently a serious dispute on financial matters between the Client and the Contractor. Therefore, nobody was able to carry out an appraisal of the final cost of the current Bushehr project that could have been used for the planning of the new 2005 programme.<sup>29</sup> It is consequently my belief that, despite outwardly conforming to the general guidelines of domestic policy aimed at the reduction of dependence on oil and gas, the 2005 programme must have been intended to pursue goals in the field of foreign policy.<sup>30</sup>

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<sup>26</sup> See The Iranian Ministry of Energy News Portal, 13 March 2012, <http://news.moe.org.ir/vdcayonu.49nyu15kk4.html> (accessed 12 June 2012).

<sup>27</sup> In 2006-2007 this Russian company curtailed its activities aimed at gaining new contracts in the country. Since then, Iran's Ministry of Energy has been striving to put the project into practice with the help of Chinese companies and the domestic Mapna company but still in vain.

<sup>28</sup> See Center for Energy and Security Studies, <http://ceness-russia.org> (accessed on 12 June 2012). See also Anton Khlopkov and Anna Lutkova, "Pochemutakdogostroilas' busherskaia AES?" *Iadernyiklub journal*, 1(2010).

<sup>29</sup> See Mehr News Agency, 25 February 2005, [http://www.iran.ru/rus/news\\_iran.php?act=news\\_by\\_id&news\\_id=37757](http://www.iran.ru/rus/news_iran.php?act=news_by_id&news_id=37757) (accessed 12 June 2012); 02 March 2005, [http://www.iran.ru/rus/news\\_iran.php?act=news\\_by\\_id&news\\_id=28201](http://www.iran.ru/rus/news_iran.php?act=news_by_id&news_id=28201) (accessed 12 June 2012); 11 September 2005, [http://www.iran.ru/rus/news\\_iran.php?act=news\\_by\\_id&news\\_id=33388](http://www.iran.ru/rus/news_iran.php?act=news_by_id&news_id=33388) (accessed 12 June 2012); 28 November 2005, [http://www.iran.ru/eng/iran\\_news.php?act=news\\_by\\_id&news\\_id=22003](http://www.iran.ru/eng/iran_news.php?act=news_by_id&news_id=22003) (accessed 5 May 2011).

<sup>30</sup> See RIA Novosti, 29 November 2005, [http://www.iran.ru/rus/news\\_iran.php?act=news\\_by\\_id&news\\_id=35649](http://www.iran.ru/rus/news_iran.php?act=news_by_id&news_id=35649) (accessed 12 June 2012). See also Rosbalt news Agency, 20 July 2006 [http://www.iran.ru/rus/news\\_iran.php?act=news\\_by\\_id&news\\_id=41475](http://www.iran.ru/rus/news_iran.php?act=news_by_id&news_id=41475) (accessed 12 June 2012). See GolosRossii Radio, 14 October 2012, [http://www.iran.ru/rus/news\\_iran.php?act=news\\_by\\_id&news\\_id=76094](http://www.iran.ru/rus/news_iran.php?act=news_by_id&news_id=76094) (accessed 12 June 2012).

The above view of the real state of Iranian government activities in this field is also shared by many Iran specialists. They believe that the Iranian nuclear programme, including its electric power component, pursues two main domestic and foreign policy goals: a) to unify the nation by reinstating the shaken prestige of the polity and b) to use it 'as bargaining chip for extracting better terms in its dispute with the West.'<sup>31</sup> This is supported by the inconclusive negotiations that were held in Istanbul and Moscow earlier this year.

In the autumn of 2011 considerable constraints were imposed on the banking system of Iran. In the electric power industry, even with the claimed national self-sufficiency, very few projects can do without at least small-scale international participation that, in its turn, is tightly tied to conventional financial tools such as letters of credit and international bank payments. It is most likely that Chinese companies will try to fill the gap, but their participation will be sufficient in neither qualitative nor quantitative terms. Moreover, the elaboration of bilateral financial accounts schemes between Iran and any other country is likely to take a lot of time and, ultimately, such schemes will not meet the volume of cash flow required for this industry.<sup>32</sup>

The current situation was aggravated by the Society for Worldwide Interbank Financial Telecommunication (SWIFT)'s announcement that it had severed Iran from its system on 16 March 2012.<sup>33</sup> This action creates insurmountable obstacles for handling oil revenues, the main source of national income that constitutes most of the financial assets of the government.<sup>34</sup> It will also adversely affect the industry's ability to maintain existing power plants (the practice of buying spare parts from abroad for power plants is still widespread) and to implement new projects.

The second component of the sanctions package, the refusal of European and other countries to buy Iranian oil, will have a long-term impact on the Iranian economy, and has already reduced oil sales to a 10-year low.<sup>35</sup> The electric power industry is an investment-intensive industry, heavily dependent on government financial allocations. A reduction in state income from oil revenues by approximately 50% will strangle the power industry in the short-term and ultimately lead to the general collapse of Iran's economy in the medium-term.

This quick study has discussed two core issues: the status of Iranian nuclear power vis-à-vis other sources of power generation; and the fortunes of the electric power industry in Iran as a whole. With regard to the latter, it must be noted that the hardships experienced by the electric power industry in the first decade of the 2000s were caused not so much by international isolation or sanctions alone, but rather by the combination of international and Iranian domestic factors. Inefficient state management and planning and the lack of coordination between state organs were aggravated by an international 'sanctions discourse' between 2005 and 2011. Nevertheless, since the late 1980s and until recently, the Iranian electric power industry had been developing steadily and meeting, by and large, the demands of the national economy. The above mentioned domestic mismanagements, while they put off

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<sup>31</sup> See Kozhanov, *Russia's Relations with Iran*, pp. 17-18. See also the Iranian Foreign Minister Akbar Salehi's recent statement (<http://www.reuters.com/article/2012/07/30/us-iran-nuclear-talks-idUSBRE86T07S20120730> (accessed on 15 August 2012)).

<sup>32</sup> On the commercial and financial difficulties experienced by international and, particularly, Russian companies due to various sanctions regimes see also Kozhanov's *Russia's Relations with Iran*, for example, p. 15. See also his book *Economic Sanctions against Iran: Aims, Scale and Possible Consequences* (Moscow: Institute of the Middle East, 2011).

<sup>33</sup> A global communication network necessary for carrying out bank transactions (See RT TV Channel, 15 March 2012, <http://www.youtube.com/watch?v=9qc5pwEf0nQ> (accessed 12 June 2012)).

<sup>34</sup> See The New York Times, 15 March 2012, <http://www.nytimes.com/2012/03/16/world/middleeast/crucial-communication-network-expelling-iranian-banks.html> (accessed 12 June 2012).

<sup>35</sup> See Financial Times, 15 March 2012, <http://www.ft.com/cms/s/0/50079b60-6df7-11e1-b98d-00144feab49a.html#axzz1xgmhGoJI> (accessed 12 June 2012).



foreign investors, did not have a decisive impact and perhaps even played a positive role in making the country orientate towards developing its own capabilities. Recent sanctions have, nevertheless, directly affected the industry.

It is in this context that the Iranian nuclear programme cannot, in fact, be regarded as “a vital national issue” but rather as only one of the main components of long-term policies aimed at the further development of the industry in question and the diversification of the national energy basket. Unfortunately, recent political developments demonstrate that the destiny of that entire ‘basket’ is itself at stake. It seems unlikely that the Iranian government would yield to the demands of the international community and keeps understating the effect of sanctions.<sup>36</sup> Whereas sanctions since the autumn of 2011 have hit the most vulnerable domains of Iran’s economy, international financial ties and oil revenues, and will inevitably lead to the stagnation and gradual degradation of an electric power industry that is vitally important for the Islamic Republic of Iran. Taking into consideration the rapid dynamics of political developments, the answer to the question of how quick and destructive this process will be and whether it can be reversible needs further and more thorough research.

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<sup>36</sup> NIOC Director for International Affairs has recently denied Iran affected by sanctions however he has not given any figures (<http://uk.reuters.com/article/2012/09/02/uk-iran-oil-idUKBRE88102B20120902> (accessed on 2 September 2012)). See also the recent statement of the Iranian Deputy Minister of Energy on Iran’s success in withstanding international sanctions ([http://www.iran.ru/rus/news\\_iran.php?act=news\\_by\\_id&news\\_id=82301](http://www.iran.ru/rus/news_iran.php?act=news_by_id&news_id=82301) (accessed on 15 August 2012)).