

**Atoms for Conflict?**

**Security Policy Implications of Conflicts linked to the Nuclear Energy Program  
of the Hashemite Kingdom of Jordan**

Master Thesis

Submitted in Partial Fulfillment of the Requirements for the Degree „Master of  
Peace and Security Policy Studies/ Friedensforschung und Sicherheitspolitik“  
(M.P.S.)

by

Anna-Lena Punken

Hamburg, Germany

Hamburg, July 2014

Supervisors:

Prof. Dr. Gerald Kirchner

Prof. Dr. Götz Neuneck

## Table of Contents

<b>ACKNOWLEDGEMENTS</b> .....	<b>III</b>
<b>LIST OF ABBREVIATIONS</b> .....	<b>IV</b>
<b>1. Introduction</b> .....	<b>1</b>
1.1 STARTING POINT: PROBLEM DIAGNOSIS.....	1
1.2 POLITICAL AND SCHOLARLY RELEVANCE OF THE WORK .....	2
1.3 CENTRAL QUESTIONS, RESEARCH GOALS AND THESES.....	4
1.4 METHOD OF INQUIRY AND STRUCTURE OF THE WORK .....	5
1.5 THEORIES AND METHODS.....	6
1.6 SOURCES, LITERATURE, AND STATE OF CURRENT RESEARCH .....	7
<b>2. Jordan’s Nuclear Energy Program</b> .....	<b>8</b>
2.1 TECHNOLOGY AND FACILITIES .....	9
2.1.1 THE JORDAN RESEARCH AND TRAINING REACTOR (JRTR).....	9
2.1.2 THE NUCLEAR POWER PLANTS.....	10
2.1.3 URANIUM EXTRACTION .....	11
2.1.4 SESAME.....	14
2.1.5 SIGNIFICANCE OF JORDAN’S NUCLEAR FUEL CYCLE: SECURITY POLICY CHALLENGES IN SIGHT? .....	15
2.1.6 OUTSTANDING TECHNICAL ISSUES AND CHALLENGES .....	16
2.1.6.1 METHOD OF COOLING .....	16
2.1.6.2 HUMAN RESOURCE DEVELOPMENT AND TRAINING .....	17
2.2 WHY: THE OFFICIAL RATIONALE.....	19
2.2.1 ENERGY NEEDS AND ENERGY SECURITY .....	19
2.2.2 SHORTAGES IN WATER RESOURCES.....	21
<b>3. Going Nuclear Amidst Regional Crises: Why Really?</b> .....	<b>22</b>
3.1 JORDAN AS A “PARTNER OF THE WEST” AND “MODEL OF A NUCLEAR NEWCOMER”: NO NEED TO WORRY? .....	23
3.2 THE SHADOWS OF IRAN, AND A GULF COOPERATION COUNCIL IN FUROR .....	26
3.3 JORDAN’S TIES TO THE GULF COOPERATION COUNCIL .....	28
3.4 JORDAN’S STANCE ON IRAN .....	29
<b>4. The Nuclear Energy Program as a Catalyst for National Conflict?</b> .....	<b>32</b>
4.1 JORDAN’S EXPERIENCES WITH NATIONAL CONFLICTS .....	33
4.1.1 PROMISES OF REFORM – PERSISTENCE OF AUTOCRACY.....	33
4.1.2 A HISTORY OF FAILED MEGA PROJECTS AND PROTESTS .....	33
4.1.3 THE LINK BETWEEN NEOLIBERAL POLICIES AND RIOTS .....	34
4.2 A CLOSER LOOK AT THE OPPONENTS – OPPOSITION ON THE RISE? .....	35
4.2.1 THE TRIBES .....	36
4.2.2 ENVIRONMENTAL ACTIVISTS AND ANTI-NUCLEAR ORGANIZATIONS .....	38
4.2.3 FORMER SUPPORTERS OF THE NUCLEAR ENERGY PROGRAM.....	41
4.2.4 THE MUSLIM BROTHERHOOD /IAF .....	42
4.3 THE REACTIONS OF THE STATE .....	45
4.4 POTENTIAL FOR AN ESCALATION OF NATIONAL CONFLICT .....	46
<b>5. Conclusion</b> .....	<b>47</b>
<b>BIBLIOGRAPHY OF SOURCES AND LITERATURE</b> .....	<b>V</b>
<b>LIST OF INTERVIEWEES</b> .....	<b>XIII</b>
<b>PERSONAL STATEMENT</b> .....	<b>XV</b>
<b>HONOR STATEMENT</b> .....	<b>XVII</b>
<b>APPENDIX</b> .....	<b>XVIII</b>

## **Acknowledgements**

I would like to thank Prof. Dr. Gerald Kirchner for supporting my research with his helpful and much-valued remarks and suggestions as well as contributing to this thesis by sharing his knowledge, experiences and academic resources with me.

I would equally like to thank Prof. Dr. Götz Neuneck for supporting my research and inspiring me to focus on this fascinating nexus of natural and political science.

Above all, I would like to express my gratitude to all of my interview partners, especially those working for transparency and democratic openness despite of great personal risks - without them, a lot of perspectives would have remained in the dark.

### List of Abbreviations

<b>CERN</b>	European Organization for Nuclear Research
<b>CTBT</b>	Comprehensive Test Ban Treaty
<b>GCC</b>	The Cooperation Council for the Arab States of the Gulf, also referred to as Gulf Cooperation Council
<b>GNEP</b>	Global Nuclear Energy Partnership
<b>HRD</b>	Human Resource Development
<b>IAEA</b>	International Atomic Energy Agency
<b>IAF</b>	Islamic Action Front
<b>JAEC</b>	Jordan Atomic Energy Commission
<b>JERI</b>	Jordan Energy Resources Incorporated
<b>JNRC</b>	Jordan Nuclear Regulatory Commission
<b>JRTR</b>	Jordan Research and Training Reactor
<b>JUST</b>	Jordan University of Science and Technology
<b>KAERI</b>	Korean Atomic Energy Research Institute
<b>LWR</b>	Light-water reactor
<b>MWe</b>	Megawatt of electric power
<b>NPT</b>	Nuclear Non-Proliferation Treaty
<b>NSG</b>	Nuclear Suppliers Group
<b>NWFZ</b>	Nuclear-weapons-free zone
<b>SESAME</b>	Synchrotron-Light for Experimental Science and the Applications for the Middle East (Jordan)

## 1. Introduction

### 1.1 Starting Point: Problem Diagnosis

In 2006, 13 Middle Eastern countries either revived previous plans for nuclear energy or announced their objective to go nuclear in order to meet their rising energy demands (IISS 2008: 7). The states of the Gulf Cooperation Council (GCC) were equally taking part in this regional „nuclear renaissance“ as were Iraq, Syria, Lebanon and other states currently in the news for other reasons. The following map gives an overview of the respective nuclear energy aspirations in the region as of 2008.

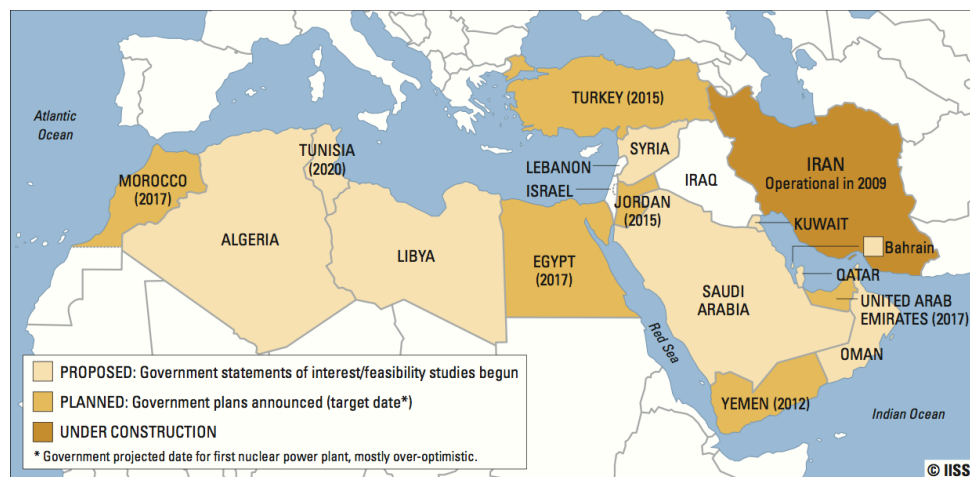


Figure 1: regional nuclear energy plans, status 2008 (IISS 2008: 11)

Meanwhile, the controversial disputes over the nature of the nuclear energy program of the Islamic Republic of Iran<sup>1</sup> continue to dramatically influence the region. The revival of nuclear energy plans of the mainly Sunni Middle Eastern states in 2006/2007 falls in a time when Iran, under the reign of the more radical President Ahmadinejad, had just resumed uranium conversion and announced it would equally resume research and development on its centrifuges in Natanz – leading to an IAEA resolution referring the issue to the Security Council of the United Nations and Iran subsequently announcing that it would immediately stop implementing its Additional Protocol (Kerr 2012: 6). All following negotiations between Iran and the P5+1 (China, France, Germany, Russia, the United Kingdom and the United States) that temporally coincide with other nuclear energy programs in the region proved mainly unsuccessful at that time for various reasons (Kerr 2012: 6 ff). Against this background, one may generally ask whether energy needs may be the only reason for

<sup>1</sup> In the following referred to as „Iran“

this regional nuclear renaissance. One may subsequently take a closer look at distinct nuclear energy programs in the region, such as the one currently planned in the Hashemite Kingdom of Jordan<sup>2</sup>, thus carefully investigating if, at least for some national and international actors involved, there might be a military dimension to it. Given the regional turmoils partly linked to the Arab Spring, partly linked to the aforementioned security issues revolving around the so-called Sunni-Shia-divide, one should also examine the impacts peaceful nuclear energy programs may have on an already challenged political system as that of Jordan. In the face of regional and national instability and further potential for conflict, further aggravated by an ongoing national and rather heated debate on the nuclear energy program, security policy makers may also be interested in other risks linked to it: is Jordan stable enough to peacefully get through the long and costly process of setting up such a project? Can a regime change or a future access of non-state or terrorist actors to nuclear facilities be ruled-out? Is an autocratic regime, especially in these times, suited to successfully conduct such a risky mega-project – a project potentially bearing severe consequences in terms of safety and security?

This work will examine current and potential conflicts linked to the nuclear energy program of the Hashemite Kingdom of Jordan, taking into account both national and international as well as civil and military dimensions. Therefore, the focus is on the current national and increasingly heated debate as well as potentials for conflict, both on the national and the international level, the latter in particular in terms of regional policies. The „nuclear issue“ therefore can be seen as using the policy area of nuclear power as a lense or even magnifying glass, allowing for putting the spotlight on several issues that should be of concern to security policy makers.

### *1.2 Political and Scholarly Relevance of the Work*

Why should one pay any greater attention to Jordan, the often so-described „boring Kingdom“, the reliable partner of the West and monarchy thus far not having faced any greater signs of an Arab-Spring-style revolution? Why should a whole case-study be devoted to its nuclear energy program, especially when its horrendous energy needs and great energy import dependency would at a first glance justify a strategic mega project such as going nuclear? In fact, there are many reasons for critically investigating the country’s nuclear energy program and looking behind the

---

<sup>2</sup> In the following referred to as „Jordan“

curtain of a professional governmental rhetoric. When it comes to nuclear energy, the potential for conflict inherent in its respective decision-making processes should always be worthy a second, closer look, especially given the powerful interest groups, safety risks and socio-economic impacts involved. This seems even more crucial when one is looking at countries in the conflict-torn region of the Middle East, both suffering from national challenges to regime legitimacy as well as international turmoil. Further relevance is added to this thesis by investigating the actual motives behind Jordan's decision to go nuclear, and this may not leave out questioning whether even in the case of „unsuspicious Jordan“, there might be a military dimension involved.

Article IV of the Non Proliferation Treaty (NPT) not only states that the peaceful use of nuclear energy was an „inalienable right of all the Parties to the Treaty“ (Art. IV 1 NPT), but also urges its parties to

„cooperate in contributing alone or together with other States or international organizations to the further development of the applications of nuclear energy for peaceful purposes, especially in the territories of non-nuclear-weapon States Party to the Treaty, with due consideration for the needs of the developing areas of the world.“ (Art. IV 2 NPT).

President Dwight D. Eisenhower's famous „Atoms for Peace“ address before the General Assembly of the United Nations on Peaceful Uses of Atomic Energy, held in New York City on December 8th, 1953, had already set the stage for that provision, ultimately leading to the establishment of the International Atomic Energy Agency (IAEA). If the international community, however, is to be taking the goal of non-proliferation in general and the establishment of a Nuclear-Weapons-Free Zone in the Middle East in particular seriously, urgent and interesting questions of regional security enter the game, and not even „boring Jordan“ may, given the high risks involved, be given the benefit if the doubt. This work is politically and scholarly relevant by providing the analytical basis for deciding whether and contrary to the idea of „Atoms for Peace“, nuclear energy and nuclear weapons may eventually turn out to be two sides of the same coin, especially in this region. This analysis, apart from that greater question, will form a fact-based, critical and comprehensive addition and maybe even counterpart to mainstream stances on nuclear energy projects. It touches on several issues – regional developments in the course of the Arab Spring, the subsequent rise and radicalisation of Islamist movements, the increasing loss of legitimacy of autocratic and often Western-backed regimes, risks

of proliferation<sup>3</sup> and the impacts of the Iranian nuclear program on its Sunni rivals in the region – and thus allows for an informed review of both security policies vis-à-vis the Middle East and the internationally supported Atoms for Peace - approach.

Even if there was no military dimension to the nuclear energy programs in the Middle East in general and the Jordanian project in particular – if they truly and exclusively turn out to be about energy –, this analysis will still offer insights into the program's impact on regime legitimacy and political developments within the country. It will finally add to the greater picture by asking whether one should not, especially when regimes in some sort of political crisis are involved, rather speak of „Atoms for Conflict“.

### *1.3 Central Questions, Research Goals and Theses*

The central questions involve: what does a very capital-intensive and, also in terms of safety highly risky strategic energy project like this one imply for a highly indebted and conflict-affected country like Jordan on the national level, especially given the fact that Jordan increasingly witnesses protests that may be put in the wider context of the Arab Spring? Will national protests and conflicts among different stakeholders inevitably be linked to it, especially in the face of widespread corruption, nepotism, a history of failed mega projects and a lack of stakeholder involvement typical of authoritarian regimes in the region? Why are less costly and less risky alternatives such as solar energy widely ignored?

Secondly and since the case of Jordan has to be seen in the context of regional security policy, economic, political and social developments in the „Arab World“, another central question is: which role does the controversy surrounding the officially peaceful nuclear energy program of the Islamic Republic of Iran play, especially given Jordan's close ties to Iran's biggest regional rival, the Kingdom of Saudi Arabia? Therefore, one will also have to examine respective regional developments, taking a look behind the curtain of the Jordan's public rhetoric, thus also examining whether there might be a thus far almost unimaginable military dimension to it. Linked to that is the question of potential for nuclear proliferation, which may on the one hand facilitate the achievement of a Jordanian nuclear breakout-capability, and on the other hand allow for its future military or deterring

---

<sup>3</sup> Understood in the following as the (potential) spread of nuclear technology, expertise, infrastructure and information that could eventually be applied to nuclear weapons or facilitate a future „breakout capability“ of states currently not defined as „Nuclear Weapon States“ according to the NPT.



use by e.g. the powerful Saudi neighbor. Given the ongoing controversy linked to Iran's nuclear program, a central question will be whether the so-called Sunni-Shia-divide does play a crucial role in the Jordanian decision to go nuclear amidst regional crises. The corresponding theses are: the nuclear energy program of Jordan has to be seen in a wider context of regional security policies. It will eventually work as a catalyst for national conflict as representing a further manifestation of authoritarian decision-making in the country in times of the Jordanian people increasingly demanding their voices being heard by both the government and the royal family. At least some actors, both national and regional, will link a military dimension to it, even if the regime itself will avoid risking the loss of Western support. Finally, the project will turn out to be a great cause of concern both in terms of safety and security.

#### *1.4 Method of Inquiry and Structure of the Work*

In order to be able to answer all of the aforementioned questions, the work is structured as follows: in section 2, subsections 2.1 to 2.4, the focus will be laid on the project's more technical details, looking at the facilities planned, the project's progress, selected technical issues (e.g. concepts for cooling), its financing and the national and international actors involved. Subsection 2.1.5 will, by looking at the actual and planned fuel cycle, describe in what way the technical factors might indicate a future potential for proliferation. Selected outstanding issues will then be addressed in the subsection 2.1.6. Chapter 2.2 is elaborating on both explicit and implicit reasons and justifications of the project, aiming at both describing and complementing the official positions. Section 3 takes on the regional and international perspective by asking what other reasons apart from „energy demand“ and „prestige“ there might be for Jordan to go nuclear. It will carefully examine whether, based on the potential *motives* rather than „just“ the technology, there might be a military dimension linked to it, and if Jordan's reliability as a partner of the West or its current lack of relevant military capabilities useful for nuclear weapons may be enough to dismiss any corresponding doubts or suspicions. Therefore, its links to the Gulf Cooperation Council (GCC), and the Kingdom of Saudi Arabia in particular, are closely being looked at. Iran and the Sunni-Shia divide will therefore also be paid attention to, as well as some corresponding cables of the U.S. Embassies to the involved countries as published by Wikileaks. Section 4 will deal with the project's implications for the national stage. It thus describes Jordanian experiences

with national conflicts, especially those linked to the several non-adhered-to promises of reform. In order to understand which potential for conflict may be linked to this highly sensitive mega project, there will also be a short description of previous mega projects that failed and led to protests and national crises. Section 4.2 is then devoted to a closer look at the opponents; those seem particularly interesting since their shared objections, even with partly different agendas, seem to represent quite a new and so far unique dynamic of political opposition in Jordan. Finally, the conclusion will answer the central questions raised above and decide on which theses are convincing given the current standard of research, the sometimes incomplete information to be obtained and the general degree of uncertainty linked to answering research questions. It will also contain a short summary of open issues, developments, dynamics and potential risks one will have to carefully observe once the project proceeds.

### *1.5 Theories and Methods*

This empirical-analytical and exploratory work will have to do without falling back on one of the “Grand Theories” of International Relations or the like. It is rather focused on an empirical analysis of the current state of affairs, given both the dynamic developments to be observed and the absence of a truly matching theory to base the work on. Assuming that theories should serve as a tool to explore a given reality or to serve as a basis for comparing the former to the latter, and recognizing that if a tool is not useful in a given case, it should not be used, this thesis is consciously doing without. The author therefore decided not to build the analysis upon a theory just for the sake of it. Methods of the social sciences, and methods of qualitative research in particular, however, did play a crucial role in answering this thesis’ central questions. This is due to the author’s conception that the “situation on the ground” will best be described by the “people on the ground”. Therefore, between the 23<sup>rd</sup> of April, 2014 and the 05<sup>th</sup> of May, 2014, semi-structured qualitative interviews were conducted during some field work in Jordan (mostly in Amman, Azraq, Ramtha and Irbid). 16 interviewees with backgrounds in political and environmental activism, governmental offices, nuclear physics, public security, etc. agreed to be both named and quoted. Some others talked to during that field research preferred to remain anonymous, leading to having to leave their remarks out of analysis or quoting them on the condition of anonymity. Understandably and given the fact that “insults” of the King will lead to prison sentences, information and

opinions on him and the royal family (if there were any) were exclusively off the record. The goal was to talk to as many and as diverse people as possible, starting the interview with very general and similar questions in order to be able to compare their answers to at least some extent. Further questions then were more specialized and adapted to the interviewee's respective background, taking into account potential cultural and political sensitivities, their relation with and their position towards the Jordanian government or other political affiliations as well as professional qualifications and profiles. Some questions, albeit any previous plans for the interview, were a result of the given context of the conversation, in terms of e.g. reacting to a certain uptightness observed with some interviewees, especially when it came to the question of uranium enrichment. This approach is following general standards of conducting interviews, including allowing for some situational leeway (Kruse et al. 2012: 53). Other instructions could, by contrast, not be followed. Usually, interviews should be recorded and conducted at a quiet location. In this field research, the interviews took place in public, sometimes crowded, and mostly noisy environments, and the sensitive issue further contributed to the impossibility of recording the interviews, as the building-up of a certain ground level of trust did not allow for any recordings. Another impediment to this work's scientific quality may have resulted out of a lack of fluency in Arabic, which in two cases rendered the involvement of an interpreter necessary.

#### *1.6 Sources, Literature, and State of Current Research*

As mentioned above, one of the main sources of analysis were semi-structured qualitative interviews with experts or stakeholders. A wide body of literature has been examined, amongst it a substantial study on nuclear energy programs in the Middle East which was published by the London-based International Institute for Strategic Studies in 2008 (see IISS 2008). Other sources were provided by the International Atomic Energy Agency (IAEA) or the Jordanian government and its bodies such as the Jordan Atomic Energy Commission (JAEC). Given the different (political and economic) interests involved, those publications had to be examined carefully and the information contained therein to be compared to those provided by other sources. In order to obtain an in-depth understanding of Jordan's political system, power structures as well as experiences with national conflicts, reports and analyses by country experts and research institutes were used. An example of that are the multi-faceted reports of the International Crisis Group. To be able to put the

national context into a wider regional perspective, the author also used articles on regional developments which were published in relevant journals of Middle East Studies and Political Science (see e.g. Bank/Morten 2010). Cables of the U.S. Embassies in the region, published by Wikileaks, provided for a further fruitful source – if not one of the most interesting ones – of information. News articles, e.g. published online by the government-friendly Jordan Times, as well as other online sources were equally used to follow up on the relevant national and international developments. Surprisingly, political scientists seem to have not yet fully embraced the topic dealt with in this analysis too comprehensively. Therefore and with the rare exception of the IISS-study, hardly any of the described pieces of literature have dealt with *all* of the aspects of nuclear energy programs in the Middle East, not even speaking of a comprehensive case study of Jordan's nuclear energy program. Even the IISS-study, published in 2008, has so far not been updated. For these reasons, the works used here mostly only cover single aspects dealt with in this analysis. In any case and given the topic still constituting a „moving target“, there will be plenty of room for further analysis and elaboration, of which this thesis shall represent a first attempt.

## **2. Jordan's Nuclear Energy Program**

In order to be able to have a closer and substantial look at conflicts linked to Jordan's nuclear energy program, initially approved by the Jordanian Parliament in April 2007 (Nuclear Threat Initiative 2007b), one will first of all have to occupy oneself with the nuclear project's details. This more technical focus – looking at the what, where, how, who and why as well as particular challenges – is vital to retrace both possible dimensions of the program. Therefore and as it is the case in this present work, if the aim is to discover a possible military dimension, retrace ongoing conflicts linked to the program or assess further potential for conflict, one must first of all look at the technical details, i.e. at what one is actually working with. Only then may one validly and objectively describe and analyze the situation on the ground; only thus and starting from a profound knowledge base is there a possibility to answer the central

research questions adequately. This is a perfect example of how natural and political sciences can form a fruitful nexus for profound analysis.

## *2.1 Technology and Facilities*

Wanting to investigate, for example, whether the nuclear energy program comprises a military dimension, one will first of all have to have a closer look at e.g. Jordan's fuel cycle and different components of its nuclear facilities. This shall be done in the following sections, which focus on the "what". A respective map can be found in the appendix.

### *2.1.1 The Jordan Research and Training Reactor (JRTR)*

In December 2009, the Jordan Atomic Energy Commission (JAEC)<sup>4</sup> selected a consortium headed by the Korean Atomic Energy Research Institute (KAERI) to build the 5 MWe Jordan Research and Training Reactor (JRTR) at the Jordan University for Science and Technology (JUST) in Irbid (World Nuclear Association 2014). The aim was to have it fully operational by 2015, with expected costs of \$ 173 million (World Nuclear Association 2014), whilst the new deadline has been extended to 2016 (Interview Irbid, Prof. Dr. Salaheddin Malkawi, April 24, 2014). 19,75% enriched fuel – supplied by France's AREVA (Nuclear Threat Initiative 2013) – will be used, with a potential of upgrading the reactor to 10 MWe, its design resembling South Korea's HANARO heavy water reactor (World Nuclear Association 2014). Construction started in December 2012 (Al-Bakhit 2013), whilst the final approval by Jordan's Nuclear Regulatory Commission (JNRC)<sup>5</sup> was given in August 2013 (World Nuclear Association 2014). The reactor is supposed to enable research and training as well as the supply of radioisotopes for medicine, industry and agriculture. JUST, supported by the IAEA, has been in charge of operation and Human Resource Development, whilst the South Korean vendor has so far been in

---

<sup>4</sup> JAEC is a national body, established by law in 2007, responsible for drafting a strategy and roadmap for Jordan's nuclear energy program and therefore works as the country's implementing organization. JAEC is responsible for international negotiations, project management, the oversight of Human Resource Development at JUST, impact assessments as well as commercial activities (JAEC/WorleyParsons 2011: 49).

<sup>5</sup> JNRC was set up by the Jordanian parliament as an independent body responsible for the legal, regulatory and safety framework for implementing the nuclear program. As a regulatory authority, it is supposed to control JAEC and other institutions involved in the fields of nuclear safety, nuclear security and radiation protection (JAEC/WorleyParsons 2011: 49). Some critics of the nuclear program, however, argue that JAEC and JNRC are actually not independent enough from each other, with JNRC in particular currently lacking a sufficient amount of nuclear expertise among its staff (Interview Amman, Dr. Kamal Khdaif, April 28th, 2014).

charge of vendor-specific training (Interview Irbid, Prof. Dr. Salaheddin Malkawi, April 24, 2014). In the future, it is supposed to become an integral part of a planned *Center for Nuclear Research*, the latter including a radio-isotope production facility, a cold neutron source research facility, a radioactive waste facility for the research reactor as well as an education and training building (JAEC/WorleyParsons 2011: 51). At a later point of time, it is also supposed to include a fuel fabrication plant (ibid). After having won the bid against Argentinian, Chinese and Russian firms, the Koreans reportedly assist financing the project with a \$ 70 million soft loan, which includes provisions for repayment within 30 years at a 0.2% interest rate (World Nuclear Association 2014).

### *2.1.2 The Nuclear Power Plants*

There have been various and changing plans for the envisaged nuclear power plants, with rather ambitious deadlines constantly rescheduled. In 2008, JAEC and the Atomic Energy of Canada Ltd. (AECL) agreed on a three-year feasibility study on building an AECL 740 MWe Enhanced Candu-6 heavy-water reactor<sup>6</sup> using natural uranium fuel (World Nuclear Association 2014); those plans were quickly abandoned in the same year in favour of AREVA, as JAEC „didn't want to send the wrong message“ by selecting a proliferation-prone technology using natural uranium and producing lots of plutonium (Interview Amman, Dr. Kamal Khdair, April 28, 2014). A number of further feasibility and site studies were conducted in the aftermath (World Nuclear Association 2014). A site near Aqaba, which would have allowed for sea water cooling, was shortly after excluded after having faced objections by the neighbouring states of Israel and Egypt. The site was then shifted to the desert of Al-Amra, around 40 km north of Amman, which is mainly populated by the influential tribe of the Bani Hassan. After the Bani Hassan had protested this site selection, the site was again shifted, now being located near Azraq – a desert area under the traditional influence of the similarly influential tribe of the Bani Sakhr.

Another agreement with the international consultancy firm WorleyParsons, worth \$ 11.3 million, followed in November 2009, including the consultants' responsibility for technology selection, assistance in fuel cycle engineering and waste management (World Nuclear Association 2014). In 2012, WorleyParsons went along JAEC's final

---

<sup>6</sup> As opposed to light water reactors, CANDU reactors allow for replacement of individual fuel elements during operation without the need to shut down the reactor. If fuel is replaced at low burnup it contains weapons-grade plutonium.

decision in favour of two Russian AtomStroyExport's AES-92 VVER-1000 pressurized light water reactors of around 1000 MWe (World Nuclear News 2013). AtomStroyExport is Rosatom's reactor export subsidiary, and its supply of the two nuclear units will be accompanied by Rusatom Oversea's strategic assistance and operation of the plants on a build-own-operate basis (World Nuclear Association 2014), meaning that the Russian partner carries a part of the costs, thus partly owns the plants and operates them for a while. The costs are officially estimated to be at around \$ 10 billion, of which the Jordanian government will provide 50.1%, with the Russian partner investing the remaining 49.9% (Interview Amman, Bahjat Aulimat and Yazan Al-Bakhit, May 4, 2014). Initially, the units were planned to become fully operational by 2021 and 2025, with the deadlines now extended to 2023 and 2025 (ibid). Another interview partner indicated, on the condition of anonymity, that a negative feedback on the project's progress from the side of the Russian partner has led to that delay, and it has since been doubted whether construction will actually start in 2016. Nevertheless, the Jordanian government seems to still envisage a total of four nuclear units, the additional two reactors being subject of separate negotiations (World Nuclear Association 2014).

One is mistaken if believing that the Russian design was chosen for economic or safety considerations only. The Jordanian-Russian agreement falls into a time that witnesses a devastating Civil War in neighbouring Syria, a brutal conflict also taking its toll on Jordan's security, and involving Russia as a key player eager to support Bashar al-Assad's regime. It might therefore not take the observer by surprise that on a visit to Moscow linked to the nuclear deal *and* discussing the Syrian crisis on April 9, 2014, King Abdullah II of Jordan called Russia's president Vladimir Putin his „dear brother“, taking his „concerns to Moscow, and not Washington D.C.“ (Al-Adwan 2014). Bilateral arms deals (i.a. involving RPJ-32 launchers, i.e. rocket grenades, to be arming the Jordanian forces) were also part of the discussions (ibid). Therefore, one may safely say that choosing the design and vendor of the nuclear power plants are at least equally due to political considerations, something that some officials at JAEC accordingly describe as „mutual benefits“ (Interview Amman, Bahjat Aulimat and Yazan Al-Bakhit, 04th of May, 2014).

### *2.1.3 Uranium Extraction*

Uranium has continued to be an important part of JAEC's nuclear equation (Luck 2012a): due to admitted financing challenges, the government seems to be relying on

the idea of extracting its „vast resources of natural uranium“ (JAEC/WorleyParsons 2011: 23) with the help of a solvent international partner and enriching it itself (Al-Bakhit 2013). Therefore, the company Jordan Energy Resources Incorporated (JERI) was established, signing an Exploration Agreement with AREVA in 2008, the latter having obtained mining rights in 2010, subsequently operating within a 1.400 km<sup>2</sup> area in central Jordan (JAEC/WorleyParsons 2011: 23). The Anglo-Australian mining giant Rio Tinto had additionally stepped in the game in 2009 (JAEC/WorleyParsons 2011: 23). The longterm vision seems to be even exporting some of the processed uranium later on, whilst covering national needs for reactor fuel at a comparatively low cost. Interestingly, the respective figures - coming down to the questions of how much uranium Jordan really has - vary considerably, depending on the sources. In May 2007, officials spoke of 80.000 tonnes of uranium, with further 100.000 tonnes within phosphate reserves – presenting those reserves as sufficient to support the economic feasibility of the nuclear project (Nuclear Threat Initiative 2007a). In the initial phase of the project, JAEC had indicated that by 2012, Jordan would be producing 2000 tonnes of yellowcake, „providing the Treasury with hundreds of millions of dollars generated from selling the uranium“ (Luck/Omari 2014) – a promise until now not kept, leading to a parliamentary committee accusing JAEC of providing the public with misleading information (ibid). In its 2011 White Paper, JAEC estimated that 65.000 tonnes of uranium oxide resources were to be found in central Jordan, with an additional 100.000 in phosphates; the Al Hasa area is estimated to have a further 20.000 tonnes of uranium oxide (JAEC/WorleyParsons 2011: 23). All those changes in numbers might explain why, in 2012, AREVA and JERI determined their contracts: AREVA’s feasibility studies on the quantities of Jordan’s uranium deposits came to the conclusion that there were about 28.000 tonnes of uranium – JAEC’s director Khaled Toukan subsequently called those figures inaccurate and said he was „hopeful that the studies will show that there are more than 40.000 tonnes of uranium in the rocks in Jordan.“ (Ghazal 2014a). Just a year before, Rio Tinto had equally withdrawn, probably for similar reasons (Greenpeace Mediterranean 2013: 53).

There have also been disputes concerning the quality of the uranium. Some critics of the overall program have quoted studies by Jordan’s National Resource Authority stating that the total reserves were at 16.000 tonnes, whose grade of 50 parts per million (ppm) were commercially unviable (Luck 2012b). In contrast to that, JAEC



claims that surface deposits in central Jordan featured 100 ppm on average, rendering extraction economically viable (Luck 2012b). In any case, and despite of all of previous doubts concerning the quantity and quality of Jordanian uranium reserves, plans to build a JOD<sup>7</sup> 100 million plant for uranium extraction have recently been announced, based on claims that there were 36.389 tonnes of uranium oxide in central Jordan that could, on top of that, be „easily mined“ (Ghazal 2014b). The plant is supposed to initially extract 300 - 400 tonnes per year, with the goal of expanding that capacity to 1.500 tonnes per year at a later point of time (ibid). The plan is to directly sell the extracted uranium on the world market or have it enriched abroad to later on serve as fuel for the nuclear power reactors (ibid). How this is supposed to happen is still questionable. The very different and rather optimistic estimates by Jordanian government officials such as Khaled Toukan deserve a reality check, especially in the face of their implicit promises. As seen in the case of the uranium deposits' actual quantities, specifications concerning their quality equally vary considerably. In a presentation, JAEC's director Khaled Toukan describes the grades as ranging from low grade in some subsurface deposits in central Jordan to medium grade with localized high grade areas (> 1.000 ppm) in surficial deposits. The deposits in the Al-Hasa area are supposed to be of medium grade (> 175 ppm), whereas those in South Jordan, found in phosphoric deposits, were described as low grade (average of 75 ppm) (Toukan 2012). But those qualifications are not necessarily the ones other sources would share. The World Nuclear Association, for example, identifies a concentration of uranium in ore as low grade if it is at around 1.000 ppm (World Nuclear Association 2012), a figure Toukan has already associated with high grade areas. 100 ppm of Uranium already count as very low grade ore (ibid). So the question remains: how commercially viable are Jordan's resources afterall – and how long will they really last?<sup>8</sup> Another source stems from an IAEA-dataset on uranium deposits in Jordan, which itself stated that a certain amount of data was unavailable (IAEA UDEPO 2014). The following table may serve as a crude point of orientation:

---

<sup>7</sup> JOD= Jordanian Dinar (1\$= ca. 0,7085 JOD, July 4, 2014)

<sup>8</sup> Given the different numbers and figures, it is difficult to calculate how long the reserves would actually last to fuel the two planned 1000 MWe-units. But one may assume: If 10 tonnes of natural uranium go into producing a tonnes of lightly-enriched uranium (LEU), which would then generate around 400 million KWh/a of electricity, today's light water reactors would need around 70.000 tonnes of natural uranium per year (Scientific American 2009). 1.000 MWe approx. equal 80 tonnes of nuclear fuel elements at the core, of which around 25 tonnes have to be replaced each year. So there is at least a considerable risk that an important part of JAEC's nuclear equation might not be without faults.

Dep. Name	Dep. Type	Dep. Status	Original Resource (t U)	Original Grade (%)
Al-Abiad	Phosphate	Dormant	10 000 - 25 000	0.01 - 0.05
Al-Hassa	Phosphate	Dormant	10 000 - 25 000	0.01 - 0.05
Attarat-Wadi Maghar	Phosphate	Dormant	10 000 - 25 000	0.01 - 0.05
Khan Azzabib	Surficial	Dormant	10 000 - 25 000	0.05 - 0.10
Ruseita	Phosphate	Dormant	10 000 - 25 000	0.01 - 0.05
Shidiya - Eshidia	Phosphate	Dormant	50 000 - 100 000	< 0.01
Siwaqa	Phosphate	Dormant	25 000 - 50 000	0.05 - 0.10

Figure 2: uranium deposits in Jordan (IAEA/UDEPO 2014)

Even if the more favourable numbers turn out to be correct, most of the deposits still would have to be recovered from phosphates – a process that is generally not seen as commercially viable, as extraction costs range from \$ 60 to \$ 100 per kilogram (IAEA 2009: 19), which would only make extraction economically viable if the prices on the world market were at a level of around \$ 120 per kilogram (Ziegler/Allelein 2013: 537). Enriching it to the needed approximate 4 - 5% with the help of own facilities would equally add to the costs as would buying enriched uranium from AREVA.

#### 2.1.4 SESAME

SESAME (Synchrotron-light for Experimental Science and Applications in the Middle East), founded in 2004, is supposed to become the region's first international research centre in Allan, Jordan, its current members being Bahrain, Cyprus, Egypt, the Islamic Republic of Iran, Israel, Jordan, Pakistan, the Palestinian Authority and Turkey (SESAME 2014). As an intergovernmental organization under the auspices of UNESCO, it is designed to be used by regional governments and scientists following the model of CERN (European Organization for Nuclear Research). Its purpose, expected to come into full operation at the end of 2015, is to „foster scientific and technological excellence in the Middle East and neighbouring countries“ (SESAME 2014), thus enabling a „better understanding and a culture of peace through scientific collaboration“ (Smith 2012: 2), which might explain the rather interesting composition of its member states. Its statutes allow for scientific and industrial research and prohibit „classified work for military purposes or other secret research“ (SESAME 2014), its activities ranging from installing, operating,

maintaining and upgrading the synchrotron light source<sup>9</sup>, light beams, spectrometers and detectors as well as training of scientists, engineers and technicians (SESAME 2014). SESAME has received a lot of international support, with most of the equipment having been donated by Germany, France, Italy, Japan, Kuwait, Portugal, the Russian Federation and many others (Smith 2012: 4). The IAEA supports its training activities (Smith 2012: 4). Whilst the basic idea sounds good – different nations of a conflict-affected region working together for peaceful purposes – there have been problems. Despite already having been founded in 2004 and despite of the aforementioned amount of outside technical support and funding, it is still not fully operational, and there have been increasing problems with funding (Smith 2012: 6). At least, its composure of members – Israel being a part of it – as well as its technical features make it hard to suspect that if one day it should in fact be operational, its facilities would or could be used for military purposes. Observers of the project's progress accordingly dismiss any such suspicions and argue that in any way, it „never worked“ (Interview in Amman, Dr. Ayoub Abu-Dayyeh, April 25, 2014), and never will, illustrating this verdict by an anecdote on how during heavy snowfalls in 2013, the SESAME-building's roof simply collapsed (ibid).

#### *2.1.5 Significance of Jordan's Nuclear Fuel Cycle: Security Policy Challenges in Sight?*

The most interesting question at this point will certainly be: does Jordan's nuclear infrastructure imply that security policy makers might have a reason to worry? Are there any signs that Jordan might just technically be able to pave the way to a nuclear bomb? As for now, Jordan indeed does not possess any significant fuel cycle capacities (Nuclear Threat Initiative 2013) that should be of a greater concern to anyone fearing there might be a military dimension to its nuclear energy program than any other average nuclear infrastructure.

The JRTR will use 19,75% enriched fuel, supplied by AREVA; the various research activities the JRTR would enable (Green 2000: 2) are less worrying in terms of e.g. contributing to plutonium production or weapons-related research. The JRTR's purpose of training nuclear experts will rather produce dual-use knowledge and expertise. The Nuclear Power Plants will be AES-92 VVER-1000 pressurized light

---

<sup>9</sup> Synchrotron light can be described as radiation with „wavelengths that range from infrared to x-rays and can be used to study matter on scales ranging from viruses down to atoms“ (Smith 2012: 2) and allows for various experiments, inter alia in the field of nuclear physics.

water reactors, using low enriched uranium (LEU) of a concentration of 4-6%, and producing reactor-grade plutonium<sup>10</sup>. As mentioned before, Jordan consciously chose this model over the CANDU-6, which would have facilitated reaching a breakout capability (Henderson/Heinonen 2013: 8). In both cases, Jordan is, as long as there are no attempts of plutonium extraction to be observed, therefore not really close to obtaining weapons-grade material via operating the JRTR<sup>11</sup> and NPPs, thus having plutonium as a by-product. Weapons-grade material would require uranium enriched to 90% of U-235 or plutonium mainly composed of Pu-239 (Nuclear Threat Initiative 2014). Nevertheless, the 19,75% enriched fuel used by the JRTR as well as that used to fuel the NPPs could, given the respective facilities, easily be enriched further – the main work consists of reaching the 3.5% level, requiring around 75% of the work. Once one has got to a level of 20% of enrichment, 90% of the work has been done (Henderson/Heinonen 2013: 6). Due to technological factors as well as Israel's membership, the work done by SESAME seems less worrying. Jordan does not plan on reprocessing the spent fuel either. In fact, the Russian vendor will take the rods back and dispose of them (Kane 2013). Jordan does not have uranium enrichment facilities yet – but uranium enrichment facilities are part of its longterm planning. Whilst having ratified the IAEA Additional Protocol, Jordan has kept insisting on its right to uranium enrichment – a contentious issue section 3.1 will deal with in detail. In any case, the actual agreements' details should be followed critically and closely, particularly when it comes to the much debated issue of uranium enrichment.

#### *2.1.6 Outstanding Technical Issues and Challenges*

There are two major and particularly outstanding technical issues and at the same time political challenges which deserve a second and closer look. Those issues are, not surprisingly, also points of critique most commonly voiced by the different actors within the anti-nuclear opposition and shall therefore shortly be described in the following two subsections.

##### *2.1.6.1 Method of Cooling*

Jordan is one of the world's driest countries, desperately lacking water resources – a problem further aggravated by the continuing influx of Syrian refugees (Whitman

---

<sup>10</sup> Reactor grade plutonium has a high background of neutrons which makes its use for nuclear weapons technologically challenging.

<sup>11</sup> Concerning the risk of proliferation, an enrichment level between 15–20% is said to sufficiently suppress plutonium production to minimize the total strategic value of the material (Glaser 2005: 9).

2013) and overall inefficiencies in water management. Jordan is already spending approximately 1.2% of its Gross Domestic Product (GDP) on the environmental degradation of water annually (United Nations Water Report 2012: 415). What will it have to spend on water management and treatment once the nuclear reactors are operational and in demand of sufficient and consistent amounts of cooling water – located in the middle of the desert of Qusayr Amra and requiring a pipeline of up to 60 km of length, a concept whose safety may already be limited by bedouins shooting at the pipeline in order to water their cattle as they regularly use to (Interview Amman, Dr. Ayoub Abu-Dayyeh, April 25<sup>th</sup>, 2014)? JAEC addresses this particular issue quite optimistically. Since the site was officially shifted to the desert mainly due to concerns over the seismic characteristics of the initial site near Aqaba (Interview Amman, Bahjat Aulimat and Yazan Al-Bakhit, 04th of May, 2014), the cooling water can naturally not stem from any natural water resource such as a river or a sea. The solution JAEC chose is to use wastewater for cooling, stemming from the municipal Khirbet Samra Wastewater Treatment Plant. This system of cooling follows the model of that at Palo Verde in Arizona, United States of America (World Nuclear Association 2014) – a model that will be used a second time only and exclusively in Jordan. This approach will require tertiary water treatment (JAEC/WorleyParsons 2011: 53), leading to quite substantial extra costs (Greenpeace Mediterranean 2013: 29). Concerning the pipeline needed for this method of cooling, JAEC officials also argue that the site of Aqaba would have needed pipelines, too, and an extensive excavation of the mountaineous terrain would have been equally necessary (Interview Amman, Bahjat Aulimat and Yazan Al-Bakhit, May 4, 2014). Former JAEC director Dr. Kamal Khdair estimates that this would have cost around JOD 50 million which doesn't keep him from suspecting that the site might eventually be moved back to Aqaba nevertheless (Interview Amman, Dr. Kamal Khdair, April 28, 2014). In any way – cooling will remain a pressing and difficult-to-solve issue in a country that is one of the world's poorest in water resources<sup>12</sup>.

#### *2.1.6.2 Human Resource Development and Training*

The IAEA links the Human Resource Development (HRD) required for the set up and operation of a nuclear program to safety (IAEA 2007: 13), and identifies HRD as

---

<sup>12</sup> The unresolved issue of reactor cooling is essential given the fact that the Fukushima accident was caused by an interruption of electricity for the coolant water system, leading to the unsteerability of the reactor.

one of the milestones of successfully setting up a nuclear energy program (ibid: 8). The process of HRD should be a „rigorous merit-based process“ (Banks/Massy/Ebinger 2012: 4), meaning that recruitment should not be linked to personal ties or favouritism whatsoever. Skilled staff is needed to operate nuclear plants reasonably safely or having efficient and competency-based oversight over the program as e.g. part of the regulatory body, stemming from the most capable group of nuclear scientists – and not those with the best relations with the government. It is estimated that a two-plant unit needs around 1.012 skilled workers for areas ranging from nuclear safety review to technical engineering, with ideal timelines leaving enough time for their training whilst not taking too long either (IAEA 2011: 34). In Jordan, a Nuclear Engineering Department was established at JUST in 2007, comprising 5 faculty members, the first 19 students having graduated from relevant BSc programs in nuclear engineering in 2011 (Banks et al. 2012: 24). The students of JUST are also trained internationally, following several academic cooperation agreements with e.g. the United States of America or the IAEA (ibid). At JUST, the JRTR obviously plays another important role in training the needed nuclear academics. The Al Balqa Applied University as well as the University of Jordan have started hosting MSc programs in nuclear physics, producing around ten graduates a year, most of whom so far ended up working for JAEC or JNRC (ibid). Until now, JNRC in particular has found it difficult attracting a sufficient amount of graduates, thus seeking help at e.g. the European Union (ibid: 25). The lack of skilled staff is partly a result of financial struggles linked to the financial crises, forcing the government to order spending cuts and hiring freezes (Banks/Massy/Ebinder 2012: 21). Prof. Dr. Salaheddin Malkawi, responsible for HRD at JUST and Head of its Nuclear Engineering Department, acknowledges those laid-out challenges whilst remaining optimistic. He relies on the respective vendors for vendor-specific training, whilst pointing out that there already were 70 graduates, working at JAEC, JNRC or in the Gulf (Interview Irbid, Prof. Dr. Salaheddin Malkawi, April 24, 2014). The „big challenge“ was to ensure that people were trained in time – but neither too early nor too late, as the former would risk emigration of skilled workforces to the Gulf states, whereas the latter would result in a lack of sufficiently trained and experienced staff (ibid). Whether this challenge will be adequately met by Jordan remains to be shown. Budgetary restrictions, however, have already taken their toll. Even worse concerning a safe operation of the future plants, the recruitment in reality

fails to be strictly merit-based, placing personal ties before competency and e.g. leading to some of the students taking part in the most prestigious cooperation programs of nuclear training and education not mainly based on skills and academic merit, but connections (Interview Amman, Dr. Saed Dababneh, May 3, 2014). On top of this, skilled and highly-qualified Jordanian academics have traditionally been leaving the country in order to benefit from the much more competitive salaries in the Gulf states, leaving Jordan with a challenging brain drain (Interview Hamburg, Dr. André Bank, March 6, 2014).

## *2.2 Why: the Official Rationale*

Following all of the aforementioned challenges and difficulties in implementing the project, one might ask oneself just what are the reasons for King Abdullah, the government as well as relevant bodies such as JAEC to keep insisting on the importance and strategic relevance of the project? Which are the officially stated reasons to hold on to their initial decision to go nuclear, even in the face of growing resistance to the project as well as likely delays or rises of costs? Answering these questions by describing and critically trying to get to the bottom of the following two most commonly voiced arguments of official rhetoric will also allow for assessing whether „energy needs“, water scarcity and „prestige“ might not be the only reasons – and whether at least a part of the official rationale comprises a potential military dimension.

### *2.2.1 Energy Needs and Energy Security*

Central documents outlining the project, several governmental statements or speeches of King Abdullah (see e.g. JRTV on Youtube: „Speech from the throne by his Majesty King Abdullah II“) identify Jordan’s energy needs as a pressing issue. And indeed, Jordan is completely dependent on regional energy exporters such as Egypt, importing 96% of its energy resources for electricity generation (JAEC/WorleyParsons 2011: 13). In fact, Jordan needs to spend an astonishing fifth of its GDP on importing fuel (Malik 2014). The Jordanian government rightfully assumes the national demand for energy to grow annually, leaving the country with shortages in supply if nothing is done in time. Especially when aiming at a growing economy, Jordan will quickly need to expand its capacities of electricity generation, particularly given the nation-wide absence of energy efficiency which could be another way of sustainably addressing the growing energy demand (Interview Amman, Dr. Ayoub Abu-Dayyeh, April 25, 2014).

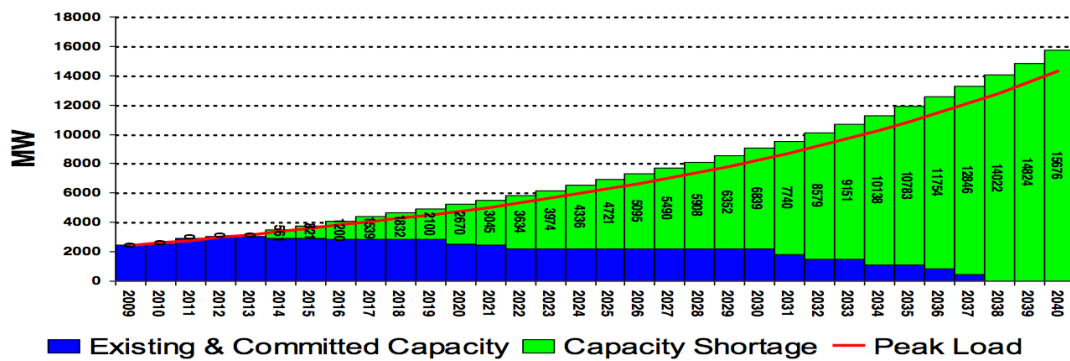


Figure 3: Overview of Jordanian Electricity Generation Capacities illustrating projected capacity shortages (JAEC/WorleyParsons 2011: 13)

As figure 3 illustrates, there is and will continue to be an increasing shortage in electricity generation capacity, one which JAEC projects will not be sufficiently covered by different projects using natural gas, mainly from Egypt, as fuel (JAEC/WorleyParsons 2011: 13). But these gaps are not only worrisome in terms of sustainable development. Officials, be they found at JAEC or in different ministries, are starting to feel the pressure substantially aggravated by the Arab Spring potentially turning to Jordan: the government, fulfilling its part of an unwritten social contract of „massive subsidies and public-sector employment in exchange for political non-participation“ (Winckler 2013: 68), is in a desperate need of keeping energy prices stable. JAEC officials talked to in Jordan therefore unsurprisingly argued that „the energy problem needs to be solved quickly“, as IMF-forced cuts in subsidies on energy had already led to price increases and people taking to the streets (Interview Amman, Bahjat Aulimat and Yazan Al-Bakhit, May 4, 2014). This urgency is further enhanced by several cutoffs in natural gas from Egypt, which were linked to the ongoing conflict there, and „caught the government completely unprepared“ (ibid). One might argue that these problems could also be addressed through other sources of energy, e.g. Renewable Energy (RE)<sup>13</sup> or oil shale, both for which Jordan has a high potential – but the official position insists on nuclear energy as maybe not the fastest, „but one of the cheapest solutions“ (Interview Amman, Bahjat Aulimat and Yazan Al-Bakhit, 04th of May, 2014). This, however, can rightfully be questioned. With an average of 9 hours of sunshine per day (Al-Zoubi 2010: 48), and plenty of space for photovoltaic facilities and solar panels, RE might in the long-run even serve as a cost-efficient and sustainable baseload, especially given the progressively better technologies of storage available (Greenpeace

<sup>13</sup> As opposed to the government’s understanding of RE as also including nuclear energy, this analysis understands RE as energy stemming from wind, solar and water.



Mediterranean 2013: 10). Even with conflict-related interruptions of pipelines, natural gas could continue to be an important source of energy, then serving as a transitional fuel. Oil shale, in which Jordan is rich (Hrayshat 2007: 93), could equally serve as an initial baseload, especially provided that the oil prices remain high. The national grid<sup>14</sup>, however, is only fit to 1.5% made up of renewables (Greenpeace Mediterranean 2013: 18), thus illustrating that renewables have never really been an option seriously considered. On top of that, analyses by scientists that can be assumed to be close to the official position, rule out renewables as still requiring a lot of research and investments (see, e.g., Hrayshat 2007: 96), thus also justifying their rather low share of currently around 3% (Ministry of Energy and Natural Resources 2007: 7) and, given the great opportunities of sector expansion, still very low 7% by 2015 (International Energy Agency 2014) in the overall energy mix. The ignorance of alternatives seems to be based on politics rather than a thorough, objective and comprehensive analysis – it also suggests that „energy“ will not be the exclusive reason for going nuclear.

### *2.2.2 Shortages in Water Resources*

Jordan has a severe deficit in water and is, as JAEC officials eagerly repeat on various occasions, „internationally recognised as one of the five most water-deprived countries in the world“ (JAEC/WorleyParsons 2011: 14). Water supply projects currently underway require serious investments (ibid: 15) and include desalination as a significant – and very energy-intensive – part of Jordan’s prospective mix of water supply (ibid: 16). The government is truly afraid that a worsening of the current situation will not only negatively affect the much-desired growth of the industrial sector, but also have an impact on the already very limited agriculture (only 5% of the land mass are arable) and thus food security (ibid: 16). More and more Jordanians have started openly criticizing the government’s approach to dealing with that pressing issue, some of them feeling that the supply of the vast number of mainly Syrian refugees in the big camps of Zatari and Azraq with drinking water is more

---

<sup>14</sup> Jordan’s national grid is another important and pressing issue. If Jordan should in fact successfully build and start operating a nuclear two-unit plant with a total of 2000MWe, the national grid of currently around 4000 MWe (Interview Amman, Dr. Ayoub Abu-Dayyeh, April 25, 2014) needs to be prepared and upgraded if blackouts shall be avoided – even more so if the government’s vision of even importing excess energy to Egypt or Syria should, against all odds, turn into reality. Currently, Jordan’s connection with Egypt is at around 500 MWe and 300MWe with Syria (Malik 2014). JAEC officials argue that the upgrading is in progress, the responsible National Electric Power Company (NEPCO) needing approximately 20-30 JOD for the accomodation of an additional 300 MWe (Interview Amman, Bahjat Aulimat and Yazan Al-Bakhit, 04th of May, 2014).

secured than theirs (Interview Amman, anonymous). The government reacts by presenting „water desalination powered by nuclear electricity“ as the „only new source of water available in the future (...) given its low operating cost and suitability for baseload operation“ (JAEC/WorleyParsons 2011: 24). Whilst water scarcity might in fact need to be eased by energy-intensive projects, the latter do not necessarily need to be powered by nuclear energy, especially when its actual costs and risks remain disputed whilst alternatives are in sight. Moreover, cooling and uranium extraction will equally require a lot of water – a fact that will take a heavy burden on the already nearly unbearable situation. It therefore seems questionable to assume that nuclear energy would be the solution to just that problem. Indeed, this shortcoming of official argumentation makes one wonder whether water scarcity is really not much more than a catch phrase.

### **3. Going Nuclear Amidst Regional Crises: Why Really?**

As outlined above, there are some contradictions within the official rationale, leading some observers to wonder whether Jordan’s nuclear energy program might not in fact partly or wholly be based on different, maybe even regional security-related and/or military reasons. As described in section 2.1.5, Jordan’s fuel cycle is not (yet) of a much greater concern than most others in terms of possibly enabling a breakout capability, so far lacking the most suspicion-raising technologies and facilities such as uranium enrichment plants or even the military capabilities<sup>15</sup> that would be necessary for launching thus-gained nuclear weapons. When asked if Jordan’s nuclear energy program possibly comprised a military dimension, most of the Jordanian interviewees, including the opponents, denied that suspicion as „ridiculous“, stating that „Jordan will never take any action upsetting the West“ (e.g. Interview Amman, Dr. Basel Burgan, April 26, 2014). Nevertheless, regional dynamics lead to think: why does the Jordanian government pursue the nuclear program despite of growing resistance and imminent political turmoil, enormous technical and financial difficulties, high and nearly incalculable risks and a growing

---

<sup>15</sup> Jordan currently does not possess Missile Technology control Regime Category I or II ballistic or cruise missile delivery systems, for instance, and has on top of that signed the Hague Code of Conduct against Ballistic Missile Proliferation (Center for Nonproliferation Studies 2012).

number of contradictions in the overall rationale? Can regional developments and events – such as the Iran issue – ultimately linked to the ancient rivalry of Sunni and Shia regimes striving for geopolitical hegemony and religious domination in the region, really be dismissed as completely irrelevant to Jordan’s decision to go nuclear amidst regional crises? Those answering these questions with „yes“ without even considering the international dimension of Jordan’s nuclear energy program might be in for an unpleasant surprise, especially if violent conflicts, fights for hegemony, political instability and inconsistencies particularly in U.S. politics vis-à-vis its regional enemies and partners continue to dominate the Middle East.

### *3.1 Jordan as a “Partner of the West” and “Model of a Nuclear Newcomer”: No Need to Worry?*

No need to worry about nuclear proliferation? Exactly – institutes of high renown such as the IISS conclude (in 2008):

„Closely tied to the West, friendly towards Israel and transparent in its strategic and technical dealings, Jordan presents no political or proliferation obstacles to Western investments in its nuclear plans. A nuclear-weapons programme would be (...) beyond its strategic needs as to be almost unthinkable.“ (IISS 2008: 85).

Whilst there might be some facts supporting this conviction, time has also brought about some changes, particularly of regional scenarios. The increasingly heated national debate over the nuclear program, which will be described in the next chapter, has brought to light that in fact, the picture is much less rosy than presented both by Jordan’s government or some Western observers. Evidence suggests that in reality, King Abdullah and his government have, just like their predecessors, become quite smart in deliberately using rhetoric much appreciated by the Western counterparts: the goal has always been to be perceived as a responsible member of the international community of states, cooperating with everyone – and especially the U.S. and Israel – and complying with international treaties at all times (Interview Hamburg, Dr. André Bank, March 6, 2014).

This politics of „branding“ and sustaining a particular image might also put into perspective that Jordan has been eager to sign about all relevant non-proliferation treaties, the most important of them being the NPT, the Comprehensive Nuclear Test Ban Treaty (CTBT) as well as its predecessors, the Joint Spent Fuel Convention and the Convention on the Physical Protection of Nuclear Material as well as the IAEA Safeguards Agreement and the IAEA Additional Protocol (Center for

Nonproliferation Studies 2012), both particularly important for verification. Jordan has also been a strong advocate of a Nuclear Weapons Free Zone in the Middle East (IISS 2008: 82), a stance, however, that is mainly based on its dislike of the Israeli nuclear arsenal as well as Iran's increasingly advanced nuclear program. Only a few inconsistencies are disturbing that picture. At first, the NPT, IAEA Safeguards Agreement or the Additional Protocol were signed in 1968, 1974 and 1998 respectively (JAEC/WorleyParsons 2011: 65). Whilst this is not automatically speaking against Jordan's non-proliferation credentials, one might nevertheless keep in mind that the situation was a quite different one back then – Jordan being ruled by King Abdullah's father, and no nuclear Iran in sight. More important, though, and ruling out an early „all-clear“ in terms of its largely harmless fuel cycle, is the fact that Jordan has been oddly reluctant to forego uranium enrichment following the model of the United Arab Emirates (UAE) (see e.g. Peel 2013). This is particularly striking given its usual strategy of presenting itself as the „first in class“ (even if, as a party to the NPT or the International Framework for Nuclear Energy Cooperation (IFNEC), it would have the right to enrich its own uranium (Asculai 2012: 397). Even more interesting is the fact that Jordan is thus entering into opposition to the U.S., one of its most important financial donors (Houk 2010) and key political partners. One reason for that might be that this stance is simply due to uranium being a central part of Jordan's nuclear equation, with any outside interference leading to a loss of the perceived financial benefits of the „massive amounts of uranium“ the government likes to assume. Another – and legitimate – reason may be Jordan's „national interest“ in terms of sovereignty, or, as JAEC director Khaled Toukan puts it: „We will not agree to sign any agreement that infringes on our sovereign rights or our international rights under any treaties.“ (Peel 2013). Whilst these might be reasons for Jordan refusing to sign any UAE-style bilateral agreement with the U.S., there might be more to it – even more so as Jordan on many occasions does willingly sacrifice independent decision-making or prestigious positioning in the region in exchange for U.S. support. One interviewee who cannot be named here, but who used to work for the Jordanian government and even the nuclear energy project for years, seemed to be rather irritated („Now you are getting naughtier!“) when asked why Jordan continued to insist on uranium enrichment when it had previously even rejected the cheaper CANDU-reactor mainly for wanting to avoid harming its non-proliferation image. The official indignantly concluded that currently, Jordan did not

possess any uranium enrichment facilities; one could start talking about signing a respective agreement following the example of the UAE once own facilities had become a reality – which could be the case in 15, maybe 20 years. Given the fact that building own enrichment plants would be very costly and therefore only be making sense if there were no assurances of outside fuel supply (Asculai 2012: 397) – which there are plenty – insisting on uranium enrichment seems a little suspicious. Developments in this field are probably the ones to be followed most closely, and should be observed carefully in the coming years.

On top of that, one may increasingly argue whether Jordan has not ceased to be almost exclusively oriented towards „the West“. Whilst the country's ties to the Gulf can probably be considered closer than ever (Interview Hamburg, Dr. André Bank, March 6, 2014), a lot has changed in other theatres of regional politics. A major reason for this is the ongoing Civil War in Syria – a brutal conflict heavily affecting Jordan, with King Abdullah and his government fearing for the regime's own stability. Western talks of a possible military intervention following the use of chemical weapons against Syrian civilians have done nothing to calm King Abdullah down. There is no solution in sight. The same is true for Iran, another unsolved issue that has been relevant to Jordanian decision-makers for years. Now that ISIS is at the Jordanian-Iraqi border (Malik/Shami 2014), the Jordanian government is increasingly worried that there might be spill-over effects (Ammonnews 2014), not to mention the renewed influx of Iraqi refugees (Avni 2014). Recent and previous statements of King Abdullah indicate that the Jordanians at least partly blame the U.S. for all of these problems, thus calling for more and reliable support (Petra News Agency 2014). The U.S.'s firm position in negotiations on Jordan's enrichment plans, especially between 2007 and 2011 (Lantis 2014: 28), did not necessarily tie Jordan any closer to the West. To make things worse, relations with Israel deteriorated as Jordan's nuclear program progressed: King Abdullah has repeatedly accused Israel of sabotaging Jordan's efforts to go nuclear by putting pressure on the U.S. to prevent the country to enrich its own uranium (McRobie 2010); on several occasions, Jordanian officials blamed Israel to be trying to keep potential partners from supporting Jordan's nuclear energy bid (Nuclear Threat Initiative 2012). Interviewees at JAEC echoed that verdict, stating: „Israel is definitely not supportive“, whilst the Saudis, the IAEA and Russia were (Interview Amman, Bahjat Aulimat and Yazan Al-Bakhit, 04th of May, 2014).

So who does Jordan turn to? The answer, apart from the Gulf, is: Russia. Russian officials and business magnates regularly link nuclear power in the Middle East to peace and development in the region (see e.g. Spassky 2013) and strongly speak in favour of nuclear cooperation (ibid: 6). JAEC, among others, is aware that there could be mutual benefits on the table: investments for the Jordanians, and political leverage for the Russians (Interview Amman, Bahjat Aulimat and Yazan Al-Bakhit, 04th of May, 2014). It is also Moscow that is increasingly active in the region, trying to become the main negotiator on the most pressing issues – Iran, Iraq, Syria – at the expense of the influence of the U.S. (Karasik 2014). And this has been successful: Amman has increasingly turned to Moscow, seeing a more pragmatic counterpart in Vladimir Putin (Al-Adwan 2014). King Abdullah knows that a solution for the Syrian crisis cannot be reached without Russia (ibid), and those considerations may explain why the Jordanian Council on Foreign Relations sent an address of solidarity to Putin, lamenting that Russia had to face „Western provocations in Ukraine“ and congratulating Russia for „the return of Crimea to the motherland“ (ibid). If Jordan’s ties to the West were as close as often promulgated, such a statement would be quite unthinkable. The geopolitical theatre has changed, and it has changed considerably.

### *3.2 The Shadows of Iran, and a Gulf Cooperation Council in Furor*

The context of the aforementioned insistence on own uranium enrichment is, to a high extent, a regional one – one that can safely be described with the key word „nuclear Iran“. Jordan’s own position towards that issue will be described in a following section as will be Jordan’s relations with the Gulf Cooperation Council. At this point, it is important to note that if the West can be described as „very concerned“ about Iran’s advancing nuclear program, the Sunni-led GCC states, with Bahran and Saudi Arabia at the forefront, can be pictured as panicing. Even if a Sunni-Shia-divide can mainly be observed on the level of the *state* (with Arab Sunni *societies* mostly viewing Israel and the U.S. as a greater threat to their countries than Shia Iran (Bank/Valbjørn 2012: 6), some authors go so far as to diagnose a continuing “Arab Cold War” (Bank/Valbjørn 2012: 3) linked to a tradition of Arab nationalism. This is further aggravated by Iran “behaving more Arab than the Arabs”, e.g. by acting as the only true defender of the Palestinian cause and thus presenting the Sunni Arab regimes as the real enemies of their own people (Bank/Valbjørn 2012: 21), thus trying to gain more influence over the region. Of

course, this does not go unnoticed, especially in times of the Arab Spring, with all regimes in the region facing challenges to their reign's legitimacy.

Saudi-Arabia's regime is one of the most determined enemies of Iran, seeing "the malevolent hand of Iran behind a lot of trouble around them" (Lippman/Vatanka/Mattair 2011: 2), blaming it for any Shia uprisings or perceived dominance and interference in Sunni states of the region (ibid). Saudi Arabia is extremely worried a nuclear-armed Iran might make use of their vulnerable targets, possibly hitting their oil installations and water desalination plants along the Gulf coast (ibid). Whilst some GCC countries like Oman have continued to sustain quite cordial, economic relations with Saudi Arabia's biggest rival, the latter sees Iran as not only challenging Saudi leadership in Islam (ibid: 3) and reaching out to Shia parts of its own population, but also regionally supporting sectarian divides in e.g. conflict-torn Syria (Kandeel 2013: 60). The GCC states have „real concerns about their area's military security“, fearing that any scenario of the U.S. or Israel reacting to Iran would lead to an Iranian military retaliation against the GCC (ibid: 61). On another level, they do not like the idea of an economically recovering Iran having pulled „the right strings to obtain international concessions, including reducing or lifting sanctions on its hydrocarbon sector.“ (ibid: 62), which is another reason why relations between the U.S. and Saudi Arabia in particular have increasingly changed for the worse (Blair 2013). Member of the Saudi royal family and former director general of the Saudi intelligence services Turki Al Faisal bin Abdul Aziz al Saud accordingly criticises the „open-arms approach“ of the Obama administration towards Iran as falling for newly elected Rouhani's „sweet talk“ (Al Saud 2013: 38) - whilst ignoring what really is at stake for the GCC. Arguing that Iran's growing influence over the region is also due to the U.S. Bush administration's invasion of Iraq (ibid: 39) and the subsequent failure of supporting the rights of the Iraqi Sunnis vis-à-vis Maliki's Shia regime (see e.g. Wikileaks Cable #08RIYADH649, sections 4 and 11), he finally pronounces a crushing judgment on Western politics towards nuclear proliferation in the region as having failed to adequately address the Iran controversy as well as to include Israeli arsenals of nuclear and other weapons into non-proliferation discussions (ibid: 44). The reactions of the GCC states and particularly Saudi Arabia to those perceived and actual shadows of Iran are quite drastic, having the potential of leading to a regional nuclear arms race. Previously having relied too heavily on Western forces and worried about their own

conventional defence capabilities (Koch 2010: 27), they do not only see the solution in small steps, such as inviting Jordan to join the GCC (Richter 2011: 1), a decision partly based on Jordan's comparably better military standing in terms of personnel<sup>16</sup>. The Gulf's answer seems to be going nuclear – but not for peaceful purposes. Various scholars have acknowledged that an Iranian nuclear-weapons program would lead the memberstates of the GCC and „other regional powers such as Turkey or Egypt to acquire their own bombs“ (Mousavian 2012: 184). And in fact, Bahrain and Saudi Arabia have been the most outspoken, both repeatedly and vividly warning U.S. officials that the Gulf states might have no other choice than to go nuclear. One of the relevant cables published by Wikileaks thus depicts a central Saudi official's statement as warning „that if Iran tried to produce nuclear weapons, other countries in the Gulf region would be compelled to do the same“ (Wikileaks Cable 09RIYADH181\_a, section 1) or at least have nuclear weapons stationed in the Gulf „as a deterrent to the Iranians“ (ibid). A leaked intelligence email reveals that Saudi King Abdullah repeatedly urged the U.S. to „cut off the head of the snake“ of Iran, simultaneously asking them to review their regional security policies (The Global Intelligence Files, Email-ID 1660009). King Hamad of Bahrain equally called upon the U.S., e.g. in talks with General Petraeus, to stop Iran's alleged nuclear program by any means (Wikileaks Cable 09MANAMA642\_a, sections 1 and 4). Given all of these factors, it seems highly unlikely that the GCC states's decision to set up their respective nuclear energy programs has been made independent of regional conflict dynamics. Even if they until now lack the facilities and capabilities needed for a military nuclear program (IISS 2008: 40), the initial decision may have been made regardless, especially given the fact that U.S. nuclear weapons will not be stationed in e.g. Saudi Arabia to deter Iran any time soon.

### *3.3 Jordan's Ties to the Gulf Cooperation Council*

If Jordan's political decision-making was independent of its neighbours in the Gulf, particularly of decisions taken by Saudi-Arabia, there wouldn't necessarily be a reason to suspect that Jordan would set up its nuclear energy program for any other than purely peaceful purposes. But Jordan is tied to the Gulf more closely than ever, with Jordan increasingly starting to resemble a Gulf monarchy (Interview Hamburg, Dr. André Bank, March 6, 2014). The influential community leader of the tribe of the

---

<sup>16</sup> The GCC's „Peninsula Shield Force“ has failed to be expanded as planned to 25.000 or even 100.000 soldiers, thus limiting it to the initial insufficient 5.000 (Koch 2010: 27).



Bani Sakhr, Mohammad Al-Shushan (himself closely related to Saudi counterparts), accordingly states that Saudi Arabia's influence over Jordan's decision to go nuclear is massive (Interview Azraq, Mohammad Al-Shushan, May 3, 2014). Other local observers conclude that whilst they cannot truly imagine Jordan to be pursuing a military nuclear program, a nuclear Iran and the Gulf's respective concerns would at least partly have informed the decision: „It's a chase.“ (Interview Amman, Dr. Ayoub Abu-Dayyeh, April 25, 2014). Finally, Jordan has not been invited to join the GCC, itself not even being a Gulf monarchy, just by chance. In fact, this invitation, voiced in 2011, has not only been due to regional upheavals – aiming at stabilising the regional monarchies – , but also related to attempts of strengthening the GCC's security infrastructure in the much cited shadows of Iran (Hamdan 2011). This step does not only mean being part of regional business and trade or receiving massive soft loans and financial assistance. It also includes some sort of mutual military assistance obligation that has been a result of Iraq's attack on Kuwait in 1990: „to take action on the principle that an attack against any Member State is an attack against all other GCC States.“ (Gulf Cooperation Council Secretariat General 2009: 15). Afterall, „all Jordanian politics is (also) regional“ (Bank/Valbjørn 2010: 307), a fact that is strongly suggesting to take a possible security-informed exertion of influence particularly on the part of Saudi Arabia into account. This impression is affirmed once more as one is looking a bit more closely at Jordan's own multi-faceted stance on Iran.

#### *3.4 Jordan's Stance on Iran*

As Jordan announced its plans for a nuclear energy program „in the context of Iran's increasingly advanced nuclear programme more explicitly than has any other Middle Eastern country“ (IISS 2008: 82), looking at its own stance on Iran needs to be the next step of analysis. This is even more necessary given its close ties to the GCC (and Saudi Arabia in particular) and its changing landscape of international alliances, which may even lead one to speak of a Jordanian „pivot to Russia“. King Abdullah's divide et impera strategy (Bank/Valbjørn 2010: 314) of referring to Iran's influence in the region as a “rising Shi'i Crescent” (ibid: 313) should therefore equally be seen as being related to Jordan's nuclear energy program, especially since many Jordanian observers of the project-related dynamics argue that one is looking at a “personal project of the King” (Interviews Amman, anonymous, April 2014). Talks behind the scenes do shed light on Jordan's stance on a nuclear Iran. Whilst the Jordanian

government has always been aware of widespread public admiration for Iran (Wikileaks Cable 06AMMAN8150\_a, section 4), it has nevertheless continued to assure Western intelligence that it would support sanctions against it (Wikileaks Cable 10AMMAN310\_a, section 1). Despite of being in desperate need of energy resources, Jordan once even rejected an Iranian offer (that came at a time of slight harmonization of relations) of oil and gas (Interview Hamburg, Dr. André Bank, March 6, 2014). Moreover, then-director of the Jordanian General Intelligence Directorate (GID), General Muhammad Dhahabi, in 2006 explained to U.S. intelligence that “a very firm and tough message” should be delivered to Tehran in order to counter its “efforts to expand its power in the region”, especially in Syria (Wikileaks Cable 06AMMAN4175\_a, sections 6 and 7). Further officials taking part in confidential consultations accused the U.S. of maintaining a double standard concerning a Nuclear Weapons Free Zone in the Middle East that did not touch upon the Israeli arsenal, further criticizing the “inconsistency” of U.S. policies targeting Iran (Wikileaks Cable 06AMMAN1735\_a). In another meeting with then-Senator and today’s U.S. Secretary of State John Kerry, GID chief Dhahabi went so far as to say: “We are scared of a new Persian empire that will use Islam and Iraqi Shia as a tool.” (Wikileaks Cable 06AMMAN645\_a, section 3), subsequently referring to Iran’s dominance over the Iraqi neighbour (ibid, section 6). In the same meeting, he referred to an increasingly intensive cooperation of intelligence service chiefs from Jordan, Saudi Arabia, Turkey, Kuwait, Egypt and the Emirates, with the Saudis taking a very active role in the organization of subsequent initiatives targeting Iranian interference in Iraq (ibid, section 14).

The King himself has regularly voiced his deep concerns over Iran being “a threat to the region and not to be trusted”, i.a. in a meeting with Russian President Putin, the latter referring to “Iran’s very threatening” nuclear ambitions and stating that “Tehran was intent on a nuclear weapons program” (Wikileaks Cable 07AMMAN701\_a, section 1). King Abdullah also frequently described Iran as an octopus using “the nuclear issue, Hizballah, Hamas and Syria as its tentacles” (Wikileaks Cable 08AMMAN3372\_a, section 6). He pictured war with or a military attack on Iran as disastrous (ibid), whilst the prospect of a nuclear Iran already did represent a strategic threat to Jordan (Wikileaks Cable 08AMMAN3172\_a, section 2). He and his officials at the same time got increasingly disappointed with the P5+1 initiatives, suspecting them to allow Iran to “continue building political power and

influence in the region” (ibid). Consequently, Jordan and the GCC states have, in the course of time, become increasingly reserved in discussing Iran’s nuclear program with U.S. officials (Wikileaks Cable 09AMMAN2114\_a), doubting that continued dialogue would lead to anything (Wikileaks Cable 09AMMAN813\_a, section 2). Various Jordanian officials have have been anxious that afterall, Iran would benefit at their expense (ibid, section 11). Thus, in between, even military strikes against Iran were on the table despite of catastrophic consequences for the region – a desperate attempt at a solution based on the belief that “preventing Iran from acquiring nuclear weapons would pay enough dividends to make it worth the risks” (ibid, section 7). To make things worse, King Abdullah distrusts the more recently elected President Rouhani even more than his aggressive predecessor, describing him as a “wolf in sheep’s clothing” (Wikileaks Cable 09AMMAN1006\_a, section 5). One may conclude that the Jordanian government, and King Abdullah in particular, see Iran as a strategic threat to Jordan’s domestic stability and to the whole region. They basically link any instability and conflict in the region as well as the resulting consequences for Jordan to Iran’s “tentacles”. Even worse, all (Western) initiatives targeting Iran have thus far been perceived as meaningless, leading so far as to even consider a military strike against Iran, which would lead to apocalyptic scenarios of war in the region. Disappointed with the West and especially the U.S., and hopeless that a Nuclear Weapons Free Zone in the Middle East *including* Israel would actually be achieved, Jordanian security circles join the King in growing frustration. This might of course not be enough to conclude that Jordan will therefore set up its nuclear energy program to eventually be able to obtain a nuclear deterrent, which might, in the eyes of the King and the intelligence services, be the only option left to protect themselves from a nuclear armed Iran. But the bigger picture does lead to questioning whether it can really only be about energy and prestige. One may also ask whether these plans of going nuclear have really just coincidentally been announced at a time when all of the Sunni regimes in the region started panicing on the prospect of a Shia Iran with nuclear weapons. One can never be sure – but several issues raised and motives described in this chapter should at least lead security policy makers to observe the development of relevant technological capacities and military facilities closely. So far, the most realistic explanation seems to be that Jordan invests in the build-up of a nuclear infrastructure in terms of HRD and technology in

order to eventually at least have the possibility to go nuclear for other than peaceful purposes.

#### **4. The Nuclear Energy Program as a Catalyst for National Conflict?**

Whilst it remains to be seen whether Jordan's fuel cycle as well as military equipment will eventually match the motives governmental and intelligence stakeholders seem to have, one can already now tell which impact the nuclear program has on Jordan's national situation. The following analysis will show how the nuclear energy program takes its toll on Jordanian domestic politics, and gives several causes for serious concerns over its likely role as a catalyst for national conflict. Not all Jordanians have been seeing the discovery of the uranium deposits, the announcement of wanting to build nuclear reactors or the commissioning of the JRTR as a blessing. In fact, not only has there been an increasing number of anti-government protests since 2011, with some of them turning violent particularly from the side of the anti riot police and loyalists (Al Jazeera 2011); but more and more of recent protests have in parts even targeted the King rather than just the regularly changing government (Interview Hamburg, Dr. André Bank, March 6, 2014), accusing him of incompetence and corruption (Barnes-Dacey 2012) - something that's previously been nearly unthinkable. As much as it could have been expected that even Jordan would eventually face growing demands for political participation and reforms, hardly ever would one have assumed that there would be such a thing as anti-nuclear campaigns, with several different societal groups starting to organize their newly-discovered engagement for democracy and ecology remarkably professionally. Who would have thought even in 2011 that Jordan's government and King would face anti-nuclear campaigns which are starting to materialize into an overall resistance to governmental politics? Who would have thought that there was a potential for new domestic alliances forming, including the tribes, the Muslim Brotherhood (MB), business men, politicians and green activists? The following sections will, in the light of previous experiences with national conflicts, riots and protests, both describe the national debate with all of its arguments and examine the nuclear program's potential for an escalation of national conflicts.

#### *4.1 Jordan's Experiences with National Conflicts*

Jordan has already experienced national conflicts before 2011, the year of the Arab Spring, and even way before anti-nuclear resistance had started to form. Understanding the patterns of national conflicts and even riots – the usual „why“ and „who“ – allows for a far better understanding of the more recent anti-nuclear debates and protests. It also makes looking at today's opponents of the nuclear project even more interesting (and alarming), as will be shown in the following sub-sections.

##### *4.1.1 Promises of Reform – Persistence of Autocracy*

Political reform has always been rather limited in Jordan. Actual democratic opening has thus far been avoided by the King, with the parliament remaining a „toothless institution elected through a gerrymandered electoral law with members who only seek patronage and have no real impact on decision-making“ (ibid: 7). Reform packages are usually designed to silence opposition and thus mostly support the status quo (ibid). Still profiting from its great historical legitimacy (Hamid/Freer 2011: 2), the Hashemite monarchy has until recently continued to get away with half-hearted reforms. Moreover, King Abdullah's reign has witnessed crackdowns on the Islamist parts of opposition, frequent cabinet reshuffles and fraudulent elections (Hamid/Freer 2011: 3) – events making his reform programs „Jordan First“ (2002), „National Agenda“ (2005) and „We Are All Jordan“ (2006) (ibid) look pretty shallow. His strategy of divide et impera (ibid: 5) seems to have paid off for a while, at least in terms of leading to calls for reform rather than revolution (Ryan 2011: 365). Whenever one speaks of „stakeholder involvement“ and „participation“ in the context of the nuclear energy program, one should keep this in mind. As will be shown, the persistence of autocracy in Jordan is clearly reflected not only in the reactions of the state to growing resistance to the program, but also in a great impatience and distrust shared by all opponents of the program.

##### *4.1.2 A History of Failed Mega Projects and Protests*

On March 25, 2011, Jordan witnessed its first major violent clash between protesters, regime loyalists and the police in the context of the Arab Spring, leading some local observers to say that „the situation may explode at any moment“ (Hamid/Freer 2011: 1). Although smaller-scale in numbers, protests and demonstrations in Amman and other cities of the Kingdom should be taken seriously, as they are still widely perceived as a social taboo (Interview Qusayr Amra, Omar Mohammad Al Shushan,

May 3, 2014). Protests have mostly been calling for the downfall of the government whilst voicing support for the royal family (Hamid/Freer 2011: 4). Common to most of them was a sense of being fooled by the government, especially when it comes to mega projects that are always being announced with big promises of benefits for all, and which usually fail miserably. And in fact, mega projects as well as their almost inevitable subsequent failure are typical for Jordan under King Abdullah's reign (Interview Hamburg, Dr. André Bank, March 6, 2014). There have been various attempts of obtaining some prestige with the help of huge projects that are always accompanied by the aforementioned promises of „jobs for everyone“, „economic growth“ and „sustainable development“. The King's ambitions went so far as to declare Jordan the new „IT-hub“ of the Middle East (something that strongly resembles his current PR-strategy for the nuclear project of calling Jordan „a model for the region“), a vision that until now did not materialize into reality. Even worse, promising projects such as the *Qualified Industrial Zones* did not lead to more employment of the increasingly desperate Jordanians, but an influx of even cheaper work force from i.a. Bangladesh (Interview Hamburg, Dr. André Bank, March 6, 2014). In every single case, not only did *Big Business* meet geopolitics, but also was there a strong link between politics and corruption, and the promised blessings never came. Unsurprisingly, this did not increase the people's trust into the government's ability to manage mega projects adequately *or* its real intentions and motives for setting up projects alike. This observation is one central part of explaining just why the nuclear energy program meets such a high level of anger and frustration.

#### 4.1.3 *The Link between Neoliberal Policies and Riots*

Jordan has seen little political liberalization, but a lot of neoliberal privatization - based economic reforms (Ryan 2011: 370). Between 1998 and 2008, fourteen state-owned enterprises in telecommunications, electricity, air transport, mining and other sectors were privatized (Mako 2012: 1). This, in a combination with political factors, lead to a decline of the public sector, previously having absorbed quite a lot of youths from the tribes, as well as to rising unemployment, poverty of the *formerly* better-off and rampant corruption among business and government elites (ibid). This link should generally be paid a lot of attention to, as it was also economic liberalization without political reforms having led to the Arab Spring (Beck/Hüser 2012: 8). Events such as violent clashes between citizens and police in Ma'an in November 2002 which led to the death of six persons underscore the link of violent

conflict and „failing to address the absence of trust between local population and local authorities – and the state more generally“ (International Crisis Group 2003b: 2) in the light of economic inequalities and lack of political participation. Already in 1989, when King Abdullah’s father Hussein was in charge of the country’s affairs, austerity agreements with the International Monetary Fund (IMF) and the resulting cutbacks in subsidies led to riots in Ma’an, Karak and Salt – traditional power bases of the Hashemite monarchy (International Crisis Group 2003b: 4). Prices for fuel and basic goods such as bread rose dramatically, prompting a high level of public anger (Ryan 1998: 54). Today, King Abdullah seems to have equally taken respective decisions without employing parliamentary checks and balances or listening to public concerns, leading many to believe that even Jordan’s membership in the World Trade Organisation (WTO) and subsequent Free Trade Agreements were not necessarily in the best interest of all Jordanians (ibid: 7). The riots in Ma’an, and this should awake both international security policy makers as well as the Jordanian government and King, are particularly in need of closer observation, as Ma’an has traditionally represented a strong indicator for political trends (ibid: 10). They have until today symbolized a broader and urgent „warning of the potential for broader dissatisfaction and unrest in the country as a whole should economic, social and political difficulties remain unaddressed“ (International Crisis Group 2003a: 1).

#### *4.2 A Closer Look at the Opponents – Opposition on the Rise?*

Given all of the aforementioned, one feels tempted to investigate the potential force of change exercised by „the opposition“. Now Jordan’s opposition has traditionally lacked unity in political visions and agendas, its fragmentation causing ineffectiveness (Bariri 2013: 4). So far, the Muslim Brotherhood (MB) has been the most organized and influential group, whereas youths stemming from the East Bank tribes, the historical pillars of the regime, have started entering the game widely unprepared for the effectiveness of the government’s mix of co-optation and repression (Barari 2013: 5). Other representatives of the increasingly marginalized tribes (Interview Hamburg, Dr. André Bank, March 6, 2014) have started to heavily criticize the royal family, mainly for corruption (Hamid/Freer 2011: 2). These unprecedented attacks have to be seen in the light of the formerly far more powerful tribes also wanting to limit Palestinian influence (ibid). Nevertheless, all parts of the opposition seem to agree that corruption as well as the all too close ties between business and politics constitute the greatest problem in Jordanian politics, economy

and society (Ryan 2011: 371), something that seems to have been confirmed by the interviews conducted during the field research. All of the groups unanimously agree on their demands for a „true parliament“, an end to the secret reign of the GID and accountability of the corrupt establishment (ibid: 383-384). All of them equally share a deep sense of distrust in King Abdullah’s frequently changing governments, and eventually in the King himself; a sense reflected by the overall weak bond of trust (Interview Hamburg, Dr. André Bank, March 6, 2014) between the regime and the people. Youths in particular – whether Islamist, secularist, tied to the government or not – are increasingly fed up with the old guards, urging observers to acknowledge that „the lessons of Tunisia and Egypt did not fall on deaf ears“ (Bustani 2011).

#### *4.2.1 The Tribes*

Jordan’s electoral law is mostly based on gerrymandering, placing disproportionate weight on rural and tribal areas (those of which to historically expect most regime-support) „at the expense of predominantly Palestinian cities like Amman and Zarqa“ (Hamid/Freer 2011: 3). Nevertheless, the tribes have increasingly pointed to their growing frustration with the Hashemite monarchy, calling for an end of „rampant corruption and economic inequality“ (ibid: 4). In 2011, a convoy of King Abdullah in tribal Tafilah was reportedly even hit by stones and bottles (ibid), something previously beyond imagination. The tribes’ growing frustration has since been linked to economic grievances and neoliberal reforms (Ryan 2011: 384), leading to calls for a revitalisation of social welfare – a call the tribes share with other opponents of economic liberalisation such as leftists, Islamists as well as secular nationalists (ibid: 385). They have been particularly angry about the near collapse of the agricultural sector as well as losing their „privileged access to the palace“ to new private sector elites (International Crisis Group 2012: 1). As Palestinians have come to dominate the private sector (ibid: 5), this tribal sentiment might eventually lead to another dimension of national conflict, and it cannot be excluded that this will be resulting in clashes between Palestinians and (some) tribal East Bankers.

Most of what could be observed before the national debate over Jordan’s nuclear energy program got more heated is also reflected in the tribes’ current stance on a nuclear Jordan. Parliament members stemming from the influential tribes of the Bani Hassan and Bani Sakhr have been quite outspoken on the issue. They have, for instance, strongly rejected JNRC chairman Majd Hawwari’s descriptions of the



desert of Qusayr Amra they live as „military wasteland (...) not heavily populated“ , and if so, „only by shepherds“, (Su 2013) with words of serious outrage:

„Is he underestimating us? We're shepherds? We're illiterate people? Does he think we're stupid? It's the desert, but what if we had an accident? Where does the radiation go? How will they control the leakage?“ (ibid).

MP Fayez, with others affiliated with the northern tribe of the Bani Sakhr, has since organized weekly anti-nuclear protests both within the area of Azraq and Amman, concluding: „They'll build that plant over my dead body.“ (ibid). Tribal leader Mohammad Al-Shushan, well-known and respected among and beyond the tribe of the Bani Sakhr in and near Azraq – the proposed site for the nuclear power reactors – has joined the debate. He and most of his sons having been in charge for „public security“ for years and decades, the community leader now joined the anti-nuclear movement. Economic deprivation, however, does not seem to inform his decision as much as the actual details of the nuclear project do. Stating that the program already had a negative impact on the local people and their livelihoods, with agriculture threatened once more, he assures that the Bani Sakhr strongly oppose the project mainly for its risks and the corruption involved – no matter where the plants would finally be build: „We refuse it as against our *national* interest – we refuse it completely, not matter where the plants are built.“ (Interview Azraq, Mohammad Al-Shushan, May 3, 2014). He describes the current atmosphere in the region as „hot“ (ibid) and explains that the people were „very angry with the government, mainly because there is no transparency, no accountability“ (ibid). According to Al-Shushan, several people were afraid of potential consequences of radioactivity, especially for the aquifer in Azraq which is one of the most important ones in Jordan (Interview Azraq Wetland Reserve, Hayem Y. Al-Hreisha, May 3, 2014). The tribal leader subsequently complains about an „outraging lack of stakeholder involvement“ (ibid), meaning a lack of consultations of the local people before the sites were moved to their area, which led to them first hearing about it in the media. According to Al-Shushan, a lot of people assumed that lots of corruption must have been involved (ibid). Asked what they intended to do about it, he said that the recently built-up Anti-Nuclear Community Committee would issue many campaigns and demonstrations „with a very clear message: the government must listen!“ (ibid). If the government continued to choose ignoring over listening, this would seriously damage the relation between the government and the local, tribal communities, with

the nuclear issue already having „changed things“: „Nowadays, the people are more powerful.“ (ibid). He ended the interview saying that local resistance would go on, even though the GID and loyalists exerted a lot of pressure on opponents of the nuclear program, but also concluded that this would become even more difficult if there was „a hidden political agenda“ involved, something he didn't elaborate on. During a tribal assembly the author was allowed to subsequently attend, this latter impression got confirmed, with a GID-employee listening carefully and taking notes on what has been said (Attendance of tribal assembly on the nuclear issue, May 3, 2014). Despite of obvious attempts of outside intimidation, however, the attendees of the assembly were very outspoken. One tribal leader stated that the most recent tribal demonstration had left an impression, and that „many more should follow“ (ibid). The same man called the Jordanian democracy a huge fake and explained that this was brought to light through the way the government tried to push the nuclear energy program through. Calling upon the government to examine alternative sources of energy, other members of the anti-nuclear committee voiced their concerns over possible impacts of earthquakes or terrorist attacks on the nuclear facilities. Others were outraged by JAEC reportedly using the National Security Fund (intended for social welfare) to fund the nuclear project, another reason they identify for the grave lack of information on the project's progress coming from the side of the government (ibid). All of this seems to fit quite well into the broader picture. The tribes, amongst them the Bani Sakhr, have traditionally been the Hashemite monarchy's power base. Changes in that have, as has been described before, been observed in the course of economic liberalization and privatization measures. But the nuclear issue seems to catapult their frustration and anger to unprecedented levels. Facing serious risks for their livelihoods, the environment as well as the overall security situation, they do not only oppose the nuclear project, but are also ready to materialize their growing furor into serious actions. Finding out about most project details via the internet, and being called „shepherds“ that basically do not matter anymore, they have reached a point that could eventually turn out to be a historical one.

#### 4.2.2 *Environmental Activists and Anti-Nuclear Organizations*

As a surprise to many, anti-nuclear groups have formed reaching beyond ad hoc activism. Two of them seem to particularly stick out: the *Jordanian Friends of the Environment*, headed by the well-known environmental activist and central figure of resistance to Jordan's nuclear energy program, Dr. Basel Burgan, as well as *Nuclear*

*Free Jordan*, actively supported by its decisive member and renown advocate Dr. Ayoub Abu-Dayyeh. Both activists either have strong backgrounds in related academic fields or have been advocating the promotion of Renewable Energies for years. They basically share the same objections. Basel Burgan for instance suspects that top-level decision makers involved into the nuclear program must have been briefed with far too optimistic data, e.g. on the actual quantity and quality of Jordan's uranium deposits, in the first place (ibid). Even worse according to him, though, are the horrendous and continuous cost increases which are ultimately linked to corruption among the relevant nuclear players, most of all JAEC (ibid). The whole program, Burgan states, was „built on corruption and *wasta*“ (ibid), „*wasta*“ referring to the practice of prioritizing connections over skills. „Where did all the money go?“, he asks, stating that the White Paper alone had swallowed up \$ 9 million. Being asked about the government's and JAEC's approach to „stakeholder involvement“, an important step the IAEA International Nuclear Safety Group identifies as crucial, (International Nuclear Safety Group 2006) makes him laugh: in fact, JAEC's budget of JOD 20-25 million would allow it to „buy off press“ – and even the greater mosques' imams were allegedly asked to hold sermons on the „blessings of nuclear energy“ (ibid). What's really outraging him and his fellows beyond those issues are JAEC's internal structure and processes of decision-making, especially in the face of the risks linked to nuclear energy that require thorough analyses, nuclear expertise and commitment to effective solutions to nuclear safety challenges. As opposed to those requirements, Khaled Toukan (and this has been reported by several other interviewees, too), is supposed to only hire „his own people“, firing anyone „who finds a mistake“ (ibid). Asked why the JAEC director could get away with that, the answer is once again pretty simple: the only ones with an actual access to the palace were Toukan, his inner circle and the nuclear lobby (ibid), leading to a perpetuation of the same ineffective and ultimately dangerous mode of decision-making. This is why several Jordanians – the actual stakeholders – have come to agree that Jordanian stakeholder involvement actually means prioritizing nuclear energy lobbyists and a selected handful of people over those actually bearing the risks. On top of that, Burgan explains, people in e.g. Ma'an and the surrounding southern areas of Jordan do not understand why the government didn't invest in RE in their region, especially given the reasonable expectation that photovoltaic plants would solve local electricity supply problems comparably quickly and create employment. Violent

clashes in Ma'an at the end of April 2014 were, according to Burgan, therefore a direct result of the nuclear energy project, leading him to sarcastically conclude: „What's happening right now in Jordan can serve as an international model of how a nuclear lobby can rape a whole country.“ (ibid).

All of these issues particularly cause opponents of the program with e.g. backgrounds in civil or electrical engineering – such as Ayoub Abu-Dayyeh or former member of the government H.E. Dr. Ibrahim Badran – to conclude: „They know it will fail“ (Interview Amman, Dr. Ayoub Abu-Dayyeh, April 25, 2014). Those experts on related fields first of all base this observation on the enormous costs involved – costs reflecting 30% of the Jordanian GDP a deeply indebted country like Jordan could impossibly handle (Interview Philadelphia University, H.E. Dr. Ibrahim Badran, April 28, 2014). They also heavily criticise the ignorance of alternatives such as oil shale and the already observable environmental pollution linked to uranium exploration that particularly affect tribes such as the Bani Sakhr (Interview Amman, Dr. Ayoub Abu-Dayyeh, April 25, 2014). Moreover, Badran is particularly concerned about the cooling concept involving a 65 km pipeline that lacks a plan B for disaster response: „The government has no answer to that.“ (Interview Philadelphia University, H.E. Dr. Ibrahim Badran, April 28, 2014). This inadequacy of nuclear safety planning in combination with regional instability leads him and others to not only ask why those risks were taken when there were safer alternatives, but also raise the question: „In this atmosphere, how can you predict the safety of the power station?“ (ibid).

The same observations hold for a group of activists in Ramtha, a town within 2 km of distance to Syria, who have started to protest the nuclear program in general and the nearby JRTR in particular. Inter alia lead by Asam Ahmedi, the well-informed activists voice their lack of trust in the government, accusing the latter of taking advantage of locals not knowing a lot about nuclear energy (Interview Ramtha, Asam Ahmedi and other members of the group, April 30, 2014): „150.000 people live in the area of the JRTR without even knowing about it“ (ibid). They, as several others interviewed, link this failure in stakeholder involvement to Khaled Toukan and his people, heavily criticising his unfulfilled promises of employment for locals and vast amounts of „under the table money“ linked to JAEC (ibid). A part of their anger is equally based on land disputes over the site of the JRTR, but most of their outrage

is linked to their doubt of adequate concepts for disaster responses: „If the fire fighters need hours to even get to a fire, how will we deal with accidents at the JRTR?(...)This project is bigger than Jordan.“ (ibid). Toukan’s silence and the nuclear program’s „top secrecy“ are what they see as scaring the local population even more. For now resorting to widely peaceful demonstrations and anti-nuclear campaigns, they warn: „The people will have the last word.“ (ibid).

#### 4.2.3 *Former Supporters of the Nuclear Energy Program*

Amongst the most interesting interviews conducted during the field research were two with former supporters of the nuclear energy program – two nuclear experts and scientists who are generally in favour of nuclear energy, and who have been inside of JAEC and the JNRC respectively. Dr. Kamal Khdair, former director of JAEC (who had to leave after having pointed out what he had identified as mistakes in the management of nuclear safety issues) is definitely not opposed to nuclear energy. But, as he states frequently referring to the respective IAEA milestones and guidelines: „You have to do it by the book.“ (Interview Amman, Dr. Kamal Khdair, April 28, 2014). As an expert on water management, he until today cannot understand why the site had been shifted to the desert – a shift rendering cooling with wasterwater a necessary and yet inadvisable option (ibid). Neither does he like the idea of nuclear power plants being close to heavily populated areas, especially when the cooling concept was „anything but convincing“. Most interestingly, he does not even believe that the project will be successfully completed; several unresolved issues – such as the need to build new roads in order to be able to transport heavy equipment to the new sites – would continue to raise the project’s costs to a level that Jordan would no longer be able to handle (ibid). But it’s not only the costs or safety risks he sees as major obstacles to the project: in fact, he also argues that Khaled Toukan, the present director of JAEC (and as others repeatedly say, a close friend of the King), already fails in IAEA’s first milestone: the decision-making process. It needed far more transparency and an involvement of the *whole* public to turn the project around. Since he does not expect that to happen, and given the unresolved and risk-bearing cooling issue, he (for now) seems to remain on the side of the opponents. Dr. Saed Dababneh, former Vice Chairman of the JNRC, sheds a light on further problems linked to the nuclear energy program. Himself not opposed to nuclear energy either, he stresses that several things had gone wrong along the process. First of all, tough, he argues that Jordan’s National Strategy for Energy had

laid out the principles: looking at nuclear energy *and* the alternatives (Interview Amman, Dr. Saed Dababneh, May 3, 2014), stating that the nuclear lobby was stronger (ibid). Surprisingly, he equally states that the project will actually „never happen“: the biggest problem being unrealistic planning, a lack of HRD as well as mismanagement and *wasta* before efficiency (ibid). The „unprofessional management of the program and the compromised safety issues“ as well as „the increased influence of JAEC over JNRC“ (ibid) have finally caused him to resign from his position at JNRC. As the nuclear project, however, was „purely political“, and big egos were involved, withdrawing would now be impossible for others, as the vast amounts already having been wasted „on nothing“ make it harder and harder to admit that mistakes have been made (ibid). What the former regulator means by „unprofessional management“ becomes even more clear when discussing the JAEC’s role in the construction of the JRTR: the construction permit for the latter would have had to be based on JNRC’s previous permission, provided the solving of remaining safety issues. As a regulatory and oversight body, this should in fact be JNRC’s very job. But in reality, work on the JRTR started before the permission was obtained. JAEC, according to Dr. Dababneh, then told the South Korean partner they had actually already obtained the permission to start construction works, when it really was not true. Even worse, the JRNC-employee in charge subsequently got fired for initially denying an unjustified permission (ibid). Having occurrences as these described by former insiders does not only offer insights into JAEC’s and JNRC’s decision-making processes, but also already hints at increasingly likely safety and security issues linked to obvious mismanagement.

#### *4.2.4 The Muslim Brotherhood /IAF*

As an Islamist group, the Muslim Brotherhood (MB) and the Islamic Action Front (IAF) as its political arm may be assumed to build upon a widely shared “Muslim perspective” on nuclear weapons, derived from the Qur’an as well as other sources of Islamic law, tradition and religion (Hashmi 2004: 322). Therefore, one would have to assume that the Jordanian MB as well as the IAF would have to join the participants of the 1984 World Muslim Congress in concluding that the peaceful use of nuclear technology would be fine, whilst nuclear weapons would have to be rejected as “barbaric instruments of death” (resolution of the 1984 World Muslim Congress quoted after Hashmi 2004: 344).

Corresponding to the diverse currents of Islam, which is not to be understood as a quasi-monolithic and self-contained religion, the Jordanian MB as well as the IAF are themselves marked by some variety and diversity. It may therefore not take by surprise that Jordanian Islamist activists have traditionally taken on the role of a “loyal” or “legal” opposition, thus emphasizing reform and moderation (Ryan 2008: 1) instead of aiming at a revolution, questioning the Hashemite reign’s legitimacy or resorting to militancy. This may initially lead one to assume that the MB and its political arm would now also widely support the government’s nuclear energy program, possibly in accordance with the aforementioned Muslim consensus on nuclear weapons. The situation, however, is a little more complex. Not only has there been a rise of the more radical and fundamentalist *Salafiyya* in Jordan as well as an increase of intervention of foreign *jihadis*, mainly affiliated with al-Qa’ida (Ryan 2008: 1) and nowadays linked to *jihadi* groups in Syria or foreign fighters still returning from war-torn Afghanistan – the past decades have also witnessed quite a few occasions on which the more moderate parts of the Brotherhood entered into direct opposition to both the Hashemite royal family as well as the Jordanian government. Most of those occasions of open opposition were linked to the peace process with Israel<sup>17</sup>, Jordan’s King Hussein’s support of the shah in the course of the Iranian Islamic Revolution in 1979 or Saddam Hussein’s subsequent invasion of Iran in 1980 (Ryan 2008: 3). When Jordan signed a peace treaty with Israel in 1994, the Brotherhood took the lead in opposing the normalization of relations between the two countries’ societies, e.g. by refusing to work with Israeli parliamentary counterparts (Ryan 2008: 3). The U.S.-led invasion in Iraq in 2003 complicated matters further, given the fact that this represented yet another challenge to the Hashemite regime, finding itself in a situation of having to at least rhetorically balance the different regional and national interests involved. The observable rise of the more radical and militant part of the Jordanian *Salafiyya* will be an even greater cause of concern. As indicated above, Islamist terrorists’ transnational involvement in the Syrian Civil War as well as the return of radicalized and well-trained Salafi *jihadis* from Afghanistan or Iraq strengthens the violent and militant parts of the Jordanian Salafi movement. Those oppose the Hashemite regime as *kafir* (unbelievers), seeing *jihad* as the only solution. Whilst the majority of Jordanian

---

<sup>17</sup> When Egypt’s former president Anwar Sadat, for example, entered into a separate peace agreement with Israel, the Jordanian Muslim Brotherhood criticized the Hashemite regime for not opposing the treaty the Brotherhood strongly objected to (Ryan 2008: 3).

Islamists, therefore, still remains reform-oriented, moderate, democratic and critical of the regular appointments of government officials due to *wasta*<sup>18</sup> (connections instead of formal and impersonal criteria), future developments do deserve a closer look. Now the Jordanian MB certainly does not, at least officially, refer to a possible military dimension of the program. There have, however, been some voices assuming that more radical parts of the Jordanian Islamist movements, be they within the MB or IAF, would welcome the nuclear energy program as paving the way to obtaining nuclear weapons. The reason for that would be, in some radicals' conception, the possibility to either actually use those against Israel or to use them as a deterrent vis-à-vis "the West", by which they feel suppressed (Interview, anonymous, Amman). This, the uncertainty of the regime's political future, and the rise of the more radical parts of the *Salafiyya* in Jordan, further exacerbated by regional developments in the neighboring countries Syria and Iraq, leads to believe that caution is in order. Even if the current regime did not pursue the nuclear energy program in order to one day have a breakout capability, one does not know if, given a regime change, the then likely rather Islamist government would take on a different stance, especially given the fact that more secular opponents of the nuclear project associate parts of the MB with a "mentality of war" (Interview Amman, Dr. Ayoub Abu-Dayyeh, April 25<sup>th</sup>, 2014).

Interestingly, however, the MB in its aforementioned more moderate form strongly opposes the nuclear energy program. During a press conference in June 2014, leading MB members rejected the government's plans for nuclear power. Their reasons correspond to what has been described above: they oppose the program as being based on misleading information, e.g. on its costs, environmental impacts, safety measures and project planning. They also strongly doubt the government's information on the quantity and quality of uranium, water management and statements on the overall feasibility. JAEC and its director Khaled Toukan have in particular been accused of corruption and nepotism (Namrouqa 2014). Therefore, the IAF concludes:

"We [the IAF] eye the nuclear project as unjustifiable with suspicions of corruption surrounding it and demand halting the project... we call for investing in safe alternative energy resources, with which Jordan is rich."(ibid).

---

<sup>18</sup> In 2006, the IAF's leader Jamil Abu Bakr was prosecuted for the IAF's criticism of the government's practice of appointing officials based on their links to the rich and powerful (Ryan 2008: 8).



Thus, the MB and IAF at least in their official position shared by its majority have visibly criticized the same points as the other parts of the recent or historical Jordanian opposition.

#### *4.3 The Reactions of the State*

The reactions of the state occur in mainly two ways: Not taking popular concerns seriously and trying to address them with a mix of silence and inaccurate information, or resorting to intimidation and surveillance – a tactic that could be observed for decades. Traditionally, the security apparatus (particularly the powerful GID – *Mukhabarat*) and the government have answered popular protests with „a combination of targeted arrests and co-optation to further weaken the protest movement“ (Barari 2013: 3). This approach seems to be based on a conviction shared by governmental elites that the protest movement merely consisted of „entrenched and ossified elites that have turned against the king and have a vested interest in the status quo“ (Hamid/Freer 2011: 5). So either, one can observe a contradiction between „sweet talk“ and action (Ryan 2011: 372), ridiculing the opposition - or repressing it. This stance on democratic opening is mainly due to the regime’s notion that „free political discussion is, in itself, a threat to national security“ (Jarrah 2009: 13). And this is exactly true for the current reaction of the state to growing resistance to the nuclear energy program: opponents are increasingly confronted with surveillance by Jordanian intelligence as well as other means of intimidation (Interview Amman, Dr. Basel Burgan, April 26, 2014). This approach to answering public concerns is i.a. due to the government’s fear that in the light of the Syrian Civil War throwing its shadows on Jordan, a politisation of e.g. the JRTR-controversies would lead to chaos and conflicts (ibid). All of this creates breeding grounds for ineffective and insufficient stakeholder involvement in the course of the set up of the nuclear program. An interview of *The Atlantic* with King Abdullah sheds another light on what King and the government generally really mean when saying „stakeholder involvement“ and „democratization“ – words the West truly likes to hear. The interview received a lot of domestic attention since King Abdullah displayed quite a lot of cynicism when talking about the people: calling the tribes „dinosaurs“, presenting parts of his own family as politically inexperienced and accusations of various types directed at him and his inner circle as meaningless rumours (Goldberg 2013). This approach of dealing with popular concerns may help to explain an incident near the JRTR that occurred in July 2012: After some activists

had told the local and widely unaware population that construction of the JRTR had already started, a bigger group of locals attacked some of the offices of the South Korean project partner, leading to arrests. Whilst the anti-riot police had seemingly arrived late on purpose to avoid clashes, warrants of arrests were finally issued. One of the activists was reportedly tortured afterwards, leading to another demonstration before the police station that called for his release (Interview Ramtha, Asam Ahmedi and others, April 30, 2014).

#### *4.4 Potential for an Escalation of National Conflict*

A lot of groups within the general and anti-nuclear opposition still seem to have a lot of regime connections (Ryan 2011: 382), which could lead one to argue that even given growing resistance to the nuclear energy program, one will not witness any major escalation of national conflict any time soon. Nevertheless, this does not necessarily have to be the case for this particular issue. All of the opponents, tied to the government or security services in different ways or not, share similar objections. Those objections, as has been laid out, focus on the environmental and safety risks arising out of an inadequate project management and the prioritization of connections and corruption over nuclear expertise and risk assessment. Another focus was on alleged corruption within JAEC, with Khaled Toukan being the most prominent and at the same time most heavily criticized player in the game. Contrary to what JAEC officials describe as „intensive engagement in stakeholder activities“ (Interview Amman, Bahjat Aulimat and Yazan Al-Bakhit, 04th of May, 2014), all of them argue that they have not been informed adequately, and that their concerns have fallen on deaf ears. Between the lines, one could read that other issues only indirectly linked to Jordan’s nuclear energy aspirations also played a role: Some, such as the tribes or the anti-nuclear movement in Ramtha, have implicitly linked the nuclear energy program to their economic grievances and water- or refugee-related hardships. They have, for instance, kept asking why those vast amounts of money were spent on a risky project like the nuclear one – especially in times of Jordan struggling with the huge number of Syrian and Iraqi refugees – when actually, investment in infrastructure, education, water management and RE could have produced more jobs, solved more pressing problems and laid the ground for a better future for all. Whilst those objections resemble each other, the subsequent agendas do not. The tribes (or at least significant parts of them) and activists in and near Ramtha are particularly active when it comes to demonstrations and campaigns, and are joined in their activism by environmental

activists and occasionally the MB. Whilst all opponents are very determined and engaged in their different ways of protesting the project, some of the groups described above may, given their disappointment with the government as well as sense of being utterly disrespected, eventually resort to more radical ways of resistance. Surely, one must be careful to describe any of the groups as one potentially resorting to violence – but the government’s and King’s reactions to the protest as well as the *whole* population’s experiences with half-hearted reforms, failed mega projects, corruption, social and economic inequalities and lack of political participation have certainly laid the ground for an escalation of conflict.

## 5. Conclusion

“Atoms for Conflict” rather than “Atoms for Peace”? Eisenhower’s promise does indeed seem to have lost its appeal, at least and most clearly in the case of Jordan - and this is true for both the international as well as the national dimension of the monarchy’s nuclear power adventure. As has been laid out, Jordan does not (yet) possess the technology or fuel cycle that would be needed to acquire nuclear weapons. And given Jordan’s traditional alliance with the West as well as its widely cooperative stance on verification and international cooperation, it seems close to ridiculous to suspect it would even consider breaking out of the “Western Camp” and join the club of nuclear proliferation. But there are a few issues that do deserve a second look. One major issue is that of uranium enrichment: national interest and economic viability or not, why should it insist on enriching its own uranium for years, and even when facing increasing pressure from the U.S.? The U.S., its historical ally and major financial and military contributor? Especially given the doubts over the actual commercial value of Jordan’s uranium deposits, one may rightfully raise the question whether there might be more to the uranium enrichment issue than “national interest” and “sovereignty”. In the face of a history of maneuvering, with both King Hussein and King Abdullah constantly trying to balance the population’s demands with those of its Western supporters, one must indeed wonder why things are so very different when it comes to uranium enrichment. Security policy makers, however, should be far more worried about the

potential and likely motives and actual reasons for setting up a nuclear energy program. One might want to remember that Jordan's nuclear energy program faces serious challenges in terms of safety (e.g. cooling, seismicity), security (e.g. nuclear terrorism in an increasingly unstable region) and environmental consequences (e.g. water pollution through uranium exploration). One might also recall that not only have there been delays in planning and construction, but also constantly rising and, in this combination, unforeseeable costs. Those costs have to be handled by a country that is highly indebted and very dependent on outside support. Those costs equally have to be handled by a country that is one of the world's five poorest in water and thus in need of a comprehensive and equally costly strategy for sustainable water management. At the same time, Jordan does have considerable alternatives. Without having to become the world's greenest developing economy at once, it may nevertheless profit from its ideal preconditions for successful and profitable solar energy projects. Given all of that, and looking at the growing resistance, one feels obliged to wonder just what are the actual motives for pushing the project through at all costs. And those motives are to a great extent based on Iran.

Neither Jordanian intelligence nor King Abdullah himself have remained untouched by Iran's increasingly advanced nuclear program. Tied to the Gulf politically and economically at an unprecedented level, both security circles and the King are strongly influenced by the GCC in general and Saudi Arabia in particular. As has been demonstrated, the GCC member states have quite likely set up their respective nuclear energy programs in the shadows of Iran. At least on the level of the state, the Sunni-Shia-divide, struggles for regional political and religious hegemony, historical rivalries and the sense of not being conventionally well prepared against an Iranian military attack have brought the Sunni Gulf to a perceived abyss. As various cables published on Wikileaks have shown, they have also been highly disappointed with U.S. security policies vis-à-vis Iran. This disappointment has finally grown into an unprecedented sense of distrust, and possibly a sense of having to address a nuclear Iran by more drastic means. When looking into King Abdullah's stance on Iran as well as his ties to the Gulf, it becomes obvious that this feeling is shared. King Abdullah and his security services perceive Iran as the ultimate strategic threat, both to regime stability as well as the country's overall security. Their moving closer to Russia possibly illustrates a pragmatic approach to that very threat and coincides with a general shift of regional alliances. Whilst those motives might not materialize

into an actual nuclear weapons program, the announcement of a nuclear energy program might nevertheless at least have constituted a desperate attempt of signalling that Iran's nuclear ambitions will be addressed adequately. Why, if not for such a reason, should the government and King hold on to the nuclear project despite of all the financial, technical and political factors speaking in favour of RE rather than nuclear energy? Afterall, energy needs and prestige might play a role for many – categories such as geopolitics, regional security and deterrence do so even more, especially for the King and his inner circle. In any case, this complexity of interests, regional politics and uncertainty in the face of existential threats already represents a conflict directly linked to the nuclear energy program. It also bears the potential for further escalation of conflict on an international level.

The second dimension addressed in this analysis was the national one. Itself influenced by regional politics and developments, this national dimension should be taken equally seriously. After thousands of unkept promises and a history of failed mega projects, the Jordanians have become increasingly impatient. Although the majority still does not question the legitimacy of rule of the Hashemite monarchy, the King has increasingly come under criticism himself. As described, this may rightfully be seen as an important development, a development also reflected by the tribes' realignment vis-à-vis the King. If the former main source of regime support is now taking to the streets to fight a program that, as everyone in Jordan knows, is a personal project of the King, this does mean something. The reactions of the state and the way JAEC and the government approach the opponents of the nuclear energy program do their bit to increase public frustration, impatience and outrage. A horrendous lack of transparency, accountability and stakeholder involvement does no longer go unnoticed. The subsequent rampant corruption as well as unresolved safety issues that are ultimately linked to the former complete the picture of a careless regime that would sacrifice the future of a whole country for the benefit of the usual handful of profiteers. Whilst the opponents' protests have thus far remained widely peaceful, previous incidents have shown that the side of the state might not. Instead of taking public concerns seriously, the state reacts by the usual means that have been described before: repression or co-optation. More recent clashes in Ma'an and near Ramtha directly linked to the nuclear energy program brutally illustrate that the potential for a further escalation of national conflict is there. That escalation might take place between the security services and distinct groups within the anti-nuclear

movements. There is, however, also a possibility that the nuclear debate might eventually unify the opposition – the shared objections serving as a unifying force. Depending on the further governmental handling of these developments, a larger-scale national conflict might be in sight. This conflict further comprises the possibility of spilling-over to other suppressed social and political conflicts in the country, e.g. the one smouldering between the majority of tribal East Bankers and those Jordanians with a Palestinian background. Interviews near the big refugee camps of Zatari and Azraq as well as further observations of the local developments lead to fear that if the Syrian conflict remains unsolved for much longer (which it will), the nuclear-program-generated anger might turn to e.g. the Syrian refugees. A lot speaks for a near escalation of national conflict into (further) violence. This escalation is ultimately linked to the nuclear energy program, as the program not only symbolizes the government's and King's general attitude towards the Jordanian population, but also includes unprecedented risks that could materialize into severe accidents. Given the deficits of project management that result out of authoritarianism-related delusions of grandeur and corruption, safety and risk assessment can by nature not be JAEC's and other's main considerations. This time, this does not go unnoticed, and this time, it seems, the different groups of nuclear opposition see the stakes as too high as to content themselves with the usual little.

Both this national as well as the equally serious international dimension of conflicts and potential conflicts linked to the nuclear energy program make it hard to believe in the *Atoms for Peace*-formula. As has been shown in the case of Jordan, one is in fact very far from international, regional or national peace. Ironically, Art. IV NPT obliges the Nuclear Weapon States to contribute to that very spiral of (potential) violence by committing them to assist those states without nuclear weapons in pursuing the peaceful use of nuclear energy. If, as it seems to be the case for distinct countries in the Middle East, this deal might eventually turn out to enable nuclear proliferation in the face of regional threats and conflict scenarios, not only will international diplomacy have failed miserably. The NPT itself may experience another blow and lose a lot of its credibility, if not all. In the end, this might turn out to be the most severe consequence of nuclear energy programs in the Middle East.

## Bibliography of Sources and Literature

- Al-Adwan, Sakhr* (2014): Jordanian king in Moscow to discuss bilateral ties. Al Akhbar English, April 10, 2014. Last accessed June 28, 2014, <http://english.al-akhbar.com/node/19371>.
- Al-Bakhit, Yazan* (2013): Jordan's Nuclear Energy Program. Technical Meeting on the Country Nuclear Power Profiles (CNPP). Jordan Atomic Energy Commission, <http://www.iaea.org/NuclearPower/Downloadable/Meetings/2013/2013-03-18-03-21-TM-NPE/12.albakhit.pdf>.
- Al Jazeera* (2011): Jordan protests turn violent. Al Jazeera Middle East, February 18, 2011. Last accessed March 2, 2014, <http://www.aljazeera.com/news/middleeast/2011/02/201121821116689870.html>.
- Al Saud, Turki al Faisal bin Abdul Aziz* (2013): Saudi Arabia's Foreign Policy, in: Middle East Policy, Vol. XX, No. 4, Winter 2013.
- Al-Zoubi, M.* (2010): Renewable Energy Potential and Characteristics in Jordan, in: Jordan Journal of Mechanical and Industrial Engineering, Vol. 4, No. 1. Yarmouk University: January 1, 2010, 45-48.
- Ammonnews* (2014): Jordan's officials worry ISIS may target it next, after Iraq, June 29, 2014. Last accessed June 29, 2014, <http://en.ammonnews.net/article.aspx?articleno=25841>.
- Asculai, Ephraim* (2012): Nuclear Power in the Middle East: Risks and Opportunities for Regional Security, Nonproliferation Review, Volume 19, No. 3, November 2012.
- Avni, Benni* (2014): Is Jordan at risk as neighbors Syria and Iraq burn? Newsweek, June 30, 2014. Last accessed June 30, 2014, <http://www.newsweek.com/jordan-risk-neighbors-syria-and-iraq-burn-256805>.
- Bank, André/Valbjørn, Morten* (2012): The New Arab Cold War: rediscovering the Arab dimension of Middle East regional politics, in: Review of International Studies, Volume 38, Issue 1, January 2012, p. 3-24.
- Bank, André; Valbjørn, Morten* (2010): Bringing the Arab Regional Level Back in... - Jordan in the New Arab Cold War, in: Middle East Critique, Vol. 19, No. 3, p. 303-319.
- Banks, John et al.* (Ed.) (2011): Models for Aspirant Civil Nuclear Energy Nations in the Middle East. The Brookings Energy Security Initiative: Policy Brief 11-01.
- Banks, John/Massy, Kevin/Ebinger, Charles* (Ed.) (2012): Human Resource Development in New Nuclear Energy States: Case Studies from the Middle East. The Brookings Energy Security Initiative: Policy Brief 12-02.
- Barari, Hassan A.* (2013): The Limits of Political Reform in Jordan. The Role of External Actors. Friedrich-Ebert-Stiftung Foreign Policy Analysis, December 2013.

- Barnes-Dacey, Julien* (2012): Jordan – no longer boring? European Council on Foreign Relations, last accessed on March 26, 2014, [http://ecfr.eu/content/entry/commentary\\_jordan\\_no\\_longer\\_boring](http://ecfr.eu/content/entry/commentary_jordan_no_longer_boring).
- Blair, David* (2013): The real reason Saudi Arabia and America have fallen out: the US is talking to Iran. *The Telegraph*: 24. Oktober 2013. Last accessed on March 26, 2014, <http://blogs.telegraph.co.uk/news/davidblair/100242894/the-real-reason-saudi-arabia-and-america-have-fallen-out-the-us-is-talking-to-iran/>.
- Beck, Martin/Hüser, Simone* (2012): Political Change in the Middle East: An Attempt to Analyze the “Arab Spring”, GIGA Working Papers, No. 203, August 2012.
- Bustani, Hisham* (2011): The Alternative Opposition in Jordan and the Failure to Understand the Lessons of Tunisian and Egyptian Revolutions. *Jadaliyya*, last accessed on March 26, 2014, <http://www.jadaliyya.com/pages/index/959/the-alternative-opposition-in-jordan-and-the-failu>.
- Center for Nonproliferation Studies* (2012): Jordan. Inventory of International Nonproliferation Organizations and Regimes, last updated May 25, 2012, <http://cns.miis.edu/inventory/pdfs/jordan.pdf>.
- Eisenhower, Dwight D.* (1953): Atoms for Peace. Address before the United Nations Assembly on Peaceful Uses of Nuclear Energy, New York, December 8<sup>th</sup>, 1953. <http://web.archive.org/web/20070524054513/http://www.eisenhower.archives.gov/atoms.htm>.
- Ghazal, Mohammad* (2014a): Nuclear commission preparing for two agreements with Russian reactor vendor. *Jordan Times*, March 10, 2014. Last accessed March 10, 2014, <http://jordantimes.com/nuclear-commission-preparing-for-two-agreements-with-russian-reactor-vendor>.
- Ghazal, Mohammad* (2014b): Study shows uranium resources encouraging. *Jordan Times*, May 21, 2014. Last accessed May 25, 2014, <http://jordantimes.com/study-shows-uranium-resources-encouraging>.
- Glaser, Alexander* (2005): About the Enrichment Limit for Research Reactor Conversion: Why 20%? The 27th International Meeting on Reduced Enrichment for Research and Test Reactors (RERTR), November 6–10, 2005, Boston, Massachusetts.
- Goldberg, Jeffrey* (2013): The Modern King in the Arab Spring. *The Atlantic*: 18. März 2013, last accessed on March 13, 2014, <http://www.theatlantic.com/magazine/archive/2013/04/monarch-in-the-middle/309270/>.
- Green, Jim* (2000): Research reactor and nuclear weapons capability. Paper from MAPW Conference 2000, Medical Association for Prevention of War.
- Greenpeace Mediterranean* (2013): Jordan’s Future Energy. Greenpeace Report Jordan, [http://www.greenpeace.org/arabic/PageFiles/481146/Jordan\\_Report2013.pdf](http://www.greenpeace.org/arabic/PageFiles/481146/Jordan_Report2013.pdf).
- Gulf Cooperation Council Secretariat General* (2009): The GCC: Process and Achievement, 4<sup>th</sup> edition.



- Hashmi, Sohail H.* (2004): *Islamic Ethics and Weapons of Mass Destruction: An Argument for Nonproliferation*, in: Hashmi, Sohail H. / Lee, Steven P. (Eds.) (2004): *Ethics and Weapons of Mass Destruction. Religious and Secular Perspectives*. Cambridge: Cambridge University Press.
- Hamdan, Sara* (2011): *Gulf Council reaches out to Morocco and Jordan*. The New York Times, May 25, 2011. Last accessed June 30, 2014, [http://www.nytimes.com/2011/05/26/world/middleeast/26iht-M26-GCC.html?pagewanted=all&\\_r=0](http://www.nytimes.com/2011/05/26/world/middleeast/26iht-M26-GCC.html?pagewanted=all&_r=0).
- Hamid, Shadi/Freer, Courtney* (2011): *How stable is Jordan? King Abdullah's half-hearted reforms & the challenge of the Arab Spring*. Brookings Doha Center Policy Briefing, November 2011.
- Henderson, Simon/Heinonen, Olli* (2013): *Nuclear Iran. A Glossary of Terms*. Policy Focus 121, May 2013 Update. The Washington Institute for Near East Policy. In copublication with Harvard Kennedy School – Belfer School for Science and International Affairs.
- Houk, Andrew* (2010): *Nuclear Energy in the Middle East: The Jordan Factor*. Stimson: 25 Years of Pragmatic Solutions for Global Security, July 15, 2010. Last accessed April 15, 2014, <http://www.stimson.org/spotlight/nuclear-energy-in-the-middle-east-the-jordan-factor/>.
- Hrayshat, Eyad S.* (2007): *Analysis of Renewable Energy Situation in Jordan*, in: *Energy Sources, Part B: Economics, Planning, and Policy*, 3:1, 89-102.
- IAEA* (2007): *Milestones in the Development of a National Infrastructure for Nuclear Power*. IAEA Nuclear Energy Series, No. NG-G-3.1, Vienna: 2007.
- IAEA* (2009): *Status and Trends of Nuclear Technologies*. Report of the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO). IAEA-TECDOC-1622, September 2009.
- IAEA* (2011): *Workforce Planning for New Nuclear Power Programmes*. IAEA Nuclear Energy Series, No. NG-T-3.10, Vienna: 2011.
- IAEA/UDEPO* (2014): *Uranium Deposits in Jordan*. Last accessed June 24, 2014, <https://infcis.iaea.org/UDEPO/UDEPOMain.asp?Region=The%20World&Country=Jordan&Type=All&Status=All&Order=1&DepositID=&DepositName=&RPage=1&Page=1&RightP=CountryReport>.
- IISS* (2008): *Nuclear Programmes in the Middle East. In the shadow of Iran*, London: The International Institute for Strategic Studies.
- International Crisis Group* (2003a): *Red Alert in Jordan: Recurrent Unrest in Maan*. ICG Middle East Briefing, Amman/Brussels, 19 February 2003.
- International Crisis Group* (2003b): *The Challenge of Political Reform: Jordanian Democratisation and Regional Instability*. ICG Middle East Briefing, Amman/Brussels, 8 October 2003.
- International Crisis Group* (2012): *Popular Protest in North Africa and the Middle East (IX): Dallying with Reform in a Divided Jordan*. Middle East Report N°118 – 12 March 2012.

- International Energy Agency* (2014): National Energy Efficiency Strategy. May 12, 2014. Last accessed May 14, 2014, <http://www.iea.org/policiesandmeasures/pams/jordan/name-24769-en.php>.
- International Nuclear Safety Group* (2006): Stakeholder Involvement in Nuclear Issues. Vienna: IAEA.
- Jarrah, Sameer* (2009): Civil Society and Public Freedom in Jordan: The Path of Democratic Reform. The Saban Center for Middle East Policy at the Brookings Institution: Working Paper Number 3, July 2009.
- Jordan Atomic Energy Commission; WorleyParsons Resources and Energy* (2011): White Paper on Nuclear Energy in Jordan. “Final Report”.
- JRTV* (2013): Speech from the throne by his Majesty King Abdullah II. Opening the 1<sup>st</sup> Ordinary Session of the 17<sup>th</sup> Parliament. Last accessed on March 10, 2014, <http://www.youtube.com/watch?v=PH9k6PZMSIQ>.
- Kandeel, Amal A.* (2013): Regional Upheaval: The Stakes for the GCC, in: Middle East Policy, Vol. XX, No. 4, Winter 2013, 59-67.
- Kane, Chen* (2013): Are Jordan’s nuclear ambitions a mirage?. Bulletin of the Atomic Scientists, May 12, 2013. Last accessed May 25, 2013, <http://thebulletin.org/are-jordans-nuclear-ambitions-mirage>.
- Karasik, Theodore* (2014): Moscow to play negotiator, Ryadh holds the keys. Al Arabya News, June 22, 2014. Last accessed June 22, 2014, <http://english.alarabiya.net/en/views/news/middle-east/2014/06/22/Moscow-seeks-to-play-negotiator-Riyadh-holds-the-keys.html>.
- Kerr, Paul K.* (2012): Iran’s Nuclear Program: Status. Congressional Research Service 7-5700, September 26th, 2012.
- Koch, Christian* (2010): The GCC as a Regional Security Organization, KAS International Reports 11/2010.
- Kruse, Jan et al.* (2012): Qualitative Interviewforschung in und mit fremden Sprachen. Eine Einführung in Theorie und Praxis, Weinheim und Basel: BELTZ JUVENTA.
- Lantis, Jeffrey S.* (2014): Economic Competition and Nuclear Cooperation. The Nonproliferation Review, 21:1, 21-41.
- Lippman, Thomas W./Vatanka, Alex/Mattair, Thomas R.* (2011): Symposium: A Reawakened Rivalry: The GCC v. Iran, in: Middle East Policy, VI. XVIII, No. 4, Winter 2011.
- Luck, Taylor* (2012a): Jordan’s uranium potential remains promising. Jordan Times, February 19, 2012. Last accessed April 16, 2014, <http://jordantimes.com/jordans-uranium-potential-remains-promising>.
- Luck, Taylor* (2012b): French firm ups uranium projections. Jordan Times, June 06, 2012. Last accessed June 24, 2014, <http://jordantimes.com/french-firm-ups-uranium-projections>.
- Luck, Taylor/Omari, Raed* (2012): House panel accuses nuclear commission of “misleading” public. Jordan Times, May 26, 2012. Last accessed April 15, 2014, <http://jordantimes.com/House+panel+accuses+nuclear+commission+of+‘misleading’+public-48371>.

- Mako, William P.* (2012): Privatization: Lessons from Jordan, MENA Knowledge and Learning Quick Notes Series, World Bank: Number 68, July 2012.
- Malik, Nikita* (2014): Does Jordan need nuclear energy? Open Democracy, January 30, 2014. Last accessed June 25, 2014, <http://www.opendemocracy.net/arab-awakening/nikita-malik/does-jordan-need-nuclear-energy>.
- Malik, Nikita/Shami, Abdullah* (2014): Jordan: The Jewel in the ISIS Crown. Carnegie Endowment, June 24, 2014. Last accessed June 25, 2014, <http://carnegieendowment.org/syriaincrisis/?fa=55995>.
- McRobie, Heather* (2010): Jordan's uranium and Israel's fears. Open Democracy, August 23, 2010. Last accessed April 15, 2014, <http://www.opendemocracy.net/heather-mcrobie/jordan's-uranium-and-israel's-fears>.
- Ministry of Energy and Natural Resources* (2007): Updated Master Strategy of Energy Sector in Jordan for the period (2007-2020). First Part, December 2007, <http://www.memr.gov.jo/Portals/0/energystrategy.pdf>.
- Mousavian, Hossein* (2012): Iran, the US and Weapons of Mass Destruction. Survival: Global Politics and Strategy, 54:5, 183-202.
- Nuclear Threat Initiative* (2007a): Jordan Reports Sufficient Uranium for Nuclear Effort. Global Security Newswire. Last accessed on April 15, 2014, <http://www.nti.org/gsn/article/jordan-reports-sufficient-uranium-for-nuclear-effort/>.
- Nuclear Threat Initiative* (2007b): Jordanian Parliament Approves Nuclear Power Plans. Global Security Newswire. Last accessed on April 15, 2014, <http://www.nti.org/gsn/article/jordanian-parliament-approves-nuclear-power-plans/>.
- Nuclear Threat Initiative* (2012): Israel is not meddling with Jordanian atomic energy effort, official says. Global Security Newswire, September 14, 2012. Last accessed April 15, 2014, <http://www.nti.org/gsn/article/israel/>.
- Nuclear Threat Initiative* (2013): Jordan. Country Profiles. Last accessed on April 15, 2014, <http://www.nti.org/country-profiles/jordan/>.
- Peel, Michael* (2013): Jordan close to commissioning two nuclear reactors, declines to sign accord with U.S. The Washington Post, March 6, 2013. Last accessed March 8, 2014, [http://www.washingtonpost.com/world/middle\\_east/jordan-close-to-commissioning-two-nuclear-reactors-declines-to-sign-accord-with-us/2013/03/06/82b99cf6-868e-11e2-98a3-b3db6b9ac586\\_story.html](http://www.washingtonpost.com/world/middle_east/jordan-close-to-commissioning-two-nuclear-reactors-declines-to-sign-accord-with-us/2013/03/06/82b99cf6-868e-11e2-98a3-b3db6b9ac586_story.html).
- Petra News Agency* (2014): King, US delegation discuss ties, regional developments, June 29, 2014. Last accessed June 29, 2014, [http://www.petra.gov.jo/Public\\_News/Nws\\_NewsDetails.aspx?lang=2&site\\_id=1&NewsID=156715&Type=P](http://www.petra.gov.jo/Public_News/Nws_NewsDetails.aspx?lang=2&site_id=1&NewsID=156715&Type=P).
- Richter, Thomas* (2011): 30 Jahre Golfkooperationsrat: Schützt Mitgliedschaft vor Revolution? GIGA Focus Nahost, 2011: Nr. 5.

- Ryan, Curtis R.* (1998): Peace, Bread and Riots: Jordan and the International Monetary Fund, in: Middle East Policy, Vol. VI, No.2, October 1998, p. 54-65.
- Ryan, Curtis R.* (2008): Islamist Political Activism in Jordan: Moderation, Militancy, and Democracy. Gloria Center. Last accessed on March 19, 2014, <http://www.gloria-center.org/2008/06/ryan-2008-06-01/>.
- Ryan, Curtis R.* (2011): Political Opposition and Reform Coalitions in Jordan, in: British Journal of Middle Eastern Studies, 38:3, 367-390.
- Scientific American* (2009): How long will the world's uranium supplies last? January 26, 2009. Last accessed June 24, 2014, <http://www.scientificamerican.com/article/how-long-will-global-uranium-deposits-last/>.
- SESAME* (2014): Synchrotron-Light for Experimental Science and Applications in the Middle East. Last accessed on June 24, 2014, <http://www.sesame.org.jo/sesame/index.php>.
- Smith, Chris Llewellyn* (2012): Synchrotron Light and the Middle East: Brining the Region's Scientific Communities Together through SESAME. Science & Diplomacy, Vol. 1, No. 4: 1-8.
- Spassky, Nikolay* (2013): Nuclear Energy as a Tool to Promote Peace and Security in the Middle East, in: Security Index: A Russian Journal on International Security, 19:2, p. 5-8.
- Su, Alice* (2013): Jordan faces no-nukes campaign. Al-Monitor, November 12, 2013. Last accessed April 15, 2014, <http://www.al-monitor.com/pulse/originals/2013/11/jordan-nuclear-rosatom-environment-energy.html#>.
- The Global Intelligence Files, Email-ID 1660009*: Saudi reservations over Iran – „cut off the head of the snake“, released on October 18, 2012. Last accessed June 30, 2014, [https://wikileaks.org/gifiles/docs/16/1660009\\_saudi-reservations-over-iran-cut-off-the-head-of-the-snake-.html](https://wikileaks.org/gifiles/docs/16/1660009_saudi-reservations-over-iran-cut-off-the-head-of-the-snake-.html).
- Toukan, Khaled* (2012): Moving Safely and Securely Towards Nuclear Power. Presentation at the World Nuclear University, August 13, 2012, [http://www.jaif.or.jp/ja/wnu\\_si\\_intro/document/2012/6.1-1%20khaled%20Toukan\\_Moving%20Safely%20and%20Securely%20Towards%20Nuclear%20Power.pdf](http://www.jaif.or.jp/ja/wnu_si_intro/document/2012/6.1-1%20khaled%20Toukan_Moving%20Safely%20and%20Securely%20Towards%20Nuclear%20Power.pdf).
- United Nations Water Report* (2012): Managing Water under Uncertainty and Risk. The United Nations World Water Development Report 4, Volume 1. Washington: UNESCO 2012.
- Whitman, Elizabeth* (2013): Refugee influx worsens Jordan's water woes. Al Jazeera, May 30, 2013. Last accessed June 18, 2014, <http://www.aljazeera.com/indepth/features/2013/05/20135268026616381.html>.
- Wikileaks Cable 06AMMAN645\_a*: Senator Kerry's meeting with Jordan's intelligence chief. Last accessed April 14, 2014, [https://wikileaks.org/plusd/cables/06AMMAN645\\_a.html](https://wikileaks.org/plusd/cables/06AMMAN645_a.html).
- Wikileaks Cable 06AMMAN1735\_a*: Some Jordanian views on Iran's nuclear ambitions. Last accessed April 14, 2014, [https://wikileaks.org/plusd/cables/06AMMAN1735\\_a.html](https://wikileaks.org/plusd/cables/06AMMAN1735_a.html).

- Wikileaks Cable 06AMMAN4175\_a*: A/S Welch meeting with Jordanian Intelligence chief. Last accessed April 14, 2014,  
[https://search.wikileaks.org/?q=06AMMAN4175\\_a&sort=0](https://search.wikileaks.org/?q=06AMMAN4175_a&sort=0).
- Wikileaks Cable 06AMMAN8150\_a*: Iran and Shi 'ism – Jordanian views. Last accessed April 14, 2014,  
<http://cables.mrkva.eu/cable.php?id=83720>.
- Wikileaks Cable 07AMMAN701\_a*: Further response from GOJ on UNSCRE 1727, Iran and Russia. Last accessed April 14,  
[https://wikileaks.org/plusd/cables/07AMMAN701\\_a.html](https://wikileaks.org/plusd/cables/07AMMAN701_a.html).
- Wikileaks Cable 08AMMAN3172\_a*: VCI A/S Desutter discusses WMD, Iran, and North Korea with Jordanian officials. Last accessed April 14, 2014,  
[https://wikileaks.org/plusd/cables/08AMMAN3172\\_a.html](https://wikileaks.org/plusd/cables/08AMMAN3172_a.html).
- Wikileaks Cable 08AMMAN3372\_a*: King Abdullah outlines a regime in transition with Codel Dorgan. Last accessed April 14, 2014,  
[https://wikileaks.org/plusd/cables/08AMMAN3372\\_a.html](https://wikileaks.org/plusd/cables/08AMMAN3372_a.html).
- Wikileaks Cable 08RIYADH649*: Saudi King Abdullah and Senior Princes on Saudi Policy Toward Iraq. Last accessed on May 26, 2014,  
<http://www.wikileaks.ch/cable/2008/04/08RIYADH649.html>.
- Wikileaks Cable 09AMMAN813\_a*: Wary of U.S.-Iran engagement, Jordan offers words of caution. Last accessed on May 26, 2014,  
[https://wikileaks.org/plusd/cables/09AMMAN813\\_a.html](https://wikileaks.org/plusd/cables/09AMMAN813_a.html).
- Wikileaks Cable 09AMMAN1006\_a*: Codel McConnel's April 9 meeting with Jordan's King. Last accessed on April 14, 2014,  
[https://wikileaks.org/plusd/cables/09AMMAN1006\\_a.html](https://wikileaks.org/plusd/cables/09AMMAN1006_a.html).
- Wikileaks Cable 09AMMAN2114\_a*: Jordan: Expanding the chorus on Iran, IAEA Middle East issues. Last accessed on April 14, 2014,  
[https://wikileaks.org/plusd/cables/09AMMAN2114\\_a.html](https://wikileaks.org/plusd/cables/09AMMAN2114_a.html).
- Wikileaks Cable 09AMMAN2604\_a*: Jordan: Demarche delivered on Iranian nuclear program. Last accessed on April 14, 2014,  
[https://wikileaks.org/plusd/cables/09AMMAN2604\\_a.html](https://wikileaks.org/plusd/cables/09AMMAN2604_a.html).
- Wikileaks Cable 09RIYADH181\_a*: Saudi Exchange with Russian Ambassador on Iran's Nuclear Plans. Last accessed on April 14, 2014,  
[https://wikileaks.org/plusd/cables/09RIYADH181\\_a.html](https://wikileaks.org/plusd/cables/09RIYADH181_a.html).
- Wikileaks Cable 09MANAMA642\_a*: General Petraeus with King Hamad: Iraq, Afghanistan, Iran, NATO AWACS, Energy. Last accessed on April 14, 2014,  
[https://wikileaks.org/plusd/cables/09MANAMA642\\_a.html](https://wikileaks.org/plusd/cables/09MANAMA642_a.html).
- Wikileaks Cable 10AMMAN310\_a*: Jordan: GOJ will support Iran sanctions, but general public may not. Last accessed on April 14, 2014,  
[http://www.wikileaks.org/plusd/cables/10AMMAN310\\_a.html](http://www.wikileaks.org/plusd/cables/10AMMAN310_a.html).
- Winckler, Onn* (2013): The "Arab Spring": Socioeconomic Aspects, in: Middle East Policy, Vol. XX, No. 4, Winter 2013, 68-87.
- World Nuclear Association* (2012): Supply of Uranium. Last accessed June 24, 2014,  
<http://www.world-nuclear.org/info/Nuclear-Fuel-Cycle/Uranium-Resources/Supply-of-Uranium/>.

*World Nuclear Association* (2014): Nuclear Power in Jordan. Last accessed April 14, 2014,  
<http://www.world-nuclear.org/info/Country-Profiles/Countries-G-N/Jordan/>.

*World Nuclear News* (2013): Jordan selects its nuclear technology. Last accessed on May 15, 2014,  
<http://www.world-nuclear-news.org/NN-Jordan-selects-its-nuclear-technology-2910134.html>.

*Ziegler, Albert/Allelein, Hans-Josef* (Hrsg.) (2013): Reaktortechnik. Physikalisch-technische Grundlagen. 2., neu bearbeitete Auflage 2013. Berlin / Heidelberg: Springer Vieweg Verlag.

## List of Interviewees

### **Bahjat Aulimat**

Jordan Atomic Energy Commission (JAEC)

Commercial and Contracts Engineer

Interview: Amman, 4<sup>th</sup> of May, 2014

### **Dr. André Bank**

GIGA - Institute of Middle East Studies (IMES)

Country expert on Jordan and Syria

Directs the research project *Middle East Monarchies: A Configurational Comparison of Breakdown and Survival since 1945*

Interview: Hamburg, 6<sup>th</sup> of March, 2014

### **Dr. Ayoub Abu-Dayyeh**

Society of Energy Conservation & Sustainable Environment – President

Active and decisive member of *Nuclear Free Jordan*

Background in civil and structural engineering

Interviews: Amman, 26<sup>th</sup> and 28<sup>th</sup> of April, 2014

### **Dr. Basel Burgan**

Jordanian Friends of the Environment – President

Well - known environmental activist in Jordan and one of the central figures within the group of opponents of the nuclear energy project

Interview: Amman, 27<sup>th</sup> of April, 2014

### **Dr. Kamal Khdair**

Consultant in water management, environment, energy and sustainable development

Between 2008 and 2011: Director of the Jordan Atomic Energy Commission (JAEC)

Interview: Amman, 28<sup>th</sup> of April, 2014

### **Hazem Y. Al Hreisha**

The Royal Society for the Conservation of Nature

Azraq Wetland Reserve Manager

Interview: Azraq, 3<sup>rd</sup> of May, 2014

### **Mohammad Al Shushan**

Community leader of the tribe Bani Sakhr in Azraq

Interview: Azraq, 3<sup>rd</sup> of May, 2014

### **Omar Mohammad Al Shushan**

Spokesperson of the Committee against Nuclear Energy in Jordan

(i.a. on a tribal assembly on the nuclear issue near Amman, which was composed of around 30 Committee members including a Jordanian MP and tribal leaders)

Near Amman, 3<sup>rd</sup> of May, 2014

**Prof. Dr. Ibrahim Badran**

Associate Professor at the Department of Electrical Engineering at the Philadelphia University, Jordan

Member of the Jordan Environment Society

Former functions include: Advisor to the Jordanian PM, Member of IAEA's Board of Governors in Vienna, General Secretary of the Jordanian Ministry of Energy and Natural Resources, Minister of Education

Interview: Philadelphia University (near Jarash), 28<sup>th</sup> of April, 2014

**Prof. Dr. Saed Dababneh**

Al-Balqa Applied University

Associate Professor in Nuclear Physics

Former Vice Chairman of the Jordan Nuclear Regulatory Commission who resigned in 2012 protesting the “unprofessional management of the program and the compromised safety issues” as well as the “increased influence of JAEC over JNRC“

Interview: Amman, 3<sup>rd</sup> of May, 2014

**Prof. Dr. Salaheddin Malkawi**

Jordan University of Science & Technology

Head of the Nuclear Engineering Department, in charge of the Human Resource Development for Jordan's nuclear energy program

Interview: Jordan University of Science & Technology, Irbid, 29<sup>th</sup> of April, 2014

**Asam Ahmedi (and others)**

Leading member(s) of a group of activists in ar-Ramtha opposing the nearby Research and Training Reactor at the Jordan University of Science and Technology

Interview: ar-Ramtha, 30<sup>th</sup> of April, 2014

**Yazan Al-Bakhit**

Jordan Atomic Energy Commission (JAEC)

Economist

Interview: Amman, 4<sup>th</sup> of May, 2014

**Yazan Khrais**

Project Manager in the field of energy

Interview: Amman, 4<sup>th</sup> of May, 2014



## Personal Statement

Name: Punken  
Vorname: Anna-Lena  
Anschrift: 22767 Hamburg  
Geburtsdatum: 21. April 1988  
E-Mail (privat): Anna-Lena.Punken@gmx.net



---

### Berufserfahrung:

- 02/2014 – 07/2014 **Carl Friedrich von Weizsäcker – Zentrum für Naturwissenschaften und Friedensforschung, Hamburg**  
**Forschungsaufenthalt und Recherche für Masterarbeit**, inklusive Forschungsaufenthalt in Jordanien zum Führen von Interviews
- 03/2013 – 01/2014 **IEA Data Processing and Research Center, Hamburg**  
**Studentische Assistenz**, Abteilung National Field Operations  
Assistenz im Projektmanagement von Bildungs- und Schulleistungsstudien (z.B. PISA, NEPS)
- 11/2012 – 01/2012 **Präsidialverwaltung der Universität Hamburg, Hamburg**  
**Studentische Angestellte**, Abteilung 6 - Recht, Personal und Organisation
- 09/2012 - 04/2013 **GIGA / German Institute of Global and Area Studies, Hamburg**  
**Wissenschaftliche Hilfskraft** im DFG-Projekt „A Dangerous Liaison? Ethnicity, Natural Resources and Civil Conflict Onset“
- 10/2011 - 02/2012 **Lehrstuhl für Soziologie / Prof. Dr. Maurizio Bach der Universität Passau, Passau**  
**Studentische Hilfskraft / Tutorin** Vorlesung „Einführung in die Gesellschaftstheorien“

---

### Studium:

- 10/2013 - 09/2014 **Institut für Friedensforschung und Sicherheitspolitik (IFSH) , Universität Hamburg**  
**Studiengang:** Peace and Security Studies  
**Schwerpunkte:** Naturwissenschaften und Friedensforschung / Politische Ökonomie von Konflikten, Kriegen, Terrorismus und Rüstung sowie Energie- und Geopolitik.  
**Masterarbeit zum Thema:** „Atoms for Conflict? Security Policy Implications of Conflicts linked to the Nuclear Energy Program of the Hashemite Kingdom of Jordan“  
**Abschluss:** Master of Arts (M.A.)

- 10/2012 - 09/2014 **Universität Hamburg**  
**Studiengang:** Politikwissenschaft  
**Schwerpunkte:** Internationale Politik,  
Kriegsursachenforschung und Demokratisierungstheorien mit  
regionalem Fokus auf dem Nahen und Mittleren Osten  
**Abschluss:** angestrebt, Master of Arts (M.A.)
- 10/2009 - 05/2012 **Universität Passau**  
**Studiengänge:** Governance and Public Policy – Staats-  
wissenschaften  
Rechtswissenschaften  
**Abschluss:** Bachelor of Arts (B.A.)
- 10/2007 - 06/2009 **Universität Bremen (Hanse Law School)**  
**Studiengang:** Comparative and European Law
- 

#### **Praktika:**

- 07/2012 - 08/2012 **IMES / Institute of Middle East Studies am GIGA /  
German Institute of Global and Area Studies**, Hamburg, mit  
regionalem Fokus auf dem Maghreb, Jordanien, Syrien und  
den Golfstaaten
- 09/2011 - 10/2011 **Auslandsbüro der Friedrich-Ebert-Stiftung**, mit regionalem  
Fokus auf Jordanien und Irak, Amman, Jordanien
- 08/2010 - 10/2010 **IPPNW / International Physicians for the Prevention of  
Nuclear War**, mit Schwerpunkt auf den Programmen  
„Frieden“ und “Atomwaffen”, Berlin
- 03/2010 - 04/2010 **Adelheid Rupp, Mitglied des Bayrischen Landtags** und des  
Ausschusses für Bundes- und Europaangelegenheiten,  
München
- 

#### **Sprachkenntnisse:**

Deutsch, Englisch, Französisch, Niederländisch, Spanisch,  
Arabisch (Grundkenntnisse)

---

#### **Engagement:**

Mitgliedschaft bei der DAVO / Deutsche Arbeitsgemeinschaft  
Vorderer Orient für gegenwartsbezogene Forschung und  
Dokumentation.

seit 06/2013: Stellv. Vorsitzende im Distrikt Altona-Altstadt  
(SPD – Hamburg: PR, Kommunikation, Organisation)

## **Honor Statement**

I pledge that this Master's Thesis, entitled "Atoms for Conflict? Security Policy Implications of Conflicts linked to the Nuclear Energy Program of the Hashemite Kingdom of Jordan" has not been submitted for academic credit in any other capacity and that this Master's Thesis has not yet been published.

I further pledge that I wrote this Master's Thesis myself, without help from others. I did not use any sources or aids other than those listed. I appropriately identified and acknowledged all words and ideas taken from other works.

Hamburg, 10<sup>th</sup> of July, 2014

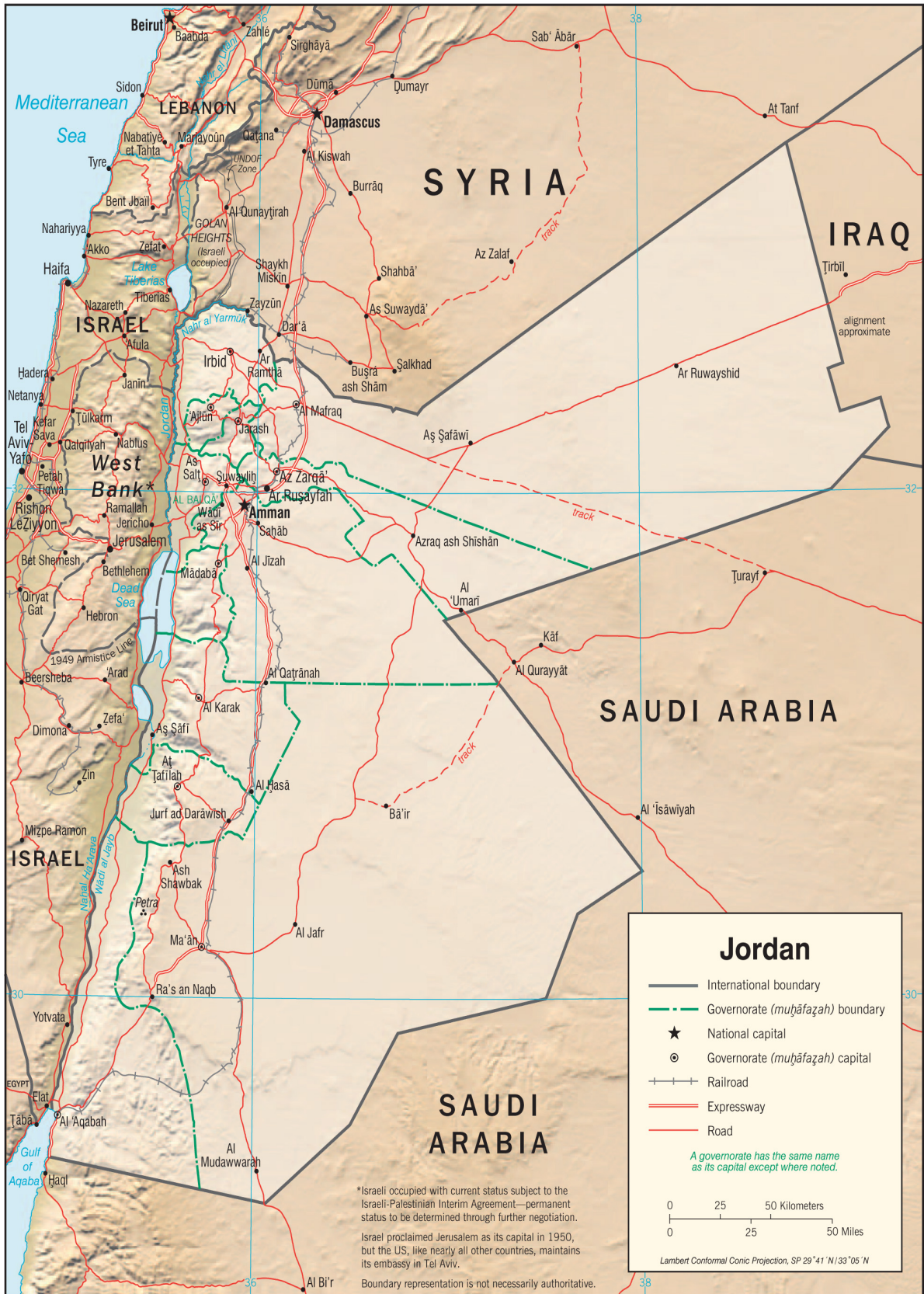


---

Anna-Lena Punken

## Appendix

Figure 1: Map of Jordan (CIA World Fact Book)



Base 803051AI (C00697) 4-04

**Figure 2: Ranges of Iranian ballistic missiles partially explaining concerns of regional Sunni states over the Shia rival's nuclear program (IISS 2008: 8)**

