

## **Green Modernization - The political, social and societal setting of Morocco's solar energy policies**

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*LINKS (Linking climate change mitigation, energy security and regional development in climate and energy model regions in Austria) project description:*

**LINKS** has examined the economic feasibility of simultaneously pursuing climate-mitigation, energy autarky and regional development with investments in renewable energy in Austria's model regions. It has explored the social and political commitment, and the drivers of this commitment (e.g., participatory governance), to Austria's goals of climate-change mitigation, energy autarky and regional development and assesses together with Moroccan stakeholders the relevance and transferability of the experiences made with Austria's Climate and energy model regions for RES development in Morocco.



**LINKS project partners involved in this research are:**

oiiip – Austrian Institute for international Affairs

MENARES - MENA Renewables and Sustainability

IIASA – International Institute for Applied System Analysis



## Executive Summary

In 2009, Morocco initiated an ambitious energy transition program. The aim is to increase the country's independence from energy imports until 2030. The plan targets the reduction of the import of fossils and large investments into renewable energies. The goal set is to meet 42% of its power generating capacity needs through renewables by 2020 and 52% by 2030. Morocco's bold and ambitious plans are often highlighted as a model for how to invest into future technologies and bring about clean energy transition. Due to its geography, weather conditions and solar irradiance, Morocco is considered to have huge potentials regarding wind and solar energy production. Morocco's energy transition program includes the construction of a number of large and medium scale solar plants until 2020. Their planning and construction is often managed by MASEN (Moroccan Agency for Sustainable Energy), a public limited company. Recently, Noor 1, the first of several large scale solar plants was completed. Noor 1 is situated in Ouarzazate in the East of the country. Currently Noor Tata is in the planning phase. Similar with Morocco, energy transition has been also a hot topic in Austria. However, different from Morocco, planning, decision-making and governance structures have rather reflected the country's federal system.

Austria's energy transition strategy is a decentralized one. As much as this often entails strong involvement and ownership on societal level, as much its success is dependent on a complex set of diverse political entrepreneurs on different political and administrative levels (national-federal-district and local). LINKS project aims at learning from both; Austrian and Moroccan experiences. In its last phase, the project deals with the question whether decentralized small-scale energy production models as implemented in some of the Austrian energy model regions are transferrable to Morocco. This assessment takes place against the background of the Moroccan state's ambitions to decentralize and strengthen the regional and provincial levels. Accordingly, this report elaborates the structural, political, social and societal setting in which Morocco's energy policy is embedded. The report tries to define the major actors, analyse the decision-making structures, and review the socio-technical imaginaries which have shaped national energy policies. "Socio-technical imaginaries" define mind-sets and frames which do not only guide policies and strategies but also give insights about the expectations connected with technological developments. The report aims at providing a background for the preparation of the stakeholder forum to be held in Tata/Morocco in October 2017. The forum aims at bringing together local and regional stakeholders and to debate at eye level experiences, expectations and ideas for solar energy production in their region.

**Content**

- 1. Introduction..... 7
- 2. Methodology ..... 8
  - 2.1 Theoretical approaches ..... 9
  - 2.2 Interviews ..... 11
- 3. Morocco Governance ..... 11
- 4. Morocco’s Energy Policy ..... 14
- 5. Renewable Energy Production Sides ..... 18
  - 5.1 Solar Power – the NOOR Project ..... 19
  - 5.2 Solar power PV rooftop applications..... 21
- 6. Energy Policies as part of National Identity Production..... 23
- 7. An overview of the Climate Energy Model Regions in Austria..... 25
- 8. Technology transfer, or, how can models travel?..... 28
- 9. Tata – Morocco’s first energy model region? ..... 30
- 10. Preliminary conclusions and considerations ..... 33
- List of Stakeholders ..... 37
- Bibliography..... 38

## 1. Introduction

Morocco is one of the few states in the Maghreb region with only few fossil fuel resources and reserves. More than 90 percent of the country's demand is covered by imports. In 2007 and 2008 the significant rise in the price of fossil fuels, put Morocco's economy under pressure. This was considered to be one of the major triggers for the elaboration of the energy strategy in 2009 and a more balanced mix of the country's energy supplies (Steinbacher 2015, p. 11). The strategy's goal is to meet 42% of Morocco's power generating capacity needs through renewables by 2020 and to increase this share to 52% by 2030. Investments into renewable energy production are seen as an engine for the country's general development. Morocco's economic development plan harmonized with climate friendly energy production has been promoted as Green Growth. King Mohamed VI is considered to be one of the major drivers if not to say the patron of this national plan.

Moroccan energy policies should be reviewed and understood against the background of the country's political and governance structures. Political structures, the administrative system (centralized versus federal) define the actors and decision making processes behind energy policy. Accordingly, we suggest that governance structures do affect preferences for certain modes of energy production over others as well as the spectrum and degree of societal participation.

In a rather destabilized broader region Morocco is considered as an island of stability. Morocco is a constitutional monarchy with an elected parliament. While the elected government (appointed by the king) is the country's executive, the king still holds vast executive and legislative powers. His authority and strong legitimation build on the historical role, which the royal Alaoui dynasty has played, its alleged direct lineage with Prophet Mohammed, but also his political role as head of state, arbiter, and chief of the army. As the father of the nation, standing aloof of daily politics, the king can function as a patron of national interests. Authors as Bank et al. (2014) define the Morocco as a "linchpin monarchy", where the personality of the king and not his family or court stands in the very center of the system. In linchpin monarchies, the monarch rules directly and indirectly through the state institutions. Despite administrative reforms, the Moroccan state can be still defined as a centralized political and administrative system. The country has not yet turned into a federal system.

Building on the theoretical concept of socio-technical imaginaries this report assumes that Moroccan energy policies reflect the country's political and administrative setting. While recent reforms have created new political and administrative units, strategic decisions such as those in the area of energy,

are taken in the capital and not on a regional or local level, also because these administrative units do hardly have the financial means to implement such decisions. Hence, one can say, that energy policies are drafted and operationalized in the state ministries and state agencies in view of the overall development of the Moroccan nation. In some cases decisions on the construction site can conflict with local interests, which are then subjected to larger national interests. From a national perspective, large-scale solar energy production sites are often considered as more effective for the goal of national modernization and development.

Morocco's development strategy of "Green Growth" reflects the socio-technical imaginaries associated with renewable energy production. Accordingly, among broad parts of society, including decision makers, representatives of the state administration as well as civil society investment in renewable energy technology is expected to bring about economic development (industrialization, job creation), stability and security (reduction of energy dependency and guaranteeing supplies). One can hold that Green Growth and the imaginaries connected therewith feed into a common national project oriented towards the future, stimulating optimism and balancing social, regional and other differences and interests.

In the following the report analyses the Moroccan political system, highlights the governance structures, reviews the energy transition against this background and presents the two decentralized Austrian examples of renewable energy production; the models of Güssing and Freistadt. In the last section, the report draws preliminary conclusions on the challenges and advantages for transfer of these models to Morocco. These preliminary conclusions were developed based on analysis of the governance structure, the socio-technical imaginaries driving energy transition and, on the other hand, on the insights gained from the analysis of the Austrian experiences and qualitative expert background talks with local and regional stakeholders in Morocco during the first mission to the Tata province in April 2017.

## **2. Methodology**

Methods applied have been advanced literature review, expert conversations and informal open ended, semi-structured interviews/talks. The first phase of the literature review process included the search and study of documents, articles, reports and other publications dealing with Morocco's history, state formation, governance structure, and energy policy. We applied the process proposed by



Hart (1998, p. 1) who defines the literature review process as: “the use of ideas in the literature to justify the particular approach to the topic, the selection of methods, and the demonstration that this research contributes something new”. First, we set out to find out what is already known, while secondly, we set out to suggest what research is needed (Levy and Ellis 2006, p. 183).

First documents were provided by project partners from IIASA and MENARES. Literature review was then expanded to a set of relevant peer-reviewed journals. Journals were selected according to four categories and searched through different data base search engines. Categories were derived from the thematic focus of our report and defined as; “Morocco -governance structure”; “Morocco – renewable energy”; “theory and concepts”; “Austrian climate regions – Güssing and Freistadt”.

The scanning of relevant literature was facilitated through access to the data base *Scopus*, provided by IIASA. Other data search engines visited were *Sage Journals*, *Taylor and Francis online* and *Elsevier*. We used the most important keywords (Morocco, governance, energy governance, energy policy, Green Growth, PV, CSP, renewable, small-scale, large-scale, inclusion, civil society, centralized and decentralized). Results were cross-checked through google scholar search. This broadened the findings by including peer-reviewed open access journals as *Politics and Governance*. Through Elsevier we screened journals as “Energy Policy”, “Energy Research & Social Science” and “Renewable and Sustainable Energy Review” giving an overview of quantitative studies with a usually more technical focus. *Sage online* helped gain an overview of the conceptual side and of security and energy policies through Journals such as “Security Dialogue”. The most important one for our focus turned out to be Taylor and Francis online and particularly Journals with a focus on the Middle East and specifically the Maghreb region. Those journals usually have a focus on qualitative and ethnographic case-studies. It was this third section which provided most of the information regarding Morocco’s governance structure. This certainly helped understand and analyse the political settlement in place.

## **2.1 Theoretical approaches**

A political settlement can be defined as; “an expression of a common understanding, usually forged between elites, about how power is organized and exercised” (DFID 2010). Alternatively, political settlements are also called “the rules of the game”, as they refer to informal as well as formal institutions and how decision making processes are practiced and performed. Comparing Austria and Morocco, it is important to bear in mind that the political settlements of a constitutional monarchy with

strong executive powers of the king (who is an important player in the field of renewable energies) and a federal republic, which is part of the European Union are rather different.

To take this central difference of Moroccan and Austrian decision-making process into consideration, and embed it in a wider national identity trajectory we also based our analysis of the chosen literature on a socio-technical imaginaries (STI) theory approach. Socio-technical imaginaries are a constructivist theory. Constructivist methodology is in a nutshell:

“A phenomenologically-informed constructivist ontology and an interpretive epistemology informed by hermeneutics combine in support of a subjectivist methodology: that is, a position that argues that “knowers” (researchers and participants) and what is known are both situated in specific historical and cultural contexts, such that objective knowledge – by definition, that obtained from some external vantage point – is not possible” (Yanow 2009: 429).

The hypothesis we drew from the literature review is that the chosen energy models (thus technology) become part of a national identity production, because energy is needed for basically every aspect of modern life and is a central aspect of national security provision (social security as well as defense related issues) (cf. Levy and Ellis 2006, p. 201). To anchor the analysis in a STI approach derives from Jasanoffs (2002, p. 271) emphasis to critically engage apparent value-neutrality of concepts such as “development” and “technology”:

“[...] we have observed four mechanisms that help to denude development of its subjective and meaning-laden elements: the persistent misreading of technology as simply material and inanimate; the uncritical acceptance of models (importantly including economic ones) as adequate representations of complex systems; the failure to recognise routine practices as repositories of power; and the erasing of history as a relevant factor in producing scenarios for the future. All these processes have contributed to the view that, despite a variety of regional shocks and setbacks even in technologically advanced societies, there is a strong global consensus on the basic directions and instruments of development.”

Furthermore, Jasanoff & Kim (2009) engaged in the question of development and regulation of nuclear power in the US and South Korea. In this article, they address the question of science and technology and its relation to political power, which they perceive as undertheorized. Jasanoff and Kim (2009), as well as Felt (2015), are thereby engaged with what constitutes knowledge and what constitutes “experts” as such. Therefore, a STI approach stresses the importance of societal participation, acceptance, and non-scientific knowledge production. Interviews (or focus groups) are important elements of a STI analysis.

The field research therefore focused on decision-making processes as we mainly highlighted the differences in the governance structures. Thus, the interview sample consisted mainly of political representatives. Accordingly, all levels of the political representations are represented: local, regional, central state administration and elected representatives as well as representatives of civil society. To

establish accounts of the opinions towards the construction of renewable energy a so-called “stakeholder forum” is held in a later stage of the study. Regarding the interviews so called expert interviews based on a semi-structured questionnaire were held. In this context politicians and officials are regarded as experts of governance structures, although we do not perceive this occupational group as the only expert group concerning governance issues (cf. Meuser and Nagel 2009, p. 468).

## 2.2 Interviews

A first field trip to Morocco (Agadir and Tata) allowed the project partners to get in contact with officials on the regional, provincial and local (communal) level as well as with representatives of civil society associations operating on the regional as well as the local level. Moreover, contact with representatives of GIZ (the German Development Agency) on the regional as well as the local level in Tata broadened the picture.

Interviews/talks with officials and representatives of civil society organizations were semi-structured. They followed an earlier developed questionnaire. However, in semi-structured in-depth interviews the questionnaire simply provided a guideline. Questions were posed according to the expertise and responsibility of the respective interview partners. Expertise can be divided according to decision-making processes, technical questions, legal provisions, expectations of the population, and environment.

Talks served as a first step to introduce the project, establish trust and interest. Contacts established have been of great value for the stakeholder forum scheduled for mid-October in Tata.

## 3. Morocco Governance

From the 14<sup>th</sup> century on, Alaoui Sultans gained hegemony over most parts of the territory of today's Moroccan state. Although they formally ruled over large parts of the country they had to share powers with local notables and tribal leaders. Particularly, in remote areas, the power of the Sultan was absent in everyday life. It was only the Treaty of Fes signed in 1912 between France and the Sultan of Morocco, which established the modern Moroccan territorial state. Through the so called “pacification” of the country's interior, dominated by tribal structures, the French eliminated decentral, local

power centers and established a centralized modern administrative system. However, different from Tunisia or Algeria in the case of Morocco French intervention removed traditional local traditional power structures (chiefs and strongmen) and entailed the establishment of a modern administrative system, but it did not remove the Alaoui dynasty. One can hold that although French intervention removed the reigning Sultan from the throne in the long run, French modernization policies ensured the survival of the monarchy and helped expand the Moroccan state into its territorial margins. However, this was at the price of the Morocco's dependence. Nevertheless, French intervention altered the traditional "political ecosystem" which had been characterized by complex interactions between urban and seminomadic rural groups. The sultanate was built on the "co-optation of the military potential of the tribal periphery or defusing it by projecting the sultan's symbolic power through granting titles, conferring gifts, and mediating conflicts" (Wyrzten 2011, p. 228-229).

The modern Moroccan state can be defined as a highly centralized administrative and political system. Modelled on the French state administration, the state consists of 12 regions (*wilaya*), which are subdivided into prefectures and provinces, which in turn consist of arrondissements (in cities), circles, caidats and municipalities in rural areas. Although modern state building altered the understanding of statehood, including the relations between state and society at large, some of the historically grown structures have continued to exist informally and shape formal political institutions, processes and habits, in short political reality.

Today, Morocco has been defined as a so-called linchpin monarchy. Similar to Jordan or the former monarchies of Egypt (1952) and Iraq (1958), in Morocco, the "the monarch — with the support of the respective royal court (*al-dīwān al-malikī*) — maintains the balance between other influential institutions like the army or the parliament" (Bank et al. 2014, p. 166). The monarch himself, and not the royal family, is at the very center of the system. The monarch functions as "the linchpin around which other centers of political power revolve [...]" (ibid.).

King Mohamed VI is considered to have a rather different style than his father the late King Hassan II. Hassan II repressed any political dissent and even called for the state of emergency, when he saw the stability of the monarchy under threat, such as after urban riots in 1965. Mohamed VI, was enthroned at a rather young age. After his ascendance to the throne, the relatively young King Mohamed VI positioned himself as a reformer. In contrast to his father the late King Hassan II's authoritarian reign, he promised a new concept of royal authority which included the expansion of civil liberties (Maghraoui 2008).

King Mohammed VI did not alter the essence of the monarchy itself, but he initiated reforms which opened new political spaces. Stressing the importance of good governance, human rights, economic development and citizen participation was part of a balancing act, which aimed to bridge the growing social gaps in society, win over the urban elites and the middle class and oust some of the grey eminences from the era of his father. Limited political liberalization also opened room for the return of formerly imprisoned activists (Bogaert 2015, p. 29-30).

Although, Moroccan politics have become more pluralist and the regime underwent various reforms, the overall authority of the king has remained untouched. The king has remained the absolute and unquestionable integrative authority. The overall authority of the king builds on legitimation through religious references such as the Alaoui dynasty's claim to be in lineage with Prophet Mohammed, historical references as the longstanding uninterrupted reign of the dynasty as well as the political authority deriving from the king's function as head of the state and of the army. However, while the first years of King Mohammed VI were characterized by a more liberal approach, creating hopes among many for the democratization of the authoritarian political regime, cautious steps towards democracy were abruptly ended after the Casablanca attack in May 2003 in which 43 people were killed in a series of suicide bombings. Among other reasons this led the king to clarify that Morocco would not follow the path of Spain and transform into a constitutional parliamentary monarchy, but rather remain an "executive monarchy". In an executive monarchy, the king represents the highest and often sole executive authority. "The king still both rules and governs and is accountable to no one. His representatives in the state's central administration, government ministries, justice system, and security apparatus maintain tremendous powers and are accountable only to him. Freedom of expression remains a particularly sensitive area, notwithstanding significant gains in press freedom in the past decade (Maghraoui 2008).

As a more reserved monarch who has left daily politics to others, the king has generated legitimacy through gradual top-down reforms. The system of the executive monarchy grants King Mohamed VI "the appearance of being the only one who can guarantee real political change" (Dalmaso 2012, p. 222). Accordingly, political initiatives and reforms have often been the result of a combination of top-down and bottom-up interactions in which however civil society actors have often played a pivotal role (ibid. 220).

Generally speaking, Moroccan civil society has remained surprisingly silent on political issues. They have hardly challenged the regime, but have rather chosen to cooperate and indirectly influencing.

Dalmaso (2012, p. 229) assumes that considering the king's image as a liberal modernizing reformer, they have made a rational choice and have opted for an apolitical stance vis-à-vis the regime, as this would promise more influence. The king's role as an integrative figure standing above politics and his religious legitimation has bestowed upon him the role of the leader of the country who knows best what is beneficial for the nation.

In that regard, the Moroccan state has traits of patrimonialism. The king does not only have the authority to trigger and stop initiatives, but he is even expected, by some groups, to intervene in the political sphere. Cavatorta and Dalmaso (2011) highlight that in view of the rise of Islamists in parliamentary elections; secular members of the bourgeoisie have relied on the king's intervention. The constitutional reform of 2011 and the coming into power of the moderate Islamist PJD (Parti de Justice et Développement) have highlighted the monarchy's adaptability. In response to the uprisings in most parts of the Arab world and a growing wave of protest, King Mohammed initiated a controlled reform process, including the promotion of human rights, women's equality, and Berber (Amazigh) cultural rights as well as an encouragement of decentralization. However, neither changes to the constitution nor the participation of the PJD in power have so far led to substantial changes in the system. Although decentralization has entailed the democratization of regional governance – the presidents of the Moroccan regions have been elected - real powers have remained with the governors as the representatives of the central state.

However, the de-centralization of the administration has been considered as an important step towards good governance, which together with ecological sensitivity, and the inclusion of social aspects is considered to bring about Green Growth. In 2010, in his throne speech, the king defined "Green Growth" as the country's strategic development strategy (Schinke and Klawitter 2016, p. 26).

#### **4. Morocco's Energy Policy**

Morocco is a country strongly affected by the negative effects of climate change. In 1995, the country ratified the UNFCCC. Furthermore, a National Committee on Climate Change was set up in 1996 and a National Scientific and Technical Committee was inaugurated in 2000 (Ksouksou et. al 2015, p. 47). King Mohamed VI has been a strong proponent of clean energy production.

The king can be also seen as the patron of the country's Green Growth strategy. His strong commitment has facilitated the adoption and promotion of this strategy at all levels of the state administration (including the regional and local levels) and, also among civil society. The COP22 Conference, held in Marrakesh in 2016 has functioned as a further driver for Morocco's ambitious energy transition plan and helped build the country's new image. However, particularly implementation of single projects depends on the support of single social and political entrepreneurs. Therefore, the will and inclusion of elites, decision makers on different levels as well as of civil society is essential for the success of Morocco's energy transition. The elites will shape the institutions and concrete projects which facilitate and bring about transition (Fritz et al. 2014, p. 2). Institutions are generally seen as the units which define the "the rules of the game"; they make regulations and contribute to laws. Vidican (2015, p. 230) elaborates that in centralized political systems as Morocco, where the king's authority is highly legitimized and almost uncontested, his strong support for energy transition facilitated, but also streamlined decision making processes, often leaving little room for different or opposing views and ideas.

There is also limited room for initiatives on the regional or local levels. While regions and the communes have their own budgets and they can realize projects, their financial capacities vary according to the tax revenues. While richer regions and communes have more capacities, others have less. However, energy is not something which falls into the responsibilities of the regions, but its rather is the matter of the ministry. However, while the regions and communes neither have a say in defining the sites of large-scale energy production plants, nor can decide to build and finance any autonomous decentralized small-scale energy production plants, they play an important role in informing about, educating, promoting and defending decisions made in the capital. In each region, a committee for climate change has been institutionalized by law. They work on education and governance as well as capacities. They have been working on developing a so-called climate plan for the respective region. The regional climate plan is supposed to guide the plan for development.

Energy transition can be considered as a national strategy which does not only have an economic, but also a political and strategic dimension. Green Growth building on renewables is not only hoped to decrease the country's dependency on foreign suppliers, but also create jobs, prosperity and maintain stability in the country. Moreover, the focus on renewable energy bestows upon the monarchy a modern image. Morocco's green "modernization" has been already acknowledged by the World Bank and other international organizations, and the COP22 summit held in Marrakesh helped further promote this image at the international stage. Morocco also aims to transform its energy

transition into a soft power and function as a model for others in North Africa and Africa (Steinbacher 2015, p. 8).

Reflecting the focus on national development policies influenced by modernization theory, Morocco has favored large-scale production units over de-centralized smaller production units. Investment in large scale solar plants are perceived as more rapid and more effective solutions. The focus on centralized large-scale projects has been driven by the positive experiences made in the context of the Tanger Med; a large harbor project which led to more than 10 billion € investment. Hence, one can say, that the government hopes that large scale projects trigger more private investments. Incentives for decentralized energy production have therefore remained rather limited. Vidican (2015, p. 236) highlights how Morocco's clientalistic system (consisting of several powerful families) has also infused the country's energy policies<sup>1</sup>. As part of the Moroccan National Solar Plan in 2010, three new national institutions were established: MASEN (Moroccan Agency for Sustainable Energy), ADEREE (The National Agency for Renewable Energies and Energy Efficiency) which was later transformed into AMEE (Moroccan Agency for Energy Efficiency) and SIE (Energy Investment Company).

*MASEN* became the most prominent of the three. *MASEN* is a public limited company, working closely with the ONEE<sup>2</sup> (Office National de l'Electricité et de l'Eau Potable - The National Agency for Electricity and Drinking Water), the state-owned utility agency. *MASEN* manages all large projects in Morocco. Large projects are usually accompanied by social projects.

*MASEN* has three main tasks: "a) developing solar and other renewable energy power projects, b) contributing to the development of national expertise and c) proposing regional and national plans on solar and other renewable energy technologies" (Schinke and Klawitter 2016, p. 37).

*ADEREE* was supposed to develop the national, regional and sectoral plans to carry out renewable energy programs. In this regard, *ADEREE* advises local authorities on the selection of sites (ibid.) but was then replaced by *AMEE*. *AMEE* deals with developing and implementing energy efficiency action plans in sectors such as transport, industry and construction (*AMEE*).

*SIE* is the state-funded national interest company to finance Green Growth. It manages assets up to 1 billion MAD provided by the Energy Development Fund to facilitate and "according to its own mission

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<sup>1</sup> "The king is the supreme institutional power [...] the power of the Royal Place is channeled through an 'intricate web of influence and allegiances spun between the Place, the Moroccan elite, and key institutions, the so-called Makhzen', which shape key national decisions (ibid. 229).

<sup>2</sup> ONEE is a merger of ONE (the National Agency for Electricity) and ONEP (the National Agency for Water) created in 2011.



statement, the company facilitates and develops projects in the energy sector with the support of partner investors, developers and private industry” (SIE 2015 quoted after Schinke and Klawitter 2016, p. 37).

Efforts for private sector engagement in the energy sector of North Africa generally have created situations described as “hybrid”, which means that state owned enterprises have a dominant market position, whereas privately owned energy producers are just introduced at the “fringes” (Malgas and Eberhard 2011, p. 3191). Malgas and Eberhard (2011, p. 3193) elaborate that all privately owned operators in Morocco need to cooperate with ONEE, as there is still a monopoly on distribution. Besides a certain control over the energy producers ONEE’s monopoly allows also the oversight over the energy prices reflected to the consumers. Moreover, a monopoly over distribution can also entail strategic national interests. Additionally, one interview (introduced below) showed that at least in Tata the local population prefers state projects over private ones due to trust issues.

The bill No 13-09 on renewable energy, issued in February 2010 liberalized the production of renewable energies and opened high-voltage grid to independent power producers (Vidican 2015, p. 229; Nachmany et al. 2015, p. 8). The law has however remained vague and fuzzy:

“Any producer of electricity based on renewable energy – private or public – has now the right to be connected to the medium, high and very high voltage national electricity grid, while the exact conditions for the connection to the medium grid stated in law 13-09 are rather unclear” (Schinke and Klawitter 2016, p. 34).

While privately run large scale production units have been able to feed into the grid, small-scale units and individual producers (as single households) are still prevented from feeding into the national grid.

The Moroccan government’s reluctance to build on decentralized small-scale renewable energy production units contradicts the country’s ambition to spread modernization and growth across the national territory as well as the goal to “generalize energy access to all segments of the population at affordable and competitive prices” (ibid.). This is especially important as energy supply can be considered as a part of the national subsidy provision. In that sense, affordable energy provision has been considered as a part of the social security system. In the past, there have been occasions when cuts in subsidies (although in other areas) triggered protests (as in Casablanca in 1965) (Fritz et al. 2014, p. 71).

However, law No 13-09 has been completed by law No 58-15 to address some shortcomings, especially concerning photovoltaics. Whereas law No 13-09 prohibited projects whose power was greater

than 12 MW, law NO 58-15 increases the MW to 30. Therefore, selling of electricity to ONEE from renewable energy sources of high, very high, medium and low voltage is in effect since 2016. The government apparently hopes that this might create new jobs in the sector, as private generates are allowed to sell up to 20% of production to ONEE (IEA; MEM).

## 5. Renewable Energy Production Sides

In this section, we will present an overview of renewable energy production. While we will touch upon wind and hydro power, the focus rather lies on solar power production. Further analysis will focus on the Noor Project as an example of centralized large-scale production on the one hand and decentralized models including PV rooftop installations on the other hand. Moreover, the report deals with the question which stakeholders (private companies as well as communities) are included in the projects and through which processes they are integrated.

**Wind Energy:** The program is operated by ONEE. Several wind farms are under development, three of them are situated in the south of the country (Tarfaya, Laayoune and Akfhenir). “A consortium of Enel Green Power, Nareva (owned by the King Mohammed VI’s investment company) and Siemens won a bid in March (2016) to build five new wind farms at different sites across Morocco – Midelt, Tangier, Jbel Lahdid, and Tiskrid and Boujdour in the disputed Western Sahara territory. Their combined capacity will be 850MW, a huge increase taking Morocco closer to its aim of producing 14 percent of electricity from wind by 2020. The unit cost in the tender documents was one of the lowest in the world, at just \$0.03 per kWh” (The Guardian 17-11-2016). Some of the new wind farms are operated as IPPs (Independent Power Project contracts which constitute long-term agreements with private sector actors), still all energy is bought by the state owned ONEE. Kousksou (2014: 51) highlights that wind power is a problem for power grids, therefore electricity exchange with Spain might become a challenge.

**Hydropower:** The goals the hydropower plan set out are nearly met (Steinbacher 2015, p. 6.) This is not surprising as hydropower mostly concerns dams, and Morocco has experience in generating electricity from dams since 1929: “Sidi Said Machou (1929), Fes Aval (1934), Zidania (1935), and Lalla Takerfoust (1938). More recent ones include Idriss the First (1978), Oued El Makhazine (1979), Al Massira (1980), Allal el Fassi (1994), and Al Wahda (1997) (Power Plants Around the World 2012) “ (Bahgat 2013, p. 296).

## 5.1 Solar Power – the NOOR Project

As part of the Green Growth strategy, the government has adopted the Moroccan Solar Plan NOOR which is operated by MASEN or ONEE.

Noor includes the construction of large- and medium scale solar plants until 2020, at different sites, mainly in the region of Ouarzazate, and of one with 320 MW CSP and with 80 MW PV in Tata (Schinke and Klawitter 2016, p. 33). The first phase, Noor 1 was inaugurated by the king in February 2016 (The Guardian 17-11-2016). “Instead of PV (photovoltaic) solar panels, Noor (1) uses CSP (concentrated solar power) technology – giant mirrors to reflect the sun’s rays on to tubes containing liquid which is super-heated to drive turbines. CSP offers storage of electricity for up to three hours after the sun has set, which covers peak demand times” (Ibid.). Noor 2, 3 and 4 are either in a planning phase or under construction.

The Noor 1 CSP is also part of the investment plan for concentrated solar power in the MENA region which is led by the Clean Technology Fund. Firsari and Stadelmann (2015, p. 14) describe the project stakeholders in the following fashion: “While mostly driven by public actors, the project also features private project developers in partnership with a local governmental agency, providing interesting insights into risk sharing between public and private stakeholders”. MASEN was established to carry out the ambitious plan to install 2000 MW of solar capacity by 2020. The pilot project started in Ouarzazate. To install the plan MASEN carried out a two-stage competitive bidding, which aimed to first establish the technical and financial set-up of the bidders and then choose between them. MASEN in turn guarantees the contractor to buy an agreed amount of solar power which is established through a contract lasting for 25 years at a set price (ibid. 15). This is set up as a public-private partnership, which ensures the sharing of risks and keeping interests aligned, while the private developer is the sole responsible for the construction and technical risks (ibid. 15). MASEN in turn is backed by the Moroccan government and international financial institutions with guarantees of financial viability (ibid. 15).

Regarding the technology supply for the provision of solar energy, the whole MENA region is still dependent on imports from the US, France, Spain and Germany (Mahia et al. 2014, p. 587) and increasingly China. Mahia et al. (2014, p. 589) assess that low public interest in CSP manufacturing (lack of an industrial strategy), over-presence of public actors in the CSP value chain and high taxes were the main reasons (absence of legislative and fiscal framework) why private actors were not interest-

ed in starting such endeavors, as the uncertainty has been perceived as too high. Interestingly it was also asserted that a 'low level of commitment/support by multilateral or European institutions to promote regional initiatives' was considered a barrier (ibid.).

Rignall (2016, p. 549) establishes the framework of the deal MASEN made with the collective owners of the land in Ouarzazate where NOOR 1 was constructed. She conducted 12 months of ethnographic field research in 2010 and returned in 2012 to conduct interviews focusing on the solar installations in Rabat especially with MASEN and in Ouarzazate with local, elected officials, activists and residents active in mobilization around the plant (Rignall 2016, p. 541). Rignall (2016) criticizes that the deal behind the sale of the land where the construction was planned, ignored the expectations of the local population. She elaborates that the residents of the surrounding communities were neither informed about the deal, nor told about its consequences (Ibid.). As Rignall holds they only learned about the deal and its effects when the king inaugurated the project. Subsequently the project met fierce local resistance, leading to a symbolic public meeting held in Ouarzazate's most luxurious five-star hotel (ibid.). Just the symbolism of the location enraged the local resistance groups, which were just once more reminded of the long history of exclusion and marginalization, they have been facing from Moroccan officials (ibid.). Their resistance was against the low prices paid for their land and against regional development initiatives. Concerns as summed up by the local teacher: "if we can help the whole world with clean energy, why we cannot do more to build factories here, improve agriculture, and help people out of poverty in Ouarzazate?" (ibid.).

On the other hand Hanger et al. (2016) made a household survey focusing on overall community acceptance of the same project. The household survey was based on 232 face to face interviews conducted in 2014 in settlements within a 20, 40 and 60 km radius of Noor 1 (ibid. 83). These findings showed a high acceptance level of local communities attributed mainly to the image of solar energy as "clean" and "environmental friendly" power source (ibid. 87). However, people also responded that they were poorly informed, but the less they knew, the more favorable they perceived the project. Still, the authors started to suspect that "the universally high acceptance might partly result from people telling us what they thought we wanted to hear" (ibid. 87-88). Nevertheless, the authors also attribute the high acceptance levels to the fact that the project developers (especially MASEN) conducted local campaigns and thus generated trust and raised awareness, that the king himself inaugurated the project and that people expect job generation as well as a positive impact on energy prices in the future (ibid. 88).

A further study carried out by the Wuppertal institute in coordination with German Watch also found that the introduction of Noor 1 was received positively in the region in the contrast of:

“the skepticism and critique in the popular media and academia that usually arises from the typical ‘conflict-oriented’ portrayal of deploying large-scale renewable energy projects in North Africa and the perception that exporting electricity from North Africa to Europe, or even from local communities to other parts of Morocco would necessarily end in exploitative, neocolonial relationships” (Terrapon-Pfaff et al. 2015, p. 14).

The authors attribute the positive acceptance to the informative initiatives of MASEN, which in their assessment addressed the “livelihood dimension” of the project (ibid.). Livelihood dimension means that the project shall contribute to human development objectives and to integrate the project in the economic structure of the region (ibid.).

The studies pointing to the positive acceptance of the project are largely concerned with a positive attitude towards renewable energy production and expectations like labor opportunities. Therefore, the protest cannot be attributed to e.g. a “not in my backyard” phenomenon as observed in other contexts. In this regard, the resistance against the project has probably less to do with a resistance against renewable energy production in the region, than with land distribution which is embedded in the political economy structure within Morocco.

## **5.2 Solar power PV rooftop applications**

In the 2000s, ONEE launched a joint venture with Total and Tenesol companies to establish affordable energy for certain areas of the Moroccan countryside. The idea was that certain areas were so scattered that it was impossible to integrate them in the national power grid in a cost-efficient manner. Therefore, single solar panels were installed on an individual household basis. Apart from providing affordable and sustainable rural electrification, which was the general aim during the 1990s, the project also considered the improvement of rural living conditions. This was also seen as an important factor to lower migration from rural areas into the country’s cities (Bahgat 2013, p. 297). Currently about 55.000 households in Morocco have solar systems in place.

Despite a prioritization for large-scale units, Steinbacher (2015) highlights that the Moroccan parliament has shown interest in decentralized and small-scale energy production through photovoltaics. Therefore, two feasibility studies (Potentialstudien) were commissioned. In 2007, the Moroccan parliament drafted a law which aimed at enabling decentralized and diversified individual energy pro-

duction based on photovoltaics. But the plan was dropped due to its negative effect on overall energy prices. Jäger (2011, p. 3) highlights that the then energy minister Mme Benkhadra withdrew the law in reaction to heated debates driven by the fear that potential additional costs for renewables could be passed on to the consumers.

Still, decentralization in the meaning of small-scale or even household level production was kept on the political agenda mainly through stakeholders from the GIZ and the private sector who supported an opening of the low-voltage level to private producers. In 2013/14, the debate about small-scale production, inspired by models from the German “Energiewende” (energy transition), gained momentum again, because of GIZ incubated stakeholder discussions, leading one Moroccan consultant to conclude that the German involvement was crucial in “getting things moving again, from a categorical ‘no’ to the possibility to discuss the issue” (Steinbacher 2015, p. 11).

On the other hand, Steinbacher (2015, p. 8) raised the question of “decentralized” energy production with Moroccan, German and international stakeholders during her field research (she conducted forty-five semi-structured interviews with Moroccan and German government officials, NGO employees, international companies and advisors, and one Moroccan citizen’s organization). Her assessment showed that “decentralization” had a different meaning for Moroccan interview partners than for German ones. Decentralization in the Moroccan context was often understood as a distribution of production sites throughout the Moroccan state territory. In this regard, decentralized energy production as “societal or identity” project of the Moroccan society meant inclusion of the disputed “Southern provinces”. The statement of the Moroccan energy minister Amara puts it “this [renewable energy] program encompasses also the national grid in our Southern provinces in the framework of a long-term vision of electricity interconnection with the Sub-Saharan countries via Mauritania and Senegal” (ibid. 8). From this perspective, one could hold that decentralization also aims at the inclusion of the “Southern provinces” into the Moroccan national project, thereby contributing to centralization.

Steinbacher (2015, p. 8) further elaborates that there was one interviewee in favour of the “democratization of photovoltaics” but also this interviewee did not see it in perspective of local empowerment, but rather as a factor which would “contribute to the national energy [transition] process” and hence help strengthen the state. Steinbacher’s findings show that decentralization is neither understood as the decentralization of decision making processes, nor as the decentralization and the indi-

vidualization of energy production, but rather as a diversified geographic distribution of large and middle scale production sites.

## 6. Energy Policies as part of National Identity Production

Jasanoff and Kim (2009) point out, that technological transitions, especially in the area of national energy strategies, are not just based on economic considerations, but they are rather part of a wider socio-political and cultural projection of how a desirable future might look like. The two authors call it the “socio-technical imaginaries” of a country. Socio-technical imaginaries are “collectively imagined forms of social life and social order, reflected in the design and fulfilment of nation-specific scientific and/or technological projects” (Jasanoff and Kim 2009, p. 120). In this regard, Morocco adopted the idea of “Green Growth”. Green Growth suggests that climate change should be transformed into an opportunity and that a focus on environmentally friendly energies will also induce economic growth and welfare.

Green Growth is as much a vision and message directed to the global as to the domestic constituencies. It suggests a “clean” and therefore more modern, more sensitive development path.

This discourse derives from neoclassical economics. Death (2015, p. 2213-14) argues in this regard that countries from the global south pursuing a Green Growth strategy use this discourse to “‘leap-frog’ older and more inefficient industrialization paths”. “Green Growth” became a global buzz word in recent years and the concept became attractive and popular culminating in the slogan “green is hot” (Death 2015, p. 2213). The Moroccan energy strategy, in general, and the solar energy plan, in particular, are classical examples of this strategy. Headlines as “Morocco lights the way for Africa on renewable energy” (The Guardian, 17/11/2016) highlight how successful the promotion of renewables has fed into the country’s constructed image. Similarly, CNN International underlines the global importance of Morocco by naming a report; “why Morocco is leading the charge against climate change” (CNN, 12/12/2016). Jasanoff and Kim (2013) highlight that developments as Morocco’s energy transition and its promotion resonate with unfolding dominant global discourses. Industrial states attempt to replace fossil fuels as these resources have become scarce and politically costly to obtain – geopolitically as well as considering environmental concerns. Therefore, Western powers promoted – at least until recently – clean, efficient and renewable energies. Jasanoff and Kim (2013, p. 189) point out that:

“radical changes in the fuel supply are likely to transform social infrastructures, changing established patterns of life and work and allocating benefits and burdens differently from before. Accordingly, analysts should pay greater attention to the social dimensions of energy transitions, complementing more conventional analyses of economic and engineering issues.”

In this regard, renewable energy is portrayed as clean. The hegemonic narrative is not only neglecting any flip sides of solar energy production such as for instance the conditions under which solar panels or mirrors are produced, environmental effects connected therewith or working conditions, but it also often ignores the side-effects on the localities and regions where large scale-production sites are constructed. The critical question of high water consumptions caused by the cleaning and wet cooling of solar panels is often left out of sight. Particularly, in deserted areas such as Ouarzazate and Tata water supplies for large-scale solar energy plants will cause huge problems in the future.

Besides an identity building function, the focus on renewable energy production also entails a security and foreign policy dimension. On the one hand Morocco aims to become independent from Algerian imports, as they are in a fierce competition over regional leadership which is additionally fueled by the conflict for the West Sahara (Werenfels and Westphal 2010, p. 11) on the other hand the country wants to position itself as an energy supplier and strategically important partner of Europe and other African countries as Mauritania (*ibid.*).

In view of growing global demands for energy, energy security is termed “total” security: “Nothing exists that is not energy, or not affected by energy” (Ciuta 2010, p. 124). Energy security works on different levels, which are at times subjected to competing goals - economical goals, provision of energy to households, protecting the environment, foreign politics – which makes national energy policies difficult to harmonize. Ciuta (2010, p. 129-135) differentiates between two logics of energy security: (a) the logic of war which concerns the geopolitical dimension as energy is needed to fight wars, energy as a resource over which wars are fought and the survival of society which is dependent on the provision of energy, in this logic energy is usually equated either with nuclear energy or with gas and oil; (b) energy as subsistence concerns the societal dimension of energy supply as a public good and is characterized by diversification of energy sources and actors involved, mitigating between environmental, economic and political aspects, in this logic energy security is equated with renewable sources and a multiplicity of stakeholders.



## 7. An overview of the Climate Energy Model Regions in Austria

In contrast to Morocco, Austria has a federalist political structure. The nine federal states; “Bundesländer” were established along historical administrative units. The last Bundesland to be established was Vienna. Despite of a decentralized administrative and political structure; federal states have their own parliaments and their own legislation, the federal government and the federal bureaucracy in Vienna have still enormous powers, particularly when it comes to the distribution of money. This is also why scholars tend to define Austria as a “centralist federation” (Erk 2004, p. 1-2). Only issues which are not explicitly under national jurisdiction are left to the individual political spheres of the “Bundesländer” or to the municipalities.

Most of the energy relevant issues are regulated by federal law, but the federal states are highly involved in the specification and implementation of these laws. The country’s energy strategy and measures for the reduction of emissions (including investments in renewables) are elaborated in collaboration between the federal government and the federal states. The measures taken are brought in line with the climate and energy package issued by the EU in 2008 which sets besides the promotion of renewables and the increase in energy efficiency the goal to reduce emissions until 2020 by 20 percent (compared to 1990).

The Austrian energy strategy also targets lower administrative and political units, supporting Austrian municipalities and regions to become independent from fossil fuels and increase their share in renewable energies. Driven by the former minister for environment, the Austrian government strongly supported the establishment of so called “Klima- and Energiemodellregionen” (Climate Energy Model - CEM) and “Klimaaktiv Gemeinden”. The decision to form a model region is taken on the local level. The national level just provides an incentive system (cf. BMLFUW).

Stakeholders in such processes usually are on the national level (Truger et al. 2016); the Climate and Energy Fund (in turn funded by the Austrian Federal Ministry for Transportation and Ministry of Agriculture); Scientific Partners and Universities. On the regional level; public regional development agencies and LEADER regions (LEADER is a funding program of the EU), regional management associations, the chambers of agriculture as well as energy suppliers (private partners) do play a role. On the local level mainly members of the municipalities, energy groups, and local initiatives are important stakeholders.

This decentralized decision-making structure cannot only be explained by the country's historically grown administrative federal structure, but also by Austria's socio-technological imaginary. Felt (2015, p. 3) investigated the specificity of the Austrian imaginary and calls it "imaginary of the absent", referring thereby to the rejection of nuclear power and agrobio-technology by the Austrian people. "Imaginary of the absent" thereby refers to a national identity based on "keeping a set of technologies out of the national territory and becoming a distinctive nation precisely by refusing to embrace them". According to Felt (2015, p. 6-7), in Austria people need to perceive a technology as "local" to embrace it, rather than defy it, due to a conspicuous conduct towards some technologies which might have a negative impact on collective values such as "untouched nature" and agriculture (ibid.). Thus, national politics take two points of the socio-technological imaginary of Austria into consideration. First, the local level is not "forced" to adopt and implement renewables through a law or other provisions, instead incentive structures are created which enhance local decision making. Secondly, renewable energy fits well in the national imaginary as renewables appear to be "natural" and "nature-friendly" which is important for Austrian national identity (ibid. 15-16).

One of those incentives are the establishment of "Climate Energy Model (CEM)". Regions which are taking part in the "Klima- and Energiemodell"-project aim to achieve energy autarchy and independence from fossil fuels. In most of the cases this is based on a bottom-up approach. To achieve this goal, civil participation is encouraged through several initiatives (Truger et al. 2016, p. 1-2). CEMs are organized as associations. Each CEM has a CEM manager who plays a key role in developing plans for renewable energy, civil participation and so on (Truger et al. 2016, p. 2). The differences between these CEM's lie in their structure, their goals and the different points of departure.

The CEMs in Güssing and Freistadt are examples of how different the approaches to complete self-sufficiency can be. The district of Freistadt favors measures with a focus on citizen participation and includes stakeholders on many different levels. The CEM Güssing on the other hand names economic prosperity, the improvement of the touristic sector and infrastructure (through ecoMobility), and the creation of new jobs as their main objectives. Citizen participation is just a supporting feature on the way to a strengthened economy and tourism sector.

Comparative data on the CEMs of Freistadt and Güssing:

	<b>CEM Freistadt</b>	<b>CEM Güssing</b>
Organisation	association "Energiebezirk Freistadt"	association „ökoEnergie-land“
Participating Municipalities	27	17
Population	65.521 (Statistik Austria 2010)	15.650 (Statistik Austria 2010)
Geographical description	42% forestation, high percentage of agriculture	40 % forest, sunny region, agriculture
Economic details	3,5% unemployment, 28,77% commuter rate	high commuter rate, weak infrastructure and economic performance

(data from: <http://www.klimaundenergiemodellregionen.at/> )

Before the CEM Freistadt was established in 2010, the “Energiebezirk Freistadt” (EBF) was founded as a bottom-up attempt to increase energy efficiency and the usage of RES (Renewable Energy Sources) in the region. The first association was established by members of the local waste association over concerns about the nearby power-plant in Temelín. The main goal was the creation of new jobs “by using the district’s high biomass potential” (Truger et al. 2016, p. 23).

Since its establishment, the CEM Freistadt has been closely linked to the work of the EBF, building on existing (local) structures.

The CEM Freistadt can be defined as a “rural cluster” –showing little population density, a high potential of electricity self-sufficiency (125,3%) and a high heat self-sufficiency as well (83,5%) (Truger et al. 2016, p. 13). The CEM Freistadt builds on strong financial participation and involvement of citizens and municipalities. Citizens pay in and become shareholders of the HELIOS company which in return constructs and maintains photovoltaic cells on the roofs of single households (Miesenberger and Klepatsch 2011, p. 36). There is also a clear focus on awareness raising and increasing energy efficiency. Activities include the establishment of so called climate schools, awareness raising campaigns, renovation workshops and other events.

In comparison to Freistadt, the CEM Güssing mainly has mainly relied on subsidies (EU and national level) and external private funding, although there have been also attempts to include broader parts of the citizens. 20 % are capital resources, 30 % are subsidies and 15 % are external funds (EZEE 2016, p. 118).

Güssing has is an economically poorly developed region in the South East of Austria. There has been a lack in infrastructure. In 1990, a model to achieve 100% self-maintenance regarding fossil resources was proposed by local stakeholders. In consequence, the community of Güssing has taken various measures in the field of energy efficiency. Later, the Europäische Zentrum für Erneuerbare Energien Güssing GmbH which was established in 1996, decided to expand the model over the whole district of Güssing. This was accomplished by 2004 (EZEE 2016, p. 6-7). Ever since, the “Europäische Zentrum für Erneuerbare Energie” (the European center for renewable energy) and the “Verein zur Förderung der Lebensqualität in der Region südburgenland plus“ (the association for the support of life quality in the region of Southern Burgenland plus), together with the mayor of Güssing have been major drivers for energy transition in the region.

According to the ökoEnergieland website citizen participation has been mainly realized in field of photovoltaic for single households<sup>3</sup>. Compared to Freistadt which has a bottom-up approach, Güssing has a stronger focus on the economic development of an economically underdeveloped region. The CEM Güssing links energy transition with the clear goals of the development of infrastructure economic growth job creation and prosperity in the region (with energy autarky being the ultimate goal). The CEM Güssing aims at preventing the outflow of capital and expanding the potential of ecotourism. Another difference between the two CEMs is Güssing’s focus on ecotourism: ökoEnergieland (the association) highlights that ecotourism is one of the main goals (EZEE 2016, p. 165).

## 8. Technology transfer, or, how can models travel?

Science and Technology Studies (STS) have demonstrated that technology transfers are an intricate issue. For a successful transfer, many things need to be considered and accounted for, as technologies are hardly neutral and easily dispatch able entities: successful technological innovations – i.e.

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<sup>3</sup> <http://www.oekoenergieland.at/index.php/172-oekoenergielandtourismus-glasing>

innovations that graft well into the fabric of society, providing solutions to problems – need to be analyzed as dense socio-material networks, or “assemblages”, in which objects (e.g. a particular technology), subjects (e.g. “users”) and spaces in which technologies (e.g. a certain institution, branch of industry or market) are mutually (re-)configured (Akrich 2006, Latour 1990, Akrich et al 2002). Madeleine Akrich, for instance, has pioneered scholarship that shows how technologies, once disentangled from their contexts of emergence and introduced into different socio-cultural environments, assume different meanings, are applied differently or “behave” in rather unanticipated ways. Policies or strategic programs concerned with technology travel, hence, are well advised to consider ways to explore the socio-technological contexts as well as the lived realities of users-to-be, to make a technology work in the destined environment.

Recently, STS work has further conceptualized the ways in which innovation models travel (Hird and Pfothenauer 2016; Pfothenauer et al. 2016). Pfothenauer and other colleagues draw on the notion of “socio-technical imaginaries” to explore the reconfiguration of particular innovation models. Pfothenauer et al. (2016, p. 54) point out, that interpretative policy analysis supported by socio-technical imaginaries may help understand how “the social practices surrounding seemingly identical technologies (such as nuclear power) differ vastly in their social practice across countries [...] Imaginaries may thus help us explain why some architectures are feasible only in certain socio-political contexts, while other architectures are inhibited, and how idiosyncratic features of national identity and societal experiences enter into what on the surface looks like the same policy instrument”.

While this work is in large parts ongoing and itself does not provide a ready-made conceptual framework of analysis, this type of study with its grounded, qualitative-interpretive methodologies can help direct an in-depth empirical and theoretical investigation of technology transfer between the EU and Morocco in the field of renewable energy solutions. The question whether the concept of Climate Energy Model Regions in Austria can serve as a source of inspiration for decentralized renewable energy production in Morocco needs to be assessed in the following of the interviews made with relevant stakeholders and their discussions in the stakeholder forum. What can be clearly assessed by the literature is that energy production sites are also sites of political power, and therefore sites of political contestation (cf. Molvaney 2013). Social problems cannot be fixed through technological solutions (alone) although as the example of South Korea shows in an impressive manner a “technological nationalism” can be forged, leading to social cohesion in a nation state (Jassanoff and Kim 2009).

## 9. Tata – Morocco’s first energy model region?

The province of Tata is an economically underdeveloped province in the south-east of the country. In consequence of the administrative reform of 2015 which established Souss-Massa region, Tata became part of this region. The president of the region holds that Souss-Massa has a water problem. The region has developed an expertise in water-economy (with sensors, computers and small meteorological stations= smart agriculture). Representatives of GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) highlight that ever since its coming into existence, representatives of the region have been very open to include representatives of civil society. They organize workshops on a regular basis, mainly with the target of capacity building. There is much need to develop administrative capacities (maybe because the regions are newly established and have not been able to develop capacities). GIZ supports Morocco’s energy transition. It supports projects that accompany larger projects. During talks in Tata and Agadir, GIZ representatives held that to create acceptance for larger projects also smaller projects would be needed (Interview with authors in April 2017).

Due to its geography and solar irradiance, Tata has been chosen as a site for a large-scale energy production site as well as a smaller production. Both are part of Morocco’s ambitious energy transition plan. While Noor Tata, planned in the commune of Akka Ighen will mainly produce for the national network, the smaller production site in Taghmoute is planned to contribute stronger to the energy supply of the region. The hope is that the mega project will contribute to the economic and social development of the region. Noor Tata has been defined by local stakeholders as a top-down project, but one which has the aim to resolve a local problem.

Moreover, there is also a plan to construct a smaller production site in Taghmoute (also part of the province of Tata).

### Taghmoute

In Taghmoute ONEE plans a PV station which is also financed by ONEE, while the consultant is FICHTER. The middle-scale station in Taghmoute is planned to produce 30 Megawatt. It will be connected to the HT (60kV) grid. The average yearly production will be around 50Gwk. Throughout the country, ONEE runs 8 projects (Enjil, Oulat El Haj, Ain Beni Mathar, Bouanane, Bondnib, Tata, Bouizakarne, Tan Tan). In Tata ONEE has 32.000 clients. While most of the households in Tata are electrified, only in Taghmoute 50-60 households will be electrified by the PV project. During talks in Tata it was stated that energy needs in the region have been rather low, except for the period be-

tween June and September. In these months the need rises, it even doubles. 63% of the energy are used for households. This is very profitable for l'ONEE (parce que c'est en bout de ligne). The ONEE middle scale project in Taghmoute does not include any involvement of locals. It can be rather seen as a DAD - (decide, announce, defend) model. The project is estimated at 500.000 Dirham. The site is 197 hectares. The site where it will be build is a collective land. Collective land has many owners. It is historical tribal land. The money for the site will be paid to a funds. It will be then used for socio-economic projects in the community. The community needs to propose projects. It could be used for a high school, or to bring teachers to the commune.

The mayor holds that there is hope that the power station will also help develop tourism and agriculture. Particularly, men in Taghmoute hope that the station will boost development. There is little infrastructure. They hope to open a restaurant, hotels and so on. There is also the plan to build an auberge in Taghmoute, financed by the Agence du Sud. However, investments will be only able as a "side-effect" of the construction of the energy production site, there are hardly long-term revenues which can be expected on the side of the local communities. As the mayor of Taghmoute expressed, one of the problems is that in financial terms it is not the local commune which benefits from taxes, but rather the commune where the agency has its headquarters (Interview with authors in April 2017).

Before there was a private company which wanted to invest in Taghmoute. They were about to invest into the agricultural sector, but locals did not want to sell their lands. "We had bad experiences with this businessman. He did not keep his word. Locals are critical. People resist. They do not want to give away their land, it is the only resource they have, they are afraid of losing it. But, l'ONEE is different. It is not a private company. It is a public company which is official and is guided by the law" says the deputy mayor (Interview with authors in April 2017).

### **Akka Ighen – NOOR Tata**

Representatives of the commune of Akka Ighen, where Noor Tata is planned, expressed that expectations in the community regarding the benefits from the project were very high. "People are very happy and proud that their commune has been chosen as a site for the construction of Noor" (Interview with authors in April 2017). People hope that it will have a positive impact on the economic and social development of the commune and create jobs. Local authorities hope that the project will also

entail investment in local youth (just as in Ouarzazate), such as education, infrastructure, hotels, ecological tourism and so on. People have already expressed their hopes and expectations.

MASEN has done all the preliminary assessments. Some of the water will be used from the locality. During the interview it was pointed out that the water deriving from the locality will be “good” water, in the meaning of freshwater, rather than salty water. This might lead to a decrease in water even if additional water will be imported from Ouarzazarte (where the water situation is not so bright neither). On top, the import of water from Ouarzazate might be rather expensive. Still, the water considerations are at this point just considerations and not certitudes.

As local representatives stated, as households are already electrified people’s largest concern in regard to energy is the use of energy for the pumping of water and heating. Power is mainly needed for agriculture. The price is 1 dirham per kilowatt. Most of the people live together, they also share the money, but there are also people who cannot afford to pay the money for electricity.

Local representatives hold that one of the major problems in the commune is the lack of infrastructure for the many workers who will be employed in the construction of Noor. It is estimated that around 3000 workers will be there for the time of 5 years. Workers are expected to be hired from the commune. They state that so far, there have been only two meetings with the authorities on the provincial level. Until April 2017, no one has ever contacted the local authorities of the commune regarding timetable.

One representative of Akka Ighen highlights that after the first encounter with representatives of the project, he discovered that the community was not prepared at all. In comparison to Ouarzazate which is a large town, their commune is small.

Civil society has been strongly involved with energy transition. This contrasts with political parties which are weakly established and do hardly play a crucial role on the local level. The many associations existing at the local level are often reflecting traditional structures and are often less institutionalized<sup>4</sup>. There are approx. 60 associations in the commune of Akka Ighen, each oasis has its own association, but not all of them are active. Their fields of activities mainly range between social and cultural activities. The commitment for environmental issues and for women is relatively new. Climate change has a strong effect on the region. The representatives of civil society hope that the investments in Noor will contribute to economic development and the rise in the quality of education. Although, the large number of local associations is perceived as an important element for the

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<sup>4</sup> Many have reflected the jamehas (informal networks) which have traditionally played an important role in the oasis and which have negotiated over the conditions of common water usage and the usage of roads.



maintenance of social coherence and order, local associations are hardly included into decision-making processes. Rather than as politically relevant stakeholders, they are rather perceived by the authorities as important links to society as such. Associations are usually included into social projects which accompany larger investments such as the Noor project. Authorities visit them when they do not have solutions as one representative of civil society stated (Interview with authors in April 2017). Law No 12-03 holds that any project has to entail an environmental impact and social assessment report – this is an adaption to international standards environmental acceptability is also a necessary precondition for international financing.

## **10. Preliminary conclusions and considerations**

Morocco has embraced a very ambitious energy transition plan. The goal is to reduce the country's dependence on fossil imports through investments in renewable energy sources. Renewables are hoped to bring about Green Growth. Energy transition and the therewith connected potential of renewables has been successfully promoted on all levels of the state. National, regional and local authorities are involved in drafting climate plans, assessing potentials for energy transition. Moreover, a large number of civil society organizations have been dedicated to environment relevant, social and economic issues. Many associations, operating on the local level have been indispensable partners of local authorities. Although, they have been particularly important for the implementation of social and cultural projects – in view of relatively weak political party structures, they serve as contact points for the state authorities – they have not been included into any decision-making processes.

Morocco has a highly centralized political and administrative structure. Despite reforms introducing larger decentralization the majority of decisions are still taken in Rabat. This is particularly the case for energy relevant issues. After all, energy is not simply a technical matter. Energy transition has a strategic, economic, social and political dimension. Investment into the country's renewable energy potentials also serves the national identity construction and the promotion of a modern image. Centralized political and administrative structures favor centralized solutions. From a national development strategy perspective, centralized large-scale solar energy production are considered to be more effective than small-scale productions. At the same time, expectations on the local level are high, particularly in those areas where production sites are in planning.

Talks with stakeholders in Tata revealed the high expectations among mayors and civil society representatives about the positive effects of the construction of large-scale production sites in their communities. In view of poor economic investments, the investment in huge production sites is seen as a huge opportunity for the region's economic development. The mayors held that expectations revolved around improvements in the area of infrastructure, job creation and education. However, experiences with other examples highlight that usually the long-term returns of large projects remain relatively low. The construction of large-scale production sites might lead to the hiring of locals for the construction, but they hardly create jobs in the energy sector. The question whether the construction of large-scale production units will boost tourism or improve education remains open. While large-scale projects are usually accompanied by social and cultural projects, or investments in schools or other institutions, building a school alone does not bring teachers to the province and improve the quality of education. Moreover, large-scale production sites might have negative effects on the water supplies in the specific area.

Tata is a location where a large scale energy production unit (NOOR Tata) and a mid-range production unit are planned. While NOOR, to be constructed in the commune of Akka Ighen has a national focus, the mid-scale production planned in Taghmoute will be producing mainly for Tata and the region of Agadir. Hence, the solar energy produced in Tata will only have rather limited direct effects on the energy situation and the financial income of the province or the communes. Effects are rather hoped to be indirect returns on infrastructure, tourism and education.

Morocco's centralized energy solutions contrast with Austrian experiences. While similar to Morocco, the Austrian government has also promoted energy transition, the implementation of this strategy rather reflects the country's federal political structure. Austrian CEMs build on de-centralized small- and mid-scale productions. Accordingly, energy transition is hoped to be the result of the sum of local and regional initiatives for energy autarky. While the model of Freistadt suggests a bottom-up approach where individual households participate financially, but also benefit financially from solar energy production, the Güssing model, representing a more top-down solution, has a stronger focus on regional development. Güssing has been able to function due to subsidies and other external funding, but at the same time investments in and around biomass energy production has also attracted other companies and investors.

The transferability of the experiences with the Austrian "Climate and Energy Modelregions", as described on the two different examples of Güssing and Freistadt, to Tata in Morocco depends on a

number of factors. The province of Tata, chosen as the case study in this paper, is a possible candidate regarding a transfer since three solar energy projects are in planning and as it constitutes an ideal territory in that regard (Jamea & Khallat 2017, p. 14). There are however some structural aspects (regarding the political settlement, the legal framework and economic realities) that should be taken into account.

One of the central aspects in this regard turned out to be an active civil society. Both, in Austria as well as in Morocco civil society associations are vibrant. In Tata, many of them are committed to environmental issues related to the effects of climate change, social questions, youth, women, sports and culture. In comparison to Austrian associations they are often less institutionalized. Although, they are hardly consulted, but rather visited in cases authorities need their immediate help, their sheer existence is an important asset. Besides, mayors and the representatives at the provincial and regional level, they constitute important potential partners for decentralized small scale solutions with the clear aim to contribute to local and regional development.

Hence one can hold that an active and organised civil society and the awareness for the importance of renewable energy sources and production are present in Tata. Abegg (2011) also points out that for example considering the establishment of „energy self-sufficient regions“ (which includes the Austrian examples) needs a broad consensus of opinion where stakeholders have to agree on a common vision in order to support a transition. While the interviews show that there is such a consensus in Tata, a common vision seems to be missing on the local level. However, there also seems to be potential for such a development.

Especially in Tata the consequences of climate change will become one of the major issues concerning a sustainable future perspective. Tata will face an increasing scarcity of water as well as a major enlargement of the desert due to increasing heats and droughts. Therefore, the inhabitants are forced to think of new ways to tackle these issues. While the development of the solar system projects helps Tata on its way to energy independence (93% of the energy supplies in Tata are being imported), there are other issues facing water scarcity (Jamea & Khallat 2017, p. 5). In this regard, Tata would require solutions tailored for the specific needs of the regions, and such solutions are usually better developed on the local, rather than on a national level. Particularly, water sensitive solutions are relevant for the survival of agriculture in the oasis.

Regarding governance structures, the Austrian system is based on an incentive structure. The national state gives incentives for the local sphere to change its energy model, while the implementation is left to the local level. The model region of Güssing is the result of an initiative of a local politician, a scientist and a private company (Hellsmark and Jacobsson 2009). Furthermore, such a decentralized model shows more potential for an embedding of the energy production site in local structures, which benefits local employment, the local market and infrastructure

Regarding the governance structure in Tata, the analysis shows that involved stakeholders are much less dispersed on different levels (national, regional, local) than in Austria. One of the three planned solar energy projects is developed by ONEE (within the NOOR-project), a national actor; the second one is being implemented under the guidance of MASEN while the third project is realised by the commune in Tata (Jamea & Khallat 2017, p. 4). The CEMs in Güssing, as well as in Freistadt are both run by associations which are rooted in the civil society and ensure measures where civil participation is encouraged and actively achieved. In contrast, local stakeholders in Tata explicitly favour a state led project, because they have more confidence in state structures than in private ones, due to negative experiences in the past. Furthermore, the local property structures are quite different, as in Tata land is often times held as community property. Therefore, state-led projects are more sensitive to local needs in this regard in addition to the trust issue.

From a socio-technological imaginaries perspective the development strategy following the Green Growth paradigm fits well with the current national identity production. From the king to the civil society associations all perceive renewable energy production to be a positive outlook for the future of a more modern Morocco which will be able to tackle the consequences of climate change. But there are two central differences in the identity production through centralized or decentralized energy production. Whereas the grand centralized CSP plants feed into the national image from the outside as a reflection of how well Morocco develops, small de-centralized solar panels might feed into the national identity from the bottom-up through social cohesion and opportunities on the local spheres, to stimulate local engagement and affiliation by participation. Such local engagement might be triggered by a state initiated incentive structure as created in Austria, or on a smaller scale as through the stakeholder forum taking place in autumn.

## List of Stakeholders

During the field trip to Agadir and Tata (30 March – 6 April 2017) the team had background talks and meetings with the following stakeholders:

Stakeholder name	Person names
GIZ Maroc	Farid OUIDDER Conseiller Technique Senior Coordinateur régional du Secteur Environnement Climat de la GIZ Maroc au niveau de la Région Souss Massa.
Région Souss Massa	Khadija Sami, directrice régionale de l'environnement Souss Massa
Région Souss Massa	Brahim Hafidi Président du Conseil Régional Souss Massa. Abdeljabar Kastalani Vice-Président du Conseil Régional Souss Massa.
Sustainable energy committee: Province, Provincial Council, ONEE, GIZ Program, Cooperative des jeunes électriciens	-Mr. Nouhi (Deputy president of Provincial Council) -Mr. Amzil Lhoussine (ONE) President of Coop Jeunes électriciens Andreas Krewet: GIZ RE and EE program In Tata Ahmed El Hazzab: GIZ RE and EE program in Tata
Province	Hassan Khalil, Governor of Tata province -Mr. Nouhi(Deputy president of Provincial Council) -Mr. AmzilLhoussine (ONE) -President of Provincial Council « Mustapha Tadoumante”
Provincial council	Mr. Nouhi (Deputy president of Provincial Council) -Mr. AmzilLhoussine (ONE) -Vice-Président de la commune Tagmout
Commune Ikka	-Mr. Maachi Omar, 3ème Vice-Président de la Commune Ikka -Mr. Hou Mohamed, Directeur de la Commune Rurale Ikka Mr. Aït Ali Said, Service Economique et Social de la Commune Ikka
Association des jeunes électriciens	M. Boumeryem Président de la Coopérative des jeunes électriciens
Association de la Jeunesse de Tamdout pour la Culture et le Développement»"	
Commune Inta	Vice president de la commune Inta Technician au sein de la commune Inta

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