

AUCTION STUDY

Tunisian case study

Mechanisms and main factors of a RES auction

March 2018

RES4MED

RENEWABLE ENERGY SOLUTIONS
FOR THE MEDITERRANEAN



About RES4MED & Africa

Renewable Energy Solutions for the Mediterranean & Africa
RES4MED&Africa

Who we are: RES4MED&Africa promotes the deployment of large-scale and decentralized renewable energy and energy efficiency in Southern-Mediterranean and Sub-Saharan African countries to meet local energy needs. Since its inception in 2012, the association gathers the perspectives and expertise of a member network from across the sustainable energy value chain.

Our work: RES4MED&Africa functions as a platform for members and partners of emerging markets to foster dialogue and partnerships, share knowledge and build capacity to advance sustainable energy investments in Southern-Mediterranean and Sub-Saharan African countries.

Our mission: RES4MED&Africa aims to create an enabling environment for renewable energy and energy efficiency investments in emerging markets through 3 work streams:

- *Acting as a connecting platform for dialogue & strategic partnerships between members and partners to exchange perspectives and foster cooperation;*

- *Providing technical support & market intelligence through dedicated studies and recommendations based on members' know-how to advance sustainable energy markets;*

- *Leading capacity building & training efforts based on members' expertise to enable skills and knowledge transfer that supports long-term sustainable energy market creation;*

At the end of 2015, RES4MED members decided to expand the geographic focus to Sub-Saharan Africa in light of the huge potentials and growth opportunities for Africa's renewable energy sector.

Members: RES4MED&Africa gathers a network of 38+ members from across the sustainable energy value chain including industries, agencies, utilities, manufacturers, financing institutions, consultancies, legal and technical services providers, research institutes, and academia.

Partners: RES4MED&Africa works with local, regional and international partners, agencies and organizations to pursue its mission and promote renewable energy and energy efficiency deployment in the region of focus.

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Abbreviations

ANME	National agency of energy efficiency (Tunisia)
CSP	Concentrate Solar Power
DLR	Deutsches Zentrum für Luft- und Raumfahrt
DNI	Direct Normal Irradiance
EETC	Egyptian Electricity Transmission Company
EGP	Enel Green Power
EPC	Engineering Procurement and construction
FEM	Fonds Mondial pour l'environnement (Global Environment Facility)
FiT	Feed in Tariff
FiP	Feed in premium
GHI	Global Horizontal Irradiance
IEA	International Energy Agency
IPP	Independent Power Purchase
IFC	International Finance Corporation
IRENA	International Renewable Energy Agency
MW	Megawatt
MWh	Megawatt hour
ONEE	National Office of electricity and drinkable water
PEER	Performance Excellence in Electricity Renewal
PNUD	United Nation program for the development
PNUE	United National program for the environment
PPA	Power purchase agreement
PST	Plan Solaire Tunisien - Tunisian Solar Plan
PV	Photovoltaic
RE	Renewable energy
RES	Renewable Energy Solutions
RES4MED	Renewable energy solution for Mediterranean
STEG	Tunisian company of Electricity and Gas
STEG-ER	Tunisian company of Electricity and Gas - Renewable energy
WB	The World Bank

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Introduction to the auction mechanisms

1. EVOLUTION OF SUPPORTING SCHEMES: TOWARDS AUCTION MECHANISMS

Renewable energies have been developed massively for the last ten years thanks to new supporting schemes such as Feed-in-Tariffs (FiTs) and Feed-in-Premiums (FiPs). This evolution was quite important and total installed capacity grew from 814GW in 2004 to 1560GW in 2013 (Table 1) and reached1785GW at the end of 2015, basically doubling the installed power in 12 years.

Total Installed Capacity		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Solar Photovoltaic	GW	2.6	3.1	4.6	7.6	13.5	21	40	71	100	139
Concentrating Solar Power	GW	0.4	0.4	0.4	0.4	0.5	0.7	1.1	1.6	2.5	3.4
Wind Power	GW	48	59	74	94	121	159	198	238	238	318
Bio Power	GW	39	41	43	45	46	51	70	74	78	88
Geothermal Power	GW	8.9	9.8	10	10.4	10.7	11	11.2	11.4	11.7	12
Hydro Power	GW	715	-	-	920	950	980	935	960	990	1,000

Table 1 : Evolution of total installed capacity between 2004 and 2013

Source: REN21 (2014), '10 years of renewable energy progress', pp.9

This development allowed significant improvements in terms of technology-efficiency and cost. For instance, between 2008 and 2015, the average cost of onshore wind and solar photovoltaic (PV) decreased respectively of 35% and almost 80% (Figure 1).

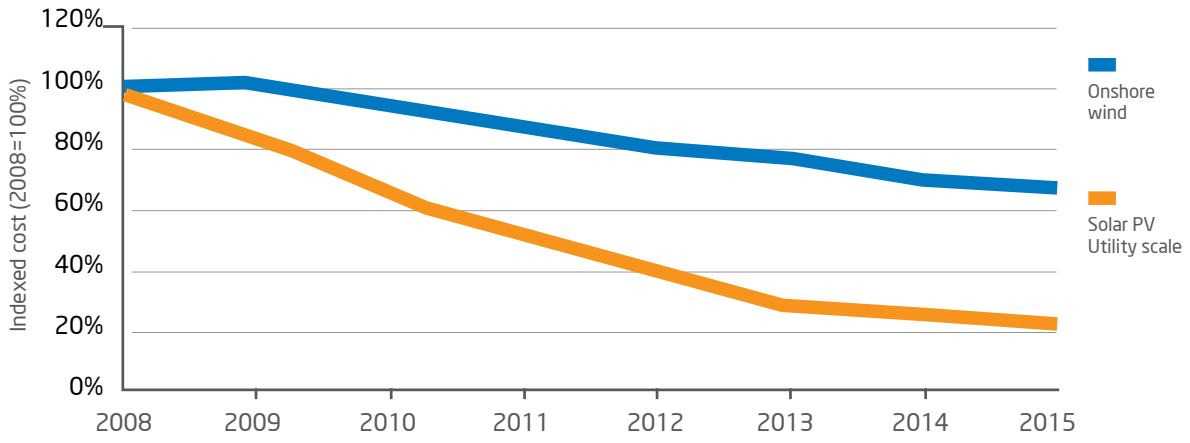


Figure 1: Indexed cost of onshore wind and utility-scale PV

Source: IEA (2016), "Next generation wind and solar power" – From cost to value, pp.8

As these supporting schemes began to be costly for the States while the actual costs were decreasing, new forms of subsidies needed to be used. Consequently, an important switch appeared, between the years 2010 and 2016, from these supporting schemes to a competitive and market based one: the auction mechanism (Figure 2).

Across the world, in both developed and developing countries, this process is massively adopted for its capacity to develop RE technologies at a lower price than any other subsidy system.

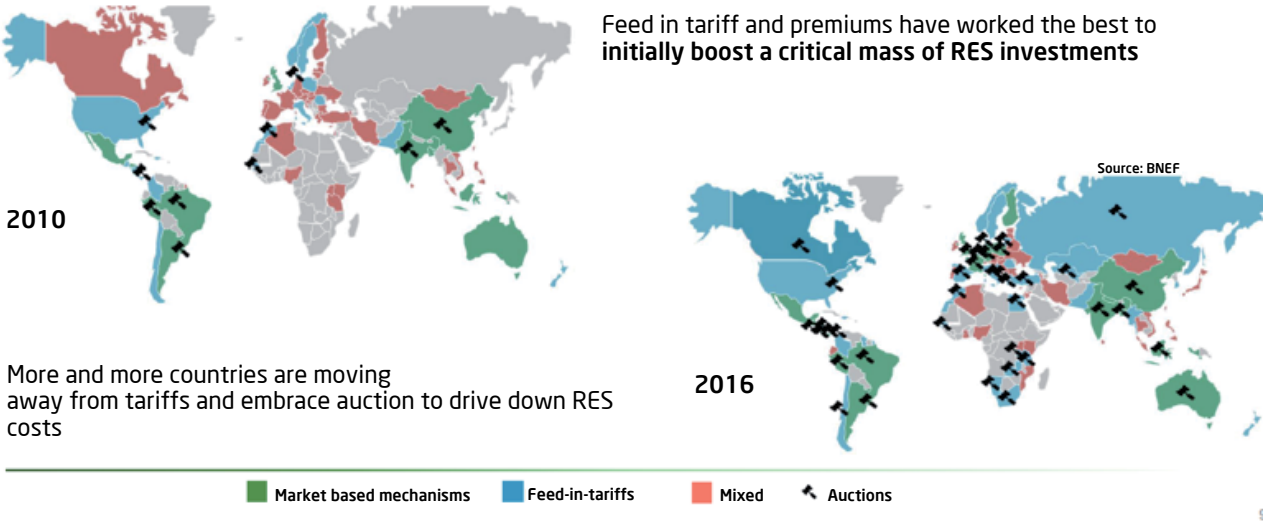


Figure 2 : - From FiTs and FiPs to auctions in countries around the world

Source: Bloomberg New Energy Finance

The introduction of competition in a state funded sector changed the rules and gave public authorities the access to market based prices, brought by the organized competition between actors. For instance, in 2010, the auction processes around the world for solar PV resulted in a global average price of almost Dollars US (USD) 250/MWh, to compared with the average price of USD 50/MWh obtained in 2016. This results in a reduction of 80%, thanks to the auction system and to the cost efficiency innovation introduced by the competition. Recent bids in Zambia or Morocco even reached respectively USD 60.2/MWh for solar PV and USD 30/MWh for wind. This cost-efficiency is the reason why most countries now choose this system for medium and large-scale RE projects.

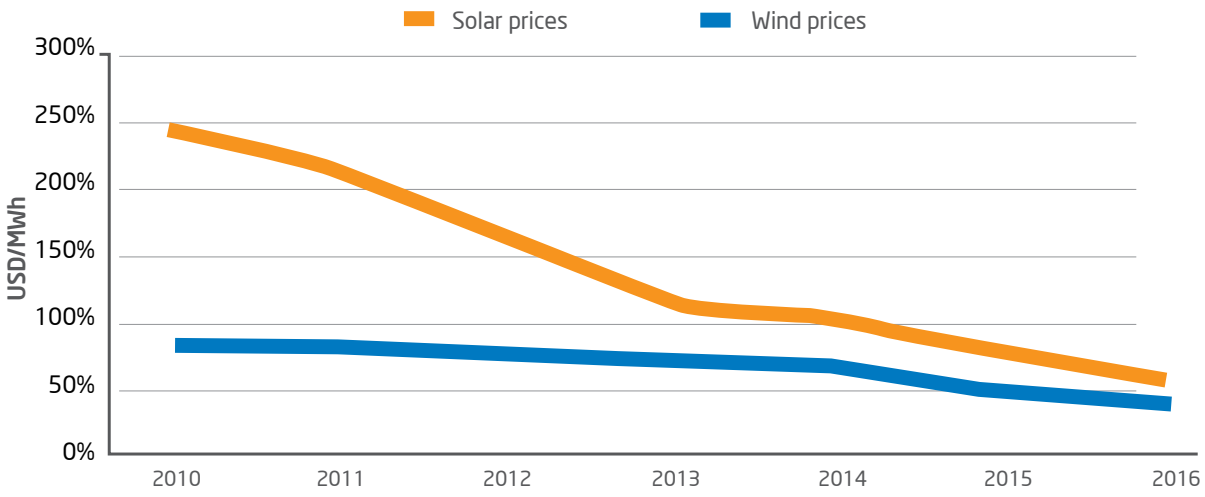


Figure 3 : Average prices resulting from auctions from 2010 - 2016.

Source: IRENA (2017) "Renewable Energy Auctions: Analysing 2016"

2. MAIN CHARACTERISTICS OF AUCTIONS

Although the wind and solar PV technologies become competitive almost all around the world, providing price security to investors is still the best way to boost their development by giving price securities to investors. Nevertheless countries need to find a cost-efficient way to do so, and for many countries around the world auctions proved successful in this sense. The main benefits from auctions is to allow public authorities to reveal the real prices of the projects while letting subsequent opportunities for the private sector to invest in a profitable project. If three main types of auctions can be found (sealed bid, iterative and hybrid processes), the global process is similar: the public authority informs the market about a specific RE development project and ask the private sector to make offers of price and quantity, together with commercial, financial and social details on how they will fulfil the project.
Then the winner(s) of the bid is/are chosen, either on the base of one single offer or after several stages of offers and negotiations, depending on the type of auction.
Once a winner, or a group of winners, is selected, a clear and transparent agreement is signed between the public authority and the private actors on a long-term duration basis and the construction and exploitation process can start. Diverse types of contracts are possible but the most common is the Power Purchase Agreement (PPA), because of its high flexibility and adaptability. Among all agreements contracted between the government and the investors, the PPA is the most important as it will secure the payment steam for the duration of the project. It also sets the required design, outputs, operation and maintenance specifications for the power plan. It can include penalties for both parties in case of delays in execution or payments, conditions for the investor not to fulfil its duty because of force majeure or purchaser breach of contract.
Overall the process takes about 2 years for the groundbreaking of the first project. When the tendering process has already been established in a Country it can take only several months (excluding the construction stage). The outcome is a reliable project for both the public authority and the private investors on a 20-25 years basis.

Benefits and weaknesses of the tendering process

Benefits	Weaknesses
Efficient price discovery Introduction of competition allows lower prices.	**Transaction costs** High transaction costs for bidders and public authority.
Flexibility Adaptable to each case in each country, whatever the market model and it can include local socio-economic requirements.	**Underbuilding and delays** Cancelled projects make investors lose up-front investment. Delays can outdate original bids if politico-economic conditions change.
Stable & transparent Clear commitments and liabilities for each party, regulatory certainty for investors. Favour investments in emerging markets.	**Deficient competition** Possible underbidding (price under costs) causing loss of profitability. Predatory bidding can keep out small bidders (which cannot reach very low prices) and let an oligopoly choosing the prices.
Greater certainty for policy makers Enable government to select price and quantity of RE.	**Other risks** External market factors, grid costs and delays, heavy domestic content requirements, environmental impact assessments, poor project management.
Benefits grid planning Scheduled implementation allows the authority to plan grid development and connection as well as predictability of production.	

Table 2 : Benefits and drawbacks of the auction process
Source: IRENA and CEM (2015), 'Renewable Energy Auctions'

All in all, auction programs are a very efficient way of developing RE technologies, and the weaknesses highlighted in the table above can be eliminated relatively easily. Indeed, the auction process and the related contracts need to be duly drafted, either by an experienced public authority or by an external advisor. This

allows to fix guarantees for public and private stakeholders through lowering risks for both investors and lenders: the authority obtains a low price and knows the quantities and the schedule of development; the investors are comforted with a reliable and secured investment with fixed prices on a well-known duration. In these conditions, developing countries can obtain access to foreign capital by attracting international investors with opportunities of secured investments. Moreover, the authority can even include local economic development to ensure that the country will benefits from the operation.

Optimizing the benefits and minimizing the risks

To make sure that the process takes only the best outcomes of the auction programs, different critical points can be identified, based on researches and best practices around the world:

***A healthy competition needs** to be guaranteed to ensure that the market mechanisms will push the prices down. In order to get competition, the size of the tender must depend firstly on the amount of capacity that the network can assured, although it can be split across multiple sites. It means that the terms of the auction must be well defined to comfort the investors and that the lots should be dimensioned to be accessible to medium size companies. However, larger size projects could mean that the transaction costs are a smaller part of the overall project and the price can be lower. On average for solar PV, the investment costs are about 2.2 million euros per MW installed, and 1.7 million for the wind.*

***However**, passing through a financial trade-off process (arbitrage), the government could favour investors that have access to the necessary financing capabilities and so it can dimension moderately larger lots (more than a 100MW each). In that case the PPA, the securities and guarantees need to be highly reliable as the risk for the companies becomes higher with a high undiversified investment.*

***Then the Agreement needs** to be very complete, transparent and clear with every guarantee for investors and authorities so that no unexpected event can notably harm either the company or the authority.*

***This can only happen** with a clear framework raising significantly the investor's confidence if transparent, stable, consistent and with credible timelines that need to be respected by the authority. Other contractual means for a consistent RE frameworks are based on long-term PPA's, either USD or EURO-denominated, which include grid expansion plans if this is the case.*

***In emerging countries**, the RE development can't be done without considering a healthy local growth and job creation targets which nevertheless needs to be realistic and grounded in the market context. That's why a domestic content and socio-economic component must be considered in the winner selection. Indeed, price criteria and local added value should be weighted according to their mutual importance.*

***Another crucial point** is to reduce entry barriers for the participants while ensuring the competency of the bidders. This is made through adapted prequalification requirements. If too high, the pool of bidders will be reduced, limiting competition and thereby raising the prices. If too low, risks of underbidding will occur together with excessive delays due to the lack of experience of the bidders. Clear penalties can be used to avoid this risk.*

***To favour a large variety of bidders**, the government shall offer good financing possibilities so the smaller companies could have access to interesting loans through mechanisms such as guarantees, partnerships with international or national institutions, public or private banks. The duration of the agreement (the so-called PPA) is usually between 20 and 25 years, giving investors a secured and fixed investment with long term visibility. However, PPA duration can be reduced once the auction procedure is well settled.*

Cases study: Renewable Energy tenders in Africa

The following sections will investigate the main points of the auction mechanisms through the study of African auction cases, totally or partially successful, organized by countries like Zambia, Egypt or Morocco. This tends to identify the key points for the success of an auction and to show that whenever the location, some specific features can ensure the efficiency of the process.
This part aims to identify the main reasons why some auction processes succeeded and why some others failed or encountered difficulties, and doing so, identifying the lessons to learn from these cases.

1. Case study Zambia : Solar PV: USD 60.2/MWh



Thanks to the Scaling Solar program of the International Finance Corporation (IFC) and the World Bank, Zambia organized a successful solar auction of a 73MW power plant, in 2015.
In a nutshell, the Scaling Solar program is an IFC facilitating program, giving to the governments the main keys to drive an efficient and secured solar auction program. It also allows both governments and investors to beneficiate from securities, first importance element in African developing countries.
By giving strong financial securities with the support of the IFC and the World bank, the government attracted 48 solar power developers, among which seven reached the final proposal step. The winners of the first layer (45MW) of the auction were First Solar and Neoen, with a record low contracted price in Africa of USD 60.2/MWh and the second (28MW) was Enel Green Power with USD 78.4/MWh.
These record low prices in Africa could have been reached mainly through the expertise of the IFC and the World bank and through the securities brought in the project. Indeed, the World Bank's insurance products and the Multilateral Investment Guarantee Agency's guarantees were used, together with the financial possibilities, such as the IFC's debt financing. Same for the duration of the PPA, 25 years of power purchasing are guaranteed to the companies, providing secured revenues every year on a long-term perspective.
But, according to the IFC, securities need to be backed by three important aspects in the tenders: scale, repetition of the process, and competition.
To optimise these points, some pre-requirements steps were already done by the Zambian government in a way to secure the project site and all the documentation the bidders would need (construction permits, land exploitation...). The government also found the right balance between over and under-scaled prequalification required: they had a pool made of competent companies, experienced and numerous enough to create a real competition effect. Moreover, the well-structured, transparent bidding process allowed not only to comfort the investors but also to make them respect the schedule: nine months after the first engagement with IFC for advice on the auction process, the bidders were chosen and the project finalised less than a year later.
If there is no perfect auction procedure for every African country, Zambia's example proves at least that the main factors of success in auctions around the world work also in developing countries and should be considered in any RE tendering process.

2. Case study Morocco : Wind: USD 30/MWh



In 2012, Morocco started an auction program to develop 850MW of wind energy generation in the country. This ambitious target is more than the current capacity of the country in wind energy (787MW in 2015).
If the specific terms of the project are still under negotiation, the winning consortium of Enel Green Power (EGP), Nareva Holding and Siemens Wind Power has been pre-awarded the right to develop, design, finance, construct, operate and maintain the

wind projects. According to EGP, the construction will require a total investment of about one billion euros and the end of construction and operation date is expected to be between 2017 and 2020.

The 850MW auction process was launched by ONEE (Office National de l'Electricité et de l'Eau potable), national electrical Moroccan agency, and divided in five batches:

- Midelt (150 MW)
- Tanger (100 MW)
- JbelLahdid (200 MW)
- Tiskrad (300 MW)
- Boujdour (100 MW)

Among the numerous consortia that applied for the program, five have been shortlisted by ONEE, including:

- Spanish Acciona Energia and Acciona Wind Power
- France's EDF Energies Nouvelles with Qatar Electricity and Water Company
- Fipar Holding and Alstom Wind
- Saudi group International Company for Water and Power Project in cooperation with GamesaEolicaSl
- Enel Green Power with the Moroccan company Nareva Holdings and the turbine builder Siemens.

The price obtained was a considerable success for the country, with USD 30/MWh (Euro 28/MWh), making the technology even cheaper than coal for Morocco. However, the ONEE's decision to retain the consortium was not only based on the price offered but also on the local content that they had to include that was given a significant weight by the national agency in the formula that determined the scoring of each bidding consortium. The minimum local requirement was imposed by ONEE: the development of a local wind industry, through the creation of blade production units in Morocco, the local production of towers and the implementation of formation centre, allowing for a true added value and a skill transfer for the country. The local content requirements were then quite engaging for the investors, but considered by many as fair, considering the size of the project and the amount of the investment.
Through loans contracted by ONEE as at very low rates as concessional financing and granted to the Project companies where ONEE itself was a minority shareholder, the tender was equipped with very attractive financing conditions. To do this, numerous international financial institutions were involved in the financing of the project. For instance, the ONEE raised funds through the German Bank of Development (KfW) for 130 million euros, the European Investment Bank (EIB) for 200 million euros, the European Commission for 15 million euros, the African Bank of Development (ABD) for 40 million euros and other entities. This operation allowed reducing the risks for the investors, as much as the cost of debt.
Concerning the PPA itself, although currently still in negotiations, the stakeholders were satisfied with the general terms including a 20 years old duration, numerous but fair penalties and a mixed currency for the purchasing of the power, partly in an international currency and in the Moroccan Dirham. This mixed currency is common in the projects in developing country, being a fair compromise between investor's request (100% international currency) and government's request (100% local currency).
The PPA, as we can see, is a good example of a bankable contract with strong securities and guarantees, good competition and appropriate local content. However, the project was not exempt from some difficulties concerning the timelines, due to the large scale of the project and the many entities involved in the various transactions.

As a first large-scale RE development auction, the Moroccan government delegated the oversight of the project to the national energy company: ONEE. Although an effective way to organize the auction through

an experienced and specialized entity, the skill concession had also its drawbacks. Indeed, ONEE was given many roles in the process: awarding authority, second main investor (50% of the total investment) and lender, via funds raised from international financial institutions. And if the national company have successfully managed the project well, producing an exemplary bankable PPA, and granting concessional financing to the project, the multiple roles ONEE took in the transaction required the build-up of complex procedures and corporate structures, resulting in a long and exhausting tender process (it took almost 7 years from the publishing of the project to the contraction of agreement.)

3. Case study Egypt



The Egyptian government started in 2010 a national plan whose goal is to install a total capacity of 11GW of RE until 2020, among which 2GW is to be constituted of wind energy. Stopped during the Arab spring, the plan started again in 2013 and had some new development recently: indeed, a 250MW wind farm in the Suez region has been awarded to a consortium of companies (ENGIE, Toyota, and Orascom) in 2016. The auction was organized in a single lot of 250 MW, designed to be awarded to one bidder, individual or consortium of companies. This moderate size lot, together with adequate pre-qualification conditions, allowed the Egyptian Electricity Transmission Company (EETC), organizing the bid, to attract many companies and to beneficiate from a sane competition. Indeed, the bidders had to justify the understanding of the project's scope, the exploitation of at least three similar wind projects in the past 5 years, a healthy history of the company, good human and financial resources/ capabilities.

Moreover, as the expected total investment was relatively important (about 345 million dollars), the New and Renewable Energy Authority (NREA) has started to raise consequent amounts of funds through international entities: the EBI, for 115 million euros; the KfW, for 72 million; the Agence Française de Développement, for 50 million, the European commission, for 30 million and finally the Egyptian government should provide around 78 million euros. Those funds have been lent mostly through the form of subventions as part of the international program to favour RE development in African countries. They represent just a possibility offered to the consortium for the 75% of debt required in the PPA to finance the project. If not mandatory, it is most likely that these funds will be used considering the very low interest rates provided by those institutions.

Concerning the local content, it was required initially to account for 25% of the project. As part of this requirement, the labour employed during the construction and operation of the Project was requested to be made only by Egyptian people (for unskilled and semi-skilled tasks) in accordance with Egypt Labour Law. The scoring weight of the different elements (price, local content…) was not given to the initial bidders, but the importance of the socio-economic local development was proven by a compliance criterion. Therefore, if after the Commercial Operation Date (COD), the consortium will not be able to demonstrate that the local content has been achieved, this will be treated as a breach of contract.

Initially in discussion with Lekela Power-Actis (which offered the lowest prices), the EETC is now awarding the project to a consortium formed between ENGIE, Toyota and Orascom. This was decided because the previous company did not complete the procedures and requirements announced by the ministry. Although the winning bid does not have the lowest price, it is still an international record low price, as the consortium won the bid for USD 46/MWh. The ministry later announced that this price would even serve as a reference for negotiations during any other tender in the future.

Considering the political instability of the country, strong guarantees and adequate penalties have been set. For instance, if the Ministry of Electricity (via the EETC) is unable to purchase the generated electricity, the government will pay the company (Take or Pay clause). The delays have also been covered, for both parties. On the consortium's side, in case of delays, 120 000 USD per day up to 180 days will be given to the EETC (Supply or Pay clause). Concerning the EETC, 660 million USD will be issued by the Egyptian Ministry of Finance to guarantee the payment capabilities of EETC to the Project Company, and 120 000 USD for each day of payment delay will be due. Finally, the consortium negotiated the payment of the tariff in two currencies: USD and Egyptian Pounds (EGP). This option is the most viable and balanced for both public and private actors. The PPA itself is a 20 years contract, as it is commonly seen in the wind energy sector, based on strong liabilities for the buyer and on the take or pay mechanism, giving locked and secured revenues for the seller. The contract locks the guarantee concerning the payment failure from the Ministry of Finance and the currency in which the different elements are paid. Although the initial contract was planning a decommissioning bond (of about 9 million euros), further negotiations allowed to remove this clause.

The auction process was thus a success, and as the PPA negotiations have finished, the operational phase is most likely to start in the coming year. Nevertheless, as for the Moroccan case, the process was not exempt from timeline difficulties. For instance, the qualification phase was in 2009 and the request for proposal was issued in 2013, due to the Arab spring and the high political instability of the country. Overall, the process took 8 years so far and is still in negotiation phase, but once again, this is also due to the will of the Egyptian authority to organize carefully its first ambitious RE auction process, considering its lack of experience in this domain. For the Egyptian case, the initial agreement was considered quite unclear, as it did not lock the future situation regarding currency or payment guarantees. Egypt being more unstable than Morocco, and economically less certain, the agreement needed to be revised and renegotiated by the consortium, but the conditions seem to have been accepted and the PPA might well be a bankable one.

Analysis of the Tunisian Context and Design of a Suitable Auction Mechanism

In 2017, Tunisia set the target of achieving a 30% share of renewables (RES) in its total electricity generation by 2030. In order to attend this target, in May 2017, the Ministry of Energy, Mines and RES launched the first round of the RES tender national programme, i.e. of a Request for Proposals (RFP) intended for private investors. Thanks to this programme, different RES technologies with a total installed renewable capacity of about 1,000 MW and investments around of 2 billion Tunisian dinars (US$ 0.84 billion), will be implemented during the 2017-2020 period.
The launch of this programme and the publication of this first RFP concerning renewable energy (RE) plants represent a major step forward in terms of RE deployment in Tunisia.
This chapter will analyse the Tunisian context, identifying the challenges and framework for RE development, and stressing the need for designing RFP attractive for private investors.

1. The role of RES in Tunisia

Since 2001, Tunisia has been confronted with an electricity deficit. Based on the 2015 data published by STEG on 25 February 2016, national electricity injected into the transmission grid was estimated at 18,256 GWh. About 81% of electricity generation (14,851 GWh) was generated by STEG. STEG generated 91% (13,459 GWh) of its electricity from natural gas. 53% of natural gas comes from Tunisian gas fields and 47% from purchases from Algeria. 74% of this gas is used for power generation. Actually, 65% of electricity is generated by combined-cycle plants, 12% by gas-turbine plants and 20% by steam-fired thermal plants. The share of RES in electricity generation is as little as 3%.

Power demand is constantly growing. In 2015, power consumption amounted to 1,446 kWh per person, vs. 977 kWh per person in 2000, up by an average of 3.4% per year in 14 years. In 2015, power demand rose by 2.98% with a peak of around 3,600MW in July. In 2016, the number of electricity customers was equal to 3,836,994, against 3,725,603 in 2015, up by roughly 111,500 customers.

This situation is quite serious, considering the following risks: worsening of the deficit, depletion of domestic energy resources, increase of energy demand, scarcity of energy supplies and price hikes on international markets, growing environmental requirements, etc.

To tackle this situation, Tunisia designed an energy efficiency strategy based on two pillars: increasing use of energy and the development of RES.

Plan solaire tunisien (PST)

In 2009, the "Agence Nationale de Maîtrise de l'Energie" (ANME – national energy conservation agency) put in place the "Plan Solaire Tunisien" (PST – Tunisian solar plan). This plan covers energy efficiency projects in the transport, construction and industrial sectors. The plan also includes some projects using RES (solar, wind, biomass). The implementation of the plan, in which both the public and private sectors participate, relies on an array of administrative, regulatory and financial support schemes.

The plan provides for developing a power capacity from RES of 4.7 GW by 2030, and for continuing the energy efficiency programme in the various sectors. Its goal is to save a total of 100 million tonnes of oil-equivalent (Mtoe) by 2030.

For the 2010-2016 period, multiple projects, involving investments of 3,360 million Tunisian dinars (US$ 1,380 million), were selected.

Given the evolution of the country's regulatory and political framework, the PST was updated after consultations with the key players of the sector. The updated version of the Tunisian solar plan, issued in December 2015 by ANME and approved by the Council of Ministers on 13 July 2016, reflects the country's intent to initiate an energy and economic transition towards a low-carbon economy based on two major choices:

- high energy efficiency to better manage energy demand;
- strong reliance on RES to diversify the energy mix for power generation.

By 2030, wind and solar will be the main technologies used for power generation from RES.

The following diagram shows the pace of integration of RES and the Performance Excellence in Electricity Renewal (PEER) Public by 2030 with respect to demand.

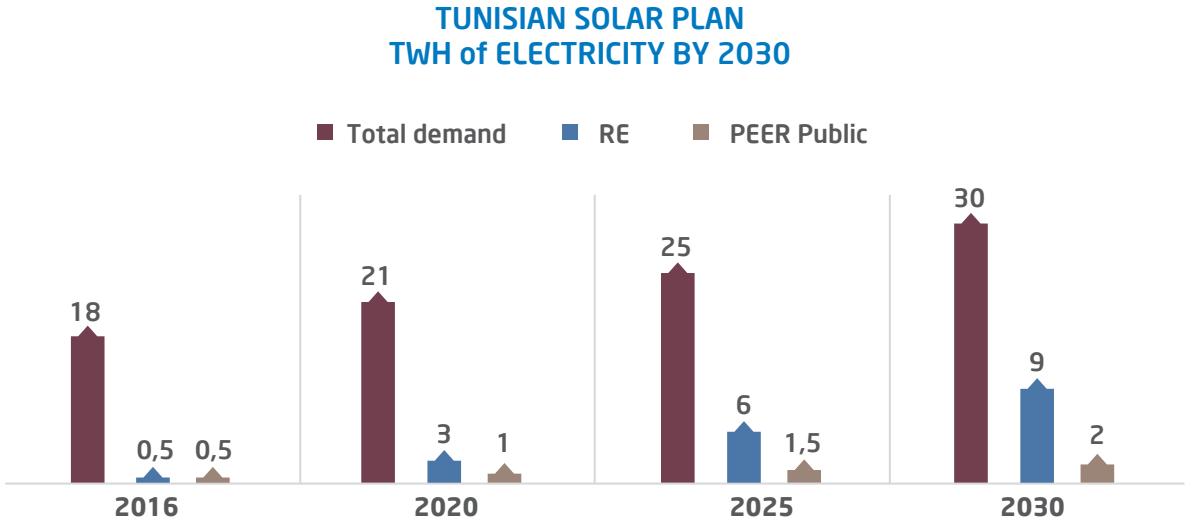


Figure 4: Tunisian Solar Plan for 2030 (TWh)
Source : Présentation développement des énergies renouvelables : Défis, Perspectives et Préalables STEG janvier 2017

2017-2020 development outlooks

With the framework of the PST, the Tunisian State put in place a programme of power generation from RES for the 2017-2020 period. This initiative will result into the installation of a capacity of 1,000 MW, of which 620 MW for the private sector, through investments of 2 to 2.5 billion Tunisian dinars (US$ 0.82 to 1.02 billion).

Hence, Tunisia hopes to progressively integrate RES into its energy mix, reaching a 12% RE share in electricity generation by 2020. A cooperation agreement was signed between Tunisia and Germany to fund the technical and logistic part of the program of power generation from RES (2017-2020). The following diagram displays the technologies involved in the RE programme for the 2017-2020 period.

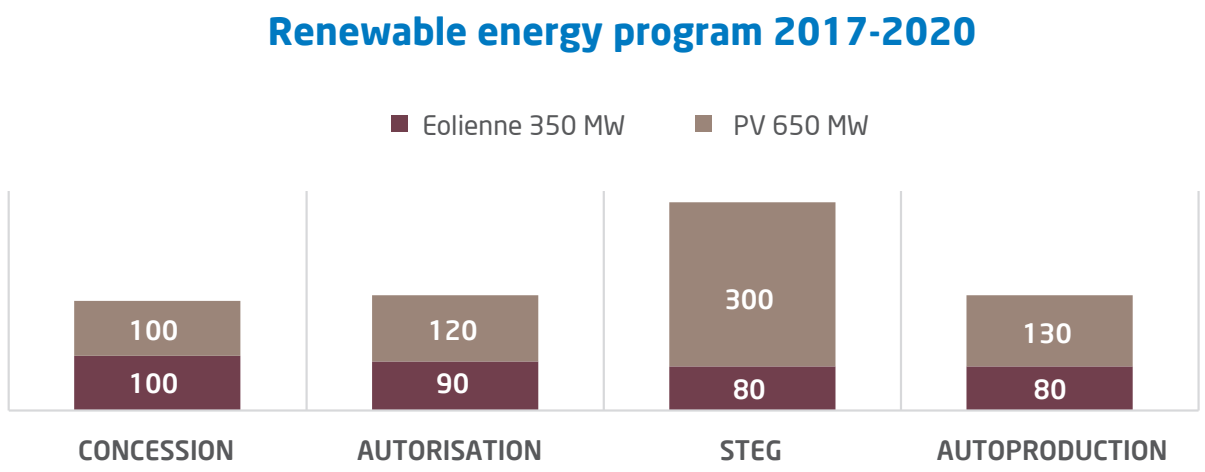


Figure 5 : Renewable Energy Program for 2017-2020 in Tunisia
Source : Présentation développement des énergies renouvelables : Défis, Perspectives et Préalables STEG janvier 2017

Given the wind and solar potential of Tunisia, the generation of 1,000 MW of electricity from RES will be based on solar PV and wind technologies.
One part of these projects will be implemented by the private sector through different schemes (concession, authorisation and self-generation). The other part will be developed by STEG. For each of the planned schemes, the State worked out an appropriate procedure.
The second stage of the national plan for power generation from RES, taking place in the 2021-2025 period, will cover the installation of an additional capacity of 1,250 MW. Part of this capacity may be installed earlier, i.e. in the 2017-2020 period.

The RE potential of Tunisia

• Wind

The wind atlas of Tunisia shows that there are good winds (speeds exceeding 7m/s at an elevation of 60 m) in the regions of Nabeul and Bizerte, in the central regions (Kasserine) and in the southern ones (Tataouine, Médenine, Gabès, Kebili).

Taking into account the installed capacity (MW) per unit area ratios and the land or sea area occupied by wind farms (1% of the total surface area of the country), the gross wind energy potential of Tunisia is estimated at over 8,000 MW.

• Solar

No accurate estimation of the Tunisian solar potential has been made so far, owing to the lack of detailed studies. In particular, there is no solar atlas that is accurate enough to estimate this potential. Nonetheless, as part of a program to qualify and harness Tunisian solar sites, various weather stations are being put in place. Thanks to these stations, more accurate estimations will be carried out.
A weather station has already been installed as part of a programme of cooperation between STEG- ER and the German Aerospace Centre (DLR). This station is gathering data (insolation, irradiance, temperature, pressure...) in the region of Tataouine. Another weather station was installed by STEG as part of the implementation of a 50-MW CSP project.

A comparison of recorded data with available satellite data indicated that the highest solar radiation values are measured in the southern regions, as well as in some mountainous areas of the central-western portion of the country. Sites with a DNI of 2,100 kWh/m² per year were identified in the northern regions; other sites with a DNI of over 2,400 kWh/m² per year were spotted in the south of the country.
Depending on geographic location and equipment performance, the average yearly generation of a fixed PV system in Tunisia ranges from 1,500 to 1,800 kWh/kWp (whereas for a mobile PV system, the average yearly generation ranges from 1,750 to 2,100 kWh/kWp) for an installed capacity of 1 kWp, i.e. covering the yearly consumption of 3 people.

The following table lists the potential sites for each technology and the related capacities.

	Site	Capacity (MW)	Total Capacity
WIND	Bir M'cherga	60	300 MW
	Douar dar remel	60	
	Takilsa	60	
	Tataouine	60	
CSP	Tataouine sud	250	400 MW
	Feriana	150	
SOLAR PV	Bir m'cherga	50	350 MW
	Tataouine	50	
	Oueslatia	50	
	Tyna	50	
	Tajerouine	50	
	Feriana	100	

Table 3: Potential capacities by site and by technology
Source: GIZ - Etude sur les potentiels ER pour la production d'électricité en Tunisie, 2013.

Programmes already implemented

• Wind: "Projet de développement par le secteur privé de l'électricité éolienne" (development of wind power by the private sector) - 2011

This project was implemented in close cooperation by the Tunisian Government and the United Nations Development Program (UNDP). The World Environment Fund (WEF) contributed to the funding of the project. This project represents one of the strategic achievements of the cooperation established between the Tunisian Government and the United Nations Development Assistance Framework (UNDAF) in the 2007-2011 period.

The goal of the project is to support public authorities' efforts in opening up the market of wind power to private developers, by creating a regulatory framework for granting the relevant concessions. The project is also intended to: reduce the use of hydrocarbons in power plants, while increasing the share of RES in the country's energy mix; and increase the level of integration of the Tunisian industry through the provision of wind power-related services or the manufacturing of some wind-turbine components.

• Solar

Since 2013, Tunisia has embarked on a process of energy transition based on ambitious RE deployment and energy efficiency targets. It is in this setting that ANME introduced the PROSOL programmes for residential customers.

– "PROSOL thermique résidentiel" (2005):

In 2005, the Tunisian State put in place its "PROSOL résidentiel" programme, with a view to promoting the development of solar thermal facilities in the residential segment. The programme involves an innovative form of funding based on investment subsidies and loans.

– "PROSOL tertiaire" (2009):

Given the success of "PROSOL résidentiel", the State rolled out a programme that took off in 2009 with the support of the United Nations Environment Programme (UNEP) and the Italian "Ministero dell'Ambiente e della Tutela del Territorio e del Mare" (Ministry of Environment, Land and Sea Protection). This programme was expected to develop sustainable solar thermal facilities in the service sector (especially hotels), by supporting the construction of about 15,000 m2 in the 2010-2016 period with a grant of €1 million.

– PROSOL ELEC:

The objective of the PROSOL ELEC project is to construct approximately 1,000 solar buildings with a total PV module capacity of 1,500 kW. The PROSOL ELEC scheme provides a number of incentives to STEG residential customers wishing to install solar PV facilities in order to cover part of their electricity requirements.

2. Context of the Tunisian market for the design of an auction mechanism

Structure of the electricity market

• Current situation

In the past decade, the primary energy demand of Tunisia is growing. However, demand remains dominated by hydrocarbons (natural gas and oil products), accounting for 99% of primary energy consumption, whereas RES (except for biomass) have a share of as little as 1% of this consumption. Higher dependence on conventional energy sources and lower domestic production of hydrocarbons have disrupted the energy balance since the early 2000s. Moreover, net electricity consumption, especially by households, went up in the past decade.

The electricity mix is poorly diversified, with a very weak penetration of RES. The share of RES (including hydro) in electricity generation in 2010 accounted for as little as 3%, the remaining share being chiefly represented by natural gas, 60% from domestic gas fields and 40% from the Algerian gas pipeline (royalties plus imports). This high dependence on natural gas may be a serious issue in terms of security of electricity generation, as forecasts suggest a gas shortfall beginning in the 2017-2018 period.

In the future, taking into account current conventional resources, the country's energy situation will pose major challenges in terms energy supply security.

The following diagram exhibits the energy mix for electricity generation in Tunisia in 2014.

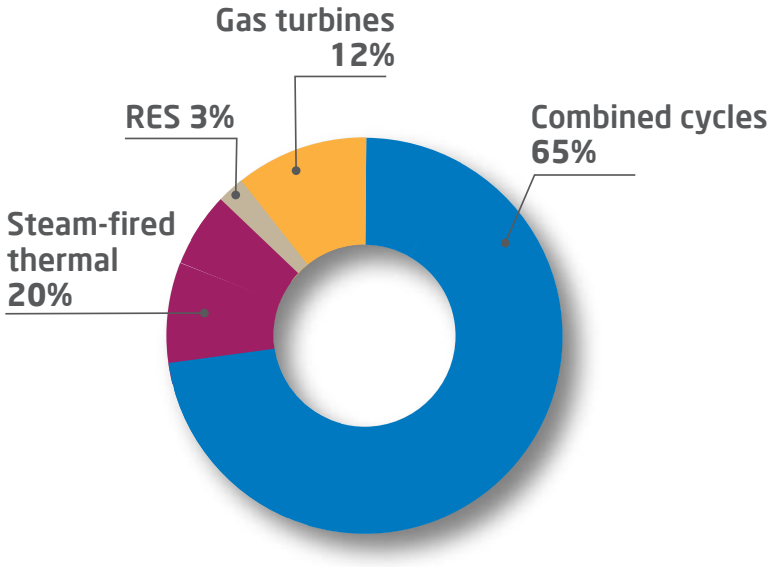


Figure 6: Tunisian energy mix
Source: MEDELEC / 22ème réunion annuelle - LE SYSTÈME ELECTRIQUE TUNISIEN - Avril 2014

In 2016, generation and capacity from RES vs. total generation and capacity were as follows:

	Generation	Capacity
RES	519 GWh	310 MW
Total	18,142 GWh	5,467 MW

Table 4 : Current generation and capacity from RES vs. total generation and capacity
Source: Présentation STEG-Développement des énergies renouvelables: Défis, Perspectives et Préalables-Janvier 2017

These figures show that, in 2016, the share of RES in total generation was still weak. Indeed, based on the previous table, generation from RES accounted for only 2.8% of total generation and 5.67% of total capacity.
This is the reason why the Tunisian State intends to start an energy transition and conservation policy in order to align its PST with current requirements.

The players of the Tunisian electricity market

"Ministre de l'Energie, des Mines et des Energies Renouvelables" (Minister of Energy, Mines and RES)

The Minister's tasks are as follows: **1.** Encouraging research and rational use of the energy resources of the country and ensuring its energy requirements coverage. **2.** Drafting legal instruments on energy matters. **3.** Enforcing the applicable regulation on and standard agreements for exploration and utilisation of hydrocarbons and other energy sources. **4.** Negotiating with companies and submitting permits for hydrocarbon exploration and concession agreementss for hydrocarbon exploitation to the Government. **5.** Working out projects of development of energy sectors; **6.** Monitoring the rational use of energy sources. **7.** Ensuring the optimisation of production from hydrocarbon fields and the sale of energy products on the best commercial terms. **8.** Stimulating and promoting the use of new energy sources. **9.** Implementing a policy for saving energy and substituting conventional energy sources with new and renewable energy sources. **10.** To finish, nowaday the ministry is also the regulator of the market.

STEG

The key points of the mission of "Société Tunisienne de l'Electricité et du Gaz" (STEG) are as follows:

- electrifying the country;
- developing the natural gas network;
- building the electricity and gas infrastructure.
- STEG is engaged in production of electricity and Liquefied Petroleum Gas (LPG), as well as in transmission and distribution of electricity and natural gas.

STEG-ER

This private-law company is a subsidiary of STEG. Its mission is to give impetus and boost to the "Plan Solaire Tunisien" (PST). The creation of the company in May 2010 marked the take-off the national policy of promotion of RES. STEG-ER is engaged in developing private-public partnerships in the areas of RES and energy efficiency. Its main activities are design, construction, operation and maintenance of RE and cogeneration facilities. STEG-ER provides expertise, assistance and know-how for RE and energy efficiency projects.

ANME

"Agence Nationale pour la Maîtrise de l'Energie" (ANME - national energy conservation agency) was established in 1985. It is a publicly owned non-administrative agency operating under the supervision of the "Ministère de l'Industrie" (Ministry of Industry). Its mission is to implement the State's energy policies by conducting research on and promoting energy efficiency, RES and energy substitution.

Under law no. 62-8 of 3 April 1962, STEG is in charge of production, transmission and distribution of electricity and gas all over the country. Electricity is generated by a diversified generating mix, including 25 power plants (gas-turbine, steam-turbine, combined-cycle, hydro and wind plants) with an installed capacity of about 5,224 MW in 2015 (86% of total production, 17% through IPPs).

STEG manages and operates a 6,440 km-long transmission grid, which is divided as follows:

- 400-kV grid, 208 km;
- 225-kV grid, 2,790 km;
- 150-kV grid, 2,157 km;
- 90-kV grid, 1,285 km.

STEG operates and maintains a 165,090-km grid of Medium- and Low-Voltage lines and supplies electricity to 3,725,475 customers (residential, industrial, agricultural and institutional). It handles customer relations through 41 Districts and 88 Agencies.

The figure below displays the structure of the Tunisian electricity market.

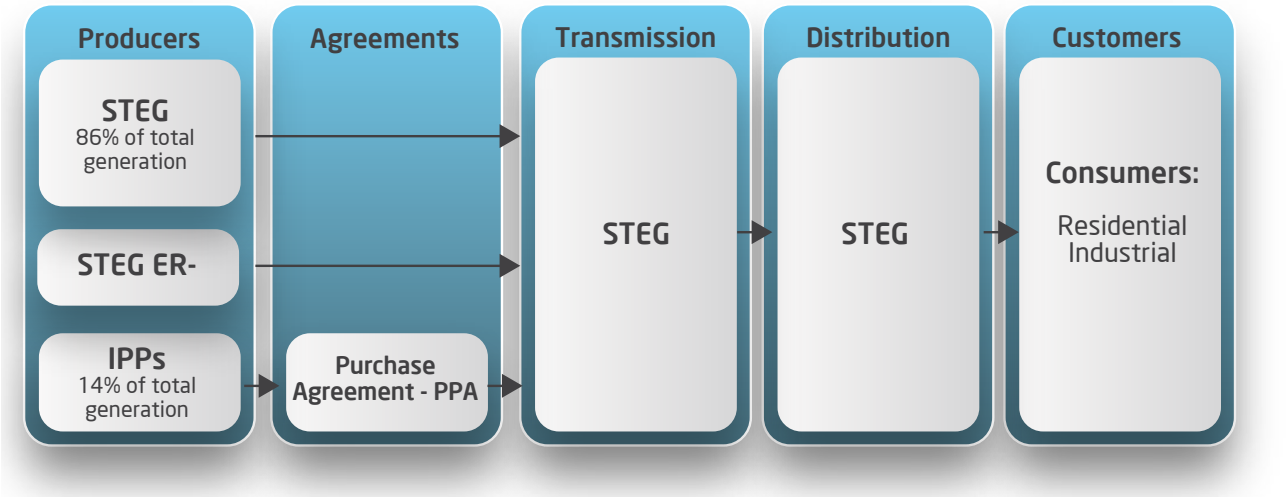


Figure 7 : Structure of the Tunisian electricity market

In 2016, 54 years after the creation of STEG, the country's electricity scenario was as follows:

- overall electrification rate from 21% to 99.8%;
- rural electrification rate from 6% to 99.5%;
- installed capacity from 100 MW to 5,476 MW (vs. 5,224 MW in 2015);
- national generation from 288 GWh to 18,246 GWh (vs. 18,256 GWh in 2015);
- consumption of gas by power plants equal to 3,840 ktoe (vs. 3,816 ktoe in 2015).

The Tunisian power grid

• The national transmission system

The overall electrification rate has reached 99.8% (100% in urban areas and 99.8% in rural ones).
The power distribution grid of Tunisia, covering 165,090 km at the end of 2015, consists of the following lines and substations:

Medium Voltage (MV) lines	56,576 km
Low Voltage (LV) lines	108,514 km
Total MV/LV lines	165,090 km
Total no. of MV/LV substations	68,669km

Table 5: Tunisian power distribution grid
Source: Rapport Annuel STEG 2015

• International interconnections

STEG has two international interconnections:

- the first between Tunisia and Algeria via 4 transmission lines of 90kV to 240 MVA;
- the second between Tunisia and Libya via 2 transmission lines (one 225 kV line and one 720 MVA line).

Legislative framework

2004

Law no. 2004-72
providing for the utilisation of RES, especially of solar and wind energy.

2009

Law no. 2009-7
integrating the law of 2004, by authorising self-generation of electricity from RES and introducing the option for self-generators to sell their electricity surpluses, limited to 30% of their generation, to STEG.

2015

Law no. 2015-12: generation of electricity from RES
This law has the following objectives: establishing the legal framework for implementing projects of electricity generation from RES, for self-consumption, for covering local requirements or for exports; and establishing the legal framework governing the facilities, equipment, buildings and materials required for generating electricity from RES and transmitting it.

2016

Decree no. 2016-1123
setting forth the requirements and modes of implementation of projects of generation and sale of electricity from RES.

2015

"Arrêtés" (decrees) of 9 February 2017
concerning:

- technical specifications for connection to the LV grid;
- technical specifications for connection to the HV/MV grid;
- agreement for the purchase of surpluses of LV self-generation (net metering);
- agreement for the purchase of surpluses of HV/MV self-generation (option to sell 30% of surpluses to STEG);
- PPA for selling total generation to STEG (authorisation scheme).

Possible structure for developing RE projects

The favourable context of Tunisia and the incentives that it planned for harnessing RES certainly encourage investments in this sector. Indeed, law no. 2015-12 of 11 May 2015, followed by the decrees of August 2015 and those of February 2017 encourage foreign investors by:

- Designing a national plan for power generation from RES;
- Extending the status of self-generators to local governments, publicly owned companies, and private companies. Under an authorisation scheme, the above parties can self-generate and self-consume electricity and sell their surpluses to STEG (resale price set by a decree of the Minister) within a maximum threshold limit (defined by a standard agreement);
- Enabling private companies to develop projects of power generation from RES to cover local requirements under an authorisation scheme;

- Allowing power generated from RES to be exported: under a concession agreement, private companies may generate green electrons for export, provided that a share of this electricity is allocated to the State. The agreement specifies the amount of electricity to be set aside for the State and its repurchase price.

3. Regulatory framework for a future auction mechanism

Law no. 2015-12

After a long period of adjustments, law no. 12, enacted in May 2015, finalised the regulatory framework for RE projects.

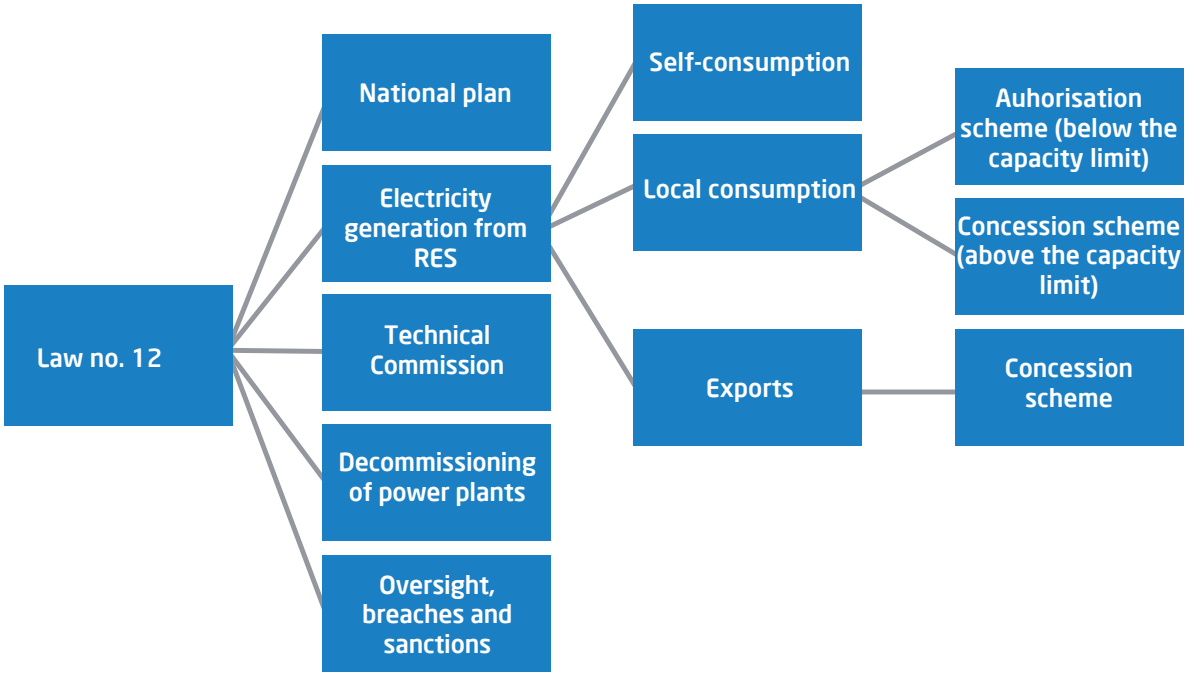


Figure 8: Law no. 2015-12 of 11 May 2015
Source: STEG présentation "Raccordement des installations EnR" avril 2017

In particular, this law entrusts the Minister of Energy with the task of formulating a national plan for power generation from RES, with generation programmes based on national requirements. The projects to be implemented shall cover generation for self-consumption, sale or export.

Law no. 12 provides that, for projects of electricity generation for sale, producers shall set up a SPV (Special Purpose Vehicle). Under the law, power plants shall be connected to the power grid through a single point of connection. For export projects, the producer may build a direct transmission line.

For all matters concerning the technical requirements for connection, the law refers to the relevant technical specifications. Furthermore, the law specifies that the power producer shall bear all expenses for connecting the plant to and strengthening the national grid.

As regards the decommissioning of RE plants, law no. 12 stipulates that the project developer shall bear all expenses for dismantling them and restoring the related sites.

• Self-consumption projects

Under law no. 12, any entity that is active in the industrial sector (local government, public or private institution) may generate electricity for self-consumption.
Thus, any self-consumption project developer may transmit electricity over the national grid and sell its generation surpluses (capped at 30% of production) to STEG in compliance with a pre-defined purchase agreement. The point of consumption and production can be different according to the law.

• Projects subject to authorisation

Projects of electricity generation for local consumption (within the capacity limit set by decree no. 2016-1123) shall be subject to an authorisation to be granted by the Minister of Energy, after hearing the opinion of the technical commission. The authorisations shall be granted after the Minister of Energy has published his/her "avis annuel" (yearly notice) of national requirements for electricity from RES.

Initially, the Minister shall give a preliminary approval of the project, enabling the power producer to set up a project company and build a plant. If the plant is to be built on State-owned land, the application shall be submitted to the technical commission for validation and then to the authority in charge of managing State-owned land. No new approval shall be given to a project developer for the same RES, if the construction of the preliminary approved plant was not completed. Finally, the approval shall be void if the plant is not built.

After the public entity in charge has confirmed that the plant is fully compliant with the technical specifications and that the inspection report has been signed, the project company shall receive an authorisation in its name to operate the plant. If the project developer wishes to transfer, assign or increase the capacity of the plant within the established capacity limit, it shall submit a new application for authorisation to the Minister. A new authorisation will have to be deliver by the minister if the producer wants to transfer, assign or increase the capacity of the production unit (within the limited power capacity established). The transfer of the authorization, of the production unit, the participation of other companies or the change in the capital structure should be agreed by the Minister for Energy on the advice of the Technical Commission.

• Projects subject to concession

Projects of generation of electricity to be sold locally that exceed the generating capacity limit set by the decree or projects of generation of electricity to be exported shall be subject to a concession to be granted by the State. Projects under concession shall comply with the competition principle. First, the technical commission shall assess the economic and technical feasibility of the project. Therefore, the project developer shall have all the required technical and financial resources, as well as bank guarantees. Subsequently, the project shall be approved by the higher commission in charge of independent electricity generation. After this approval, a concession agreement shall be entered into between the project company and the State, represented by its Minister of Energy. Law no. 12 provides details about the clauses to be included in the concession agreement, e.g. nature of the work to be carried out, duration of the concession or percentage share to be allocated to the State. In addition to collecting charges for granting of the concession, the State shall receive a given share of the electricity generated by the plant. This share may be given to the State in money equivalent or part in kind and part in money.

The electricity generated by the plant may be transmitted via the national grid or a direct power transmission line. If the electricity is transmitted via the national grid, an agreement shall be entered into between the

project company and the public entity in charge (STEG). The agreement shall lay down the financial, technical and commercial clauses for electricity transmission.

In the case of a direct power transmission line, the project developer holding the concession shall bear all expenses for construction and maintenance of the line. Then, the ownership of the line shall be transferred to the public entity directly and free of charge. In this case, the concession holder may acquire a priority right to use the direct line.

Decree no. 2016-1123

Decree no. 2016-1123 was enacted pursuant to and about one year after law no. 2015-12. This decree introduces some clarifications about the regulatory framework applicable to future RE projects.
In particular, the purpose of this decree is to set forth the requirements for implementing projects of generation from RES, as well as for selling the generated electricity.

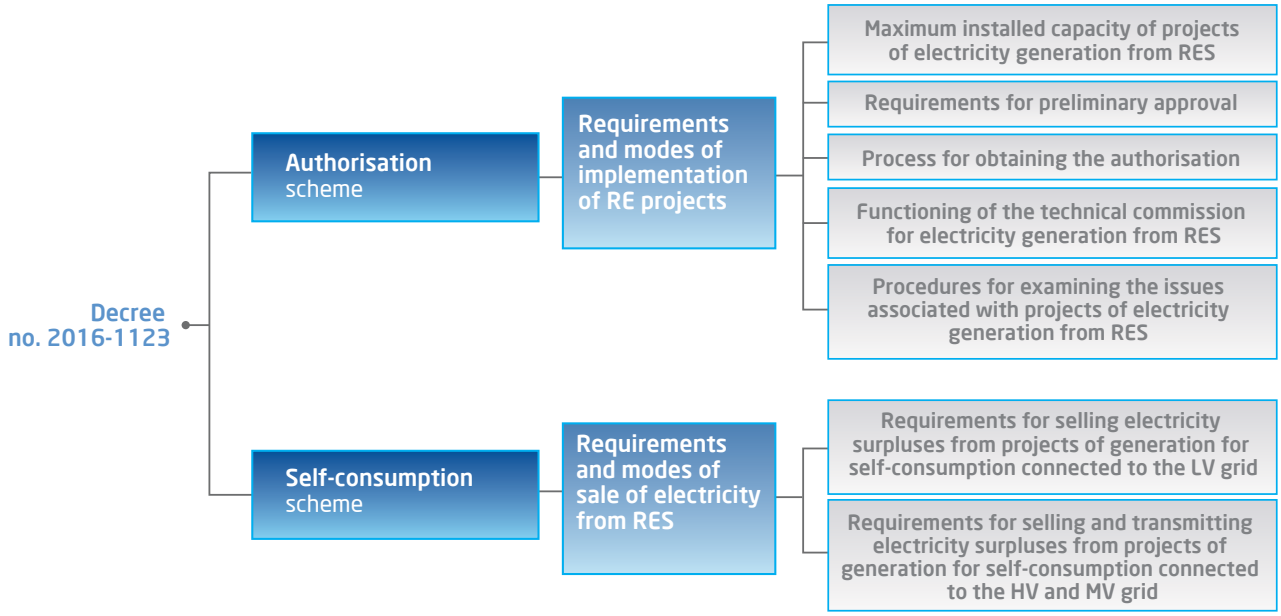


Figure 9: Description of decree no. 2016-1123

Technical specifications

The decree of 9 February 2017 introduced specifications or technical specifications for connecting RE plants to and injecting their electricity into the grid. These specifications are divided into two documents: one for the LV grid and the other for the HV and MV grid.

• Technical specifications for connecting RE plants to and injecting their electricity into the HV and MV grid

This document sets out the requirements that RE plants shall fulfil in order to be connected to the HV and MV grid. These requirements, listed below, have the main purpose of ensuring the good functioning of the national power system, in terms of:

- reliability of the national power system;
- grid stability;

- quality of service for customers connected to the grid;
- protection of grid equipment;
- safety of STEG personnel.

• Technical specifications for connecting RE plants to and injecting their electricity into the LV grid

Like the previous document, this one lays down the requirements that RE plants shall fulfil in order to be connected to the LV grid. Therefore, this document applies to all projects of electricity generation from RES that are connected to the LV grid via inverters.

Standard sale agreement

The decree of 9 February 2017 mentions a second category of important documents, i.e. the standard agreements for selling electricity generated from RES to STEG. The decree describes various types of agreements, depending on the scheme applicable to RE plants.

• Standard sale agreement for RE plants subject to authorisation

This agreement sets forth the rights and obligations of the parties (seller and buyer) in connection with the sale of electricity. In particular, the agreement specifies that all the electricity produced by authorised plants shall be sold exclusively to STEG. A decree of the Minister shall set the tariff applicable throughout the duration of the agreement and in accordance with the technical specifications.

• Standard sale agreement for LV self-generation plants

Under this agreement, a party that self-generates electricity from RES for self-consumption may sell its non-consumed surpluses directly and exclusively to STEG. If the plant is connected to the LV grid, the sale of surpluses shall depend on the congestion threshold of the grid. The agreement shall specify the electricity supplied from a single point of supply on the LV grid.

• Standard sale agreement for MV and HV self-generation plants

If a party self-generates electricity from RES for self-consumption and its plant is connected to the MV and HV grid, it shall be allowed to sell and transmit its non-consumed electricity surpluses over the national grid. These surpluses shall be sold exclusively to STEG (capped at 30% of production) which shall also take care of the transmission of electricity over the grid. The producer shall bear all expenses associated with the connection of its plant to and the improvement of the grid.

• "Avis annuel" no. 01-2016

The "avis annuel" (yearly notice) no. 01-2016 presents the programme of power generation from RES in the 2017-2020 period. The notice also specifies that projects of power generation from RES falling under authorisation and concession schemes shall be implemented by the private sector. These projects may be submitted after the Ministry of Energy, Mines and RES has launched the auctions and request for proposal for the 2017-2020 period.
Figure 10 shows the allocation of the capacity to be installed in the 2017-2020 period among the various technologies.

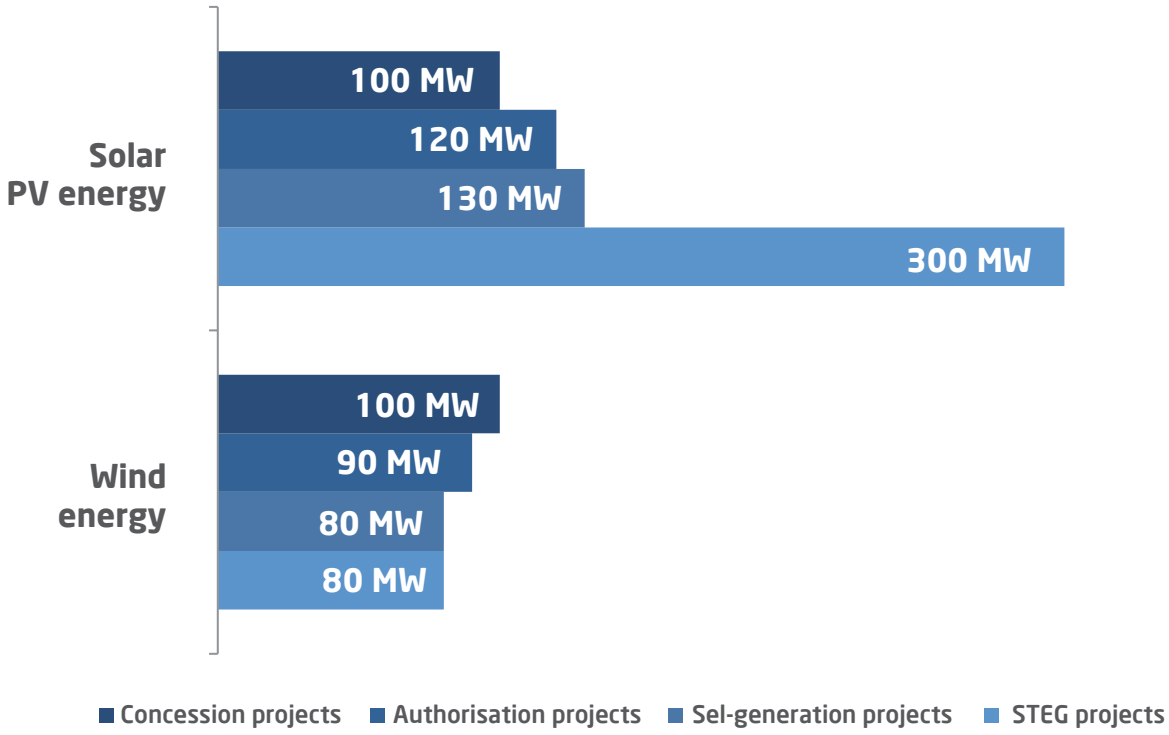


Figure 10 : Allocation of the capacity to be installed (MW) by projects of electricity generation from RES
Source: Avis annuel n°01-2016

The yearly notice also specifies that, in the 2021-2025 period, an additional capacity of 1,250MW will be installed. The allocation of this capacity among the various technologies is not yet available.

Request for Proposals (RFP)

In May 2017, the Ministry of Energy, Mines and RES launched an RFP with a view to initiating the programme indicated in the yearly notice no. 01-2016. This RFP will consist of two stages:

• Stage 1: Projects subject to authorisation

Stage 1 of the RFP concerns projects of power generation from RES subject to the authorisation scheme and whose electricity will be sold exclusively to STEG.
This RFP will cover the following capacities to be installed for each technology:

	Total capacity	Max capacity per project	Date of submission
Wind energy	60 MW 10 MW	30 MW 5 MW	15 November 2017
	60 MW 10 MW	30 MW 5 MW	15 August 2018
Solar energy	60 MW 10 MW	10 MW 1 MW	15 November 2017

Figure 11 : Allocation of capacities by technology
Source: Avis annuel n°01-2016

Project developers wishing to submit a proposal shall comply with:

- decree 2016-1123;
- technical specifications for connection of RE plants to and injection of their electricity into the grid;
- agreement of sale to STEG;
- Manuel des procedures.

The Ministry also made available an e-mail address for answering all queries regarding the RFP: ipper.autorisation@energy-mines.gov.tn.
The proposals shall be submitted to the Ministry before the deadline indicated in Figure 11.

• Stage 2: New action plan to accelerate the deployment of renewable energy projects in Tunisia

In order to better address the needs posed by the Tunisian energy transition and reach the targets of the PST issued on December 2016, with the goals of a 30% energy production from RES in 2030 and an intermediate 12% energy production from RES on 2020, the government decided to boost the program 2017-2020 with an additional capacity of 1GW. This target will be achieved with a multidiscipline approach by planning interventions on regulation, institutions, organization, financing, techniques and governance.
After a multilateral consultation with the most relevant stakeholders held on December 2017, the government approved on February the 28th 2018 a new action plan needed to reach the 12% goal for 2020.
By decision of the Ministry of Energy, in order to be able to follow the implementation of the action plan to boost the PST and evaluate its progress, a "task force" made by the Ministry of Energy, ANME and STEG has been set up. This mechanism will ensure continuous monitoring and periodic reporting for guarantee the achievement of the results in relation to the acceleration of the implementation of the program with a view to achieving its objectives for 2020 and 2030.

Definition of the Action	Set up of a follow-up mechanism to evaluate the progress of the action plan
Creation mode	Decision of the Minister in charge of the Energy
Responsible for the task force coordination	ANME
Permanent members	MEMER – ANME – STEG
Institutions / resources involved	All the ministries involved in the process, private sector, OSC, independent experts, etc
Launching date	Mars 2018

Recommendations for Optimising the Preparation of an Auction

This chapter will describe recommendations – both of a general nature and focused on the Tunisian case – to optimise the preparation of a public tender, in the interest of both bidders and of the country launching the tender.
With a view to supporting countries in their future projects, the initial part of the chapter will address the mistakes to be avoided and the key factors for a successful auction, based on the experience of RES4MED members. Then, the crucial issue of the PPA bankability will be tackled and some important points to consider in the preparation a bankable PPA will be listed.
The last part will be focused on the Tunisian case and on its current framework, with a view to providing specific recommendations. The goal is to optimise the preparation of the public tendering and ensure its attractiveness to international investors.

1. Mistakes to be avoided

Over the years, the members of RES4MED have gained sufficient expertise to identify the mistakes to be avoided during the preparation of an auction.

An unclear and uncertain framework	• Vague regulation • Uncertainties about the PPA bankability • Inaccurate decision-making criteria • Regulatory authority that is unstable and not independent.
Build-up of criteria potentially discouraging investors	• Insufficient size of proposed projects • Local development criteria that are too ambitious and impracticable for investors • Obligation to develop an irrealistic industrial project • Lack of visibility concerning the key aspects of the auction: land access, grid connection, financial aspects... • Obligation to create a joint venture or sponsorship by a local companies or partners. • High development costs for shareholders and developers • Lack of visibility of the key features of the sites, if the latter are proposed by the State.
Accumulation of delays in the programme	• Overlasting auction process • Owing to delays, downscaling for the capacity tendered • Postponement of the tender project owing to inappropriate planning
Lack of competition	• The tender does not allow enough bidders to participate • The lack of competition does not facilitate the setting of a price and the submission of an optimal project
A non-bankable PPA	• Uncertainties about the PPA bankability • Price expressed only in local currency and not in hard currency

2. The key factors of a successful auction

The key factors listed below concern various aspects associated with the preparation of a public tender and represent the toolkit for a successful auction.

Strong and committed local institutions	• All the institutions involved should be stable, committed and transparent. • The entity in charge of regulating tender projects should be strong and independent. • There should be a clear allocation of roles between institutions and players involved in the tendering procedure. • The involvement of market players during the design of the tendering procedure is essential for its success.
A clear and transparent framework	• Administrative burden related to public tendering should be minimised. • It is necessary to ensure a clear and transparent communication on the tendering procedure, during both planning and implementation phases. • Rules and standards that are suitable for both local and international investors are recommended. • The legislative framework should be firm and transparent throughout the preparation of the project (even after the auction). • The action plan and the responsibilities of players in the long term should be clearly described. • The process of the auction should be visible, clear and monitored by the competent authorities (right of land access, financial clause, grid connection...).
A flexible structure of the auction that encourages competition	• In the different rounds of the tendering procedure, the ceilings for the volumes to be auctioned should be set below the potential market demand and be realistic; this will give a signal of scarcity that promotes competition and price decreases. • The auction should be fair for all investors, so as to spur competition. • Flexibility of the energy market and of the framework of the auction is recommended in order to enhance competion. • The structure of the auction should be flexible and adjustable, depending on the intended requirements and goals. • Selection criteria should be precise and clear.
A bankable PPA	• Prices should be expressed both in dollars (USD) and in the local currency. • The legislation governing the PPA should be stable and transparent. • Before launching the auction, the bankability of the PPA should be ensured.
Guarantees provided	• Investors should be certain that the specified volumes and prices are feasible. • The Government should provide investors with risk-sharing guarantees. • The opportunities for support by the Government should be visible and certain. • The participation of international financial institutions is a plus to ensure financial guarantees in the auction.
Structured and feasible timescales	• The authorities involved should set and meet clear and accurate timescales. • Deadlines should be realistic. • The tendering process should not be too long, so that projects can be quickly implemented. • Waste of time in the definition of the tender framework and during the tendering procedure should be avoided, as this might be critical for future projects. • Continuity in the frequency of the auctions should be ensured, so as to avoid risks associated with stop & go support measures and to reduce the investment risk and allow investors for economy of scale.

3. Recommendations for preparing a bankable PPA

One of the primary elements of the auction is the agreement to be signed between the buyer and the future project developer. The PPA, which sets out all the commercial clauses for the sale of electricity between the parties, is a key instrument in the project funding process and provides legal certainty to both the off-taker and the project developer.
The current market standard and often the most competitive solution for financing medium-large scale RE project is funding new project through non-recourse financing. Projects are therefore financed purely on the basis of the quality of the project, a key factor being the reliability of the power purchase agreement. A PPA that does not provide adequate guarantees to lenders could result in bad financing condition, as well as the rejection of the project. Therefore, to be put in the condition to obtain competitive financing and consequently place a competitive bid, investors need a bankable PPA.
To this end, it may be useful to turn to International Financial Institutions that have experience in this field, to seek their opinion and advice on the actual bankability of the proposed PPA, and to make changes thereto accordingly. The following are a few recommendations for developing a bankable PPA.

• Coverage of the dispatching risk

The agreement should specify guaranteed volumes, i.e. through take-or-pay or take-and-pay clauses (under which the buyer undertakes to pay for the electricity generated, whether dispatched or not, at the set price), in order to provide the developer with return-on-investment certainty.

• Currency in which the electricity price is expressed

The electricity price should be expressed either in hard currency (USD/EUR) or in the local currency with the conversion into USD/EUR.

• Adjustment of the electricity price on a yearly basis

The electricity price indicated in the contract should be yearly adjusted in USD/EUR, to take into account the annual depreciation of the currency and other factors.

• Guarantee of solvency

The agreement should include a form of liquidity support, such as an escrow account, a demand guarantee issued by a qualified bank, or a sovereign guarantee that may be used in case of insolvency of the buyer.

• Agreement termination indemnity

In case of premature termination of the contract by the buyer, the latter should indemnify the seller for an amount covering the debt, own funds and the return on the investment expected by seller.

• Price adjustment in case of legal and economic changes

The agreement should include a price adjustment clause, covering changes that might occur after the date of its signature in terms of legislation, taxation and economic context and that might have an impact on the project developer's return on investment.

• Designation of an expert mediator

The parties (or the International Center for Expertise of the International Chamber of Commerce) should jointly designate a qualified person or independent entity in charge of settling disputes.

• Arbitration

Any dispute not solved by the mediator should be settled in compliance with the rules adopted by the international community (UNCITRAL or ICC).

• Guaranteed payment in case of errors attributable to the buyer

Payments for the assumed electricity generation should be guaranteed in case of delay or damage attributable to the buyer and making the transfer of electricity impossible.

• Force majeure clause

The agreement should include a force majeure clause to cover unforeseen events beyond the control of the developer that prevent it/him/her from fully honouring its/her/his commitments.

• Duration

The PPA is usually covering a long-term period as 25 years, which may then be extended, is recommended. However, the most appropriate type of PPA will change over time in order to dispatch the risk.

4. Recommendations for the design of a future auction mechanism in Tunisia

In May 2017, the Ministry of Energy, Mines and RES, announced the launch of the first Request for Proposals concerning RES. This RFP, described in the previous chapter, is focused on projects to be implemented by private companies under an authorisation scheme. In particular, the RFP refers to the development of wind energy projects of 30MW (within the limit of a total installed capacity of 60 MW) and solar photovoltaic (PV) projects of 10 MW (within the limit of a total installed capacity of 60 MW). The deadline for submitting proposals is 15 November 2017. This RFP, being the first experience of the country with the RE auction process, present some limitations and some margin for improvement.

In this part of the study, RES4MED and its members have formulated a number of specific recommendations with a view to supporting Tunisia to improve design of the actual request for proposal and the future auctions, foreseen under the authorisation regime, ensuring their success and optimising their attractiveness to potential investors. It is understood that most of the recommendations listed, being ultimately targeted at setting up an healthy and competitive investment environment for RE developers, can be largely applied also the projects ought to be developed under concession regime.

These recommendations result from the contributions of numerous members and partners of RES4MED, active in the different branches of RE, after the study of the current request for proposal launch in may 2017. Hence, the purpose of this chapter is to share the expertise of different RE sector players on a well-conceived auctioning process.

THE REGULATORY FRAMEWORK

Ensuring an understandable and transparent governance framework

- The Government should be fully engaged in the design of auctioning and RFP procedures and in the setting of the related timeline.
- Set clear deadlines for the publication of the Ministry of Energy's decree on the granting of the authorization at the beginning of the commercial operation of the production unit following its completion.
- Set clear deadlines for STEG to define the official start date for the production unit as provided for in the standard sales contract
- Eliminate any administrative conditions that could delay the effective start of commercial exploitation and affect the revenue of the production unit. Alternatively to provide safeguard clauses

Specifying the requirements for connection to the national grid

- Some requirements for connection to the grid should be specified, e.g. mutual costs, timescales and penalties for delays.
- Connections to the grid made available by the Government would be attractive to investors.
- Provide the possibility of modifying the connection point, without penalties, if justified from an economic point of view.
- Provide conditions for economic compensation in the event of delays that are not the responsibility of the project developer (eg delays in connection times).
- Clarify the connection procedure in order to define the obligations of the players, the conditions for covering the risk of delays and the risk of variation in costs between the date of the agreement and the date of connection

PRE-QUALIFICATION

Setting precise and simple pre-qualification requirements to ensure quality of bidders

- Setting out precise and simple eligibility requirements for bidders in order to develop and automatise a pre-qualification process and to reduce the costs of the auctioning procedure.
- Pre-qualification requirements, if any, should be defined in a clear and fair way and ensure an optimum level of competition within the auctioning procedure.
- The pre-qualification requirements have to be clear and transparent. Moreover, if a ranking is foreseen, the criteria for assigning pre-qualifications points to each bidder should duly detailed and clearly communicated to all bidders

TIMESCALES

Avoiding delays and failed deliveries

- The timescales for launching the auction and preparing the projects should be clear and firm.
- Where site selection falls under the responsibility of the Government, the latter should procure all the necessary authorisations associated with land access and use, as well as environmental permits.

THE STRUCTURE OF THE AUCTION

Establishing accurate, clear and stable criteria to ensure the competitiveness of the auction

- Turning to independent experts to determine the criteria for the auction may be a plus.
- Describing the criteria of the auction and of the RFP in a clear and detailed manner can enhance their attractiveness and favour competition.
- Set up an effective communication with bidders providing timely and clear replies to their queries.
- Remove limits on the number of projects developers can bid for in order to encourage economies of scale and cross-technology in order to achieve economies of scale

Ensuring transparency about tariff ceiling

- The process currently used to set the tariffs for the authorisation scheme might have an impact on the strategy of investors and discourage investments.
- Clarify the conditions concerning the setting of the feed-in tariff duly in advance (ministerial decree): competitive offer of the tariff on the part of the project's development as well as tariff adjustment mechanisms to be activated to maintain the same level of return on investment following a change in framework condition throughout the PPA duration.

Defining the right size of projects in order to ensure competition and effective project implementation

- The reduced capacity of some projects (project of 1 MW PV and 5 MW wind in case of the current RFP) could discourage international investors and limit participation to local players that might not have the experience required to place competitive bids as well as difficulties in bearing the financial cost of the call for proposals procedure.
- Small investors may have difficulty in bearing the financial cost of the call for proposals procedure.
- The multiplication of offers can be costly for public authorities

Establishing appropriate and realistic local content requirements

- The requirements for procuring local content should be expressed as a percentage of the goods or services used directly or indirectly for implementing the project. These requirements should be consistent with the actual capacity of local firms to supply given goods or services.
- A too high percentage of goods or services to be procured locally vs. the actual capacity of local firms to respond to this demand may decrease the competitiveness of the project, increase costs or cause delays.
- High demand for local content could be problematic for investors in the case of small project development (10-30MW)

GUARANTEES

Reducing and sharing investment risk by provision of suitable funding guarantees

- Funding options for the projects should be provided through international funding institutions.
- Guarantees should be introduced in the auctioning and RFP procedures to cover the risks incurred by investors and by the country.
- Solutions for sharing financial risks (sovereign guarantees, coverage of the exchange rate risk...) are necessary to ensure the bankability of the project.

THE PURCHASE AGREEMENT

Ensuring the bankability of the PPA

- The adoption of a simple and secure payment procedure can lower the risk premium demanded by investors, thereby improving the competitiveness of the auctioning procedure.
- Recommendations by international financial institutions can support the drafting of the PPA, making it more attractive to foreign investors.
- The use of a standard PPA, whose clauses are well known by project developers (e.g. those defined by International Financial Institutions), can ensure its bankability and procurement of competitive finance, thereby reducing the risk premium demanded by investors.
- Some of the most relevant point of attention identified by RES4MED in the Tunisian PPA for authorisation:
  - Legal clauses of the PPA, such as arbitration and force majeure, needs to be drafted based on international standard in order to make it attractive both for lenders and investors;
  - Need to clarify the conditions relating to "not withdrawn energy (Energie Non Enlevée - ENE)" and the methodology for calculating the level of this energy not delivered during an unplanned interruption of energy evacuation as well as reimbursement conditions
  - Review the conditions concerning coverage of the risk of change of law and provide a compensation scheme if new legislation affecting the economic viability of the project will be set up.
  - Introduce public guarantee clauses (eg hedging of the off taker default risk, hedging the currency risk) in order to guarantee the bankability of the PPA
  - Align the duration of the contract with the actual start of the commercial operation of the plant.
  - Make more flexible rules concerning the disposal of assets or changes in the composition of the capital of the project company in order to guarantee an exit strategy for investors.
  - Define the conditions for resolving disputes, especially concerning the conditions for recourse to arbitration
  - Lenders should be allowed to enter into Direct Agreement with STEG. At the end of the contract in case of resumption of the production unit by STEG, the appraisal procedure for valuation of the asset have to be clarified.

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RES4MED's members support

ENEL GREEN POWER - PÖYRY - PwC - ASJA - EnR (Renewable Energy Partner)

Useful Links

Link to the Ministry of Energy, Mines and RES:
http://www.energymines.gov.tn/

Law no. 2015-12:
http://www.energymines.gov.tn/documents/loi-n-12-fr.pdf

Decree no. 2016-1123:
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- For self-generation plants:
- connected to the LV grid:
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- Details : http://www.energymines.gov.tn/autorisation.htm
- How to participate: http://www.steg.com.tn/ministere/ipperautorisation.php
- Queries by email: ipper.autorisation@energy-mines.gov.tn

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