

# Improving the Market Access of Waste Management Enterprises in North Africa and the Middle East

Prof. Dr. Gerhard Roller, *I.E.S.A.R. Bingen, Germany*  
Dipl.-Ing. (FH) Ludger Nuphaus, *I.E.S.A.R. Bingen, Germany*  
Dipl.-Ing. Marita Schnepf-Orth, *sofia, Hochschule Darmstadt, Germany*

## CONTACT

Prof. Dr. Gerhard Roller  
I.E.S.A.R. (Institute for Environmental Studies and Applied Research)  
Rochusallee 4, 55411 Bingen am Rhein, Germany  
Telephone: +49 6721-919 337  
Fax: +49 6721-409 110  
Email: [iesar@fh-bingen.de](mailto:iesar@fh-bingen.de)  
Website: <http://fh-bingen.de/Institut-IESAR.118.0.html>

## EXECUTIVE SUMMARY

The export of assets and technical expertise of small and medium-sized enterprises (SME) to developing and emerging countries is often considered to be a difficult task in spite of undeniable success stories. The SMEs have to overcome diverse difficulties: alongside insufficient knowledge about the legal and market situation in these countries, there are also cultural differences that often hinder the access to new markets.

The central focus of the research project "clima-pro", which is supported by the German Federal Ministry of Education and Research, is analysis of the legal, administrative and economic requirements of market access. For this purpose, Morocco and the United Arab Emirates have been selected as target countries, followed by Algeria und Egypt. Aspects of diverse business cultures and socio-culturally determined barriers to technology transfer shall be considered as well.

The project concentrates on three industry sectors: waste, energy, and wastewater. Opportunities based on the trade of emission certificates (CDM projects) are also analysed.

The aim of the project is to develop specific tools for improving the competitiveness of German enterprises in environmental markets of developing and emerging countries. These tools are now being tested in a pilot phase. The purpose is to specifically facilitate the economic success of SMEs in terms of waste management and environmental <sup>technology</sup> in such countries.

## 1. BACKGROUND OF THE RESEARCH PROJECT

German companies supply technologies for different environmental problems, which have found long-term acceptance in the national and European markets, and are also innovative. Despite the export strength of the German economy, the export of installations and technical know-how to developing and emerging countries is often difficult, in particular for small and medium-sized enterprises (SME), since several constraints have to be overcome.

Currently in many developing and emerging countries a dynamic development can be observed in the setting up of a new framework for environmental protection. New regulations, new institutions and financial support programs have been implemented in recent years. Companies wanting to tap market opportunities there have to consider questions of technical, legal, institutional, economical and cultural aspects in the respective target country. Lacking knowledge about the legal situation in developing and emerging countries and cultural trenches on limited personal and material resources often lead to a situation where it seems impossible, particularly for small and medium enterprises, to get involved in and enter those markets. This research project aims to provide support, especially in legal, economic and institutional fields, by making this information available to SME.

Due to international agreements it can be expected that markets for environmental technologies will further increase. Particularly the negotiation of a follow-up agreement of the Kyoto Protocol including tightened emission caps for greenhouse gases affecting the climate as well as the millennium targets adopted by the United Nations point in this direction.

### 1.1. Market Opportunities in the Environmental Sector

High rates of growth are expected in all sub-segments of environmental technology. It is assumed that the market for sustainable energy production is going to be doubled until the year 2020, at which point gas and steam technology as well as carbon capture and storage technologies will be included. The renewable energy sector is going to undergo greater growth.

For the solar heat sector a growth of 22 million m<sup>2</sup> in the year 2005 to 486 million m<sup>2</sup> in 2020 is estimated. This is commensurate with an average annual growth of 23%. For photovoltaic a growth from 1 GW<sub>peak</sub> to 16 GW<sub>peak</sub> (+20% p.a.) and for wind energy 5 GW to 40 GW (+9% p.a.) is predicted.

In the waste sector more increases are expected as well. The sector of waste and recycling plants shall grow from 30 billion Euros in 2005 to 46 billion Euros in 2020. This is commensurate with an annual growth of 3%. The partition of automatic waste separation is expected to expand from 190 million Euros in 2005 to 1.4 billion Euros in 2020 (+15% p.a.) The sustainable water management is predicted to have transaction volumes which amount to 480 billion Euros in 2020. Mainly the sector of water supply is expecting a growth of transaction volumes from 160 billion Euros in 2005 to 335 billion Euros in 2020 (+5% p.a.) while annual growth rates of 10% are estimated in the waste water treatment sector.

The highest growth rates can be expected in the sector of sustainable water resource management, rising from 8 billion Euros in 2005 to 50 billion Euros in 2020, which is commensurate with an annual growth of 15%.

## **1.2. (Environmental) Law is a Driving Force for Innovation and Investment**

The traditional perception in industry and often also among the legislators is that law in general and environmental law in particular is an obstacle to investment. The understanding of our research project is in direct contrast: Environmental law can be a driving force for innovation and investment. The most convincing example is currently certainly the growing market for renewables, which would not exist without regulatory instruments and incentives, such as feed-in tariffs. But also in other environmental branches, like waste water or waste management, the regulatory framework creates new technological solutions. This effect can be seen more and more, also in developing and emerging countries. In the last two decades, a new environmental law corpus has evolved and modern concepts have been introduced into the national legal orders in these countries. New institutions have been set up in order to enforce these new regulations. German development cooperation is actively supporting this process and often is involved in the law-making process and the institutional capacity building in these countries. Another effect of this development is the fact that the reflex of companies to look for the easiest way to produce and to look for the cheapest option will become less attractive because environmental law standards are evolving worldwide.

For companies it therefore becomes crucial to know the specific legal and institutional framework in the target countries where they want to play a role on the market. While a lot of information is made available today as far as the general economic opportunities in foreign markets are concerned, there is a lack of comprehensible information on the legal and institutional orders and in particular about environmental law and its application in these countries. In addition, there is no analysis available on the extent to which this regulatory framework can lead to market opportunities for companies (in particular SME). This is our research project's point of departure.

Hence, the target of this research and development project is to develop concrete tools to help small and medium enterprises to become economically successful in the area of environment and climate change technologies in developing and threshold countries as well as to have a substantial share in the sustainable development of those countries. These tools are now being tested in a pilot phase and shall be specified in the course of the paper.

## **2. DESCRIPTION OF THE RESEARCH PROJECT**

### **2.1. Project Partners**

The research project "clima-pro" is funded by the German Federal Ministry of Education and Research and supported by numerous companies and public institutions:

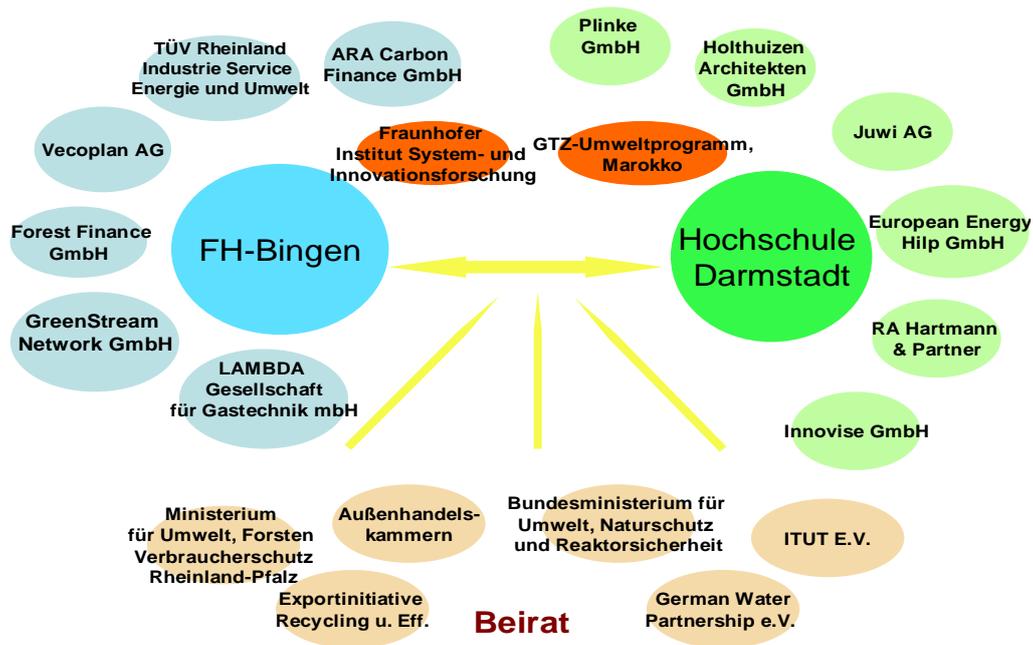
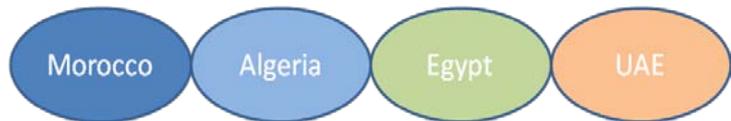


Figure 1 Project partners of “clima-pro”

## 2.2. Countries

The project focuses on countries of the MENA region. On the one hand, a very dynamic process of improving environmental solutions is underway in these countries (ambitious plans of increasing renewable energy, huge investments in controlled landfill) and German companies are still reluctant to enter these markets. On the other hand the research project has a pilot character; the regional focus may facilitate the integration of the projects results into existing networks and structures. For this purpose, Morocco, the United Arab Emirates, Egypt and Algeria have been selected as target countries.



The development of a significant market for environmental technologies can be expected in Morocco. There, the implementation of an efficient environmental legislation began in 2003 and shall continue in the years ahead. The Moroccan government intends to invest 3.7 billion Euros in waste management in the next 15 years as well as to increase the share of renewables in the primary energy demand to 10% by 2012. The UN climate Change Secretariat has recorded three Clean Development Mechanism projects in Morocco: two projects for wind power and one for photovoltaic.

In other Maghreb countries comparative developments can be observed. Although Tunisia has not been chosen as a target country within this research project, some comparative information has been collected. In Tunisia a considerable increase of environmental investments can be seen, since effective environmental legislation was adopted a few years ago.

The focus of Tunisia’s CDM activities is on the landfill sector: Two landfill projects are already indexed and other projects which are expected to save collectively 12.7 million tons of CO<sub>2</sub> equivalent up to 2011 are intended to follow.

The United Arab Emirates is one of the most dynamic economic regions in the world searching for new solutions for a rapidly growing population, especially in the sectors of renewable energies, water and waste. German enterprises are underrepresented in the Emirates at this time, so that specific information about the development in the UAE could contribute to an exhaustion of export materials.

## 2.3. Tools

### 2.3.1. Tool 1: The environmental investment radar

The environmental investment radar is a dynamic information system providing country- and sector-specific information on new environmental laws, institutional aspects, economic instruments and an analysis of the market opportunities for small and medium enterprises. The structure of the environmental investment radar can be seen in Figure 2.

This information system, which highlights current legal developments as well as the resulting market opportunities for enterprises, contributes to achieving entry to new markets or rather expanding or sustaining market shares which already exist. It provides high level, up-to-date and detailed information on the general market situation. Relevant laws and regulations, programmes and the competence of institutions and private stakeholders in the target countries are summarised in “datasheets”. Links and contact persons are provided. Important original documents are made available. ([www.umweltinvestitionsradar.de](http://www.umweltinvestitionsradar.de))



Figure 2: Structure of the environmental investment radar

Companies may use this tool to improve decision-making and to get a better picture of whether there are specific market opportunities for environmental technologies in the respective countries, whether the trend in policy and law will benefit the export of environmental technologies and whether constraints exist on special technologies.

As the environmental investment radar is conceived as a “dynamic” tool, not only is existing regulation considered, but also proposals for new regulation. The strategic decisions of companies have to take into account future developments. Given the fact that environmental regulations are usually under political discussion for a long period, proposals and drafts in early stages may constitute important information for companies.

Figure 3 shows the database structure of the “law” sector:

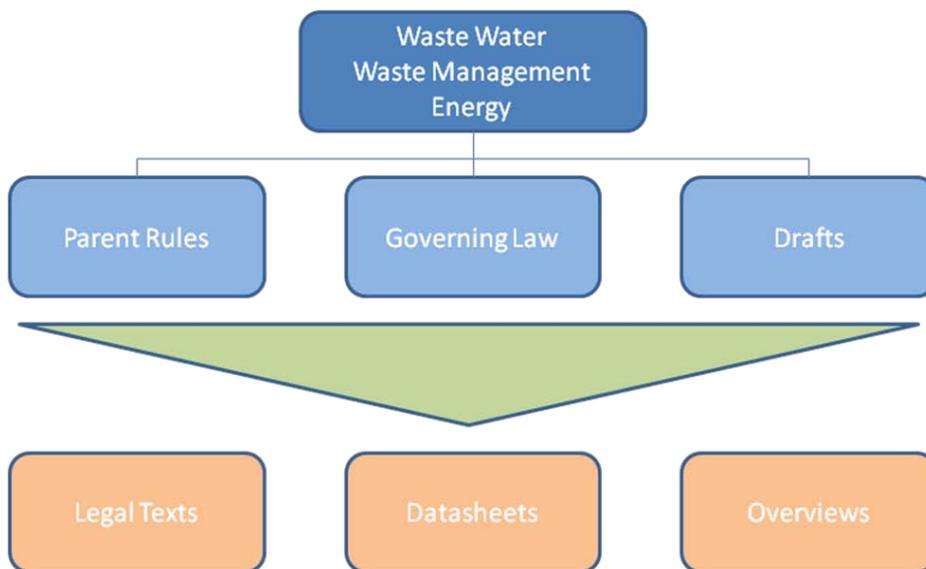


Figure 3: Database structure “law” sector

### 2.3.2. Tool 2: Recommendations for the acquisition of intercultural competencies

It is estimated that up to 70% of the Joint Ventures which have already been carried out do not fail because of problems of the negotiability of technical solutions or economical constraints, but mainly because of intercultural problems and misunderstandings.

One experience recorded is that technical solutions and technical products are not self-selling because of their rational and functional principles. The extent to which the adoption of products and technologies is accepted in non-European countries is not only based on the “objective” qualities, but also on the (social) qualities and credibility of the intercessors of the innovation. Intercultural misunderstandings and non-consideration of such misunderstandings could represent a fundamental cause of failed market entry.

For this reason, the research project has integrated the issue of intercultural competence and developed concrete recommendations for SME. The recommendations for the acquisition of intercultural competencies provide support for proprietors and employees of small and medium enterprises who are interested in intercultural trainings. This tool permits the staff to move “culturally competent” and confidently in the field of foreign trade, which could in turn help minimise the frequency of misunderstandings on an international level (<http://www.clima-pro.de/261.0.html>) .

## 3. A NEW REGULATORY ENVIRONMENTAL FRAMEWORK AS MARKET OPPORTUNITY

In recent years, the Maghreb countries have developed their own modern regulatory framework in the waste sector (Figure 3). While waste acts have entered into force in all respective countries, the regulatory framework still suffers partly from a lack of concrete technical instructions and environmental standards (limit values) concerning landfill, (co-)incineration or handling of hazardous waste. In this field, there are a number of proposals on the desk which are analysed in the environmental investment radar.

**UIR**  
UMWELTINVESTITIONSRADAR

## Abfallwirtschaft Marokko Recht

<Detailinformationen | Home | Länder | Interkulturelle Kompetenz | Exportförderung | Aktuelles | Links

Recht  
Förderung  
Akteure

Länder | Marokko | Abfall | Detailinformationen | Recht

### Abfall Recht

Recht		
Übergeordnete Regelungen	Geltendes Recht	Entwürfe
Umweltrahmengesetz Datenblatt (in Arbeit)	Abfallgesetz Nr.28-00 <b>Datenblatt</b> <b>Gesetzestext</b>	VO Abfallverbrennung <b>Datenblatt</b> <b>Gesetzestext</b> <b>Entwurf</b>
UVP-Gesetz Nr.12-03 <b>Übersicht</b> <b>Datenblatt</b> <b>Gesetzestext</b>	VO medizinische und pharmazeutische Abfälle Nr.2-09-135 <b>Datenblatt</b>	VO Gefährliche Abfälle Datenblatt (in Arbeit) <b>Gesetzestext</b> <b>Entwurf</b>
		Deponie-VO <b>Datenblatt</b> <b>Gesetzestext</b> <b>Entwurf</b>

Figure 4: Screenshot environmental investment radar

In Morocco draft regulations have been elaborated on co-incineration, hazardous waste, and transboundary shipment. Recently, a landfill regulation was adopted.

To guarantee the enforcement of these new laws, new institutions have been set up. In Morocco an ongoing process of decentralisation can be observed. Permits are increasingly being issued on a regional and even on a municipal level. In Algeria, a more centralist country, the regulation n°02-175 of 20 May 2002 has set up a new national Waste Agency; in Tunisia “ANGed”, a national waste agency, was established in 2005.

	Morocco	Algeria	Tunisia
Environmental Framework Laws	Loi n° 11-03 relative à la protection et à la mise en valeur de l'environnement	Loi n° 83-03 du 5 février 1983 relative à la protection de l'environnement	(Loi N° 88-91 du 2 août 1988 portant création de l'ANPE)
		Loi n° 03-10 du 19 juillet 2003 relative à la protection de l'environnement dans le cadre du développement durable	
Waste Legislation	Loi n° 28-00 relative à la gestion des déchets et à leur élimination (in force since 2006)	Loi n° 01-19 du 12 décembre 2001 relative à la Gestion, au Contrôle et à l'Élimination des déchets	Loi n° 96-41 du 10 juin 1996, relative aux déchets et au contrôle de leur gestion et de leur élimination
Waste Legislation Support Programme	Programme National des Déchets Ménagers et Assimilés (PNDM): Budget 37 Bill. DH (3 Bill. €) in 15 years.	PNAGDES (hazardous waste), PROGDEM (domestic waste), 9,3 Bill. USD for the development of the waste water disposal and drinking water supply	
Energy	Loi n° 13-09 relative aux énergies renouvelable (11-2-2010)	Loi n° 04-09 du 14 août 2004 relative à la promotion des énergies renouvelables dans le cadre du développement durable.	Loi n° 2009-7 du 9 février 2009, modifiant et complétant la loi n° 2004-72 du 2 août 2004, relative à la maîtrise de l'énergie

Figure 5: Legislation and support programmes of the waste sector in Maghreb countries

#### 4. CONCLUSION

The research project has shown considerable opportunities in the market of the target countries. Given that they are up-to-date and their target group focus, the developed tools constitute a valuable supplement to information that is already available.

The expected achievements of the environmental investment radar shall be integrated in current support initiatives like the ReTECH initiative of the German Federal Environmental Ministry or regional networks (e.g. the Maghreb network NECEMA<sup>1</sup>), which are supported by international cooperation agencies or chambers of commerce.

The project has been limited to date in two respects: In terms of the regions covered, only four countries of the MENA region have been selected. As the project focuses on German SME, the information on the web site is up to now only available in German language. It may be useful to widen the application of the developed tools to a European level.

#### REFERENCES

<http://www.clima-pro.de/>  
[www.umweltinvestitionsradar.de](http://www.umweltinvestitionsradar.de)

<sup>1</sup> Network for Environmental Compliance and Enforcement in the Maghreb, hosted by the Moroccan Environmental Ministry. The network is part of the international INECE network and was created in 2006, see <http://www.inece.org/mena/>. Also, in Jordan, the Arab Network for Environmental Compliance and Enforcement (ANECE) was founded in 2009.