



MOROCCO

WASTE
**Moroccan society's
uneven response to the
proliferation of waste**

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MOROCCO

Moroccan society's uneven response to the proliferation of waste

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Host of COP22 in Marrakesh in 2016, the kingdom of Morocco has successfully positioned itself as a rising climate action leader on the African continent. Located in a key Mediterranean position marked by pollution and escalating waste, Morocco has nevertheless had difficulties seeing through its first commitments, made ten years ago, to organize waste collection and treatment systems. Despite numerous initiatives, the country still lacks an appropriate governance framework to coordinate waste. As the volume of waste produced continues to rise, what are the ways to align the scattered efforts in this sector?



Key takeaways



The last decade or so has seen Morocco produce considerable institutional legislation to regulate and drive the improvement of waste collection and treatment systems in line with its environmental and climate ambitions. Yet despite the move towards decentralization that began in 2011, the policy governance framework still lacks efficiency.



Moroccan cities have made notable operational progress in the collection chain, in spite of weak planning capacities in the regions, provinces and prefectures (17 plans completed out of 67 launched). 25 disposal and conversion centres have been created since 2008.



In the "sorting-recycling-recovery" industry, the priority is on professionalizing collection and reducing landfill volumes. Energy recovery from waste using anaerobic digestion (Kenitra, Fes, Oum, Azza), incineration and conversion into refuse-derived fuel (RDF) is advancing at the cost of stagnating recycling performance (currently 6% for a target of 20% in 2030).



The private sector is an essential component of the measure aimed at improving waste treatment, through contracts delegating the management of sanitary services and landfill. Major companies (Suez, Lafarge) are investing massively in this sector in Morocco, and an SME ecosystem is developing to come up with local solutions, often initiated by young entrepreneurs.



Due to its focus on social problems and pollution from illegal dumping, Morocco is struggling to instil a recycling, energy-saving approach in order to stem waste production at source, illustrated by its difficulties in applying the Zero Mika law.



Lastly, civil society is widely taking up the issue, playing either the role of whistle blower (ZeroZbel against plastic, an environmental protection collective against the Médiouna landfill), or playing an action coalition card to put forward ideas (AESVT, AMCDD).

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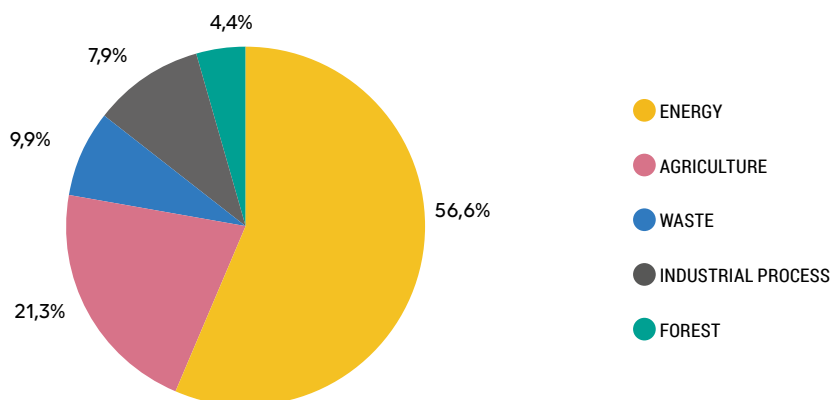
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1. Waste in Morocco,

a key emission sector made into a “national priority”

FIGURE 1

BREAKDOWN OF GHG EMISSIONS BY FIELD (2012) - Source : [World Bank, \(2017\)](#), based on data from the [Ministry of the Environment \(2016\)](#)



In 2015, the reference year, the total amount of waste in Morocco was estimated at 26.8 Mt, excluding agricultural waste, with expected growth of up to 39 Mt by 2030, according to figures published in the National Strategy for Waste Reduction and Conversion (SNRVD). This waste production was split as follows:

- 7.4 Mt of household and similar waste (HSW), 79% of which in urban areas. In 2017, 4.7 million tonnes of household waste (HW) were recorded annually.
- 5.4 Mt of industrial waste (IW)
- 14 Mt of construction and demolition waste (CDW). ([SNRVD, 2019](#))

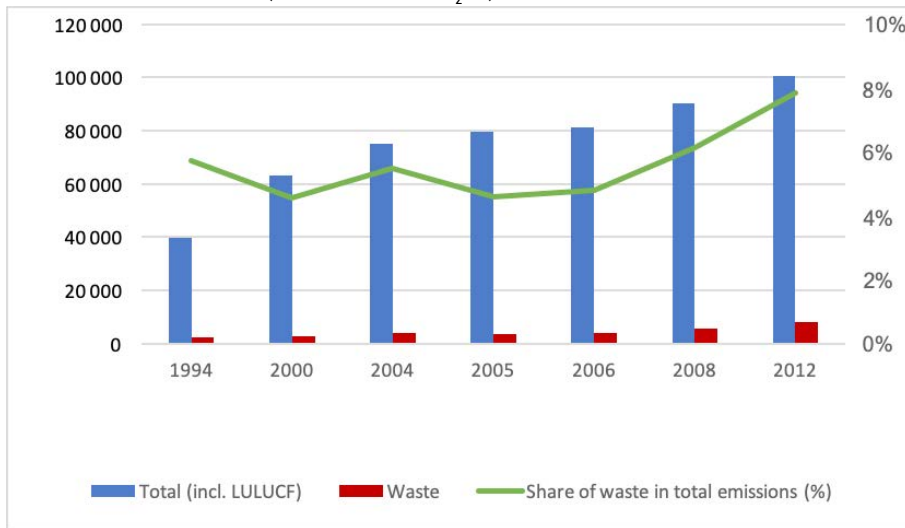
Waste constitutes a rising share of the country's greenhouse gas emissions. In its Third National Communication to the United Nations Framework Convention on Climate Change (UNFCCC), Morocco estimated its net total anthropogenic GHG emissions in 2012 as 100.55 MtCO₂eq, almost 8% of which attributed to the waste sector ([Ministry of the Environment, 2016](#)). This sectoral proportion is higher than the global average – estimated at between 3% and 5% – and constantly increasing: waste only represented 4.6% of emissions in 2000 (fig. 2).

These GHG emissions are divided between 82% from solid waste and 18% from sanitation and wastewater. **Since the introduction of its National Household Waste Programme (PNM) in 2008, Morocco has significantly improved the rate of deposit in controlled landfill of the HSW collected, increasing from 10% prior to 2008 to 44% in 2015** ([World Bank, 2017](#)). The remainder of the collected waste is deposited in one of 300 uncontrolled dumps around the country. Similarly, the rate of professionalized collection, in other words operated by private companies in the frame of a public service delegation, rose from 44% in 2007 to 86% in 2015. One of the collateral effects of these developments is the ability to refine and specify the trackability of waste, making it easier to measure its carbon footprint.



FIGURE 2

MOROCCO'S GHG EMISSIONS (IN KILOTONNES CO₂EQ)- Source : UNFCCC



In point of fact, because the quantitative data available on waste volume and GHG emissions are relatively weak, it is preferable to use secondary, or “proxy”, data to analyse the dynamics of its evolution (cf. Climate Chance’s [Global Sectoral Profile on Waste](#), 2019). It is actually difficult to establish whether nominal variations in this sector can be put down to a fluctuation in real values, or to better measurement methods. This is illustrated by the differences in raw emissions calculated since the introduction of the new Moroccan inventory system (box 1). In such an uncertain situation, it is nevertheless possible to analyse Morocco’s progress in waste management by looking at the development of recent regulatory instruments, innovations in the private sector, action undertaken by local authorities, and civil society’s efforts to foster change. Thus, as in numerous countries, most of Morocco’s progress on the environment and climate change can be put down to more efficient collection, sorting and recycling.

TO BETTER UNDERSTAND

ESTABLISHMENT OF AN INVENTORY SYSTEM OF GHG EMISSIONS SPECIFIC TO MOROCCO IN 2018 (SNI-GES)

A new decree establishing the National Inventory System of GHG (SNI-GES) was adopted in November 2018 to fulfil Morocco’s international commitments by creating a national inventory system on GHG and a national coordinator working with the different sectors concerned. On the basis of this new system, a recent evaluation of total GHG in Morocco from 2010 to 2014 was produced by the Climate Change Competence Centre of Morocco, created in 2015 (4C, 2019). Given that the methodology and areas covered are different from the methods previously employed for National Communications to the UNFCCC and reproduced in World Bank reports, the two data sets are not comparable. Generally, though, the estimated emissions produced using the new methodology are lower than previous calculations.

According to this analysis, direct emissions (except for land use) of greenhouse gases in Morocco amounted to 75,447 kilotonnes CO₂eq in 2010 and 85,224 ktCO₂eq in 2014, which is an increase of 13% between the two years, but with lower values than the country’s previous official communications to the UNFCCC.

BOX 1

Although management has been improving for several years, the quantity of waste produced continues to increase. Impacted by economic growth and urbanization, national production of household and similar waste (HSW) increased from 6.3 to 7.4 million tonnes a year between 2007 and 2015 ([World Bank, 2017](#)). Only 10% of this HSW was recycled in 2017, far below the 20% target set for 2020 by the Moroccan Ministry of the Environment.

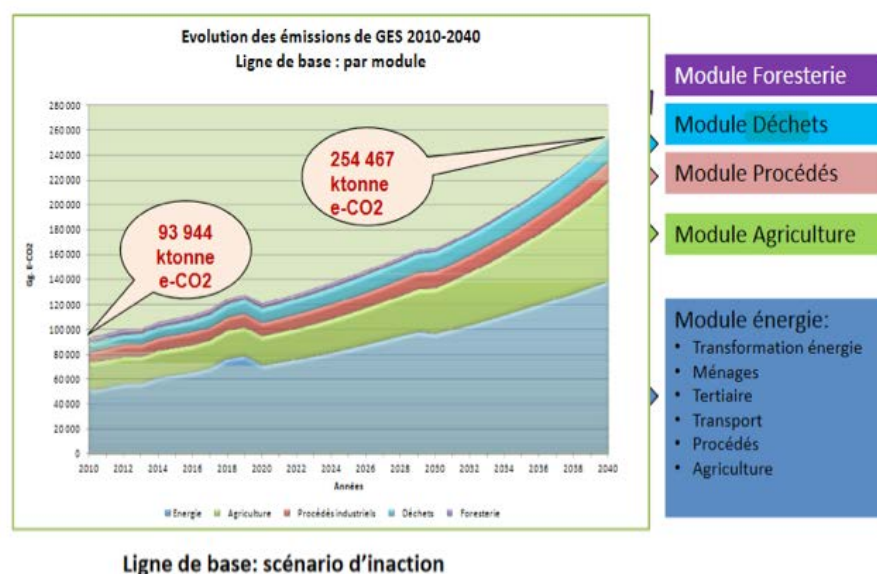
The evaluation also reports the completed or current establishment of 19 additional controlled landfills, the rehabilitation of 24 uncontrolled rubbish tips, and the programming of another 84 ([Ministry of the Interior, 2017](#)). Lastly, two biogas energy conversion experiments were under way in Oujda and Fes, along with a waste sorting experiment in Rabat. The production of biogas is a key feature of the country's recovery programmes given that organic matter represents 70% of the total weight of waste.

2. Governing climate, managing waste: an ambitious national framework with uneven progress

Over the last decade, the Moroccan state has been highly active in establishing a plethoric institutional and legal system for environmental governance. The constitutional reform of 2011 started off by making sustainable development a right for all citizens. This was followed by framework law No. 99-12 on the National Environment and Sustainable Development Charter, promulgated in 2014, which established "the fundamental objectives of state action regarding the protection of the environment and sustainable development" ([official gazette No. 6240 of 18 jomada I 1435 - 20 March 2014](#)). Article 8 of this law establishes an "updating of the legal framework on waste" to improve reduction at source, collection, conversion and extended producer responsibility.

FIGURE 3

EVOLUTION OF GHG EMISSIONS IN MOROCCO 2010-2040 - Source : Note ([Ministry for environment, 2016 - 3rd National Communication to the UNFCCC](#)).





In terms of climate, before hosting COP22 in Marrakesh, **Morocco agreed to contribute to the Paris Agreement by reducing its GHG emissions by 42% by 2030** in comparison to “business as usual” (BAU), including an unconditional target to reduce GHG by 17% ([UNFCCC, 2016](#)). A National Climate Change Action Plan in 2009, followed by a Climate Change Policy in Morocco in 2014 were developed to coordinate the different actions and initiatives for mitigation and adaptation. Morocco’s commitments and initial elements reported to the UNFCCC make it one of only two countries compatible with a 1.5°C trajectory out of the 32 countries evaluated by the Climate Action Tracker ([CAT, 19/09/2019](#)).

All of these international commitments were set out in 2017 in the National Sustainable Development Strategy (SNDD, 2017). Adopted by the Council of Government and the Council of Ministers, the SNDD aims to “implement the foundations of an inclusive green economy in Morocco by 2030”. It establishes the production of a Climate Plan for Morocco to bring together all of the country’s national climate policies, as well as a national adaptation plan, and a Fourth National Communication and Biennial Update Report to the UNFCCC. Recently, the director of [4C Maroc, Rajae Chafil](#), announced that the Climate Plan was “in its final stages” ([atlasinfo.fr, 17/05/2019](#)).

The SNDD recognizes waste management and conversion as one of the six green industries that Morocco needs to invest in to boost its green economy. The document refers to citizens’ individual responsibility by naming waste sorting as one of the eco-citizenship practices to be acquired. Lastly, the document’s Annex features numerous detailed targets, including improving recycling rates for wastewater, agricultural waste and municipal waste. It is thus estimated that from 2020 to 2030, the waste sector will concentrate 13% of the efforts required to reach Morocco’s NDC targets for those dates ([UNFCCC, 2016](#)).

Law No. 28-00 on waste management (2006), its decrees and implementation orders, marked the first milestone in the sectoral legislative measure by stipulating technical requirements for the prevention, collection, conversion, treatment and disposal of waste. Its initial content, which is currently being debated by the Association des Enseignants des Sciences de la Vie et de la Terre (AESVT), has been criticised for its lack of ecological focus (see part 4).

The National Household Waste Programme (PNDM) adopted in 2008 constitutes the legislative foundation of programmes to improve the collection chain of HSW in Morocco, by setting national targets (box 2). More recently, new public policy instruments have been created specific to this sector, refining the targets and setting out the responsibilities of the different levels of governance, integrating climate targets.

The National Household Waste Programme (PNDM) is an investment programme with a budget of 40 billion dirhams (MAD) initiated in 2008 by the Ministry of the Interior in collaboration with the Department of the Environment. The programme runs from 2008 to 2023 and features a financing system and support programmes. Local authorities contribute 73% of the total cost of the programme, 9% comes from the state budget, 4% from international cooperation, 12% from taxes on waste and other taxes, and 3% from Clean Development Mechanisms. The PNDM's main objectives are the following:

- Reach 85% collection by 2015 and 90% in 2020
- Create landfill and conversion centres in 100% of urban municipalities by 2020
- Rehabilitate or close down all existing dumps by 2020
- Professionalize the sector and develop “sorting-recycling-recovery”, including by training and raising awareness of those involved.

A first assessment of the PNDM in 2016 in the run-up to COP22 in Marrakesh produced mixed results. In the face of accumulated delays, the Moroccan authorities were obliged to push back the deadlines to 2020 instead of 2012 as initially planned. In particular, the kingdom is still a long way from reaching its objective of equipping all urban municipalities with controlled landfills: in 2018, only about 20 controlled landfills were operational out of the 75 planned for 2020 ([Heinrich Böll Rabat](#), 26/12/2018), while in April 2019 the Secretary of State for Sustainable Development, Nezha El Ouafi, announced 19 new landfill and waste conversion centres for the end of the year ([HuffPost Maghreb](#), 30/04/2019). At the time of writing (January 2020), no articles have reported new progress.

Source: [environnement.gov.ma](#)

BOX 2

Thus, “the inexorable growth of the quantity of waste produced [...] has reached a level that obliges Morocco to make the organization of this sector a national priority”, states the **National Strategy for Waste Reduction and Conversion** ([SNRVD](#), p. 3, 2019). This new strategy, presented in March 2019, is now the backbone of Morocco’s new ambitions to “make progress [...] in applying a waste treatment hierarchy” ([SNRVD](#), p. 5, 2019). The strategy draws up a table identifying shortfalls in eight recycling channels in terms of legal framework, institutional set-up and financial instruments. It also establishes nine strategic priorities combined with operational action to implement the PNDM and other governance and financing objectives concerning managing waste, promoting reduction, planning, research and development, and educating citizens.

The SNRVD marks a turning point in Moroccan policy on waste management, moving from a focus on professionalism and landfill to a circular focus that aims to improve the performance of the “sorting-recycling-recovery” sector. It defines recycling targets for each waste sector by 2030: 20% for HSW (compared to 6% in 2015), 70% for plastic (25% in 2015), and 25% for industrial waste (12% in 2015). Fitting in with the green economy objectives of the NSDS, the creation of 25,000 jobs is expected in this sector.

**TABLE 1**

CURRENT RECYCLING RATE (2015 DATA) AND NEW SNRVD TARGETS. SOURCE: SNRVD, 2019

RECYCLING RATE BY SECTOR	2015	2025 TARGETS	2030 TARGETS
Plastic	25%	50%	70%
Paper-cardboard	27%	50%	80%
Metal	46%	60%	80%
Used oil	36%	50%	70%
Electronic waste	12%	20%	40%
Batteries	30%	50%	80%
Tyres	42%	60%	80%

Morocco has also joined the international movement to phase out plastic bags, of which 26 billion are used annually in the country, the equivalent of 900 per person per year. In July 2016, **law No. 75-15, known as the “Zero Mika law”**, came into force, “prohibiting the manufacture, import, export, commercialization and use of plastic bags”. Two years later, the authorities were confronted with its ineffectiveness. A survey published in June 2018 revealed that 60% of souk and market traders questioned by the association Zero Zbel declared that 80% of their customers systematically demanded plastic bags. 49% of those questioned stated that their consumption of plastic bags had not changed or increased since the law ([TelQuel](#), 27/12/2018). **A failure that the Heinrich Böll Stiftung association in Rabat puts down to a hurried-through vote in the build-up to COP22 in Marrakesh, a total lack of stakeholder consultation (industrials and citizens), and ineffective monitoring since coming into force** ([Heinrich Böll Stiftung Rabat](#), 27/06/2018). In the face of this failure, and two days after the dismantling of a clandestine factory in the province of Berrechid ([La Nouvelle Tribune](#), 26/12/2018), the government launched a new draft law to increase control measures and set out a clear definition of the plastics concerned ([TelQuel](#), 01/07/2019).

One of the latest acts to date, **decree No. 2/17/587 of 10 December 2018 on waste management and disposal, and conditions and means of import, export and transit**, aims to establish the conditions of these movements and the granting of permits to import dangerous waste into the country ([official gazette No. 6744 of 10 jomada I 1440 – 17 January 2019](#)).

While the high number of legal texts aimed at governing the waste sector clearly illustrates the Moroccan government’s ambitions in this area, it can have the effect of making targets unclear. The relative failures of some of them raises the question of the effectiveness of the framework governing all stakeholders. It also raises the question of local authorities’ remit to organize these sectors at local level.

3. Organizing collection, managing treatment: increasing responsibility for local areas

• **PATCHY WASTE MANAGEMENT PLANNING DESPITE INCREASED DECENTRALIZATION** • The constitutional monarchy of Morocco is a centralized regime in which the king, Mohammed VI, holds the overriding executive power in the adoption of laws structuring national public policy. Nevertheless, with the constitutional reform of June 2011, proposed by the king following the “20 February Movement” and approved by referendum, Morocco reinforced the role of local authorities,

which are now key partners in developing and implementing public policies. The new constitution establishes shared management of the country between the state and elected local assemblies. The new constitutional text thus affirms that regional and local organization is based on the principles of free administration, cooperation and solidarity ([art. 136](#)), and that it assures participation in management by the communities concerned while encouraging their contribution to integrated, sustainable human development.

Following in the vein of this “regionalization”, the territorial reform of 2015 now divides Morocco into 12 regions, 75 provinces or prefectures, and 1,503 municipalities ([Ministry of the Interior](#), n.d.). In particular, environmental jurisdictions have been transferred to the regions, and the freedom of regional councils and their presidents has been reinforced ([Hamdaoui, S.](#), 2017).

The SNDD identifies “the adoption of SNDD guidelines by the different territorial levels (regions, provinces and municipalities)” as a strategic focus for the governance of sustainable development issues. Lastly, during regional debates organized by the African Development Bank and UCLG Africa on the decentralization of NDCs (15-16 May 2019), **the director of 4C Maroc also stated that the “territorialisation of climate policies” would be one of the pillars of the future Moroccan Climate Plan** ([atlasinfo.fr](#), 17/05/2019).

In terms of waste, the responsibility of local authorities was recognized some time ago. Dating back to 2006, law No. 28-00 included in the “municipal public service of household and similar waste” operational and technical responsibilities throughout the entire collection and treatment chain (art. 16). The higher levels were made responsible for planning general objectives, choosing sites for facilities in compliance with urban planning documents, inventories, investments and information; the regions were put in charge of managing industrial, medical and non-hazardous pharmaceutical waste and final, agricultural and inert waste (art. 10); and management of household and similar waste now comes under the prefectures and provinces (art. 12).

One remarkable example of planning comes from the **region of Souss Massa**, which has put together a local climate change action plan including a project on waste. This project includes the development of biomethanation and waste recovery facilities, incentives to recycle waste, and conversion of household and similar waste by 2020 (cf. [case study](#) in the 2019 Synthesis Report, Climate Chance). The action plan was launched in early 2018 and aims to involve all prefectures and provinces in the region along with activity sectors of key importance for the region and its economy. The region has not communicated any figures on its first results to date.

Nevertheless, in August 2017, eleven years after the adoption of law No. 28-00, once again targets were far from achieved: **according to the latest data communicated by the Ministry of the Interior on the National Portal of Local Authorities, only 17 of the 67 plans launched had been completed** ([Ministry of the Interior](#), n.d.).

Planning difficulties result mostly from technical challenges in establishing a reliable diagnosis of waste production at regional level. The region of Casablanca-Settat provides a perfect illustration: in March 2019, it published the results of a study to estimate the waste produced on its territory in order to put together its future management plan. The results are alarming: 33 million tonnes of waste produced annually, “not counting almost 2 million tonnes of household waste”, reported the website of “L’Économiste” ([L’Économiste.com](#), 13/03/2019). Yet two days earlier, in a synthesis report produced by the SNRVD, the Moroccan government estimated the national amount of waste at only... 29.8 million tonnes in 2015. This contradiction can be explained by different calculation methods, since the Casa-Settat study includes non-negligible quantities of agricultural waste, amounting



to 20 million tonnes; at the same time, the region's volume of construction waste (11.4 Mt) is not far from the national level (14 Mt). These astonishing proportions illustrate the gap between infra-national planning requirements and the methodological standardization of regional and national diagnoses (cf. Climate Chance's [Global Sectoral Profile on Waste](#), 2019).

Armed with few tools despite decentralization reforms, local authorities have mostly succeeded in making the progress observed in part 1 not through planning, but thanks to their capacity for action and operational initiatives.

• PROFESSIONALIZING COLLECTION, MODERNIZING TREATMENT: LOCAL AUTHORITIES MAKING PROGRESS WITH THE WASTE HIERARCHY •

At local level, and beyond their legal responsibilities, territories are faced with three major problems throughout the waste management chain. The first concerns the **improvement and professionalization of waste collection**, which is still subject to a very informal attitude, in particular concerning sorting at source. Next, the **transformation of existing rubbish tips** (uncontrolled or professional) to bring them into line with new treatment and recycling ambitions. Lastly, public policies have been set up to **improve "waste conversion"**.

Since the PNMD came into force in 2008, about 25 waste landfill and conversion centres (CEVs) have been created throughout the country ([HuffPost Maghreb](#), 30/04/2019). An objective of 15 operational sorting centres in CEVs by 2025, and 25 by 2030, has been set by the SNRVD. The very first waste sorting centre was set up in Fes in September 2018 ([Afrik21](#), 09/11/2018), prior to the biggest one in the country in Marrakesh ([LesEco.ma](#), 04/01/2019). These facilities have respective potentials of 300 tonnes and 768 tonnes of waste per day, which should strengthen upstream the "sorting-recycling-recovery" systems targeted by the SNRVD.

In parallel, a rehabilitation programme mobilized 2.4 million DMA from 2008 to 2018 according to figures released by Naezha El Ouafi, Secretary of State for Sustainable Development, in the ministry's 2018 annual report. This investment was employed to rehabilitate 49 rubbish tips, or 22.27% of the total, and create 25 controlled tips around the country ([Medias24](#), 05/11/2018; [LesEco.ma](#), 18/01/2019).

A major obstacle facing Moroccan local authorities to recover waste is related to the high level of organic waste (70%) ([PNCL, 2017](#); [CiseMaroc](#), n.d.). The moisture it contains makes waste difficult to process using standard techniques, partly due to the significant quantity of leachate that can flood machines. Towns and delegated companies generally employ two methods to adapt treatment techniques to these characteristics:

- **One of the most widespread conversion techniques involves combining anaerobic digestion units (biodigestors) with treatment centres.** Recycling and energy recovery of organic waste provide alternative sources of energy and agricultural inputs. Anaerobic digestion, in other words the breakdown (in the absence of oxygen) of organic matter by bacteria, produces biogas that can then be directly injected into the natural gas network or used to produce electricity. The residue, called "digestate", provides fertilizer ideal for spreading on crops. Biodigestors therefore offer an opportunity to recover waste while producing an alternative energy source (box 3). The cities of Kenitra and Fes, the Oum Azza landfill in Rabat, and the region of Souss Massa are already equipped with units. Numerous SMEs have sprung up around the procedure (cf. part 4).

- **Another option is to transform waste into refuse derived fuel (RDF).** With this system, non-recycled waste is crushed, dried, and then simply used to produce energy by incineration. Today, this

involves the model adopted by the Oum Azza platform, which processes waste from 13 municipalities around Rabat. Its operator, Geocycle, a subsidiary of LafargeHolcim Maroc, claims to recover 90,000 tonnes of waste per year, transforming it into 50,000 tonnes of RDF, used as a fuel to replace petcoke, a by-product derived from oil refining ([LaVieÉco](#), 14/07/2019). This sector is all the more important for Morocco given the scandal caused by the revelation in 2016 that 2,500 tonnes of combustible waste imported from Italy were used by Moroccan cement companies, including Lafarge ([Journal de l'Environnement](#), 10/07/2016). Nevertheless, while these methods effectively reduce the amount of waste sent to landfill, or substitute other fuels, they are criticised for not contributing to the objectives of recycling and source separation ([Zero Waste](#), 05/02/2018).

FEEDBACK EXPERIENCE

WASTE CONVERSION AS A SOURCE OF ENERGY EFFICIENCY AND EMISSIONS REDUCTION

The city of Marrakesh has embarked on an ambitious policy to mitigate climate change through different energy projects, including the recovery of household and similar waste. The city's former landfill currently constitutes a volume of household and similar waste of almost 3 million tonnes. At the same time, it represents a potential 1,000 m³ of biogas following its closure. This biogas comprises nearly 50% methane, generating power of 1 MW (megawatts). Extracted from the body of waste using special pumps, the methane travels through a lateral over-ground drainage system and 10 vertical sinks. This biogas will go on to be processed and transformed into electricity in a bioelectric factory with 1 MW of power and contribute to reducing almost 60,000 tonnes of CO₂ equivalent per year. The electricity generated will be injected into Marrakesh's grid, managed by RADEEMA, and help bring down the street lighting energy bill by almost 8.5 million DMA including tax a year.

Since June 2015, the municipality of Fes has been producing electricity from a biogas electricity station using anaerobic digestion of the city's organic waste. A project worth over 9 million EUR piloted by the US company Ecomed. The city's biogas power station fed by household waste collected in Fes currently produces over one megawatt, which represents a saving of almost 40% in public lighting. In the long term, its production should reach 5 MW. This power station designed and managed by Ecomed and the US company Edgeboro makes Fes a "trailblazing city for sustainable development in Morocco". 30% of the city's street lighting is currently produced from around 800 tonnes of household waste per day. ([L'Usine Nouvelle](#), 02/09/2015).

BOX 3



4. Private sector both an operational driver of local treatment and a hindrance to national legislation

• **STRUCTURED PRIVATE SECTOR TO STRENGTHEN LOCAL TREATMENT CAPACITIES** • Moroccan local authorities base the development of their local waste treatment capacities on delegated management contracts for urban waste services. This involves calling on either major international groups specialized in sanitation and waste treatment, such as Suez and Geocycle (subsidiary of Lafarge); mid-sized Moroccan companies (e.g. Ozone in Fes and Chefchaouen); or small set-ups run by local entrepreneurs. In 2015, at the initiative of a 15-year-old entrepreneur, Rabat equipped itself with an “E-Recycling Centre” to recycle electric and electronic waste. One year later, the facility had recycled 3.5 tonnes of electronic waste, avoided 3,500 kg of CO₂ emissions, and created a communication and waste separation kit for 6 schools, 7 companies and about twenty embassies ([UNESCO](#), n.d.).

Riding on the wave of the success stories that responded to initial ambitions, and less focused on the ecological advantages of treatment methods than on organizing collection and treatment, **some sites today find themselves confronted with difficulties that compromise the objectives set by the PNMD and law No. 28-00.** One example is the pioneering site of Oum Azza, close to Rabat, which was the first controlled landfill in Morocco, operated by the group Pizzorno Environnement on a 20-year contract. This is one of only two landfills in Morocco, with the Meknès waste centre operated by Suez, to have set up a cooperative of sorting workers, ATTAWAFOUK, to make rag pickers part of the staff. In terms of performance, the factory has reached a landfill rate of 50% compared to 10% at its opening, considered until recently as progress compared to the initial Moroccan situation of open-air fly-tipping. However, given the proportion of organic waste present in its landfills, the site is already struggling with the considerable quantities of leachate that, in the absence of a processing system, the operator cannot dispose of. Although the Oum Azza landfill is equipped with biogas production facilities, they have insufficient capacities to absorb the quantities of leachate generated by the buried waste ([L'Économiste](#), 19/09/2018).

FEEDBACK EXPERIENCE

SUEZ: WASTE MANAGEMENT HEAVYWEIGHT IN MOROCCO

The French company Suez, the world's number two group for water and waste management, has been pursuing an intensive expansion policy of its sanitation activities in Morocco over the last few years, via its subsidiary Suez Recyclage et Valorisation (RV) Maroc. Long-established in Morocco, the group makes a turnover of over 700 million EUR, employs 8,000 people, and possesses 13 water treatment stations and 4 sanitation plants in the country.

In Meknes, an agglomeration of around one million people in the north of Morocco, Suez inaugurated a waste disposal and conversion centre in 2016. After responding to a call for tender from the city, the French company won a contract to rehabilitate an uncontrolled dump of 2 Mt of waste, then build and operate a new centre for 20 years. The investment is estimated at 18 million EUR for the period. The creation of a cooperative, Attadamone, has led to the employment of 180 rag pickers who previously gathered waste informally. While the city's recycling rate remains at 5%, the project contributes to furthering the control and professionalization objectives of disposal and treatment sites. ([Le Monde](#), 19/08/2017)

Recently, Suez won a contract to manage waste for the North Africa Bottling Company (NABC), the local Coca-Cola bottler. Suez will be responsible for four factories and two warehouses serving the cities of Casablanca, Fes, Marrakesh and Nouacer ([Afrik21](#), 20/03/2019). In late

2018, the Suez subsidiary Sita Boughaz also set an example by installing ten underground waste containers in Tangiers to avoid the accumulation of rubbish in the open air and to improve the working conditions of the city's sanitation agents ([L'Économiste](#), 16/12/2018).

Recently the new MD of Suez, Bertrand Camus, announced that the waste subsidiary in Morocco would be moving "from a system of collection and landfill disposal to a change in the chain with recycling and conversion" of matter ([Challenge.ma](#), 24/06/2019). This new direction is part of the group's new strategy, "Suez 2030".

BOX 4

The growing attraction of the Moroccan waste market is drawing major service companies to invest in the sector and specialize in new areas. In January 2019, Veolia, the leading global group in water, waste and energy management, announced an upcoming cooperation between its new specialized subsidiary VEOS and a small Moroccan company SOS NDD. This joint venture aims to create a centre to manage medical and pharmaceutical waste, given that 60% of around 25,000 tonnes of this type of waste produced annually in Morocco remains unprocessed. The operation is likely to involve an investment of 2 million EUR ([Afrik21](#), 13/02/2019).

While the investment capacities of major companies are crucial to take on the task from local authorities with few financial resources, relations between contracting parties have generated a number of conflicts, frequently reported in the press. The case of the Médiouna landfill is one of them. In 2011, Suez and its subsidiary Sita won a contract to manage the waste of the city of Casablanca, which was then terminated by the municipal council in September 2017. The city accused the subsidiary of "shortfalls" in reaching its objectives, while Suez complained of a lack of profitability, "payment issues" and "the city's increasing needs and the practices of some inhabitants that made it impossible to reach collection targets" ([La Tribune](#), 17/09/2017). In the city of Fes, the municipality has been accused of non-payment by the operator Ecomed, which runs a biogas power station to supply street lighting (box 3). The US group claims not to have been paid since 2015, in a contentious situation surrounding the initial call for tender ([LesEco.ma](#), 18/02/2019).

To coordinate all of the companies included in the different waste treatment and circular economy sectors, in 2016 the CGEM created the **Coalition for Waste Valorisation (COVAD)**. COVAD regularly organizes symposia and workshops for private stakeholders and public decision-makers. Recent achievements include COVAD's signature, in March 2019 at the SNRVD's presentation, of a convention on the treatment of electric and electronic waste (WEEE) with the Secretary of State for Sustainable Development. Represented by the industrial waste disposal and conversion association AMVEDI, professionals in the sector have committed to aligning their objectives with national waste recycling targets ([L'Économiste](#), 23/11/2019). COVAD also initiated, with CGEM, an open letter published with association networks and addressing waste stakeholders in the city of Casablanca at the occasion of the roundtable on "*Waste conversion in Morocco: What are the sustainable, high-impacting choices for our cities?*" This letter enjoins public authorities in Casablanca to take measures to end incineration, citing the EU as an example, and recommends including the full range of local actors in a process of dialogue and joint construction of public policies ([Industries.ma](#), 01/03/2019).



• **CIRCULAR ECONOMY TRIGGERING FLOURISHING ENTREPRENEURSHIP** • As well as being the pivot of the SNDD's green economy programme, the waste management sector is perceived as an important source of economic activity and job creation. At local level, in the absence of systematic waste collection and recycling facilities, small and very-small enterprises are moving into the market. **An entrepreneurial spirit that was highly mediatized at COP22, including via the Moroccan platform Initiatives Climat, which listed and showcased individual success stories.** Two sectors are promoted in particular: anaerobic digestion and the manufacture of organic biofuel.

Created in 2013 and presented at COP24 in 2018, **Biodôme puts itself forward as the "first Moroccan company to specialize in biogas, biomass and composting"**. The company builds small anaerobic digestion installations in underground tanks. These units are specially designed to help farmers recover their organic matter as biogas and fertilizer, and bring down their expenditure on gas. This energy-saving recovery technique is adapted to meet local requirements, reduces the amount of untreated household waste, and contributes to decreasing the GHG emissions of abandoned organic waste ([Initiative Climat](#), 2016).

The **company Digest'Or** has also moved into the anaerobic digestion field. As well as providing services to characterize and determine the energy potential of Moroccan organic waste, it sizes and installs digestors to manage, treat and recover livestock waste by producing biogas, which is then either converted into heat for domestic use or into electricity. With its combination of waste management, conversion, and green energy production for the country's farmers, Digest'Or can also improve the national energy balance and help reduce greenhouse gas emissions by 2,500 litres for each gas (CO_2 and CH_4) to treat 500 kg of raw livestock waste, and capture 100% of CO_2 at the tank's outlet using a filtration system ([Initiative Climat](#), 2016).

Despite criticism for the metabolic breakdown of biomass and the emissions it generates, the production of "green coal" is nevertheless the focus of numerous entrepreneurial projects in Africa, where it is used as a substitute for firewood in cooking. In the hierarchy of waste treatment techniques, the use of green coal does not avoid the combustion of compostable matter, some of which could be used again as organic fertilizer ([Zero Waste](#), 05/02/2018). However, given the local context and high availability of organic waste, these biofuel production techniques have the advantage that they do not compete with farmland, and provide an effective back-up solution.

In Morocco, the company **BioChar Maroc** has taken a foothold on the market. Starting from the observation that Moroccan restaurants consume an average 20kg of charcoal a day, the company moved into the production of "green coal" briquettes to provide an alternative fuel. The company obtains agricultural waste from farmers in the province of Chtouka Ait Baha and supplies three restaurants and a hotel with green coal in Agadir and Marrakesh. At COP22, BioChar offered its "green coal" to all the restaurants in Marrakesh. The start-up also produces "biochar", an organic amendment and byproduct derived from biomass by pyrolysis, and used as a fertilizer and to capture carbon in the soil ([Initiative Climat](#), 2016). The social entrepreneur **Green Gold Energy**, has also positioned itself in this niche, offering a replacement for firewood in the form of biofuel produced from olive waste, coffee grounds and sawdust. The final product comes in logs or granules. Its calorific value is over 33% higher than wood, at a competitive price (1.5 MAD per kg, or 0.14 EUR), with 35% fewer emissions and a third of the volume of wood, making it easier to store ([Initiative Climat](#), 2017).

Another notable initiative in a different area was developed by a 20-year-old student from the national business school in Tangiers, Saif Eddine Laalej. In 2018, he presented his "Paveco" slab made from 80% plastic. The product complies with security standards for floor surfaces, including flame resistance. It can be used to manufacture building materials from plastic bottles, bags or film.

• **ORGANIZING A CONTRIBUTION FROM COMPANIES: EPR STILL UNDEVELOPED, ECOTAXES IN DEBATE** • The establishment of “extended producer responsibility” (EPR) did not feature in the first waste management laws, and has only recently been included in the government’s objectives. (Law No. 99-12 of 2014 on the Environment Charter). Since then, the SNRVD has also recommended “putting in place a regulation on the responsibility of companies (producers, importers and distributors) contributing to the marketing of products with a view to the effective application of EPR”. This kind of measure would make it obligatory for producers of waste or of materials composing waste to manage or participate in their disposal. In countries that enforce EPR, it often takes the form of a financial contribution, for example via an intermediary green organization. The AESVT recommends this approach in its recommendations on updating law No. 28-00, formulated during a round table in early 2019 ([AESVT, 01/04/2019](#)).

Currently, by default the responsibility for waste falls on users. However, Morocco has taken up another lever: ecotax. **The first ecotax dating from 2014 applies 1.5% ad valorem on the sale, manufacture, and import of plastics.** Despite resistance from the plastic industry, receipts are currently reported at 157 million MAD, paid into the National Environment Fund to finance the development of new recycling channels ([Ministry of the Environment, n.d.](#)). The profitability of the tax is questionable since the introduction of the Zero Mika law prohibiting the production, sale and import of plastic bags; in addition, following pressure from industry, its rate has since been reduced to 1% and the funds have been little employed ([Usine Nouvelle, 05/10/2016](#)).

Several additional eco tax projects have been regularly announced in the Moroccan media, affecting six specific products: tyres, used oil, air conditioning units, cars, batteries and fuel cells. However, all of the new projects come up against opposition from the **General Confederation of Moroccan Enterprises (CGEM)**, given that half of Moroccan waste is generated by industry. While new proposals were put forward and discussed at a tax conference that took place in May 2019 ([L’Économiste, 03/05/2019](#)), none of them features in the final recommendations ([Ministry of Finances, 05/05/2019](#)).

5. Demanding civil society wielding increasing weight in waste policies

While the contribution of civil society and NGOs to build public policies has been recognized in the constitution since 2011, Moroccan civil society is increasingly vocal in its criticism of the proliferation of waste and the slow application of national strategies, both old and new. Taking a stance of whistle blower, local pressure group, or public policy evaluator, NGOs have been embracing the cause of local and national pollution to raise citizens’ awareness and alert the authorities. Civil society, through its entrepreneurs and campaigners from associations and cooperatives, is also coming up with proposals to implement good practices. A notable trend is the forming of groups of associations that draw on the different experiences and expertise of their members to give weight to their messages.

• **STRUCTURED CIVIL SOCIETY FACED WITH LOCAL WASTE PROBLEMS** • Similar to the increasing environmental awareness in numerous countries, the perception of local pollution and contentious neighbourhood issues with polluting installations have triggered the first forms of local activism. The most emblematic conflict to date is probably the Médiouna landfill, described by its own mayor as the “trash can of Casablanca” (box 5).

**FEEDBACK EXPERIENCE****IN CASABLANCA, CITIZENS AGAINST THE MÉDIOUNA DUMP**

The Médiouna landfill on the outskirts of Casablanca was opened in 1986, and receives almost 3,500 tonnes of household waste a day, generated by the four million inhabitants of the urban area. Over 33 years, 40 Mt of waste has accumulated on the site, in piles up to 50 metres high comprising a mix of scrap metal, pharmaceutical waste and organic refuse left to ferment in the open. The toxic fumes poison the air breathed by locals and the 2,000 rag pickers on site, and reach outlying towns, while the leachate penetrates the water table and rivers.

In the face of the authorities' inaction and silence, citizens and environmental associations have mobilised to warn people about the dangers of the pollution generated by the dump and called for its closure. To coordinate local associations' long-standing action, an environmental protection collective (CPE) was set up in 2017. This "associative frontline" has pursued a series of meetings with local and national politicians, launched petitions and alerted the media ([Le Desk](#), 15/11/2017).

To date, though, no solution has been reached. The contract signed in 2008 between Casablanca and the company Ecomed, commissioned to close the site in two years and then rehabilitate it, was terminated in 2018 by the municipality. The city accuses the company of not having fulfilled its obligations. Faced with the threat of legal action before the International Centre for Settlement of Investment Disputes (ICSID), the two parties ultimately reached an out-of-court settlement for an undisclosed sum ([Le360.ma](#), 11/12/2018). The company SOS NDD has taken over management of the site during a transition period, while waiting for the city to launch a new call for tender ([L'Économiste](#), 26/08/2019).

Sources: [Le Monde](#), 13/11/2018; [Libération](#), 23/11/2018

BOX 5

"Internet and its social networks can play a role to both relay information and catalyse mobilization." On the basis of this observation, in 2013 Mouna Hachim launched the Facebook page "[Save Casablanca](#)", currently gathering 180,000 members who share photos and comments on pollution issues in Casablanca. **This kind of mobilization is common in Morocco, where networks and communities tend to be coordinated online rather than in formal associations. The group also acts as a meeting point for citizens keen to take action on the field.** Parallel groups have been created on the side-lines, such as "[Action Casa](#)", with 4,000 followers on Facebook now forming a community; some members get together in real life to teach about uncivil behaviour, act on the field to foster a cleaner city, and raise awareness with their slogan, "CLEANLINESS, SOLIDARITY, CIVIC MINDEDNESS". In July 2018, "Save Casablanca" received considerable media coverage with its condemnation of the persistent pollution on the city's beaches ([Barlamane](#), 26/08/2019; [L'infodurable.fr](#), 20/07/2018; [GEO](#), 18/07/2018).

Social networks were also behind Moroccan citizens' involvement in the international climate march movement. In 2019, AESVT, AMCCD, Greenpeace and the Heinrich Böll Foundation organized a march in Marrakesh on 20 September and in Casablanca, Fes, Rabat and Demnat on 27 September ([HuffPost Maghreb](#), 20/09/2019). The number of participants ranged from several hundred ([Jeune Afrique](#), 28/09/2019) to 8,000 according to AESVT ([Medias24](#), 30/09/2019).

• **PROJECTS BRINGING LOCAL SOLUTIONS WITH SUPPORT FROM REGIONAL STAKEHOLDERS** •

With support from international programmes and foundations, small associations are developing innovative projects to raise citizens' awareness, alert public authorities, and come up with original technical solutions.

The **association ZeroZbel** sprang from the experience of a young Moroccan, Mamoun Ghallab, qui embarked on a personal project to take up good consumer and waste management practices. His initiative, ZeroZbelXperience, was initially supported by the EU programme SwitchMed before becoming a full-blown association in 2016. Since then, the association's action includes whistleblowing the failure of the Zero Mika law (cf. part 2), and producing an analysis of solid waste collected from 26 Moroccan beaches in September 2018, with the support of the Heinrich Böll Foundation, 40 volunteers and 6 associations. The project collected a total of 36,000 refuse items, which is an average of 35 waste items and 180 micro-waste items per square metre, most of which were plastic bottle tops (18%) and fishing lines (13%) (HuffPost Maghreb, 13/09/2018).

The **Association du Docteur Fatiha (ADF)**, based in Berkane in north-eastern Morocco, works to boost women's independence through social and environmental entrepreneurship. In 2006, the association's president, Haïza Hajji, created the cooperative Ifassen to train local women to recycle plastic by crafting it into bags, baskets and decorative objects. In 2019, the association employed over sixty women in three cooperatives, and recycled over 51,000 tonnes of plastic a year. The initiative has received considerable recognition and multiple awards, along with the support of SwitchMed and the UNEP (L'Économiste, 22/04/2019).

International NGOs also provide considerable support to local initiatives. **The Heinrich Böll Foundation**, and the **Surfrider Foundation** which acts to protect coastal areas and marine environments, are established in Morocco and work through local branches to run or accompany citizens' projects, and help local authorities achieve their objectives. For example, in 2018, the two NGOs launched a survey of 102 households in Agadir to investigate their waste disposal practices and raise their awareness of sustainable development. The study revealed a fairly high level of awareness among respondents: one-third of households said that they made efforts to reduce waste, two-thirds sorted waste for recycling, and 80% claimed to be aware of the potential dangers of waste. Based on these results, the NGOs aim to carry out a pilot project on household waste management with the urban community, which will include producing good practice guidelines and raising citizens' awareness (L'Économiste, 14/02/2019).

• **A STEP TOWARDS THE CO-CONSTRUCTION OF PUBLIC POLICIES?** •

Despite the lack of consultation identified in the construction of some laws, Morocco features a network of NGOs with significant national and local influence that contribute to formulating recommendations to feed into public policy. Founded in 1994, the **Association des Enseignants des Sciences de la Vie et de la Terre (AESVT)** is a network made up of 38 local divisions and 18 environment education centres all over Morocco. The NGO is regularly involved in exchanges with parliamentary members, provincial and regional leaders and local politicians, giving it real influence in the putting-together of public policies on waste.



Each year since 2014, **AESVT has organized a “joint production of cleanliness” (COPROD)** focus day, in partnership with the Secretary of State for Sustainable Development (SEDD), the Ministry of Education and other ministries, and with the collaboration of local stakeholders. COPROD takes a civic approach to get citizens involved in making their living conditions cleaner and in sorting their waste. The 22 local divisions are associated with COPROD, and have produced a very precise record of their achievements to date:

- 90 neighbourhoods and 100 schools associated;
- 300,460 pupils and 29,009 families made aware;
- 78 neighbourhood associations and 1,424 people trained;
- waste sorting set up in 76 neighbourhoods ([AESVT](#), n.d.)

The most recent focus days, which took place on 21 and 22 January 2019 in Casablanca, featured a presentation of the results of pilot experiences, productions, challenges and lessons learned.

AESVT Maroc is more specifically involved in promoting a new waste management model. As part of its project “For effective, optimal waste management in Morocco”, at the roundtable organized in March 2019, **the Fes division of AESVT called for a reformulation of the terms of law No. 28-00 on the basis of the approach “waste is a resource”**. It put forward the following avenues for improvement:

- Establish an obligatory sorting and selective waste collection system for certain types of waste.
- Make obligatory the principle of “extended producer responsibility – EPR”.
- Generalize the authorization system for non-toxic waste management in an explicit manner.
- Create an institutional mechanism in the form of an agency responsible for devising and implementing national waste management programmes and assisting local authorities and industrials in the domain of sustainable waste management. ([AESVT](#), 01/04/2019)

The Moroccan Alliance for Climate and Sustainable Development (AMCDD), created in 2015, groups over 500 associations and NGO networks working in the environment and sustainable development. With support from GIZ, IRD, UNDP and Greenpeace, AMCDD currently works through its twelve regional branches to “actively contribute to drawing up, monitoring and evaluating public and local policies” ([HuffPost Maghreb](#), 07/05/2017). At a conference organized by the Alliance on “What options for sustainable waste conversion in Casablanca?”, participants were alarmist, in particular regarding the Médiouna landfill, insisting on the development of recycling, source sorting and waste conversion.

Thanks to their respective mobilization capacities, these large Moroccan networks have recently begun to “capitalize on their experience”. AESVT and AMCDD have thus got together with COVAD and the Observatory of the Protection of the Environment and Historical Monuments of Tangiers, to initiate a “national mobilization programme for a new model to manage household and similar waste”, presented in Casablanca in April 2018. The programme includes a cycle of conferences and the production of guides on the state of the sector in Morocco; a communication and mobilization campaign aimed at 5,000 associations and syndicates and 18 environment education centres throughout the country; and the formulation of advocacy aimed at parliamentary members, ministries and municipalities. ([HuffPost Maghreb](#), 14/04/2018).

Lastly, initiatives have recently made attempts to associate business and NGOs to produce local planning documents. For example the “Waste Management and Conversion Design Days” organized by the Essaouira Innovation Lab in July 2019 gathered business leaders and NGO representatives for two days of debates on the appropriate content of a regional roadmap to move towards a waste management and conversion charter for the province of Essaouira. According to the organizers, this dialogue event fits in with the spirit of articles 12 and 13 of the 2011 Constitution aimed at associating civil society and NGOs in building public policies ([BTP News](#), 17/07/2019; [Le Matin](#), 18/07/2019).

CONCLUSION

When it published its first policy guidelines on waste in 2006, Morocco had a long way to go to deal with huge quantities of refuse in uncontrolled dumps. The Moroccan legislator and executive have been proactive in adopting numerous laws, strategies and implementation programmes to organize “sorting-recycling-recovery” sectors as part of the country’s economic and social development. In particular, energy recovery from waste appears to face a bright future, despite the fact that it does nothing to improve recycling and is fed by waste generation at source that is constantly on the rise.

COP22 and strong media coverage of Moroccan initiatives have at times created a smoke screen over the extent of the country’s progress. Challenges include a lack of data, follow-up and transparency to assess the real impact of initiatives beyond occasional announcements in the press. The creation of 4C Maroc moves in this direction, and the first adjusted regional inventories, like in Casablanca, are encouraging. One last observation is the increasing mobilization of citizens against pollution issues generated by inadequate treatment and collection, through local associations and spontaneous movements on social networks.



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