



# Measurement, Reporting and Verification system (MRV) for the Tunisian cement industry

## Background

By signing the Paris Agreement in April 2016 and officially ratifying it on 10 February 2017, Tunisia confirmed its political commitment to voluntarily participate in global efforts to reduce greenhouse gas (GHG) emissions and to gear its economy towards low-carbon development.

In its updated NDC, Tunisia has set an ambitious target to reduce its carbon intensity by 45% by 2030 compared to 2010. The contribution of the cement industry alone represents 15% of this objective.

Indeed, the cement industry in Tunisia is a priority sector in the energy transition process and the implementation of the NDCs since a high energy consumer (10% of national primary energy consumption) and a major emitter of GHGs (14% of national GHG emissions)<sup>1</sup>.

With the support of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) through the German Development Agency (GIZ), the National Agency for Energy Conservation (ANME) launched an initiative to engage the Tunisian cement industry in a voluntary GHG mitigation program.

The objective of this program is to set up a mitigation mechanism to promote investment in low carbon-intensive technologies for each option identified in the Tunisian cement industry, namely :

- Improving energy efficiency ;
- The use of renewable energies for power generation ;
- The valorization of alternative fuels ;
- The reduction of the clinker/cement ratio in the cement composition.

## MRV system : definition and objectives

The Measurement, Reporting, and Verification (MRV) system is an international requirement to achieve the goals of the Paris Agreement and to access carbon finance.

The aim is to ensure transparency on the evolution of emissions, their impacts, and the resources of GHG mitigation projects. Indeed, the MRV system makes it possible to Monitor, Report and Verify progress made concerning the objectives, impacts, and support/resources used to achieve them.

The MRV system for the cement sector was designed for the cement industry and made available online for the stakeholders (ANME, cement producers, the National Chamber for Cement Producers (CNPC)). It is in fact, an information system to account for and monitor GHG emissions as well as monitor investments and financial support within cement industry.

This system aims to provide Tunisian cement plants with a dedicated private area allowing each of them to monitor their activities related to GHG emissions and assess their performance in terms of mitigation actions, and their impact on emissions reduction, energy savings, and economic co-benefits.

They simply need to input the required data in the area dedicated and allocated to each cement manufacturer, then the system will automatically compile the individual data, to produce the output for the whole sector.

## Structure of the cement MRV system

The MRV system for the cement sector was developed after a large-scale review of existing MRV systems at national and international levels.

On behalf

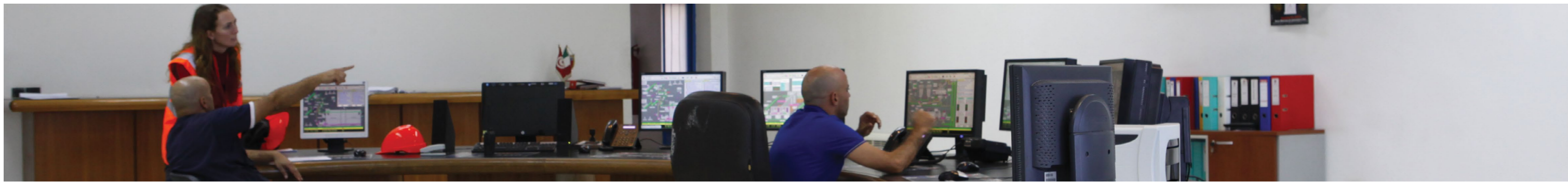


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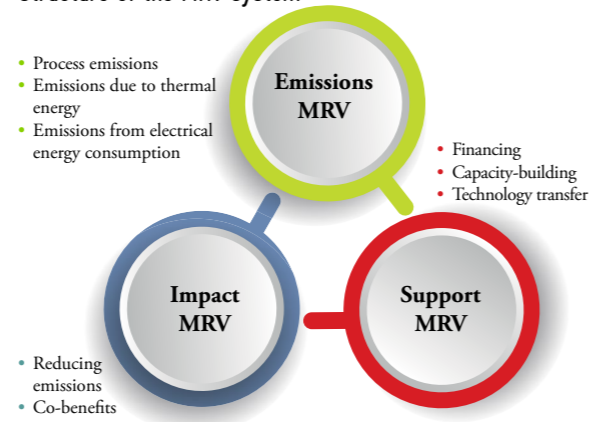


The MRV system of the European Union's Emissions Trading System (EU-ETS), as well as the guidelines and guidance from the Cement Sustainable Initiative (CSI) and the Intergovernmental Panel on Climate Change, are the most important sources of inspiration for the system.

The design of the MRV system for the cement sector was based on a complete structure in compliance with international recommendations for Nationally Appropriate Mitigation Actions (NAMA) and including the following :

- Emissions MRV: allows to monitor GHG emissions from processes, thermal energy emissions from combustion, and emissions resulting from the electricity usage ;
- Impact MRV: measures the impacts of reducing GHG emissions for each mitigation option (Energy Efficiency, Renewable Energy, Co-processing, and low clinker cement) as well as resulting co-benefits ;
- Support MRV: This is the financing received for the implementation of GHG mitigation efforts, capacity-building, and technology transfer actions.

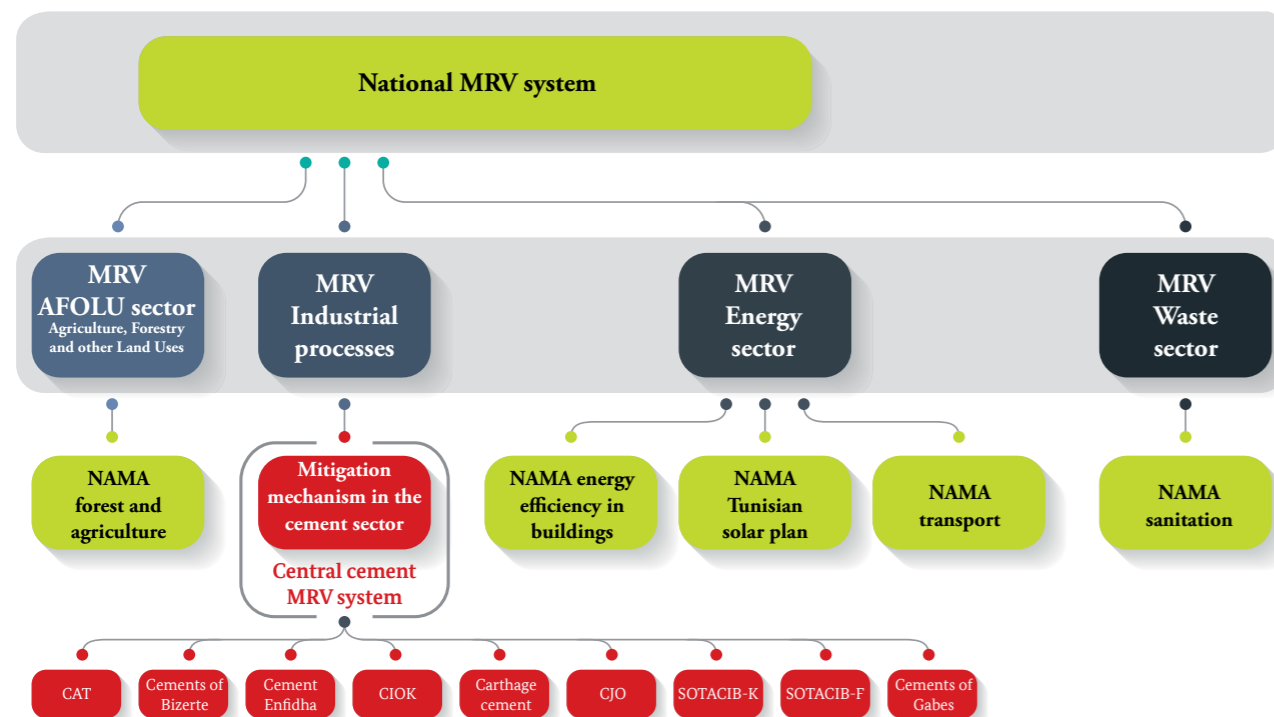
### Structure of the MRV system



### Architecture of the cement MRV system

The MRV system was built around a central core that will compile all the data that have been defined. This core is based on individual MRV systems within the cement manufacturers, who are responsible for collecting, compiling and transmitting data to the central core.

### The architecture of the MRV system for the cement sector in Tunisia



The system functioning is based on a dedicated computer application, with a full capacity to receive, store and compile data within an established framework. The latter allows us to comply with the rules and requirements of MRV. This platform is connected to the national MRV system, which receives and compiles all data and information from mitigation projects and actions, on one hand, and the national GHG inventory on the other.

From an IT point of view, the MRV system is mainly composed of two components :

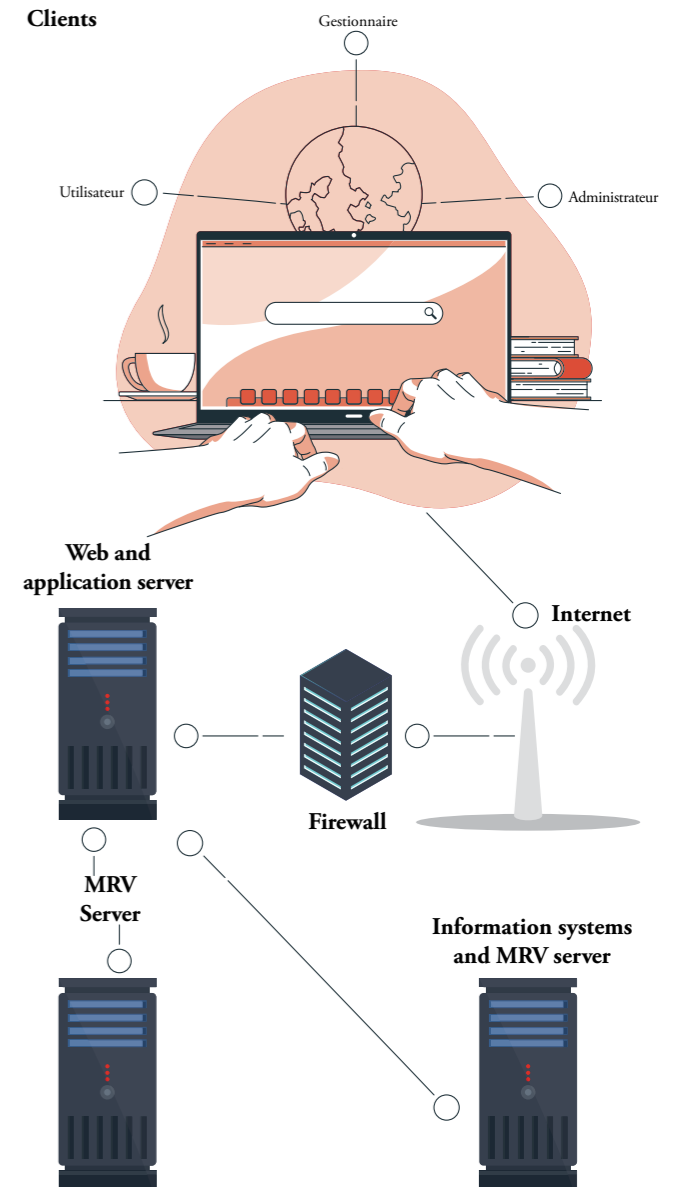
- 1- A centralised database for data storage and management;
- 2- A web application which acts as an interface for accessing the database and supporting the consultation, data editing and production, and presentation of output data (Emissions, indicators and impacts) and dashboards.

The proposed architecture is compatible with other information systems, including the MRV system of the indicators and impacts and it consists of distributing the components of the system through many servers according to their vocation and intended use.

Moreover, this architecture ensures optimal conditions for safety performance and availability of the system. The MRV data server is dedicated to hosting the system database and can contain backup areas, while the web server allows the deployment, via internet, the internet of the MRV system for the cement sector, thus ensuring users access to the resources of the data server and the execution of the required tasks.



### IT components of Cement MRV system



### Operationalization of the MRV system

- 1- Test phase of the MRV system and the support offered to the cement manufacturers

Before testing the online MRV application, data collection was carried out at the nine cement plants through the preparation and sending of a concerted standard template.

<sup>1</sup> En 2015, le secteur cimentier a consommé aux alentours de 740 KTEP en énergie finale et 1123 GWh d'électricité et a émis 8,3 MtCO<sub>2</sub>eq <sup>2</sup> GIEC : Groupe d'experts intergouvernemental sur l'évolution du climat

Subsequently, the application was tested in collaboration between GIZ and ANME, the information collected made it possible to feed the system database and carry out the necessary simulations to check the reliability of the calculations generated and to come out later with GHG mitigation action plans for each cement plant and the entire sector.

The test phase was marked by visits of GIZ and ANME experts to the cement plants, to present the MRV system and allow the cement manufacturers to familiarise themselves with the features of the system and test the application for themselves.

## 2- Consolidation Phase of the MRV system

Although the MRV system for the cement sector was developed with a complete MRV structure and in compliance with international some bugs, anomalies were detected during the test phase and improvements will have to be implemented during the consolidation phase.

## The “EnerInfo” energy information system

Since 2005, ANME had a “SIM2E” information system which made it possible to monitor and evaluate, with a top-down approach, the energy management policy and therefore of GHG mitigation.

To optimise its information system, ANME developed an integrated data management system called “EnerInfo”. This MRV system in the energy sector is based on a portal, a database, and a calculation engine. It is an analysis and visualisation tool for indicators for monitoring and evaluation of the impact of the energy transition policy, making it possible to measure the interactions between energy transition, GHG mitigation, socio-economic development, and benefits in terms of sustainable development.

Indeed, this system allows the management of information flows, analysis, and data processing of all programs of the energy sector by generating a range of energy, socio-

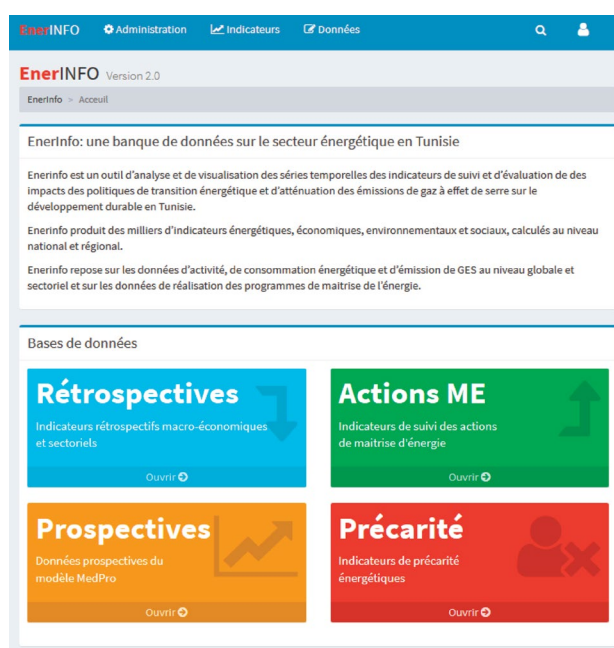
economic and environmental indicators using two top-down and bottom-up analysis approaches.

In other words, “EnerInfo” makes it possible to monitor and evaluate the energy management programs led by ANME, and to compile data from existing or potentially developed mitigation measures in the energy sector.

This system is made of four main modules :

- Energy and emissions retrospective (top-down) ;
- Energy and emissions forecasts (top-down) ;
- Energy insecurity (top-down) ;
- Energy management programs and measures (bottom-up).

### Enerinfo System Home Interface



On the other hand, the MRV system for the cement sector is a basic component of the EnerInfo system and will be used as a base for this energy information system.

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