ENGIE Lab CRIGEN

WILD SPOTTING

Biomonitoring the air quality of industrial sites

- An accessible, relevant and innovative approach with natural sensors: lichens
- Some cartographies, indexes and useful information to assess the air quality of your environment and your activities

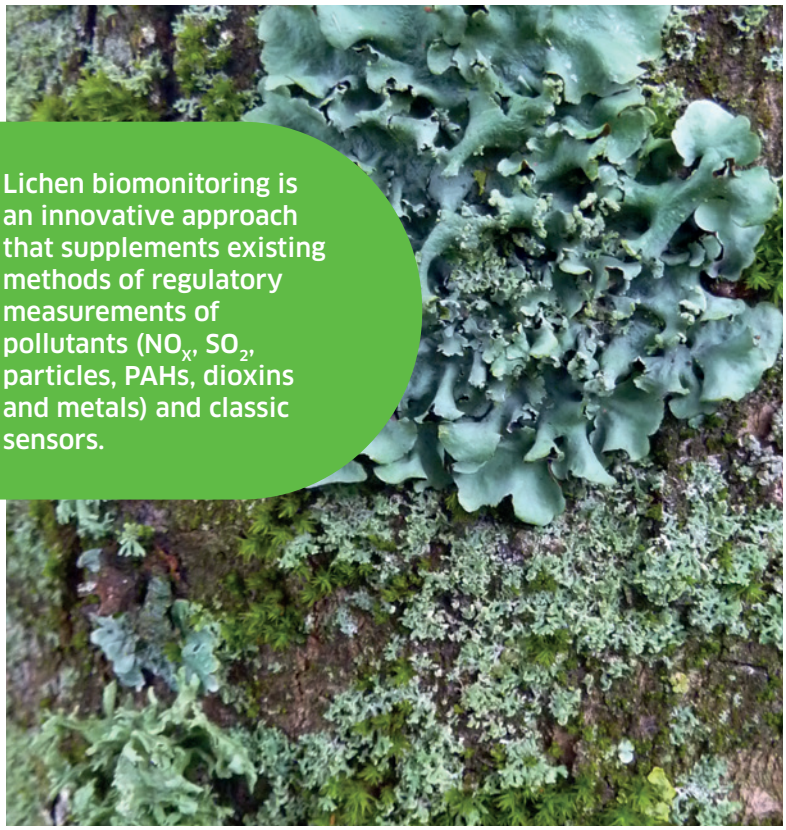


Air quality is a major concern for industrial or territorial activities

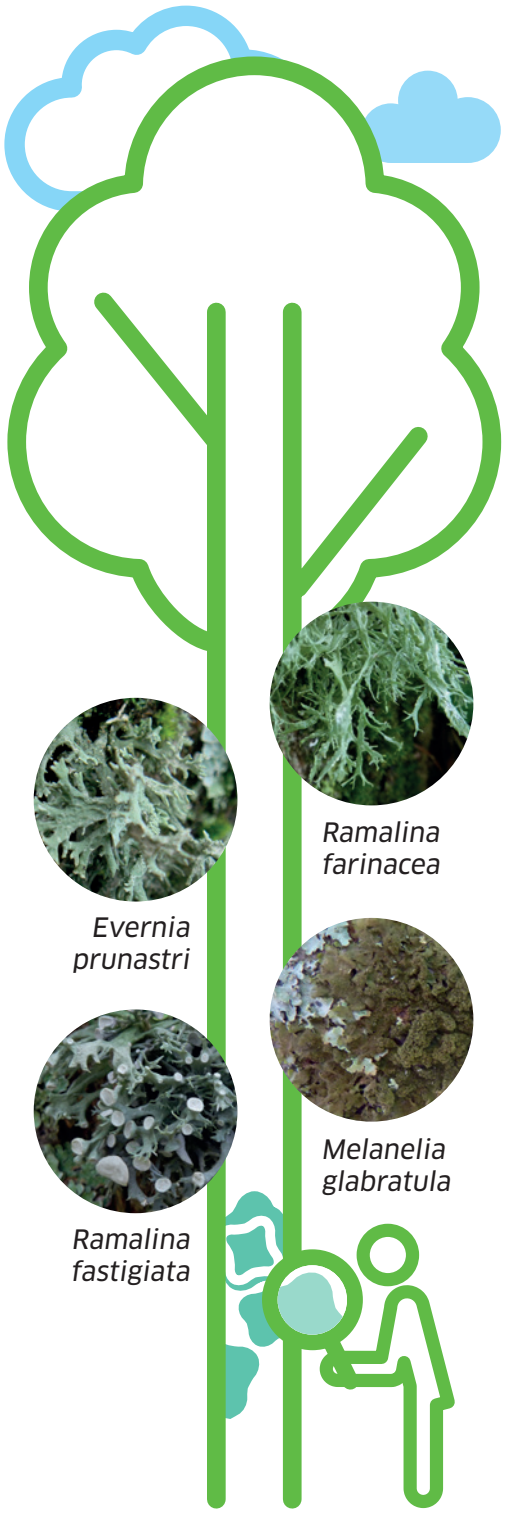
To complement the need to respect regulations, the impact assessment of industrial activities on air quality is an essential challenge for BUs, within the framework of their energy and ecological transition strategy.

Lichens, very effective ecological sentinels

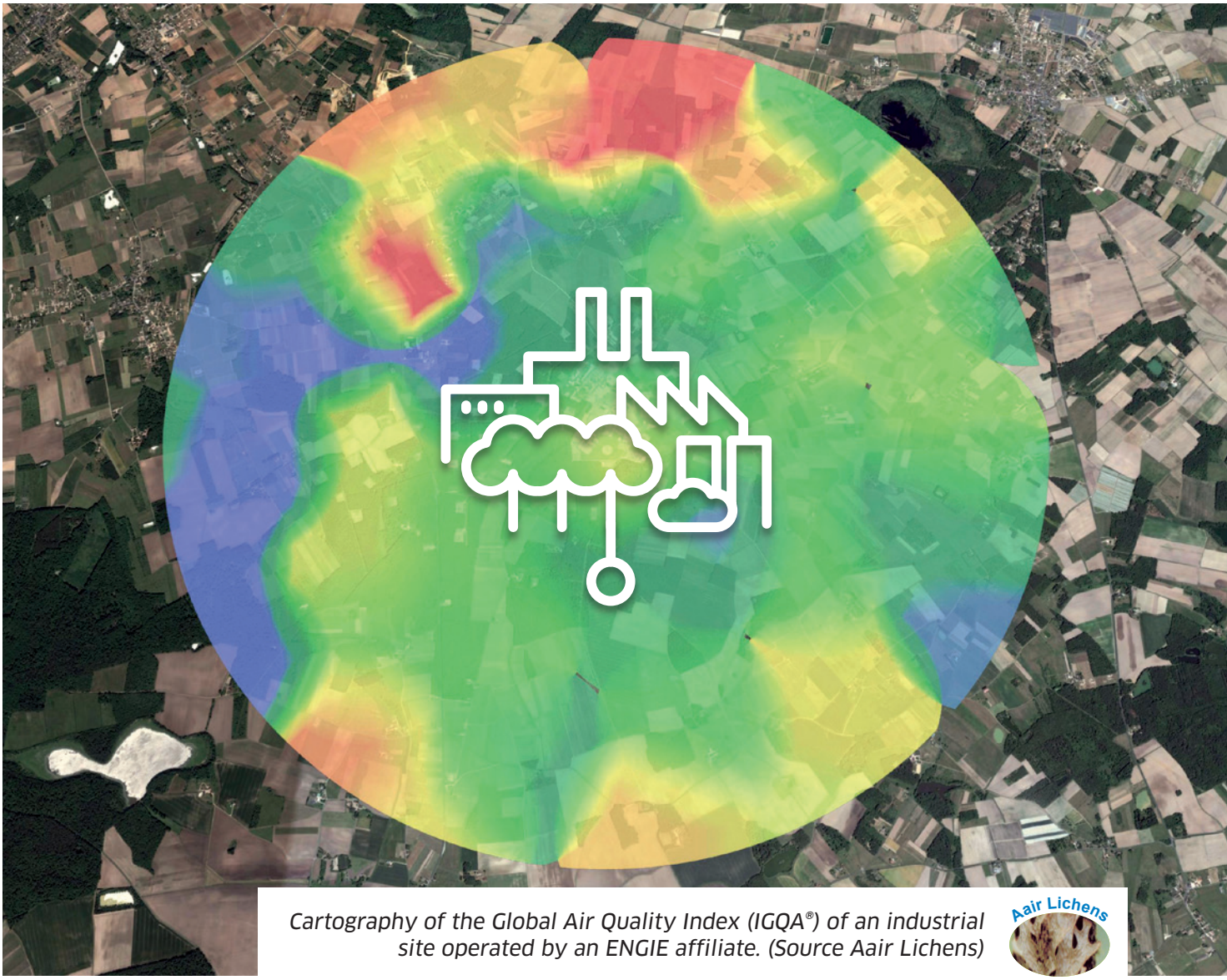
Among several methods, using lichens for biomonitoring the air quality offers a relevant response to this challenge.



Lichen biomonitoring is an innovative approach that supplements existing methods of regulatory measurements of pollutants (NO_x, SO_2, particles, PAHs, dioxins and metals) and classic sensors.



Several types of lichens can be observed and analyzed on trees



Cartography of the Global Air Quality Index (IGQA®) of an industrial site operated by an ENGIE affiliate. (Source Aair Lichens)

The method and its advantages

A first step of counting and observations of many lichens references (data base of ecologically sensitive species) is made on trees (passive method) in a circle (e.g. 3 kms) around the site. A chemical or biological analysis of lichens can also be done, especially for metals, dioxins, PAHs. Biomonitoring is relevant for instance in the case of substantial modifications to a facility and of setting up a new facility or a new activity: a first "snapshot" of local air quality can be made at time 0, irrespective of the type of facility, and it can then be compared to a new assessment of the site 2-3 years later. This method is easy to implement and cost-effective.

This innovative and voluntary method enables:

- To use natural bio-indicators to follow the air quality around industrial sites through mapping and air indexes.
- To supplement pollutant dispersion studies with a more global approach on air quality and its effects on the environment.
- To adapt a biotechnology to the specificities of a site and obtain data that can be compared year over year.

The Air Quality Indexes used by our partner Aair Lichens

- The Global Air Quality Index (IGQA®)
- The Li-NO_x® Index (for NO_x)
- The Global Acidity (adapted for SO_x)
- The Ammonia Scale (for NH_3)

Metals, Dioxins, and Polycyclic Aromatic Hydrocarbons (PAHs) can also be detected, dosed and analyzed thanks to lichens.



Since 2015, ENGIE Lab CRIGEN has contributed to the industrialization of the biomonitoring method at several facilities and some industrial sites. (e.g. gas storages). These sites include combustion plants (e.g. co-generation or compression turbines, boilers…), using different fuels (natural gas, biomass…).

These actions have been managed with the support of the **Corporate Social Division** of ENGIE and our partner **Aair Lichens.**

AWARDS

storengy
A company of GDF SUEZ
GDF SUEZ is now ENGIE

June 27, 2017: the vegetal biomonitoring of the Chémery site (Loir-et-Cher Department) wins an award at Storengy's 2017 Initiatives Challenge in the "Social and Environmental Responsibility" category.

Didier Holleaux, Deputy Director General of ENGIE and Executive committee member underlines that biomonitoring is as one of the three innovation flagships led by Storengy in France (Etrez, Manosque, Saint-Illiers…) in the Group. The innovation was implemented in other sites of gas storage of Storengy and in others BUs in 2017 and 2018.

OUR EXTERNAL PARTNERS

The Wild Spotting Offer has been developed in association with the company Aair Lichens and the University of Lille.

Aair Lichens

Université de Lille 2 Droit et Santé

OTHER POSSIBILITIES

Methods using other natural sensors like fungi, mosses, higher plants or bees can also be used and developed to assess air quality.

Fungi
Metals



Mosses (bryophites)
Metals, Nitrogen, NOx, Dioxins, PAHs



Higher plants
VOCs, PAHs, Dioxins, Fluorine



Bees
Metals, PAHs…



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