



Revolutionary **monitoring solutions** for
better **air quality and health**
in **industrial environment** !

Blue Industry and Science



Blue at a glance

A disruptive technology changing the monitoring of complex gas emissions

Blue at a glance

Blue provides **measurement services** to customers and **hardware** generating **recurring service revenues**

Blue manufactures **laser-based, mobile** analyzers for **continuous** measurement of **gas emissions**

Blue analyzers monitor multiple **molecules continuously** and **simultaneously**, among a growing catalogue of **500+ complex** gas molecules

Key Figures

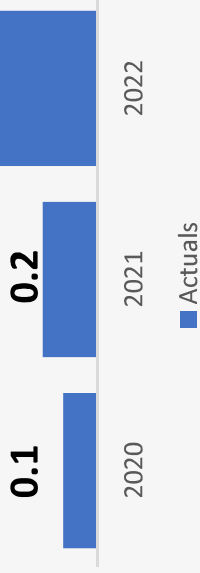
Year Founded **2010**, ~10 years of techno development

Employees **11**

Patents **7**

Total Equity financing to date **2,5M€**

Blue Turnover (€m) **0.65**



Customers



Blue has designed gas analysis solutions that **match** the specific needs of industrial customers

Industrial market needs measurement data's

Flexible systems

+

Cost-effective &
User-friendly

+

Continuous

Flexible systems are required, which **monitor & identify precisely - high to low concentrations - multiple complex molecules** in a gas flow

“**Set up & forget**” solutions, not requiring **maintenance**, repeated **consumables** supplies and constant **recalibrations**

Continuous monitoring on the field is required to take back **control** on **processes and emissions**



Blue's solution



Low to high concentrations - 500+ complex molecules measured - Identification

Low maintenance - no consumables - remote access

Real-time - continuous monitoring

Existing technologies are unable to meet the need for **all-in-one continuous & user-friendly & cost effective & precise** (low concentration detection) monitoring solutions

Existing solutions

1

Gas Chromatography (GC-MS)

(benchmark on the market)

- X** Heavy & complex use (mainly in labs)
- X** Non completely continuous
- X** High maintenance, requires consumables & people

2

Laser based analyzers (such as TDL/QCL)

- X** Only covering ~20 small gas molecules (e.g. CO₂, CO, NO_x, HCl, H₂S ...)
- X** Limited to 1-2 molecules measurement simultaneously

3

Other **industrial** analyzers

- X** Poor detection capabilities (e.g. NDIR, FTIR). Limited to high concentration measurements
- X** Not molecule specific (e.g. PIDs, FIDs¹⁾): enables only total VOCs²⁾ measurements

1) Photo/Flame Ionization Detectors

2) Volatile Organic Compounds

Blue – Continuous gas emissions measurement solutions

• Blue analysers monitor in real time critical gas molecules

- 1) Regulated **environmental** pollutants emissions (eg. chimney) continuous **compliance** monitoring, quantification of SBTI targets
- 2) Gas **exposure** in workshops, labs: mapping & continuous monitoring for **HSE** purposes
- 3) Continuous **monitoring** of gas streams in **production processes** (eg. drying step or new process development)



• Differentiated and patented technology, the world's first Broadly Tunable Laser (BTL)

- **Continuous** monitoring round the clock 24h/24; **500+** molecules
- Low **quantification** level (ppb to ppm) and wide dynamic range (up to %)
- **Simultaneous** & stable measurement of **multiple** gas molecules
 - Broad spectral range of 800 cm-1 covering wide range of VOCs molecules
- **Molecule identification** capabilities
- **Easy** to use and low maintenance costs
- **Sampling** system (extraction) adapted to measurement objective
 - Multiple sampling points and dilution module
 - Sampling **in vacuum**



Blue has launched the **world's most advanced laser-based gas monitoring analyzer**

3 Key components

Optical source

Broadly Tunable Laser
Wavelength control

Patented

Fully industrialized by
Blue

Photoacoustic Detection

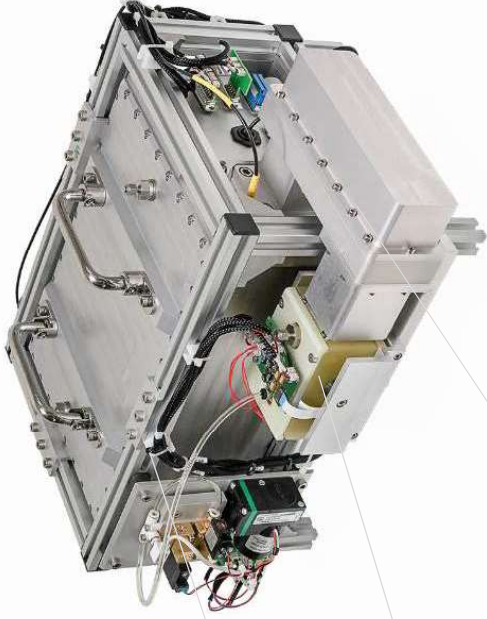
Patented, fully
developed and
qualified

Plug and play assembly

Software and Algorithms

Blue's advanced suite of
tools for enhanced and
easy measurements
Customizable

In-house know-how



The first gas analyzer based on a **proprietary Broadly Tunable Laser (BTL)** technology

The BTL **optical source** includes 2 modules :

- A special design, doubly-resonant **Optical Parametric Oscillator (OPO)** derived from French **aerospace** research
- A **wavelength control unit** ensuring proper **high spectral resolution**

Photoacoustic detection cell providing **traces detection capabilities** (ppbs to ppms)

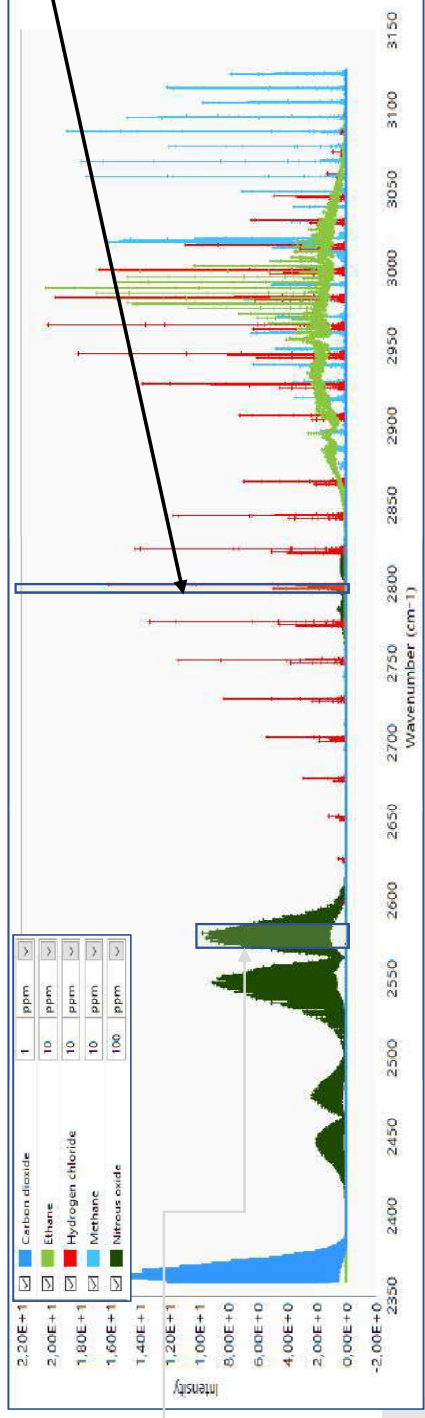
A full suite of :

- **Software** for simulation, control-command, maintenance, measurement methods design...
- 500+ molecules **spectrum catalogue**
- **Algorithms** for enhanced performance

Technology

Blue's technology has a tunability equivalent to 400 "standard" lasers!

BTL broad tunability 800cm⁻¹



Standard TDL/QCL laser limited tunability 2 cm⁻¹

Taking the best of "standard" lasers...

- **Stable**
- **Robust**
- **Easy to use**
- **Low maintenance costs**
- **No consumables**

Key benefits

... and adding breakthrough extra benefits

- **Light to heavy** complex molecules measurement among a **database of 500+**, while other laser systems only cover **20 molecules in total!**
- Ability to be specific in a **complex matrix** or in an environment facing changing conditions
- **Identification of unexpected molecules** in the gas flow

Business model

Blue's business model is based on providing **measurement data** to customers through sales of **services** and/or **hardware** generating **growing recurring revenues**

**Hardware as a service
(HAAS)**

~12k€

1 week rental with remote data's
analysis support service

Hardware sales generating **recurring revenues**

120-140k€

average unit selling price

Recurring revenues

5% of hardware selling price per
year

**Mapping of gas emissions
at a customer's facility
(HSE needs or process
optimization)**

**Sale of analyzers for
continuous monitoring
(compliance purposes)**

- Recurring services**
- **Remote measurement support and data's analysis**
 - **Maintenance contracts**
 - **Software upgrades**
 - **New molecules addition**

Environmental and safety concerns have made the **monitoring of gas emissions** a **top priority** for **many industries**

Stricter context ...

Increasing **awareness** coupled with more stringent **regulations worldwide** on industrial harmful pollutant emissions

ESG rating becomes a **key** strategic goal at many **industrial** companies

Chemical and Pharmaceutical industries are very protective of their **image** regarding their environmental impact from pollution or accidents

... generates need for higher performing monitoring solutions

Continuous monitoring to **detect and act** immediately on any **fugitive** emissions

Monitor **reduction targets** of gas emissions in **environment** and **exposure limits** at work

Communication needs of **quantitative** measurements require **real time & precise monitoring** capabilities

Solution

Blue's gas analyzers are the most **easy to use, flexible and precise** among all others, and provide **continuous measurements**

Easy to use / Continuous measurements

AlphaSense

FIGARO

Sensors (e.g. electrochemical): low precision

NDIR detectors (high concentrations only)

RAF SYSTEMS

Dräger

SIEMENS

BRUKER

gasmeter

Agilent

ThermoFisher SCIENTIFIC

SHIMADZU
Excellence in Science

PerkinElmer

Dräger

EMERSON

envea

FPI
Focused Photonics Inc.

PID, FIDs (only total VOCs)

Analysers FTIR (high concentrations only)



TDL, QCL laser systems (only ~20 molecules)

FPI
Focused Photonics Inc.

EMERSON

ABB

PICARRO

REBROINTECH

SIEMENS

ThermoFisher SCIENTIFIC

PIX ANALYTICS

SIEMENS

PerkinElmer

EMERSON

IONICON

Gas Chromatography analyzers systems (high maintenance, not continuous)

Precision of measurements

Intellectual property

A **strong IP** on top of ONERA's after **years of development**



Licence from **Onera** (French Aerospace Institute)

- **License agreement signed in 2011**
- **4 patents on specific OPO architecture (published between 1997 and 2011)**
- **Duration: Life of the patent**
- **Scope: Gas measurement applications**
- **Royalties: 3,3% of net sales**

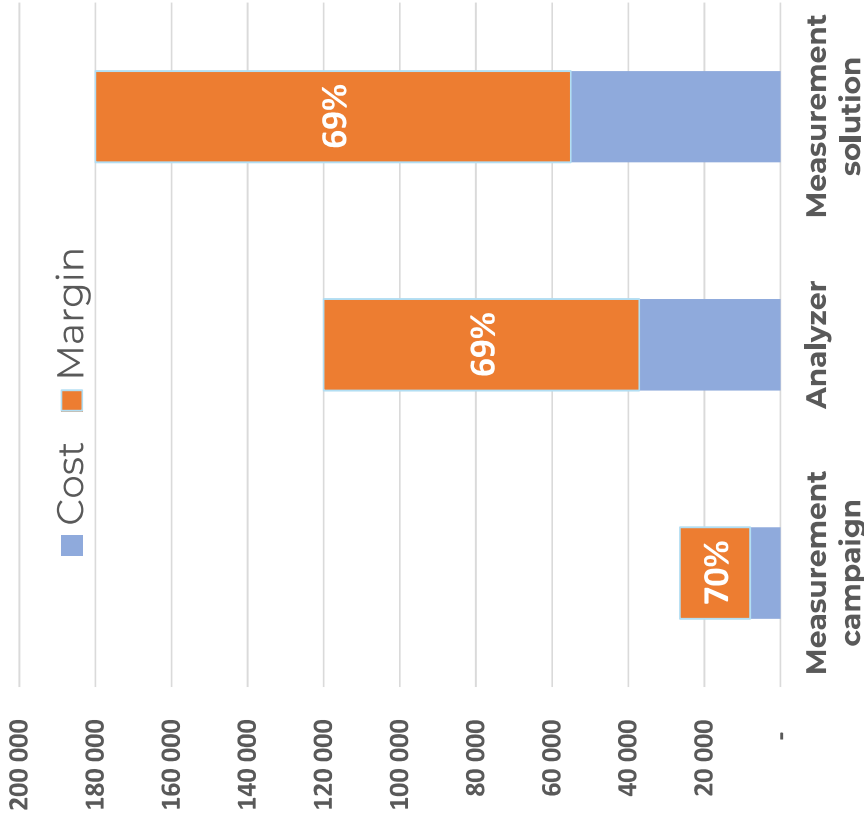
A proprietary IP owned by **Blue**

- **3 patents to date**
- **Enable industrialization of the BTL source and reduced measurement time (/100)**
- **Photoacoustic Detection (2013)**
- **Wavelength Control (2016)**
- **OPO (2018)**
- **More patents to be filled**

A unique know-how

- **Optical Integration**
- **Software Development**
- **System Industrialization**
- **Algorithms optimization**

3 business models that each generate a ~70% Gross Margin



1. Measurement campaign (measurement services provided to a customer):

- Campaign invoiced on a basis of ~12k€/week
- 70% GM for a standard 2 week campaign

2. Analyzer hardware sale:

- Base price 120K€
- 69% GM (total cost 37k€)

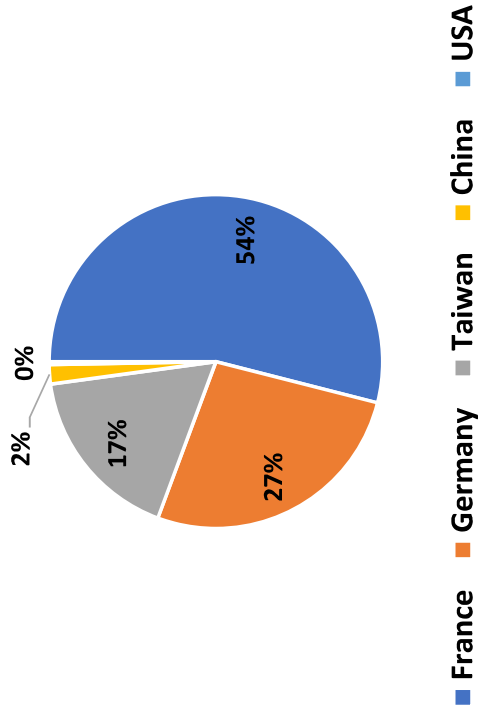
3. Full measurement solution (analyzer + sampling + integration in factory control system) sale:

- Base price ~180K€
- 69% GM (total cost 55k€)

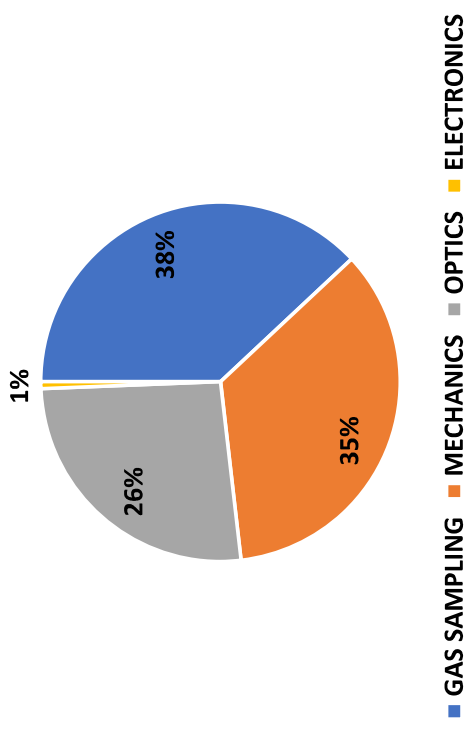
Vendors List

In 2022, most parts are purchased from **domestic suppliers** for a total of 76k€

2022 parts purchases by country



2022 parts purchases by category



- Most vendors are based in France, others in Germany, and one vendor in Taiwan
- Parts purchases are balanced between sampling, mechanics & optics purchases
- 2 optical components are single sourced
 - 1 from Taiwan
 - 1 from France (but not purchased in 2022)