



# **Operational costs reduction in a GC lab** Implementing our ucs-1000 solution

## **Our client**

Oil Refineries Ltd. (BAZAN or ORL), is Israel's largest oil refinery. Using its sophisticated and state-of-the-art industrial facilities, BAZAN is capable of refining approximately 9.8 million tons of crude oil per year, providing a variety of products used in industrial operation, transportation, private consumption, agriculture and infrastructures.

BAZAN produces refined products with a high added value by using complex refinery facilities at 9.0 on the Nelson Complexity Index, (among the highest in the East Mediterranean region). The company has a maximum crude oil refining capacity of approximately 26,600 tons per day (197,000 barrels per day). Over 75% of the company's produce goes to local consumption, while the balance is exported, primarily to the Mediterranean basin.



*"I recommend the UCS-1000 to any* laboratory that uses more than a few GCs, as well as to any laboratory that puts an emphasis on the health and safety of its employees" Mr. Alex Bershadsky | BAZAN's Operating Manager



The Challenge

To monitor and control the quality of its products, as well as to safeguard its employees' health and safety and its environmental impact, BAZAN operates 3 laboratories: an oil lab, an R&D lab and a water lab.

Due to the complex nature of BAZAN's activity and environmental impact, the lab owns and operates 15 Gas Chromatography devices, three GC/MS devices, as well as other analyzers. BAZAN uses helium as its major carrier gas. Helium is supplied from cylinder banks and its annual cost is about \$30,000 USD (or \$2,500 per month).

Suffering from ever-increasing helium costs, Mr. Alex Bershadsky , BAZAN's Operating Manager, was looking for a solution to decrease the laboratories' use and dependency on helium. Two major requirements were of essential importance to any future purchase decision:

- Any alternative should be safe to use
- Any alternative should be justified by its Return on Investment and future cost saving versus the use of helium

The common alternatives to helium as carrier gas are nitrogen or hydrogen.

- Nitrogen is cheap, safe to use and there is no shortage expected, but the analysis time is very long.
- Hydrogen is good for most applications, it has the fastest analysis time and throughput and it can be generated by a lab generator. But, working with hydrogen is not safe due to its explosion hazard.

Of all three common carrier gases, hydrogen is the best choice for capillary GC due to diffusivity and a broad working range as long as safety concerns and proper controls are in place.

Until now, there was no solution to work safely with hydrogen as a carrier gas.





BAZAN approached its vendors and service providers looking for a solution. Some offered to put better vacuuming and ventilation solutions, others to do other workarounds. Sion Technologies offered a pilot of its new product The Ultimate Carrier Solution (UCS-1000).

### **Outstanding Benefits**

- This solution saves 95% of the operational expenditure compared to the cost of helium
- The UCS-1000 burns all excess split chemicals coming from the split vent of the chromatography units
- The UCS-1000 works without downtime 365/24/7
- There is no maintenance cost

After 6 months in the lab, the outcome of this pilot is obvious. ORL's requirements were fully met by Sion Technologies.

The laboratory purchased additional UCS-1000 units and will gradually upgrade and install UCS units for every GC that can be converted to H2, for a total of 14 UCS units.





The UCS-1000 proved to be completely safe and reliable to use



Connected to one GC only - LPG application the cost saving per month is more than \$1,200 (\$14,400 per year). The ROI was justified



Air quality is improved



The UCS-1000 works 365/24/7, without requiring ongoing maintenance or consumables

"The **UCS-1000** is extremely reliable. We don't have any problems with it, and it saves me money". "on the long term, I know helium prices will only go up, meaning I will only save more money" Mr. Alex Bershadsky | BAZAN's Operating Manager

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development of analytical products, with the objective of making the impossible possible.