



# ISRAEL OIL REFINERIES CASE STUDY



## ABOUT

Oil Refineries Ltd. (BAZAN or ORL), located in the bay area of Haifa, 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.

## 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 a state-of-the-art laboratory infrastructure comprising of 3 different laboratories:

- An Oil laboratory controlling the entire production facility at each step of the refining process and controlling the quality of the end product
- A R&D laboratory providing product development and R&D services as well as supporting the oil lab
- A Water Laboratory- providing all water testing services to BAZAN

Due to the complex nature of BAZAN's activity and environmental impact, the lab owns and operates 15 Gas Chromatography devices, 3 GC/MS devices as well as other Analyzers. The following applications run in the laboratories: CO/CO<sub>2</sub>, LPG, Mercaptans, RGA, SIMDIS, Reformulyzer, Lights Ends, DHA, Low Ox, and many others. BAZAN uses Helium as its major carrier gas (which is, of course, common to many GC applications and industries). Helium is supplied from cylinder banks and its annual cost is about \$30,000 USD- \$2500 per month.

## THE PROBLEM

Suffering from ever-increasing Helium costs, Mr. Alex Bardichevsky, 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 alternative to Helium as carrier gas is Nitrogen or Hydrogen :

Working with Nitrogen has some significant advantages:

- Cheap
- No shortage expected
- Safe to use
- Can be generated by a lab generator from air

But also, some drawbacks:

- Longer analysis time, which translates to lower lab throughput
- Not possible to use with GC/MS

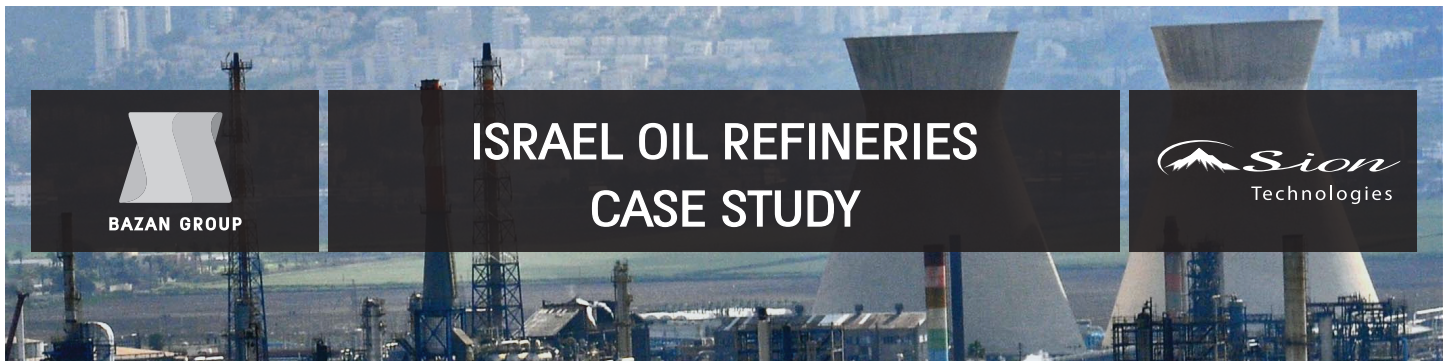
Working with Hydrogen has major advantages:

- Good for most applications
- Excellent linear velocity range
- High lab throughput
- Can be generated by a lab generator
- Can be used with GC & GC/MS

The ONE major disadvantage of working with Hydrogen is that it is not safe to use 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.**



## THE SOLUTION

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) to create a cost effective and healthier working environment for the lab as it would save 95% compared to the cost of Helium and also would burn all excess split chemicals coming from the split vent of the GC.

Was it safe?

Working with Sion Technologies' Founder for more than 30 years, and after verifying the operating principal of the UCS, Alex gave the green light for a pilot. One UCS-1000 unit was installed on an existing LPG application.

"We had some issues with the unit initially, as we had some downtime, but we weren't sure why? We asked Sion to implement a log module in the UCS". The log was implemented according to our request and showed other reasons for the downtime (lower air pressure, manual H2 replacement, etc.).

"Sion service and support is the best in the industry, and without competition," Alex says.

After the software update, the pilot proved successful, but BAZAN decided to take more time to determine the solution's reliability over time.

## THE RESULTS

After 6 months in the lab the outcome of this test is obvious:

- The UCS-1000 works without downtime 365/24/7
- There is no maintenance cost
- No split gases are coming out into the laboratory environment
- Connected to one GC only (LPG application) the cost saving per month is more than \$400. (~ 5,000\$ Per Year)

The laboratory is in the process of purchasing 3 additional units and its goal is to purchase and install UCS units for every application that can be converted to H2, for a total of 14 UCS units.

Alex says, "The UCS-1000 is extremely reliable. We don't have any problems with it, and it saves me money". "for the long term, I know Helium prices will only go up, meaning I will only save more money".

**"I recommend the UCS-1000 to any laboratory that uses more than a few GCs, and advice it to any laboratory that attaches great importance to the health and safety of its employees."**

## ABOUT SION TECHNOLOGIES

Founded in 2015 by leaders in the field of analytical device manufacturing, Sion develops advanced laboratory analytical instruments and associated support systems. The company's goal is to integrate knowledge, experience and ergonomics in the broad development of analytical products with the objective of making the impossible possible.



Safe and reliable Hydrogen supply. UCS1000 eliminates dangers associated with Hydrogen



Environmental friendly eliminates the release of hazardous chemicals



Fast ROI 95% cost savings compared to Helium



Continuous, effortless operation works 24/7/365, without requiring ongoing maintenance or consumables



Higher throughput by shortening analysis time