



# Byco Petroleum Pakistan Trusts Vitro Technology for Remote Management of Retail Gasoline Price Monoliths

## A Vitro Technology Crypto-Secure IoT Solution

### CRITICAL CUSTOMER CHALLENGES

- Gasoline and Diesel prices are officially set by the Government of Pakistan, and change twice each month
- Oil companies are fined for each station that does not comply with timely updates of retail prices

### SOLUTION

- The Vitro Crystal securely transfers control of setting the retail fuel prices from local displays to a centralized dashboard hosted on AWS IoT

### BENEFITS

- Centralized control over the prices in all stations
- Crypto security in each price display, eliminating local or remote tampering
- IoT hardware that is delivered set for power-on registration
- SIM card support for uninterrupted, reliable wireless connectivity
- Rugged design for remote industrial deployment



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### BACKGROUND

Byco Petroleum Pakistan Limited (BPPL) is one of Pakistan's leading energy firms, engaged in the businesses of oil refining, petroleum marketing, and petroleum logistics. Headquartered in Karachi, Byco's mission is to meet its customers' energy needs in Pakistan and beyond. Byco manufactures a wide range of petroleum products with a vision to achieve sustainable productivity and profitability while upholding high standards to address environmental, health and safety requirements.

Byco manages over 800 retail gasoline service stations in Pakistan alone. Spread over different provinces, these stations operate almost continuously and have to conform to the rules of the Pakistani government. Retail gasoline distribution is a key element in the Byco business model.

## Business Challenge

Given the number and distribution of gasoline stations, recurring periodic supervision over a vast geographic area of locations was unfeasible. Local personnel regularly make mistakes by delaying price adjustments, resulting in fines and penalties for Byco, the parent company.

Malicious actors even created personal arbitrage by delaying a downward price adjustment and pocketing the difference between the listed price and the official price.

The state of the art for local operators is to set fuel prices using a device similar to a TV remote control. The device is simple to use, but there are no records of when prices are changed, nor are there controls over who can make changes.

## Vitro Technology Solution

Byco realized that it needed to implement centralized, remote control and management of its networks of gasoline pricers throughout Pakistan. The company turned to Vitro Technology to develop a secure network to monitor and control its pricer equipment. The Vitro Crystal Gateway is a hardened device capable of withstanding the harsh, high temperature conditions of some locations, and features dual ethernet and GSM for persistent and resilient connectivity.

The Crystal Gateway also offers monitoring of the pricer equipment, including temperature and voltage levels that predict if the equipment is operating normally or beginning to show signs of potential failure.



## Results

Vitro dashboards and IoT data are stored and reported via Amazon AWS IoT. Vitro serves visibility in each location through a dashboard capable of updating all displays with the same price with a single entry. The dashboard also monitors the key indicators of temperature and power consumption, flagging sites that fall outside of the normal operating range for closer inspection. Historical data gathered across all sites fuels artificial intelligence (AI) and machine learning (ML) tools hosted on AWS to build highly accurate predictive maintenance models.

Predictive maintenance permits Byco to schedule service prior to failures and allows the company to optimize the route of service personnel to maximize efficiency.

Byco is also deploying LED displays on the pricer monoliths that capitalize on the traffic at each station. The LED displays are managed with advertising delivered through the same secure Vitro/AWS network. Ads can be priced according to the time of day, frequency and cycle time.

This adds up to new revenue for Byco in advertising as well as increased sales of food and beverages in the Tuck Shops. Dashboard control of advertisements and service notifications allows Byco to stay ahead of the curve managing petroleum and maximizing profit – exactly where this leading company wants to be.

## About Vitro Technology

Vitro Technology Corporation builds and operates crypto-secure Industrial Internet of Things (IIoT, IoT) networks. Vitro IoT networks serve connectivity for remote, low density, low bandwidth equipment including authentication both for security and transmitted data. Vitro employs open-source hardware, software, ECC crypto-technology and hosted services, including resilient, low cost Linux IoT hardware and AWS IoT. Vitro IoT homogenizes the control and management of heterogeneous remote equipment, including sensors, actuators and controls. Vitro IoT also securely distills operating data across equipment categories into authenticated time-series data hosted on AWS IoT for analysis and predictive modeling.

Learn more at <http://vitro.io>

