

VL Energy

 VL ENERGY	Methane Emissions Management Solution: Efficient and Secure Predictive Emissions Monitoring System, ES-PEMS
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COMPANY DESCRIPTION

VL Energy is a Calgary-based cleantech pioneer delivering the first regulator approved, software only emissions monitoring solution in Canada. Its flagship ES-PEMS platform transforms standard process instrumentation into a continuous, AI driven monitoring network with no additional hardware required.

How it Works: ES-PEMS taps into existing temperature, pressure, flow, and humidity sensors via a secure API layer, streaming timeseries data to the cloud. Four deep learning modules, convolutional for feature extraction, recurrent for temporal patterns, attention for key signal weighting, and dense for final regression, run in parallel to predict real-time concentrations of pollutants. A built-in CI/CD pipeline automatically retrains models with new operating data, backfills anomalous sensor readings, and maintains $\geq 85\%$ data availability. Users configure site specific thresholds in the web dashboard, triggering SMS or API alerts when emissions exceed compliance limits. Native integrations with SCADA/DCS systems and open APIs ensure seamless data flow without disrupting existing control environments.

Value Proposition: By eliminating the need for costly CEMS hardware, ES-PEMS slashes capital expenditures by up to 70% and reduces maintenance OpEx to a fraction of legacy systems. Continuous AI driven insights reveal emission trends and sensor drift long before manual surveys, enabling proactive maintenance and fewer unplanned shutdowns. Automated, audit ready compliance reports streamline ESG disclosures and regulatory filings, boosting transparency for investors. Scalability across oil & gas, agriculture, power generation, municipalities, and critical infrastructure means a single SaaS solution can meet diverse operational needs, delivering “software as a sensor” simplicity with enterprise grade reliability.



RECENT SUCCESSES

Since its launch, VL Energy has rapidly expanded both its technological footprint and market presence. In mid-2024, the company secured \$2.24 million from Emissions Reduction Alberta (ERA) toward a \$7.35 million demonstration project deploying ES-PEMS across diverse agricultural operations in Alberta, enabling farms to optimize on-site power, lower emissions, and pursue carbon credits. That same year, VL Energy co-authored a peer-reviewed white paper in the Oil & Gas Journal, in partnership with Suncor Energy and PTAC, validating ES-PEMS against Suncor's Firebag Cogeneration Unit 194 and demonstrating $R^2 > 0.9$ against conventional CEMS. Regulatory endorsements by the Alberta Energy Regulator and Alberta Environment & Parks mark the platform's first-mover advantage as a purely software-based alternative. VL Energy's pilot deployments in farming, coupled with early trials in oil & gas batteries and municipal utilities, have led to discussions with international partners in Europe, Australia, and Asia. These achievements reflect not only robust technical validation but also accelerating commercial traction, positioning VL Energy to capture a rapidly growing market for cost-effective, scalable, and compliant emissions monitoring worldwide.

PTAC's Contribution to Success: VL Energy has collaborated with PTAC to foster a strong environment for technology development by engaging with end users, government funders, and innovation ecosystem partners. These efforts enhanced market understanding and supported broader technology deployment. Leveraging PTAC's platforms, including domestic events, the Methane Leadership Summit, Digital Innovation Forum, TERE committee, and global conferences like CERAWEEK, OTC, COP 29, and the World Petroleum Congress, VL Energy gained valuable exposure to both Canadian producers and international markets. These efforts have been instrumental in de-risking international market development and enabling a level of scale and visibility that the company could not achieve alone. These initiatives also diversify export opportunities beyond the U.S. while reducing financial risk through modest funding support. The outcome contributed to growth in sales and employment despite geopolitical headwinds, with continued expansion anticipated.

Notable Export Achievements:

- 1. Engagement with U.S. National Laboratory**
Initiated collaboration with the **National Renewable Energy Laboratory (NREL)** in **Colorado** to explore the integration of VL Energy's PEMS into advanced low-emission energy systems.
- 2. Strategic Partnership with Global Aerospace Manufacturer**
In discussions with a **leading global aerospace company** headquartered in the United States to deploy VL Energy's emissions monitoring and optimization technology at one of its major industrial facilities. The deployment would support decarbonization and sustainability goals through AI-driven operational efficiency.
- 3. Participation in International Cleantech Events**
Showcased VL Energy's technology at global innovation platforms such as Web Summit (Vancouver) and Cleantech Open (USA), establishing the company as a recognized Canadian cleantech exporter.
- 4. Commercial Partnerships with Multinational EPC Firms with targets in UAE, Singapore, Netherlands, and US**
Establishing export-aligned collaborations with global engineering, procurement, and construction (EPC) firms to integrate VL PEMS into large-scale international energy and infrastructure projects.



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