

OZONECO RESOURCE

CEMS Selection Guide

Technical guide to selecting the right Continuous Emissions Monitoring System for your facility.

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Why CEMS Selection Matters

A correctly specified Continuous Emissions Monitoring System (CEMS) is the difference between a smooth NCEC inspection and a costly enforcement action. This guide covers the parameters, technologies, and qualification standards relevant to Saudi industrial facilities.

Parameters Typically Required

Combustion sources	NOx, SO2, CO, CO2, O2, particulate matter (PM)
Process flares	Flow, BTU content, opacity
Cement / lime kilns	NOx, SO2, HCl, HF, Hg, dust
Refineries / petrochem	VOCs, H2S, NH3, opacity

Measurement Technologies

Extractive — Hot/Wet

Sample drawn at stack temperature; ideal for sticky/condensable analytes (e.g., HCl, NH3).

Extractive — Cool/Dry

Sample dried before analysis; robust for NOx, SO2, CO using NDIR/UV.

In-situ Cross-Stack

Beam across stack; fast response, no sample handling — best for flow and opacity.

In-situ Probe

Sensor inserted directly into stack; compact and lower maintenance.

Tunable Diode Laser (TDLAS)

Specific molecule detection without cross-interference, increasingly used for HCl, HF, NH3.

Qualification Standards

- Analyzers MCERTS, TÜV, or US EPA PS-2 / PS-9 / PS-11 certified.
- Data Acquisition System compliant with NCEC CEMS Spec v2 (1-min averages, hourly transmission).
- QAL2 calibration on commissioning, AST every year, QAL2 every 5 years (EN 14181).
- RATA performance test annually using NCEC-accredited stack testing firm.

Selection Decision Matrix

Criterion	Weight	What to assess
Regulatory fit	High	NCEC permit conditions, parameter list, accuracy class
Stack conditions	High	Temperature, moisture, particulate load, corrosivity
Maintenance burden	Medium	Spares availability, calibration cylinders, local service
Total cost of ownership	Medium	CapEx + 5-year OpEx including consumables
Data integration	Medium	OPC-UA / Modbus to DCS and NCEC gateway
Vendor track record	High	Number of qualified installations in KSA

OzoneCo CEMS Practice

We design, supply, install, calibrate, and maintain CEMS for refineries, power, cement, petrochemicals, and waste-to-energy plants across Saudi Arabia, with full NCEC integration and 24/7 service.