"One Stop Shop"
Diagnosis, Control & Monitoring

EXPERTISE
25+ Years

TECHNOLOGY
Incident prevention with Big Data
& Artificial Intelligence

TSG
environmental

TOP-DOWN STRATEGY: TECHNOLOGY & BIG DATA
FOR AND ODOR CONTROL MASTER PLAN

A little about me…

TSG environmental

Pontificia Universidad Católica de Chile
INDUSTRIAL ENGINEER

esade
RAMON LLULL UNIVERSITY
MBA | BARCELONA | SPAIN

CEIBS
MBA | SHANGHAI | CHINA

FROM LIVED IN

Brief History

- Industrial Engineer
- Expertise in Operations - 10 years of working experience.
- MBA – Spain & China – **Focus in Digital Transformation and Big Data**
- Passion for creativity and innovation
  - Awarded best Wine Tourism Innovation of 2016 | Argentina

TSG: Head of Innovation since 2020

- Real Time Monitoring
- Real Time Odor Control Systems
- ML & Big Data
- New Product Developments

HAVE YOU EVER THOUGHT THAT

TECHNOLOGY & BIG DATA ARE DISRUPTING THE SCIENTIFIC METHOD?

The Scientific vs Technological Approach

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TRADITIONAL SCIENTIFIC APPROACH

Hypothesis

↓

Experiment

↓

Results

↙ ↘

Validation | New Hypothesis

IF HYPOTHESIS NOT VERY ACCURATE IN THE FIRST PLACE:

➢ LONG & EXPENSIVE

TECHNOLOGICAL APPROACH

Real Time Monitoring for Massive Data Collection

(No Hypothesis)

↓

Machine Learning & Big Data Models

↓

Conclusions

↓

Actions

ACTIONS BASED IN DATA CAN:

✓ SAVE TIME & MONEY

Specially when many variables are in stake.

THIS IS EXACTLY WHAT WE DID IN A PULP MILL IN CHILE

PULP MILL

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1. **Problem:** Community Complaints

2. **Main Reasons:**
   - **Ex-Post Analysis**
     - Running behind is already too late...
   - **Multiple variable data becomes difficult to compile.**
     - Slow corrective actions (where and when to act)

The Challenge

3. **Objective:**
   - Provide agility in response → **Where & When to act?**
     - Preventive and corrective actions on-time.
   - Lower Base Emissions and Maximize ROI → **Where to invest?**

The Challenge

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What we did? We installed both of our in house developed tools

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SMART plume

Disperse Modelling for Real time Odor Impact

SMART sense

Gas Monitoring in Real time

¿Why are both tools necessary?

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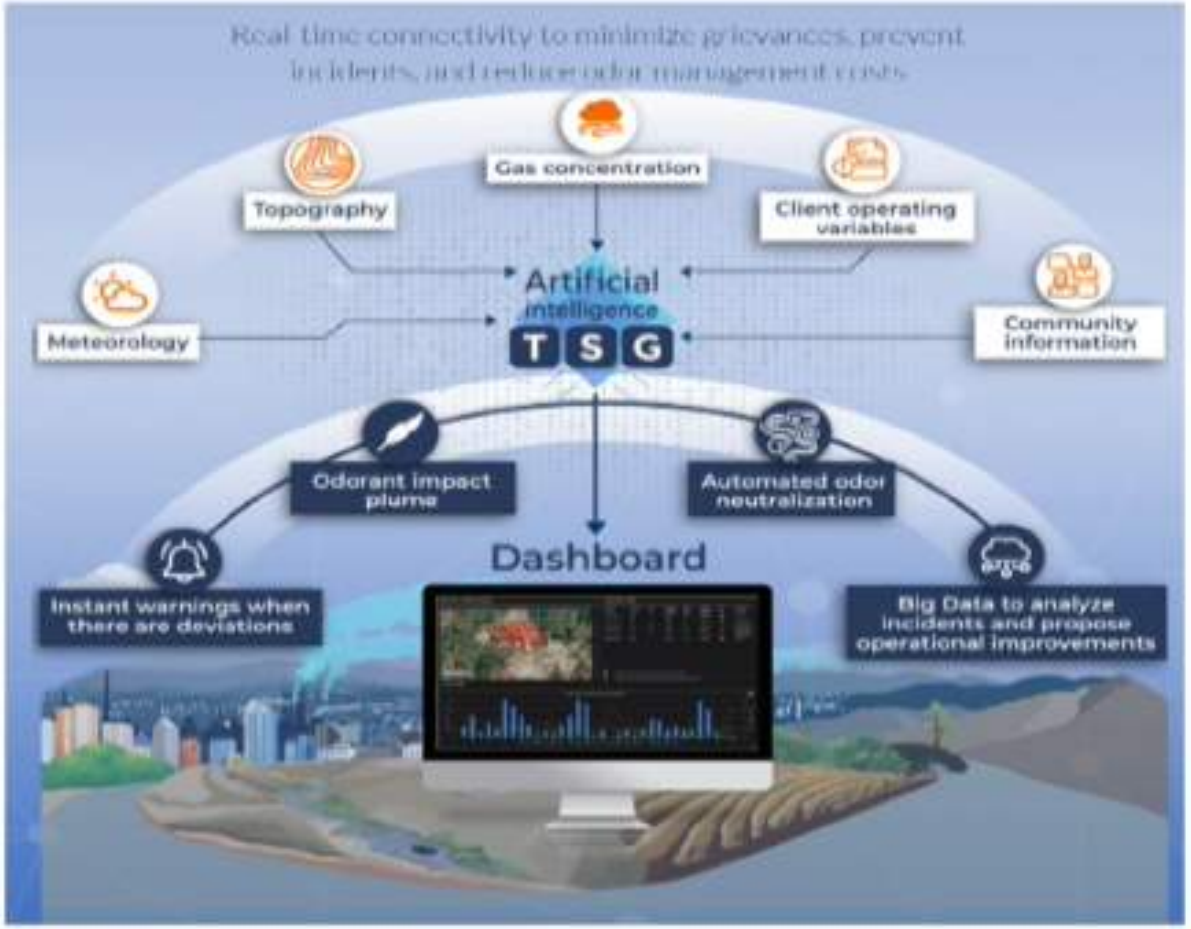
TOPOGRAPHY × EMISSIONS × METEOROLOGY → Risk Factors

FIXED — VARIABLE

		Risk	Detection Tool
↑ Emissions × Meteorology =	→	High	SMART sense
= Emissions × Meteorologia ↑	→	High	SMART plume
↑ Emissions × Meteorologia ↑	→	Critical	SMART sense + SMART plume

TSG Technology



SMART plume TSG

Disperse Modelling
Odor Impact Software

SMART sense TSG

Gas Monitoring
in Real time

TSG – What we did?

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TECHNOLOGICAL APPROACH

Real Time Monitoring & Data Collection (No Hypothesis)

↓

ML & Big Data Models

↓

Conclusions

↓

Actions

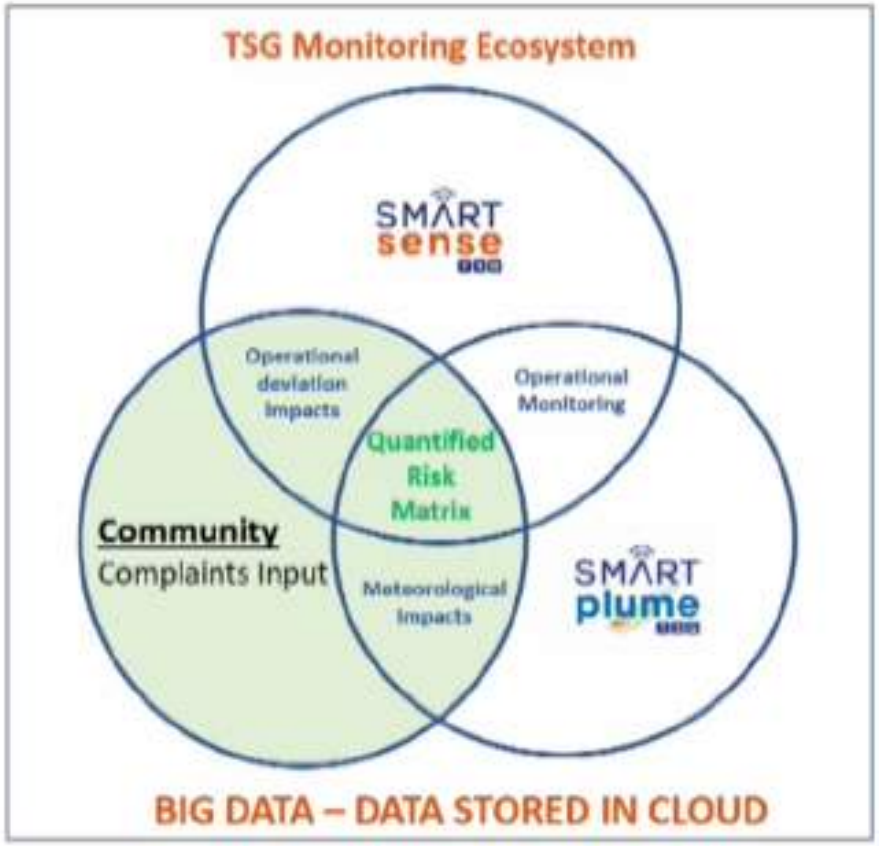
1. **Set Up System:**
   Installed 20 Gas Sensors in diverse areas of the plant.
   Installed Smart Plume – Disperse Modelling Software

2. **Determined parameters triggering complaints.**
   Base Odor Impact: ouE/ critical in each receptor.
   Emission Deviations:
   - Critical Gas, PPM & Time Exposure Thresholds
   - Identified areas mostly involved with complaints.

   Weather Variables: Wind Speed and critical directions

3. **Set-up Odor Control Plan:**
   Quantified Risk Matrix – Critical Thresholds per Community
   - Automatic Alarms for emission deviations (Email/SMS)
   - Daily Risk Report: 72hr forecast odor impact

   Investment Prioritization in Critical Areas: Data based



Operational Continuity
- Early alerts upon deviations
- Automatic activation of abatement systems

Compliance
- Historical records for audits and regulatory compliance.
- Automated reports for rapid incident investigation

Incident Prevention
- 72 hour forecast to plan activities.
- Individualization of communities – customized parameters

Continuous Improvement
- Identification of critical areas requiring investment
- Optimization of internal protocols and training shifts.

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Thank You

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FOR MORE INFORMATION, PLEASE VISIT OUR STAND ☺

SMART sense TSG | SMART plume TSG