

JPRSI 2023 6th Seminar



Environmental measurement technology of HORIBA

Takeshi KOBAYASHI
HORIBA, Ltd

2024/3/13

Today's contents

- **HORIBA Company**
- **AQMS (Air Quality Monitoring System)**
- **CEMS (Continuous Emission Monitoring System)**

JPRSI 2023 6th Seminar



HORIBA Company Presentation

Takeshi KOBAYASHI
HORIBA, Ltd

2024/3/13

Contents

1 **Corporate Profile**
Achieving Global Growth with Measurement Technologies

2 **Corporate Culture**

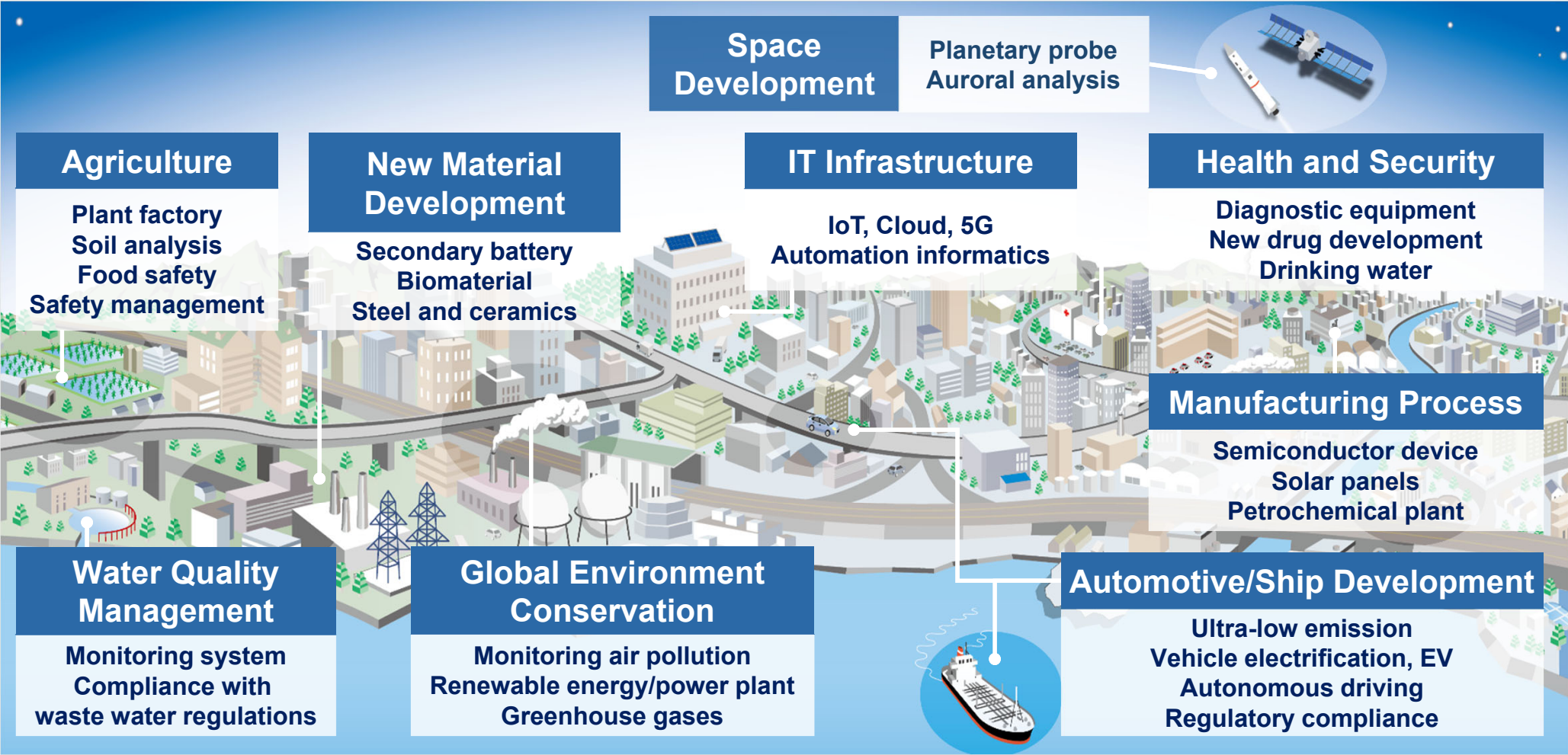
Overview

- **Line of Business** R&D, Manufacturing, Sales, Services of analysis and measurement equipment
- **Head Office** Kyoto, Japan
- **Founded** October 17, 1945
- **Incorporated** January 26, 1953
- **Net sales** 290.5 BJPY (FY2023)
- **Number of Employees** 8,665 (FY2023)
- **Chairman & Group CEO** Atsushi Horiba
- **Fiscal Year End** December 31



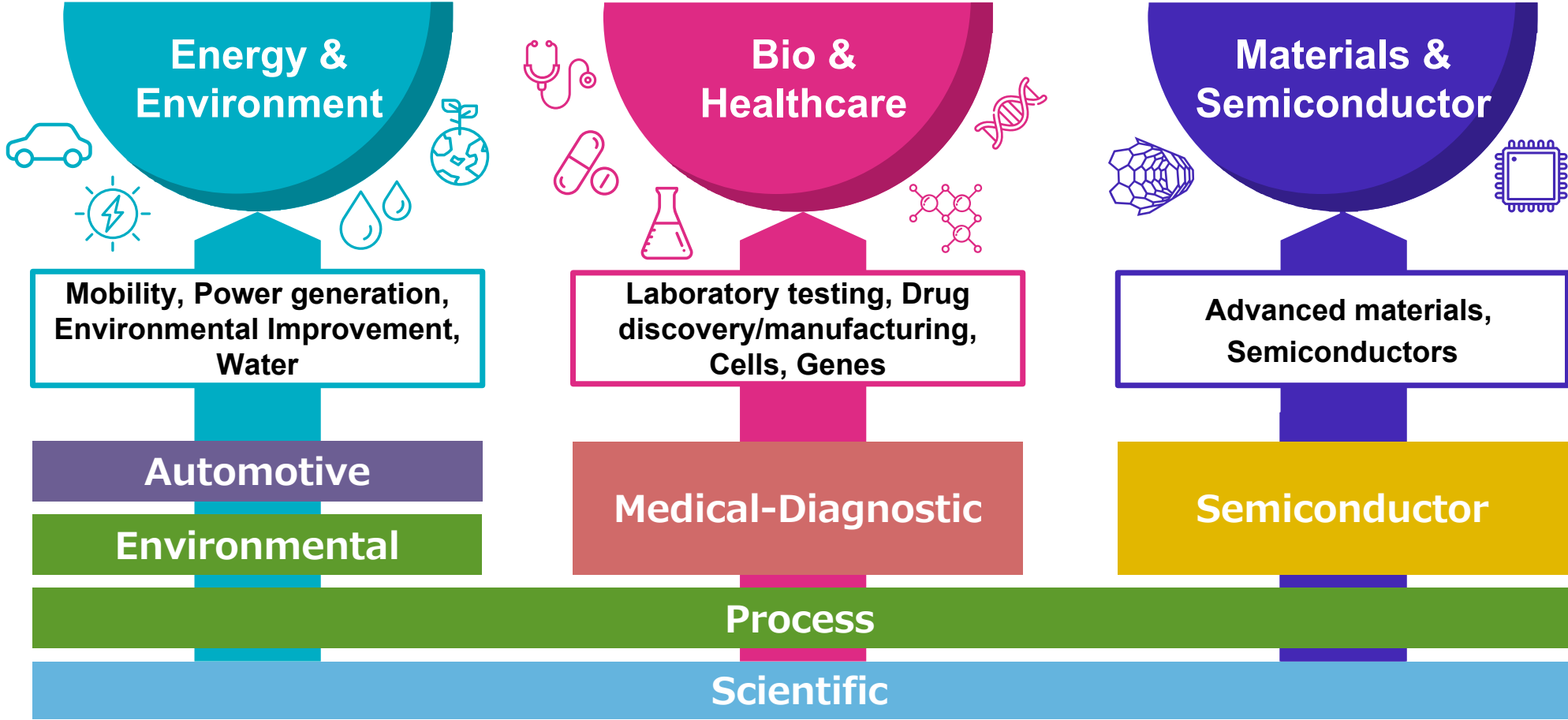
Atsushi Horiba

HORIBA's Business Domain



Mid-Long Term Management Plan "MLMAP2023" - Three Business Fields of the Mega Trend

【Target for 2023】 Net sales : 300 billion yen / Operating income : 40 billion yen



Five Business Segments & Major Products

Figures are the sales composition ratio for FY 2023


**Automotive
(28%)**



**Emission Measurement
Systems**




**Process &
Environmental
(8%)**




Stack Gas Analyzers




**Medical
(11%)**




**Automatic Blood Cell
Counters plus CRP**



**Semiconductor
(39%)**



Mass Flow Controllers



**Scientific
(14%)**



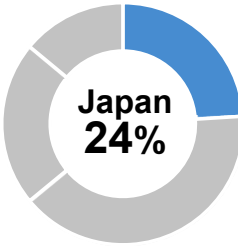
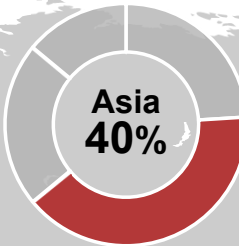
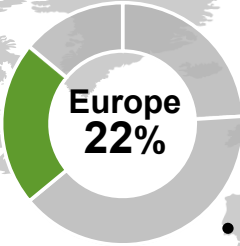
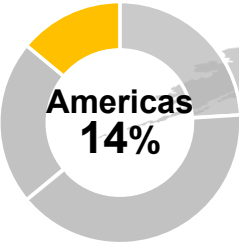
Raman Imaging Device



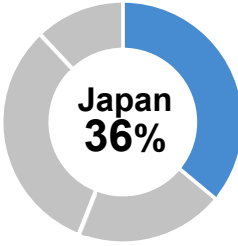
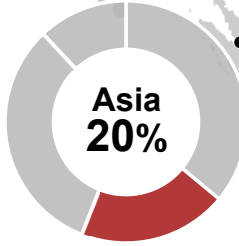
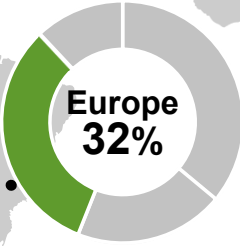
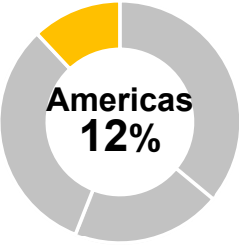
Global Network

Sales by region (as of Dec 2023)

● : Major business hubs



Employee headcount by region (as of Dec 2023)



Number of companies
(as of Dec 31, 2023)

49



Overseas sales ratio
(as of Dec 31, 2023)

76%



Foreign employee ratio
(as of Dec 31, 2023)

64%

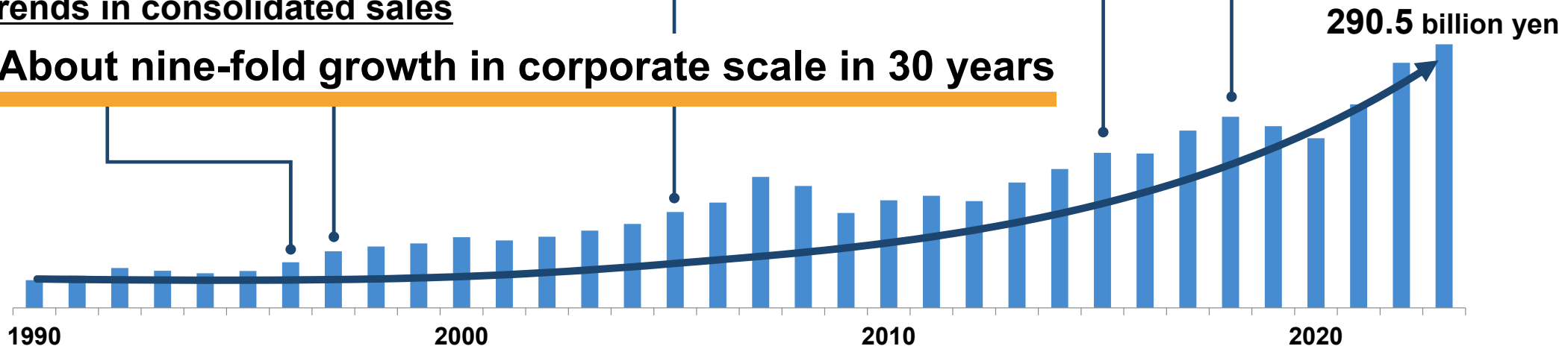
Achieving Sustainable Growth through M&A

Major M&As



Trends in consolidated sales

About nine-fold growth in corporate scale in 30 years



Contents

1

Corporate Profile

2

Corporate Culture

Creating a future of “Joy and Fun”

Beginning of HORIBA

October 1945

Masao Horiba,
a student entrepreneur, founded
HORIBA RADIO LABORATORY
in Kyoto

March 1950

Pioneered the first made-in-Japan
glass electrode pH meters

January 1953

HORIBA, LTD. was established



In front of HORIBA RADIO
LABORATORY



The first made-in-Japan glass
electrode pH meters

Corporate Motto “Joy and Fun”



The founder
Dr. Masao Horiba
(1924-2015)



If we take on new challenges and have pride in the work that occupies most of the active time in our lives, in the place where we spend a large part of each day, then the result will be a more fulfilling life, and we will be able to enjoy our lives even more. Taking on new challenges and having pride in our work leads us to “Joy and Fun.”

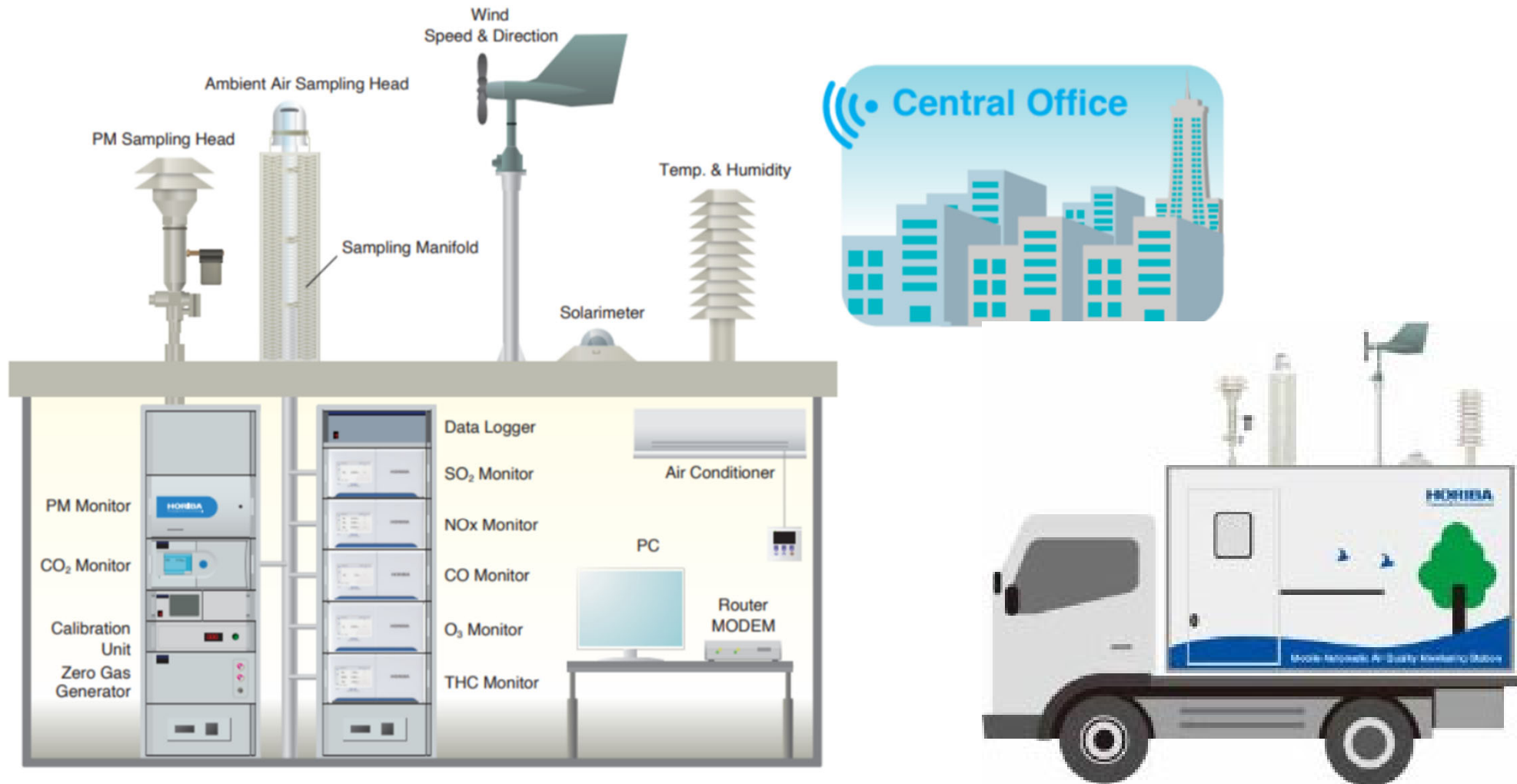


Ambient Air Quality Monitoring System (AQMS)

HORIBA, Ltd.
Takeshi KOBAYASHI

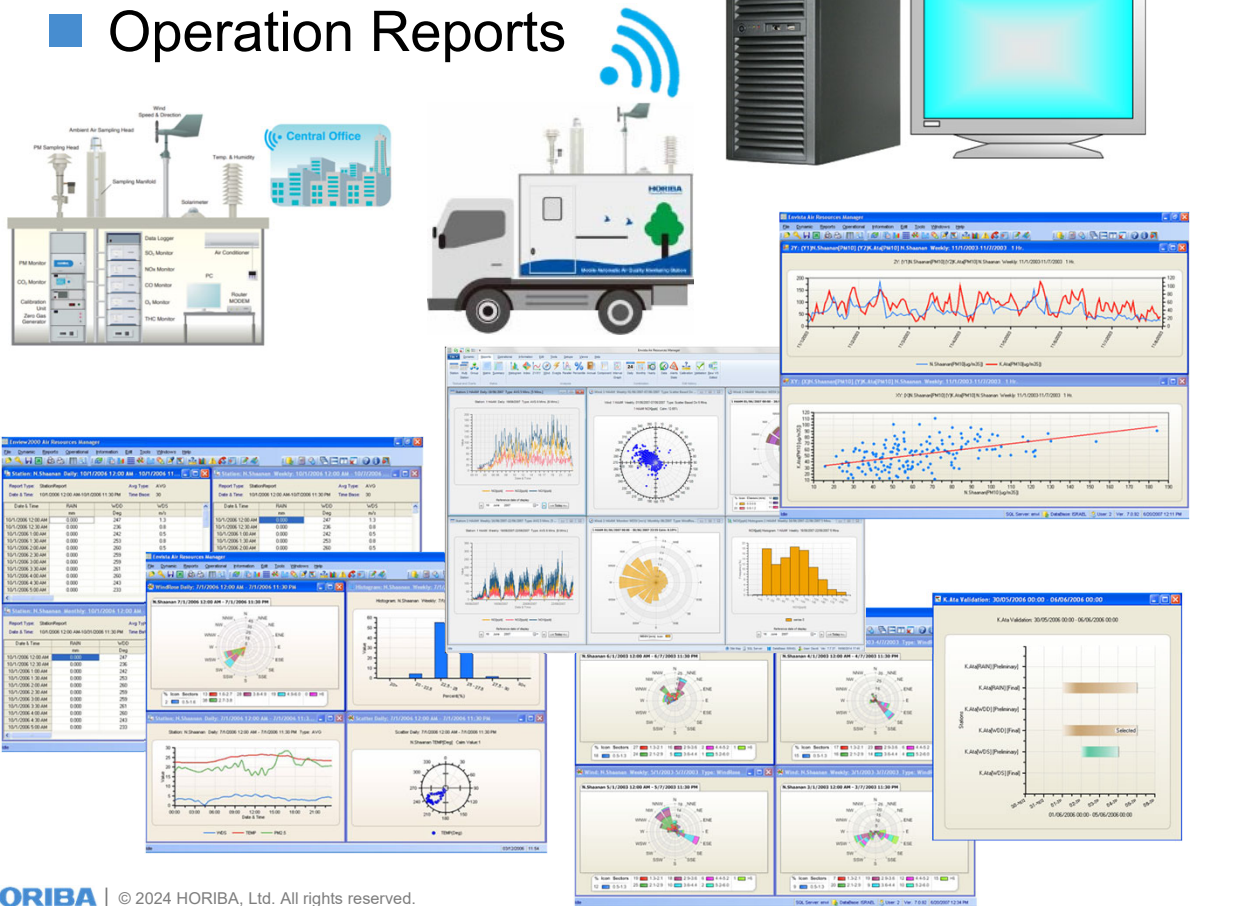
2023/04/19

Configuration of Ambient Air Quality Monitoring System (AAQMS)

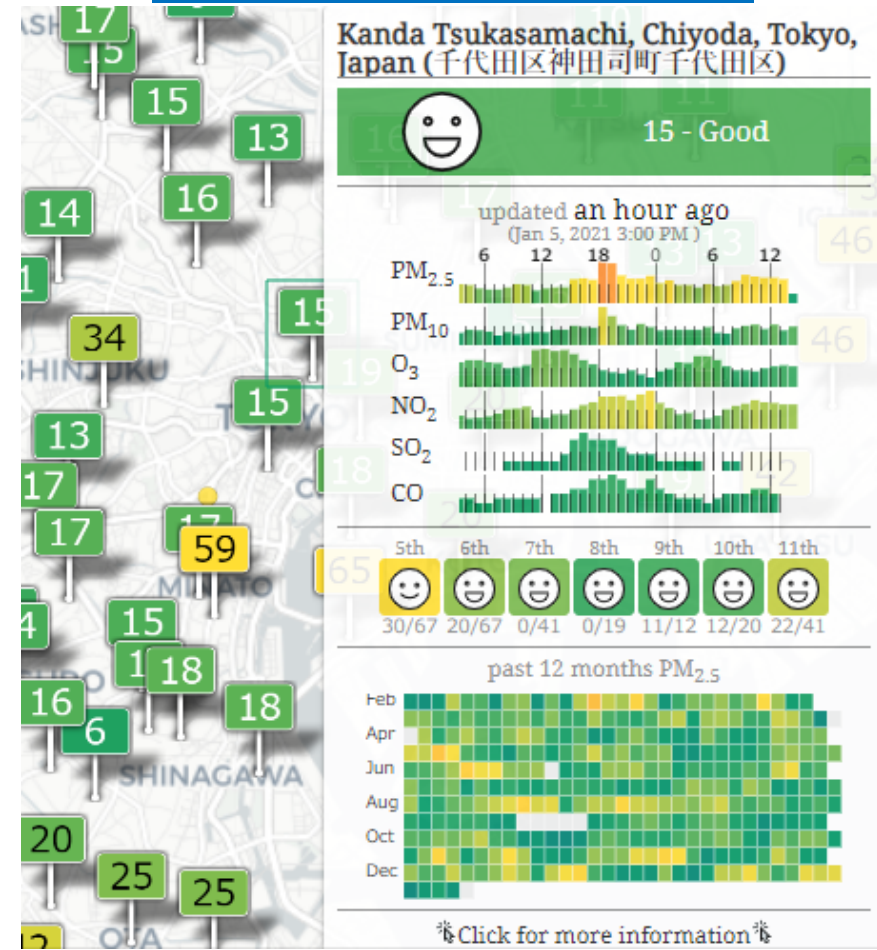


Monitoring Data Communication Overview at Office

- Monitoring Data
- Data Analysis
- Operation Reports



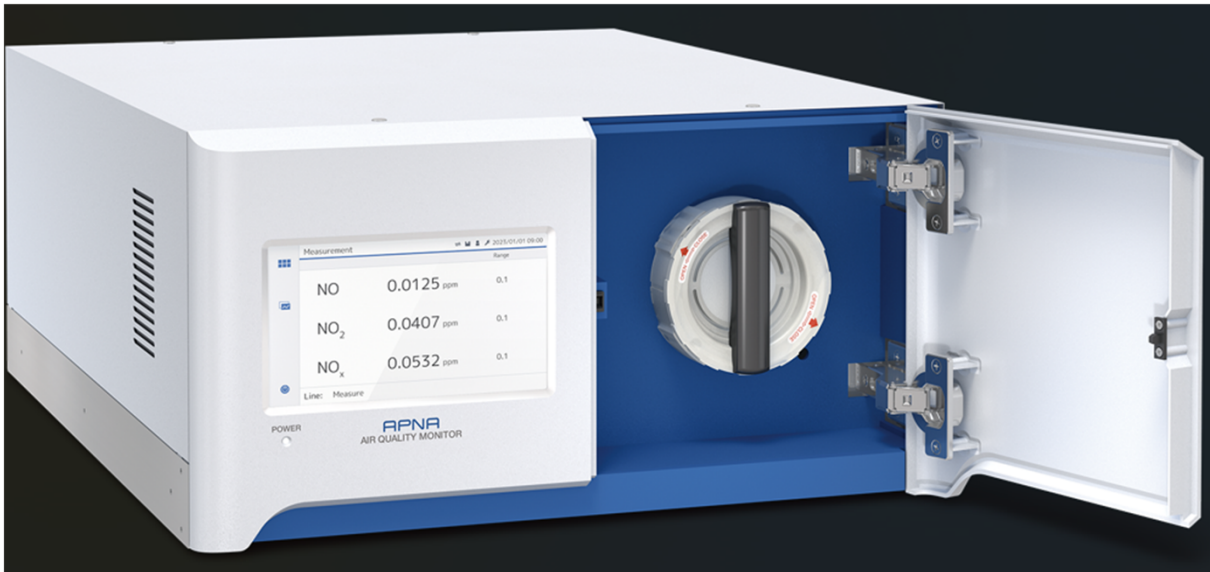
Air Quality Index (AQI)



Reference: <https://aqicn.org/here/>

Air Pollution Monitor Lineup

AP-380/370 Series



Lineup:

NO_x Monitor: **APNA-380**

SO₂ Monitor: **APSA-380**

CO Monitor: **APMA-380**

CO₂ Monitor: **APCA-370**

O₃ Monitor: **APOA-380**

THC Monitor: **APHA-380**

Measurement Method for Dust Monitor: **APDA-372**

Dust monitor using Light Scattering



APDA-372

**PM1 / PM2.5 / PM4 / PM10
/ TSP (PM_{tot})**

**Time resolution adjustable
from >1s up to 24h**

Measuring steps



Particles of different sizes



Representative „suction“ of particles in ambient air with Sigma-2



Drying of particles with IADS (Intelligent Aerosol Drying System)



Measurement of scattered light intensity with white light and 90° scattered light at the single particle



Filtration of border zone and coincidence signals

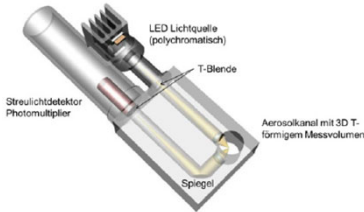


Figure 44: Sensor setup of the APDA-372 measurement system

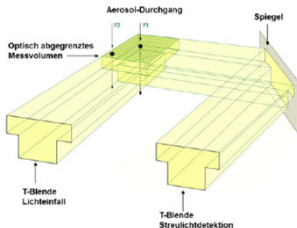


Figure 45: Depiction of the T-aperture

On-site Monitoring

- Continuous Ambient PM and Metal Monitor (PX-375)
 1. Analysis of **PM mass concentration** and **elemental concentration for metals**
 2. Monitor **trends** (interval of 60 minutes)
 3. Sampling and analysis completed **all on site**
 4. Sample on the **PTFE filter** can also be used for manual analysis comparison

H		Detectable Elements																He
Li	Be											B	C	N	O	F	Ne	
Na	Mg											Al	Si	P	S	Cl	Ar	
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	
Cs	Ba		Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	
Fr	Ra		Rf	Ha	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Unt	Fl	Unp	Lv	Uus	Uno	
lanthanoid		La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu		
actinoid		Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr		

* ○—Standard parameters, calibrated by standard calibration materials.
 * For measurement of element concentration calibration by standard calibration materials is needed.
 * Please contact separately about elements, marked as non-detectable.



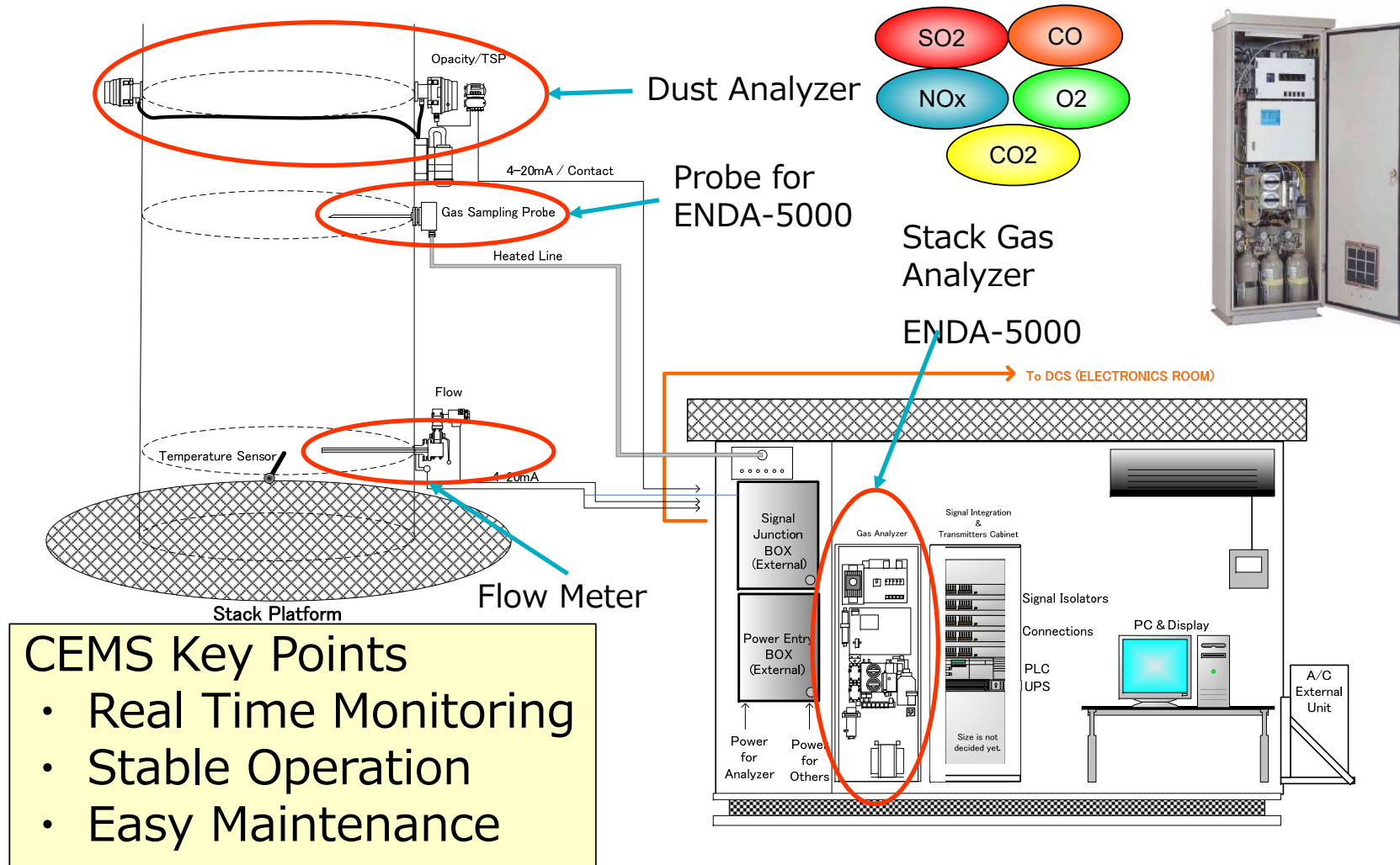


Continues Emission Monitoring System (CEMS)

HORIBA, Ltd.
Takeshi KOBAYASHI

2023/04/19

CEMS (Continuous Emission Monitoring System)



ENDA-5000 Series



Analyzer & Cabinet



**Blow Back System
(Only for Boiler)**



Sampling Probe

