

INTRODUCTION

General

Wednesday, Sep 24

Course Orientation, About GEC, NETT21, JICA-GEC Network

Purpose: Know and understand the course goals as well as the outlines of each course

Content: Explanation on course goals, outline of training program, information on GEC, NETT21 and JICA-GEC Network

Thursday, Oct 2

Country Reports Presentation

Purpose: Understand the state of air pollution in one's country, and states responsibilities at work and the training parts interested

Content: Country reports presentation by individual participants.

OUTPUT 1

Participants are able to explain about the legislative systems and the relation between industrial development and pollution with reference to Japanese cases

Overview of Air Pollution

Friday, Sep 26

Review of Air Pollution Effects

Lecture (Eng) by Technical Advisor, Hiyoshi Corporation

Purpose: Understand the impact of air pollution on the human body and stress the necessity of preventing air pollution.

Content:

- Impact of air pollution on the human body
- Impact on health from main air pollutants
- Expanded concept of toxicity and changing legal measures
- Basic concept of assessing impact on people's health

Friday, Sep 26

Review of Air Pollution Mechanism

Lecture (Eng) by Technical Advisor, Hiyoshi Corporation

Purpose: Understand the ways that air pollution is generated, and consider measures to reduce sources of pollution.

Content:

- Types of air pollution and how they are generated
- Air pollutant generation mechanisms and local/widespread pollution
- Introduction to air pollutant measurement
- Air pollution-related laws and regulations

Overview of Environmental Conservation measures

Thursday, Sep 25

History of and lessons learned from Air Pollution Control Measures in Japan and Osaka City:

Lecture (Jap) by Ex-vice Chairperson, Japan Society for Atmospheric Environment

Purpose: Learn the history of air pollution

Content: • Characteristics of air pollution and the problem

- Measures taken against the air pollution in Osaka City
- Examples of Minamata Disease and Yokkaichi Air Pollution Problem

Friday, Oct 3

Environmental Management Systems:

Lecture (Jap) by Professor, Tokushima Bunri University

Purpose: Learn and understand the basics and benefits of the ISO14001 Environmental Management System.

Content: ISO14001 and actual examples of its utilization in and benefits to local government

Tuesday, Oct 7 & Wednesday, Oct 8

Economic Development and Environmental Issues:

Lecture (Eng) by Professor, Osaka City University

Purpose: Understand how economic development and pollutions are mutually related

Content: Economical approach to deal with the environmental issues

Tuesday, Dec 2

Case Study of Air Pollution Control Measure in Osaka City:

Lecture (Jap) by Executive Director, Global Environment Centre Foundation

Purpose: Learn about Osaka City air pollution control measures taken by Osaka City

- Content: • Air pollution control measures implemented in Nishi-Yodogawa Ward in Osaka to improve the air quality
- Methods of implementing restrictions on SO_x levels in Osaka City

Laws and Regulations

Thursday, Oct 2

Japan's Environmental Standards:

Lecture (Jap) by Director of Project Division, Global Environment Center Foundation

Purpose: Learn the Japan's environmental standards relating to pollutants in the air to assess air pollution in their own countries and formulate appropriate measures

Content: • Legal status of environmental standards in Japan

- Necessity of environmental standards in formulating environmental measures
- Japan's environmental standards

Thursday, Oct 16

System of Laws and Ordinances, Complaint Handling:

Lecture (Jap) by Staff Officer, Osaka Environment Bureau

Purpose: Gain an understanding of the system of laws and ordinances related to air pollution control (such as the Law Concerning the Improvement of Pollution Control Systems in Specified Factories, the Air Pollution Control Law, and by-laws related to the preservation of the living environment in Osaka Prefecture).

- Content:
- Regulatory standards (K-values, emission standards, area wide total emission regulation, etc.)
 - Notification system
 - Measurement obligations
 - Measures for emergencies and accidents
 - Penalties
 - Regulations contained in ordinances regarding harmful substances (regulatory, etc.)
 - Complaint Handling Procedure

Friday, Oct 17

Regulatory Guidance and Factory Inspections in Accordance with Laws and Regulations:

Lecture (Jap) by Staff Officer, Osaka Environment Bureau

Purpose: Learn actual inspections based on the laws and regulations

- Content:
- Confirmation of notification items
 - Judging the effectiveness of pollution control measures (including simple measuring)
 - Checking telemeter measuring devices

Friday, Oct 17

Regulatory Guidance and Factory Inspections in Accordance with Laws and Regulations:

Visit (Jap) by Staff Officer, Osaka Environment Bureau

Sumitomo Chemical Co., Ltd.

Purpose: See how the actual inspection is done in a factory

- Content:
- Confirmation of notification items
 - Judging the effectiveness of pollution control measures (including simple measuring)
 - Checking telemeter measuring devices

Environmental Conservation Efforts

Wednesday, Oct 1

Osaka City's Air Pollution Control Measures and the Transfer of Technology, Support Systems

for Pollution Control Measures:

Lecture (Jap) by Executive Director, Global Environment Centre Foundation

Purpose: Explore for the applicability of Osaka City's experience with pollution in home country

- Content:
- Evaluation of Osaka City's experience with pollution
 - Basic procedure and method of air pollution countermeasures
 - Examples of policies by governmental and industrial sectors
 - Evaluation of Japan's Policies
 - Support Systems for Pollution Control Measures
 - Fund loan system
 - Polluted land buy-off system
 - Compensation for health problems caused by pollution

Tuesday, Nov 11

Green Cities Declaration

Lecture (Jap), Hiroshima City Environment Bureau

Purpose: Know the example of international environmental policy at a local government level

Content: Activities by Hiroshima-City who ratified the declaration

Friday, Nov 21

The Role and Achievements of Environmental Consultation Companies:

Lecture (Jap), Suuri-Keikaku Co., Ltd.

Purpose: Deepen an understanding of government support for environmental consultants.

- Content:
- Japanese government policies and scientific evaluation.
 - The standardization of environmental forecasting technology (manual preparation and operation).

Thursday, Dec 4

Protest Movement by the Victims of the Air Pollution and Rebirth of Polluted Areas

Lecture (Jap), The Aozora Foundation, Center for the Rebirth of Polluted Areas

Purpose: Understand the damages of the air pollution to the victims, and learn about the air quality measurement done by residents and the significance of the court decision as well as the rebirth movement by the victims

- Content:
- Outline of the air pollution in Nishi-Yodogawa area
 - Talk by victims
 - Explanation on Nishi-Air Pollution of court claim
 - Activities for recovery

Planning of Air Pollution Control

Tuesday, Oct 28

Calculation of Emission Amount from Mobile Source:

Lecture (Eng), Suuri-Keikaku

Purpose: Learn how to calculate emission amount from mobile sources

- Content:
- Types of mobile source
 - Character of the mobile source
 - Outline of calculation of mobile source
 - Calculation of emission amount
 - Research on device to measure emission from exhaust

Thursday, Nov 13

Calculation of Air Pollutants from Stationary Source :

Lecture (Jap) by Staff Officer, Osaka Environment Bureau

Purpose: Learn how to calculate emission from Stationary source in order to formulate plans to decrease air pollution and know the achievement

- Content:
- Method
 - Calculation of NOx, SOx and particles

Thursday, Nov 13

Formulating Air Pollution Control Plans:

Lecture (Jap) by Assistant Manager, Osaka Environment Bureau

Purpose: Learn about the steps that Osaka City has taken in order to formulate air pollution control plans and the relevance of carrying out environmental surveys and creating forecasting models.

Content: Using atmospheric environment data collected, reconstitute the current situation and predict future concentrations

Environmental Impact Assessment

Thursday, Nov 27

Environmental Impact Assessment System:

Lecture (Eng) by Staff Officer, Osaka Environment Bureau

Purpose: Learn the environmental assessment system using examples from Osaka City and consider the future of environmental impact assessment

- Content:
- What is environmental assessment ?
 - Osaka City's environmental impact assessment system
 - Examples: Maishima Refuse Incineration Facility Construction Plan
 - Examples 2: IKEA Tsuruhama construction
 - The future of environmental impact assessment

Friday, Nov 28

Examples of Environmental Impact Assessment (Maisuma):

Visit (Eng) by Staff Officer, Osaka Environment Bureau

Purpose: Gain a better understanding of the environmental impact assessment system by visiting places cited in the precious lecture

- Content: •Examples of environmental consideration and efforts by business (environmental conservation measures)
•The significance of environmental impact assessment in business

OUTPUT2

Participants are able to measure gaseous substances and particle substances related to air pollution appropriately, using the techniques learned during the program

Continuous Monitoring System

Wednesday, Nov 12

Continuous Air Pollution Monitoring System and its Use:

Lecture (Eng) by Staff Officer, Osaka Environment Bureau

Purpose: Gain an understanding regarding the role of continuous monitoring to know the state of air pollution and learn the principles of monitoring equipments and how to maintain and manage such equipments

- Content: • Purpose and significance of air pollution monitoring
• Reasoning behind the installation of continuous air pollution monitoring networks
• Details of monitoring networks and methods
• Outline of a telemeter system for continuous air pollution monitoring

Wednesday, Nov 12

Monitoring Station and Other Facilities:

Visit (Jap) by Staff Officer, Osaka Environment Bureau.

Purpose: Learn methods and current situation of continuous monitoring systems in Osaka City and gain a better understanding by visiting the Central Monitoring Room and monitoring stations.

- Content: • Air pollution monitoring station
• Automobile emission monitoring station

Friday, Dec 5

Principles of Air Pollution Monitoring Equipment:

Lecture (Jap) Kimoto Electric Co., Ltd.

Purpose: Learn about the history of the development of continuous air pollution monitoring equipments in Japan and also the principles of automated continuous air pollution monitoring equipments in order to gain a better understanding

- Content: • Sulfur dioxide monitoring device
• Nitrogen oxide monitoring device
• Particulate monitoring device

NO_x & SO_x Measurement, Measures Against Acid Rain

Friday, Oct 24

SO₂ Measurement and Practice:

Lecture & Practice (Jap), Osaka Environmental Technology and Research Co., Ltd.

Purpose: Learn SO₂ environmental concentration measuring techniques, principles, and analyzing method

Content: Measurement of environmental concentration using automatic measuring devices

Friday, Nov 14

NO_x Measurement and Oxidant Problems (1)(2):

Lecture (Eng), Technical Advisor, Hiyoshi Corporation

Purpose: Learn the behaviour of non-methane hydrocarbons, which contribute to the rapid oxidation of NO (mainly NO₂), and consider NO₂ and oxidant measurement techniques

Content: Problems associated with NO₂ and oxidants, including sources of non-methane hydrocarbons

Tuesday, Nov 18

Acid Rain Countermeasures:

Lecture (Eng) by Researcher, Research Institute of Environment, Agriculture and Fisheries, Osaka Prefectural Government

Purpose: Gain a deeper understanding of acid rain (acid deposition)

Content:

- Wet-type and dry-type acid deposition and an outline of related research carried out by Osaka Prefecture, and the Acid Deposition Monitoring Network in East Asia (EANET).
- Explanation of basic knowledge regarding acid rain (acid deposition) and related sampling methods (wet-type rain sampling method, dry-type 4-filter paper method and the passive simple measuring method).
- Trajectory analysis of acid rain (acid deposition).
- Outline of activities conducted in Osaka Prefecture, Japan and Asia.

Wednesday, Nov 19

Passive Sampling Method:

Lecture and Practice (Eng) by Researcher, Research Institute of Environment, Agriculture and Fisheries, Osaka Prefectural Government

Purpose: Gain a deeper overall understanding of the passive simple measuring method

Content:

- The passive simple measuring method and examples of field surveys carried out by Osaka Prefecture and the National Institute for Environmental Studies
- Practice in fabricating membrane resistance-type passive samplers (polyamide and impregnated filter paper)
- Practice in fabricating extended diffusion-type passive samplers
- Overview and observation of ion chromatography
- Observation of acid rain sampling equipment on the Centre's roof

Dustfall Measuring Techniques

Wednesday, Oct 15

Dust Removal and Collection Technology:

Lecture (Jap), Hosokawa Micron Corporation

Purpose: Learn the principles and characteristics of dust collection devices to be able to select the most appropriate type in each situation.

- Content:
- The structure of dust collection devices and the principles
 - Different types of bag filter
 - Types of filters used in bag filters and their characteristics
 - Examples of the latest bag filters installed in Japan

Wednesday, Oct 15

Maintenance of Dust Collection Facilities:

Lecture & Visit (Jap), Hosokawa Micron Corporation

Purpose: Learn how to operate and maintain the facility

- Content:
- Bag filter maintenance checks
 - Overview of the Nara plant
 - Bag filter manufacturing plant

Stack Gas Measurement

Monday, Oct 20

Orientation for Stack Gas Measurement:

Lecture (Jap), Osaka Environmental Technology and Research Co., Ltd.

Purpose: Learn dust, NO_x, and SO_x measurement techniques before carrying out flue gas measurement

- Content:
- Explanation of soot and dust measurement (JISZ8808)
 - Measuring moisture levels and temperatures
 - Measuring velocity: pitot tubes and manometers
 - Measuring exhaust gas substances: Orsat apparatus
 - Measuring soot and dust using isokinetic sampling
 - Explanation of SO_x measurement (JIS K0103)
 - Explanation of NO_x measurement (JIS K0104).

Tuesday, Oct 21

Steel Factory Visit:

Visit (Jap), Nakayama Steel Works, Ltd.

Purpose: Observe a steel factory before conducting flue gas sampling

Content: Company information and its environmental policies

Tuesday, Oct 21

Exhaust Gas Sampling Devices:

Practice (Jap), Osaka Environmental Technology and Research Co., Ltd.

Purpose: Learn how to operate an exhaust gas sampling device

Content: On-site practice using exhaust gas sampling devices

Wednesday, Oct 22

Flue Gas Sampling:

Practice (Jap), Osaka Environmental Technology and Research Co., Ltd.

Purpose: Learn about flue gas sampling through actual on-site sampling of flue gas

- Content:
- Measuring the concentration of dust in exhaust gas (moisture level measurement)
 - Measuring concentration of dust in exhaust gas (velocity measurement)
 - Measuring concentration of dust in exhaust gas (soot and dust measurement)
 - Measuring SO_x in exhaust dust
 - Measuring NO_x in exhaust dust

Thursday, Oct 23

Sample Analysis (NO_x):

Practice (Jap), Osaka Environmental Technology and Research Co., Ltd.

Purpose: Calculate NO_x concentration using the PDS method

- Content:
- Quantification of nitric acid ions in samples
 - Calculation of NO_x concentration

Friday, Oct 24

Sample Analysis (SO_x):

Practice (Jap), Osaka Environmental Technology and Research Co., Ltd.

Purpose: Calculate SO_x concentration

- Content:
- Quantification of sulfur ions in samples
 - Calculating of SO_x concentration

Fuel and Combustion

Monday Oct 27

Combustion Method-Related Air Pollution Control Methods:

Lecture & Visit (Jap) Combustion Research Center, Chugai Ro Co., Ltd.

Purpose: Learn the basics of combustion, effects on air pollution, and countermeasures

- Content:
- Fuel and combustion basics
 - Combustion and air pollution (NO_x, CO₂, etc.)
 - Oil burner and combustion control system observation
 - Observation of other burners and combustion apparatus, etc

Monday, Nov 10

Environmental Control Techniques at Coal Fire Plant

Visit (Jap), Osaki Thermal Power Station The Chugoku Electric Power Co., Inc.

Purpose: Learn the current environmental control techniques by visiting plant

Content: turbine, boiler and environmental control techniques

Desulfurization, Denitrification and Dust Collecting Techniques

Monday, Oct 27

Cement Plant Flue Gas Desulfurization Equipment and the Use of By-Products:

Lectures/Visits (Jap), Taiheiyo Cement Corporation

Purpose: Learn how dust and waste substances generated during the processing of exhaust gas can be used to make cement.

Content: • Cement-making process

• Cement ingredients and baking technology

• Principles of desulfurization in the cement-making process

• Use of flue gas desulfurization by-products

• Structure, operation and maintenance of desulfurization equipments

Automobile Pollution Control

Wednesday, Oct 29

Automobile Emission Reduction Technology :

Lecture & Visit (Jap), Hino Motors, Ltd.

Purpose: Observe the latest low-pollution engine system and learn about automobile emission reduction technology

Content: • Company overview

• Inspect truck assembly line, inspection line, completed vehicles, engine assembly line, etc

• Product explanation such as diesel particulate active reduction (DPR) cleaners, combined exhaust gas recirculation (EGR) systems, etc.

Wednesday, Oct 29

Automobile Emission Testing Facility Visit:

Lecture & Visit, National Traffic Safety and Environment Laboratory.

Purpose: Observe how automobile emissions and fuel consumption efficiency are tested, and learn about measurements and prevention methods

Content: Engine experiment facility, low pollution experiment facility and large emission study facility

Friday, Oct 21

Research on Automobile Emission Reduction Measures:

Lecture & Visit (Eng), Tokyo Metropolitan Research Institute for Environmental Protection

Purpose: Learn about emission estimate technology and research on pollution reduction measures

Content: • Emission estimate technology

- Diesel particulate filter (DPF) experiments and their application in movement restrictions for diesel-engined vehicles
- The effectiveness of automobile emission regulations

Tuesday Nov 4

Countermeasures to Decrease Automobile Emission

Lecture (Jap) by Assistant Manager for Traffic and Environment Section, Osaka Environmental Bureau

Purpose: Learn about improvement measures taken at an intersection in order to reduce traffic jam

Content: Right-Turn only lane, traffic light improvement, building the noise reduction wall and effects

Thursday, Nov 6

Traffic Measures:

Lecture (Eng) by Professor, Osaka City University

Purpose: Gain an understanding of the present state of traffic-related environmental problems and future challenges, traffic-related measures, including optimum automobile use, and related trends

Content: Explanation of urban problems such as environmental pollution caused especially by road traffic, optimum traffic patterns and the latest measures taken to alleviate such problems, and future measures prepared by the City, the Ministry of Land, Infrastructure and Transport and countries overseas to deal with such problems and to realize a sustainable society.

Monday, Nov 17

Osaka City Automobile Emission Control Measures:

Lecture (Jap) by Staff Officer, Osaka Environment Bureau

Purpose: Learn government automobile emission control measures

Content: • Laws and regulations

- Automobile emission control framework
- Automobile pollution control plans

Monday, Nov 17

Observation of Examination on Street

Visit (Jap) by Staff Officer for Traffic and Environment Section, Osaka Environmental Bureau

Purpose: See an actual examination conducted on Street

Content: Examination to measure emission on Street

Odour Pollution Control

Wednesday, Nov 5

Control and Measuring Malodour

Lecture (Jap) by Environmental Counselor

Purpose: Understand malodour

- Content:
- Malodour control
 - Outline of regulations
 - Use of index to controlling malodour
 - Malodour Control Laws
 - Measurement Malodour

Wednesday, Nov 5

Malodor Measures:

Practice (Jap), Osaka Environmental Technology and Research Co. Ltd.

Purpose: Learn and conduct measurement

Content: Measurement of malodour

Hazardous Substance

Monday, Dec 1

Problems Caused by Chemicals- Especially Health Hazards by Asbestos:

Lecture (Jap) by Director of Project Division, Global Environment Centre Foundation

Purpose: Understand the current situation of asbestos problem, and the framework and compensation by the government

- Content:
- Types of disease caused by Asbestos
 - Research conducted to examine damage
 - Outline of Relief Act

Monday, Dec 1

Emission Regulations on VOC & Exhaust Gas Treatment Technology

Lecture (Jap), Osaka Gas Engineering Co. Ltd

Purpose: Learn about VOC, restriction method, processing techniques and technical matters

- Content:
- Amended Air Pollution Prevention Law and VOC restriction
 - VOC processing techniques
 - VOC measurement method

OUTPUT 4

Participants are able to explain about applicable techniques for disperation models required to prepare air pollution prevention plans

Air Diffusion and Data Processing

Thursday, Nov 20

Atmospheric Environment Analysis and Prediction Methods (Statistical/Numerical Models):

Lecture (Jap), Suuri-Keikaku Co., Ltd.

Purpose: Learn about basic matters concerning air pollution assessment

- Content:
- The aim of atmospheric environment assessment and environmental standards
 - Air pollution and the behavior of weather and atmospheric material
 - Sources of air pollution and methods of calculating emission volumes
 - Atmospheric environment prediction methods (statistical/numerical analysis)
 - Analysis of sources contributing to air pollution
 - Introduction to air pollution countermeasures

Thursday, Nov 20

Methods of Handling Air Pollution Data (collection, preparation, statistical analysis and evaluation):

Lecture (Jap), Suuri-Keikaku Co., Ltd.

Purpose: Learn about the collection, preparation, statistical analysis and evaluation of atmospheric measurement data

- Content:
- Atmospheric environment measurement station data and the creation of databases
 - Statistical analysis methods (daily average, annual average, 2% exclusion value)
 - Data analysis and evaluation methods

Friday, Nov 21

Numerical Simulation Overview and Practice:

Lecture (Jap), Suuri-Keikaku Co., Ltd.

Purpose: Learn about atmospheric diffusion and calculation methods

- Content:
- Weather conditions and the application of source data
 - Awareness of various parameters
 - Prediction calculation practical

Tuesday, Nov 25

Overview of Air Diffusion Theory:

Lecture (Eng) by Professor, University of Hyogo

Purpose: Learn basic theory concerning the diffusion of contaminants released into the atmosphere and gain a deeper understanding of methods for forecasting air pollution

Content: Overview of atmospheric diffusion theory

Wednesday, Nov 26

Weather Analysis:

Lecture (Eng) by Professor, University of Hyogo

Purpose: Learn how air pollution and the weather are related

- Content:
- Flue gas attenuation, convection, diffusion and such to the weather and inversion layers
 - Land and sea breeze
 - Downwash and downdraft
 - Major weather observation methods

- Handling weather data

OUTPUT 5

Create Action Plans to solve problems/challenges, applying experience and knowledge gained through this training and dialogue programs

Action Plan

Monday Sep 29, Thursday Oct 30, Monday Dec 8

Action Plan:

Lecture and Discussion (Eng) by Senior Advisor (Environmental Management), JICA

Purpose: Prepare and draft an action plan to deal with problems within one's authority in home country

- Content:
- How to create a good action plan
 - Workshop
 - Selection of issues and points to be considered
 - Presentation of a draft copy of an action plan
 - Discussion

Tuesday Oct 14, Wednesday Nov 7

Discussion:

Purpose: Discuss and exchange concerns, opinions, thoughts and ideas of the course and the areas interested

- Content:
- Explanation of course structure and lectures in detail
 - Discussion

Wednesday Dec 10

Action Plan Presentation:

Purpose: Present an action plan to be implemented after returning home country

Content: Presentation by individual participants