

Institute of Natural Resource Management

National Taipei University

Class Handout of the Fall Semester, 2013

Lectures 14: Introduction to Air Pollution

- INTRODUCTION AND SOME HISTORIC REMARKS
 - Ambient Air Quality vs. Emission Source Control
 - Gaseous and Particulate Pollutants
 - Episodes of Air Pollution and Historical Disasters
- CRITERIA POLLUTANTS AND AIR QUALITY STANDARDS
 - Carbon monoxide CO: CO-Hb
 - Oxides of Nitrogen NO_x; Oxides of Sulfur SO_x
 - Photochemical Smog and Ozone => PAN (Peroxyacetyl Nitrate) and O₃
 - Particulate Matter PM (TSP, M₁₀ and PM_{2.5}) and Lead
 - Air Quality Index (AQI) vs. Pollutant Standard Index (PSI)
 - Volatile Organic Compounds (VOCs) and Hazardous Air Pollutants (HAPs)
- AIR QUALITY MANAGEMENT
 - Zoning and Control Strategies: Non-Attainment Area 空氣污防制區
 - State Implementation Plan (SIP)
 - Command-and-Control vs. Economic Incentives => Total Emission Control
- MOBILE EMISSION SOURCES
 - Emission Standards vs. Fuel Standards; Gasoline Engines vs. Diesel Engines
 - Exhaust System Controls => Catalytic Converter (Precious Metals)
 - Alternative Fuels and Hybrid Vehicles
- STATIONARY SOURCES
 - Control Strategies: Combustion, and Pre- or Post-combustion controls
 - Pollution Control Devices: Gaseous and Particulate Pollutants
 - ⇒ Scrubber, Bag-house, Electrostatic Precipitator (EP), FGD, SCR, SNCR...
 - Emission Trading: Conventional Pollutants and Greenhouse Gases
- INDOOR AIR QUALITY
 - Tobacco Smoke, Asbestos, Radon, Formaldehyde, Mold, and Micro-organisms.
 - Indoor Air Quality Standard => announced premises 公告場所
- HOMEWORK ASSIGNMENT #7 (Due 12/31/2013): Please describe the health effects of the air pollutants of fine particles (PM_{2.5}) and specify its ambient air quality standard.