

Yale-UNIDO Awareness Rising Workshop

Background

As a part of the "Guidance development and case study documentation of green chemistry and technologies" to increase a global awareness and capacities on Green Chemistry, Yale University is pleased to technically support and conduct awareness rising workshop to participating countries.

Center for Green Chemistry and Green Engineering at Yale University under the leadership of Paul Anastas, the father of green chemistry, is a world renown organization that specializes in green chemistry research, education and outreach. Center for Green Chemistry and Green Engineering at Yale provides practical solutions to sustainability challenges. The role of the Center is not limited to understanding and monitoring environmental problems. Through basic research the Center designs innovative technologies that provide enhanced performance while simultaneously meeting social, economic, and environmental goals.

Workshop goal

A one-day event to raise the awareness on green chemistry, its role in society and opportunities in various research areas to workshop participants.

Participants

The awareness raising workshop will be attended by the participants selected by the Partnering Centers who have a capacity to disseminate green chemistry in their countries.

Format

Awareness raising workshop will be seminar style but allowing interactive partner content. The workshop will also allow networking with green chemistry experts and among other workshop participants.

Learning Objectives

- Describe the current role of chemicals in our society, environment and economy.
- Review the twelve principles of green chemistry.
- Explain transformational role of catalysis on industry and the associated material and energy benefits.
- Assess impacts of solvent usage and identify green chemistry alternative solvent systems and the subsequent benefits.
- Identify the advantages and disadvantages of various process feedstocks.
- Discuss the ways to reduce/eliminate waste and identify its potential as a feedstock.
- Discuss a successful case study examples of green chemistry in industry and small businesses.

Agenda

8:30 AM Welcome (by the Center)

9:00-10:00 AM Morning Session I: Introduction

Chemistry in Society

- Chemicals and Health
- Chemicals and Transportation
- Chemicals and Communication
- Chemicals and Economy

Unintended consequences: Doing the right thing the wrong way

- Use of pesticides in food production
- Photovoltaics and rare/toxic metals
- Water purification with acutely lethal substances

Other Environmental Challenges

- Population
- Energy
- Global Change
- Resource Depletion
- Food Supply
- Toxics in the Environment

10:00-10:20AM Break

10:20-12:00AM Morning Session II: Fundamentals of Green Chemistry

Definition of Green Chemistry

- Focus on Design

Benefits of Green Chemistry

- Environment
- Human Health
- Economics and Competitiveness
- Sustainability

The Twelve Principles w/context

12:00 – 12:45PM Lunch and Networking

12:45 – 2:15PM Afternoon Session I: Areas or Research in Green Chemistry

Feedstocks

- Petroleum based economy
- Energy consumption demands
- Renewable vs depleting feedstocks

- Biomass
- CO₂

Catalysis

- Definition of catalyst and its advantages
- Towards greener catalyst (earth metals)
- Enzymes

Solvents

- Why are solvents important?
- Current hazards associated with solvents
 - Volume
 - Volatility
- Water as a solvent
- Other solvents
 - scCO₂
 - Solvent-less reactions
 - Ionic liquids

Waste

- Definition of waste, types
- Strategies to remove waste
- When is waste not a waste

2:15-2:30PM Break

2:30 – 4:00PM Afternoon Session II

Partners' Content - Case Study examples of Green Chemistry Application in Industry and Small Businesses

4:00PM Closing Remarks: Green Chemistry as a powerful tool to address some of the biggest challenges