

# Organized Research Center of Excellence (ORCE)



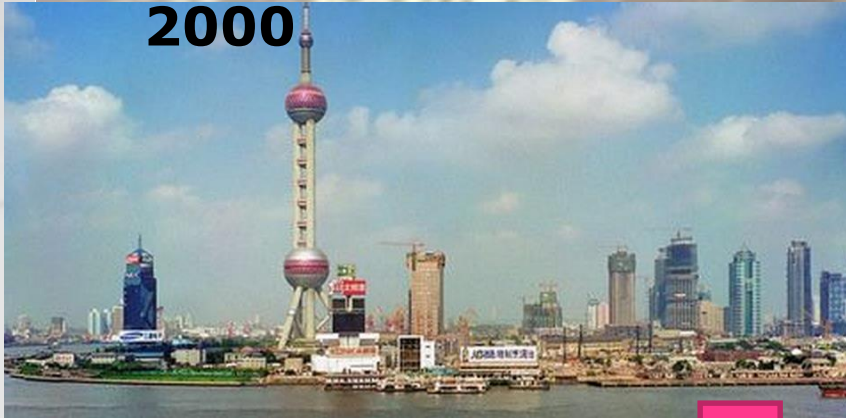
## Solid Waste Institute for Sustainability (SWIS)

**MD. Sahadat Hossain, PhD, PE**  
**Director and Prof. of Civil Engineering**  
**August 2015**



# ASWIS - Background

## Shanghai - 2000



## Shanghai - 2014

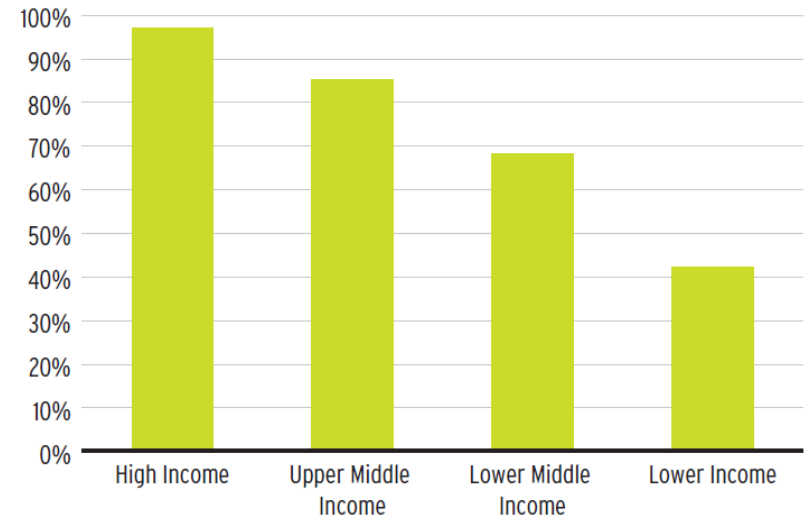
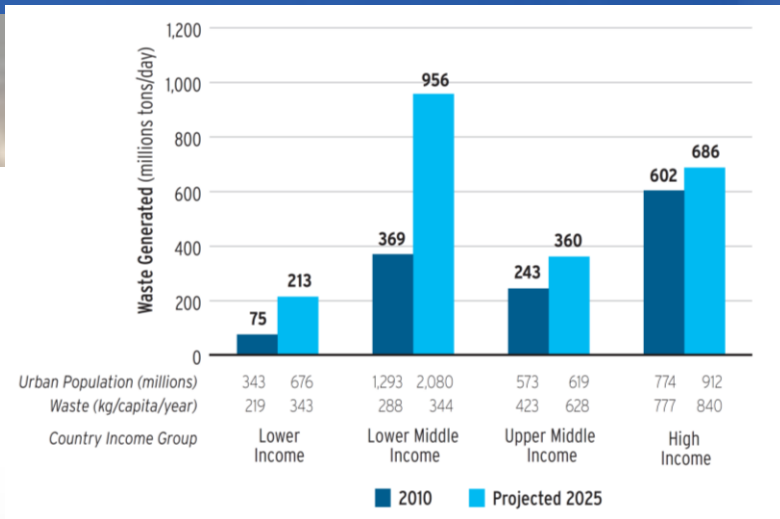


- Urban Population
  - 2002 – 2.9 Billion (0.68 kg/P/day)
  - 2012 – 3.0 Billion (1.2 kg/P/day)
  - 2025 – 4.5 Billion (1.42 kg/P/day)

As countries urbanize:

- Economic wealth increases
- Standards of living increases
- Consumption increases
- Waste generation increases

# ASWIS - Background



## Uncollected solid waste contributes to:

- Air pollution
- Flooding
- Public health impact
  - Respiratory ailments
  - Diarrhea
  - Dengue fever





# SWIS - Background

## Waste Piles up in the Street of Naples, Italy



- Foul smell – from waste facility
- Riot against – new facility and waste piles up in Naples as waste disposal was on hold
- Prime Minister finally agreed to improve existing facility to stop the violence



# SWIS – Background

## Sweden Importing Garbage

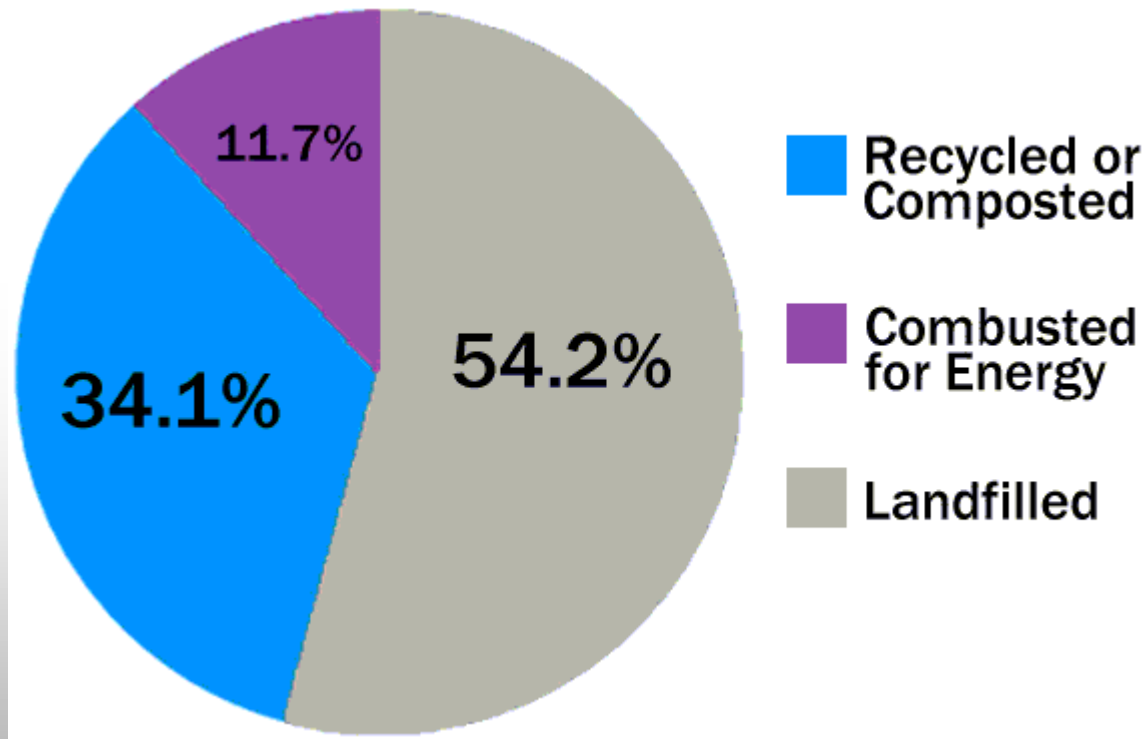


- Energy - 2 Million Tons of waste/Year
- Heating 810,000 homes and providing electricity to 250,000 homes.
- Sweden is now importing SW from Norway



# SWIS – Background

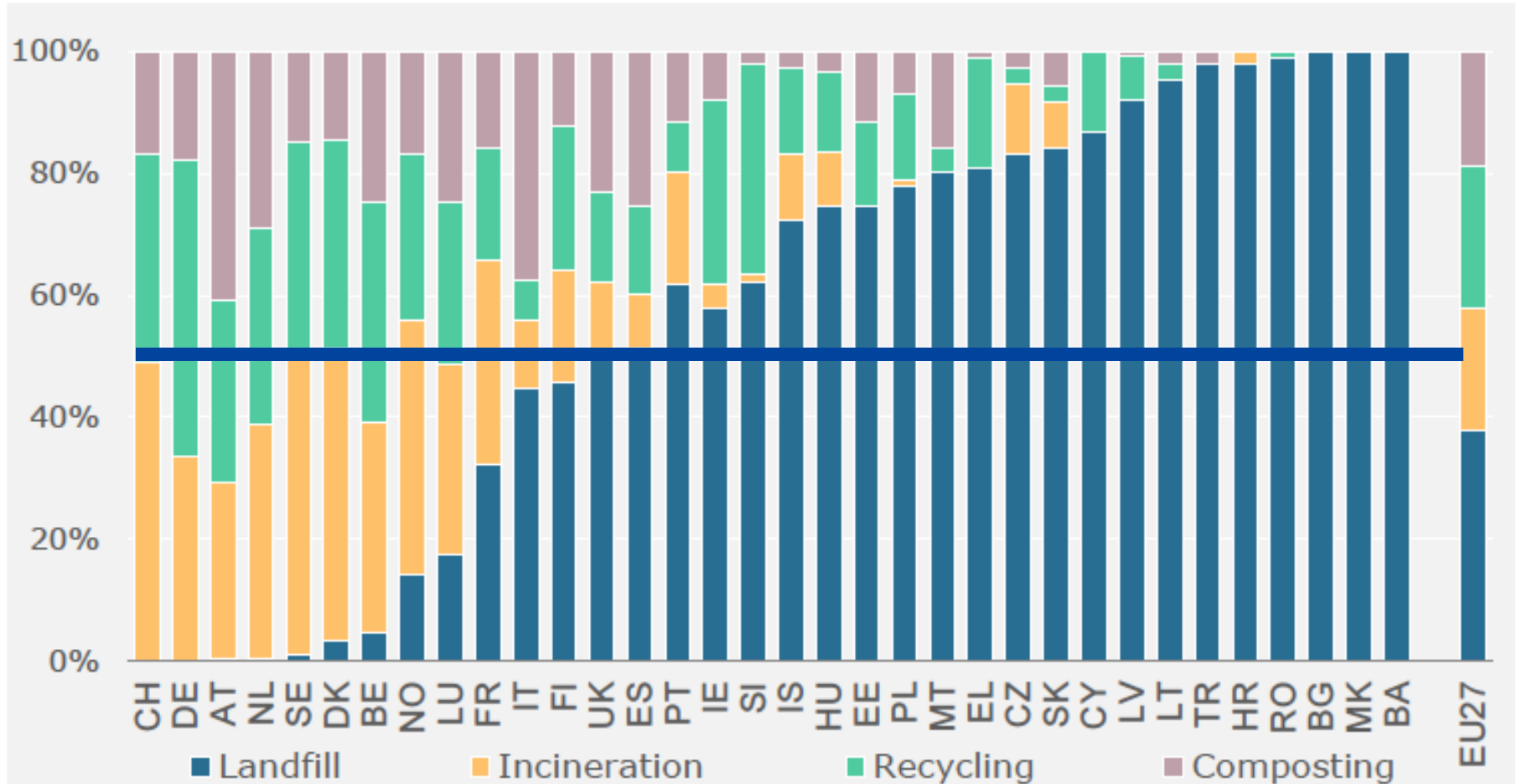
## Waste Management in USA





# SWIS - Background

Waste treatment methods per country, municipal solid waste





# SWIS – Background

## Global Waste Management Practices



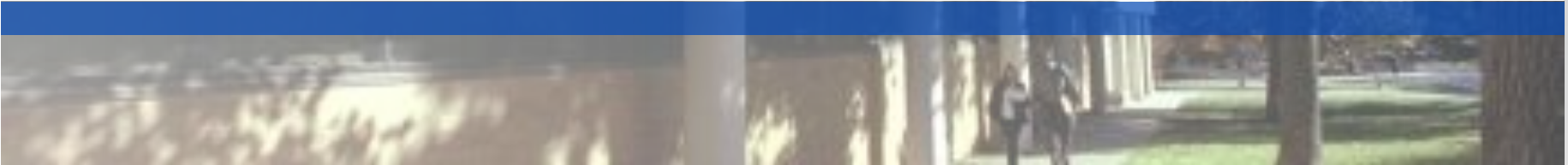
- ❑ 70% - Dumpsites and sanitary landfills.
- ❑ 11% - Thermal and Waste to Energy (WtE)
- ❑ 19% - is recycled or treated by Mechanical and Biological Treatment (MBT), including composting



# **ASWIS - Strategic Need for the Center**

- ❑ **Poorly managed waste** has an enormous impact **on health**, local and global environment, and economy;
- ❑ Improperly managed waste usually results in **down-stream costs higher than what it would have cost to manage the waste properly** in the first place.
- ❑ **Lack of understanding or training of challenges** and importance of solid waste management and its impact on health, sanitation and sustainable cities.

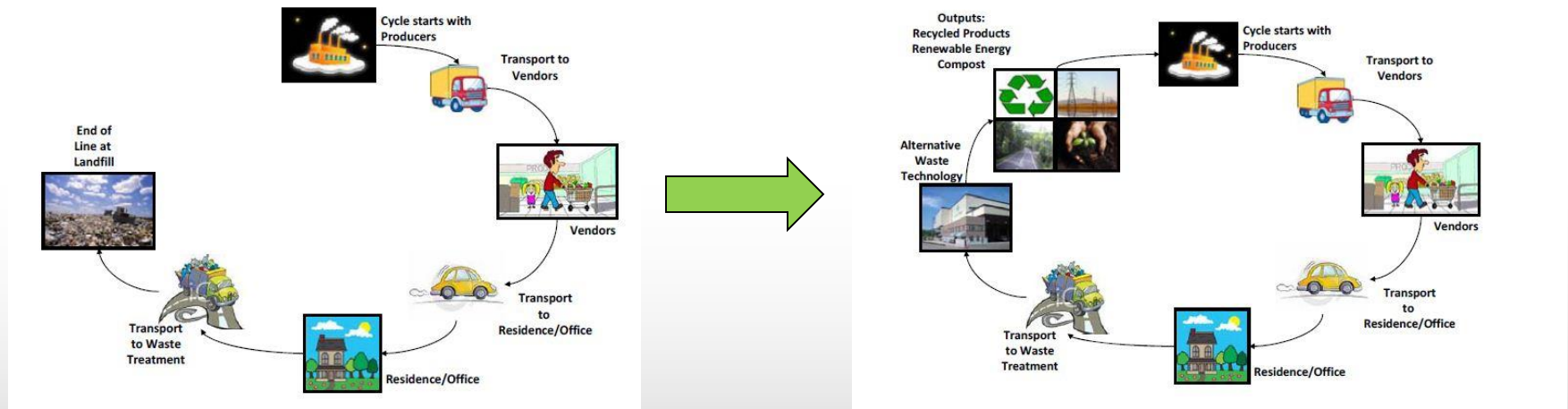
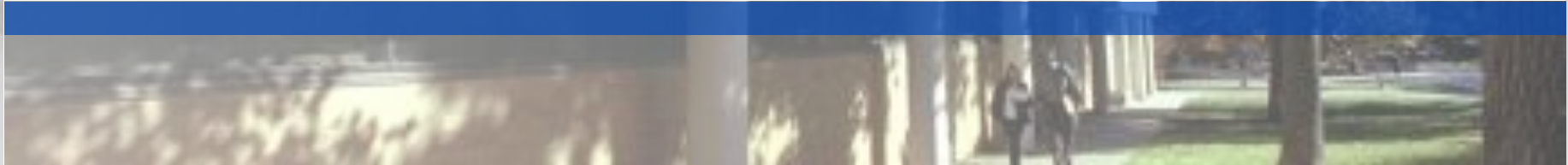




- To research, develop and implement innovative solutions for sustainable waste management**
- To provide training and support sustainable waste management in both developed and the developing countries.**



# SWIS - Future – Sustainable Resource Management

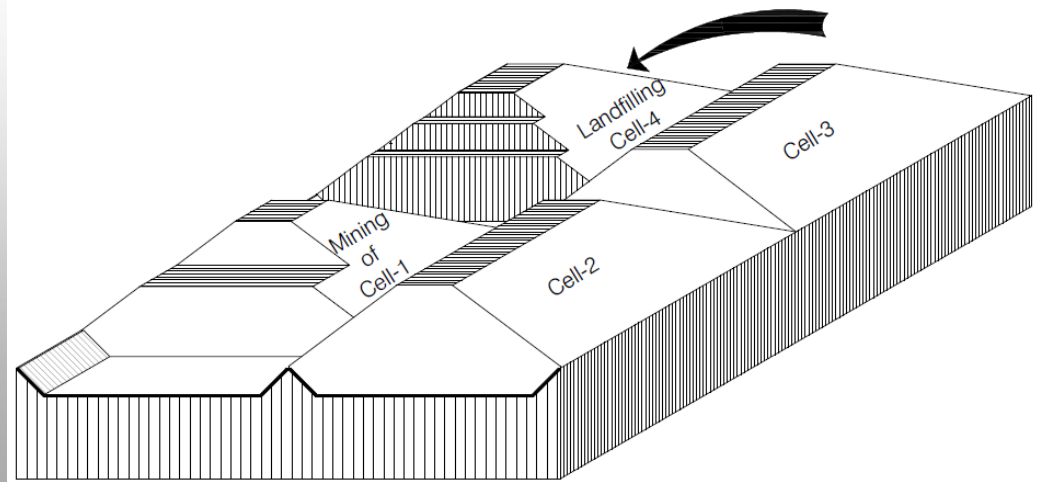
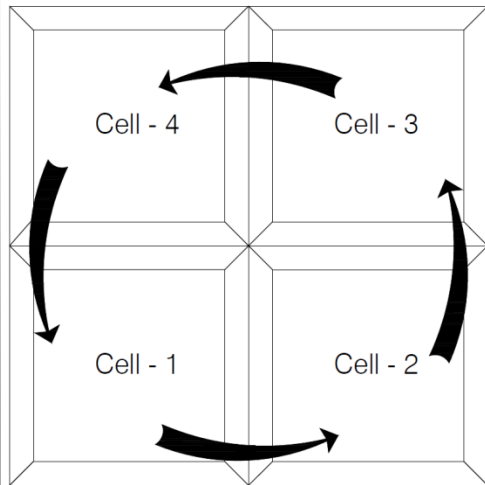
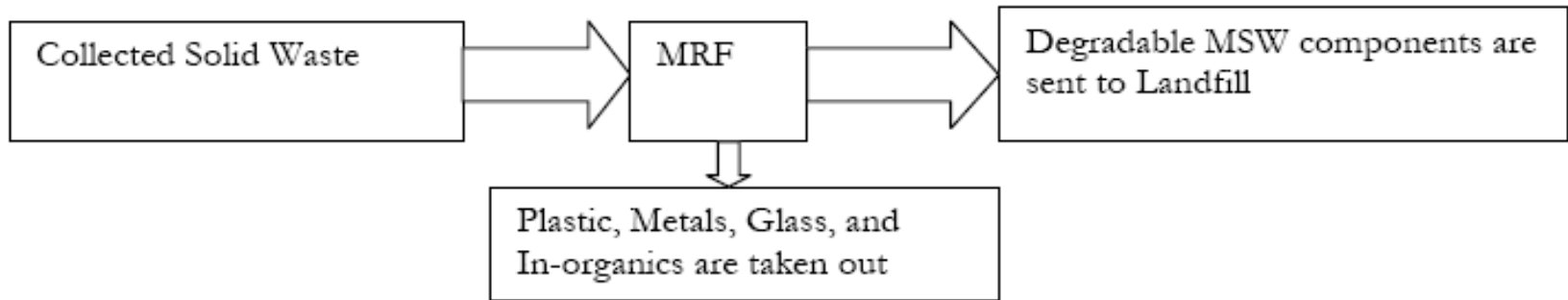


- Open Loop to Close Loop Solid Waste Management
- Landfill Mining and Operating Landfill as Perpetual Landfill is Potential Way Forward





# SWIS – Concepts of Sustainable/Perpetual Landfill





# SWIS-ISWA (International Solid Waste Association) – Winter School 2016

The objective of the Summer School is to:

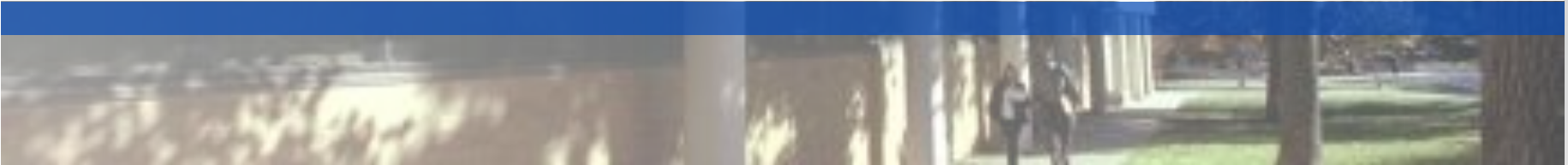
- provide advanced knowledge in the field of waste management to an international audience of existing and emerging solid waste experts.

- 2012 (Vienna, Austria)
- 2013 (Malaysia)
- 2014 (Romania)
- **2016 (UTA/Denton)**





# SWIS-ISWA Co-operation Partnership



- ❑ **SWIS is a Co-operative Partner of ISWA**
- ❑ **SWIS – is working on a collaborative partnership agreement among SWIS, ISWA and CCAC (Climate and Clean Air Coalition)**
- ❑ **CCAC is a program under United Nations Environment Programme (UNEP)**
- ❑ **SWIS is working on Agreement for Sustainable Waste Management Projects and Landfill Gas to Energy Projects with Few Other Countries**



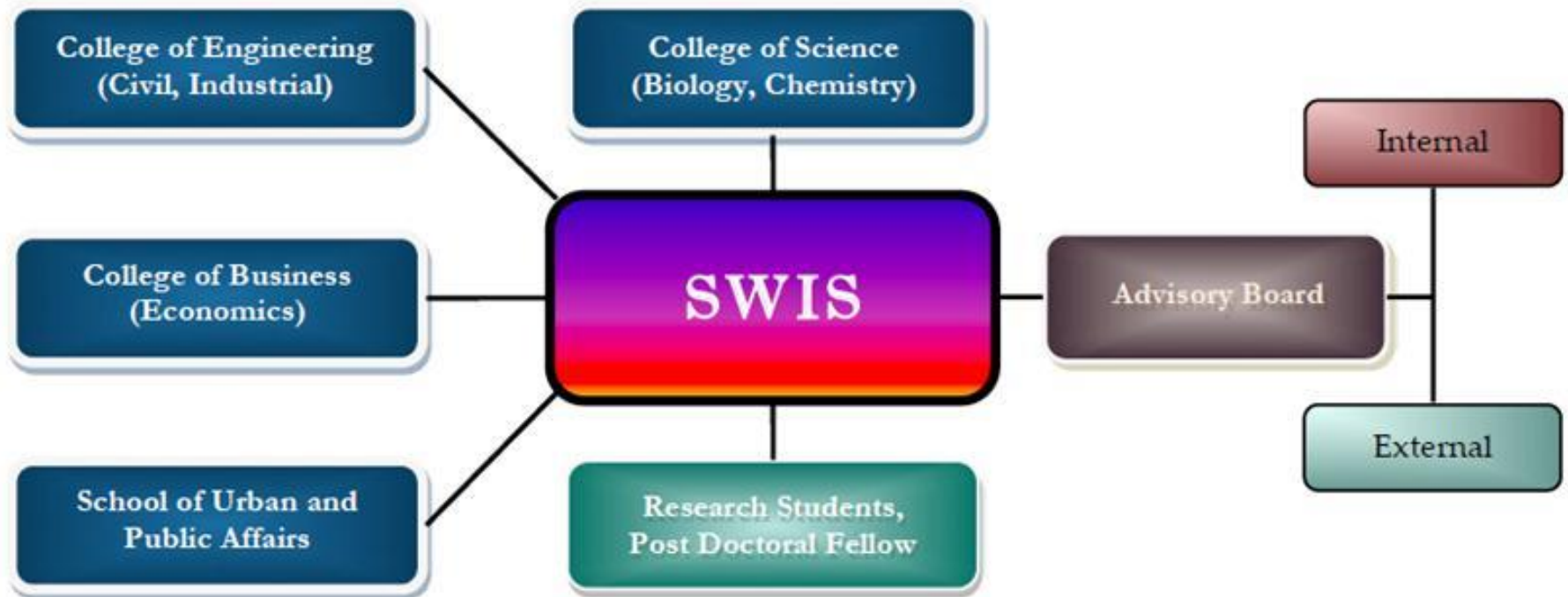
# Landfill Gas to Energy Potential in Ghana, Africa – Study Conducted SWIS Members

- ❑ SWIS Members completed a landfill to gas to energy potential project in Ghana
- ❑ The Project was funded by US EPA's Global Methane Initiative (GMI) Program
- ❑ SWIS also completed a landfill design and operation training program in Accra, Ghana in July 2014.





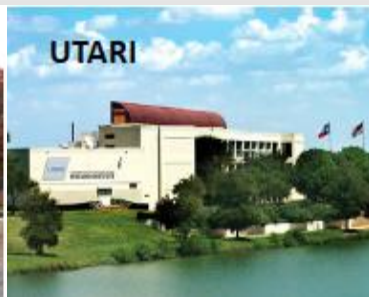
# SWIS – Infrastructure





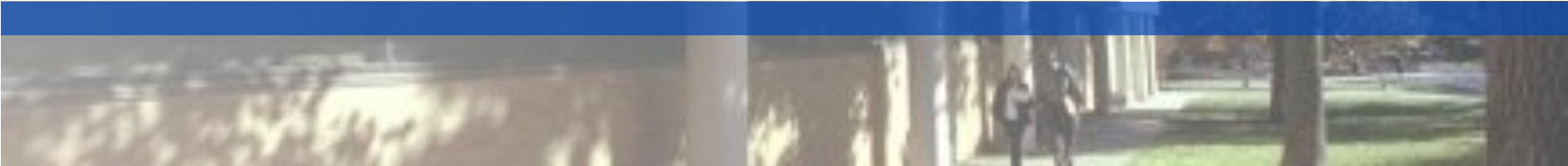


# SWIS – Infrastructure





# SWIS – Proposal for Texas



- Annual Meeting with Member Cities and Other Members**
- Discuss emerging Issues related to Solid Waste Management**
- Identify needs for the cities – Immediate and future**
- Develop solutions and protocol for the identified problems and share them among the member cities**
- Train solid waste personnel on the newly developed protocols and help them implementing the new technology**
- Present new findings to the regulatory agencies**
- Bridge the knowledge gap between solid waste operators and regulatory agencies**



## Thank You

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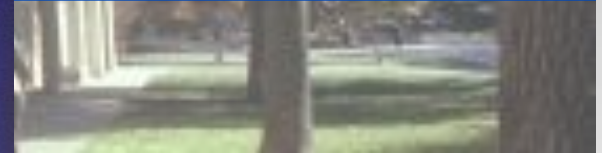


# ISWA – Finland Trip





# ISWA – Finland Trip





# ISWA – Annual Congress, Vienna

