

# KUWAIT UNIVERSITY

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جامعة الكويت  
KUWAIT UNIVERSITY

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# Integrating SDGs in Education, Research, and Practice at Kuwait University

**Success Stories in Incorporating SDGs in Education, Research, and Practices  
ANDD Third Annual Meeting – Qatar University**



# CONTENT



- Kuwait Vision for 2035
- SDG 6 – Clean Water and Sanitation
- SDG 7 – Affordable and Clean Energy
- SDG 9 – Industry, Innovation, and Infrastructure
- SDG 11 – Sustainable Cities and Communities
- SDG 17 – Partnerships for The Goals

# Kuwait Vision for 2035



**KU is committed to integrating SDGs into its campus operations, student engagement, research and community activities.**

- **Kuwait University (KU)** is a national pioneering university with outstanding qualifications in higher education and scientific research.
- KU is an essential partner in achieving the development plan of **Kuwait Vision 2035**.
- KU cooperated with different sectors to adopt the SDGs in line with the seven pillars of “New Kuwait”:
  - Global positioning
  - High quality health care
  - Creative human capital
  - Sustainable living environment
  - Developed infrastructure
  - Sustainable diversified economy
  - Effective government administration



# KU Strategic Plan

- Kuwait University is eager to provide a pioneering educational experience in which the strategic goals of the state and its future aspirations are embodied in building an informed and responsible generation.
- Through various and competitive scientific programs, the university encourages intellectual creativity and the creation of developmental skills across many and varied fields and experiences.



## VISION

Kuwait University is a center for innovation with an international reputation for excellence

## MISSION

Kuwait University is a major source of human capital that initiate the highest quality of knowledge - based economy, through embracing innovative learning and research, and contributing to the community by addressing its most contemporary challenges

# KU Strategic Plan

- Main Directions



## First objective

Encourage a healthy sustainable environment

### Goal 1

Develop ways of enhancing KU contribution to sustainability

### Goal 2

Sustainable design and construction for KU facilities



## Second objective

Establish a sustainable institutional system

### Goal 1

Build a complete institutional system that supports administrative sustainability

### Goal 2

Maintain financial and economic sustainability systems



## Innovation



Stimulating and embracing innovative initiatives from the entire KU community (students – academic staff– administrative staff) are the key for new ideas that can be translated into discoveries and inventions



## Quality



Kuwait University is committed to setting up the highest– quality criteria in all practices to meet international standards of excellence in education, research and community services



## Global Visibility



Building international reputation for Kuwait University is fundamental to becoming a globally recognized institution. This strategy is adopted in the plan to actively build Kuwait university's name and ensure it is synonymous worldwide



## Sustainability



Kuwait University aims to inhibit sustainability in its systems and practices by fully understanding and building a sustainable growth and development through an effective utilization of all the available resources, to preserve them and ensure its continuation for future generations

# SDGs in Kuwait University

- Kuwait University Administration perspective
  - Strategic plan
  - Quality assurance
  - Word University Rankings
  - Accreditation
- Colleges and Academic Departments perspective
  - Academic courses
  - Students' activities
  - Research projects

# Sabah Al-Salem University City - Kuwait University

- Sabah Al-Salem University City Kuwait University

- 557 Hectares of Land
- 40,000 Students and Faculty
- 50,000 Population
- Close to 100 Buildings and 100 Parking Lots
- World Class Learning Facilities





# Sabah Al-Salem University City - Kuwait University

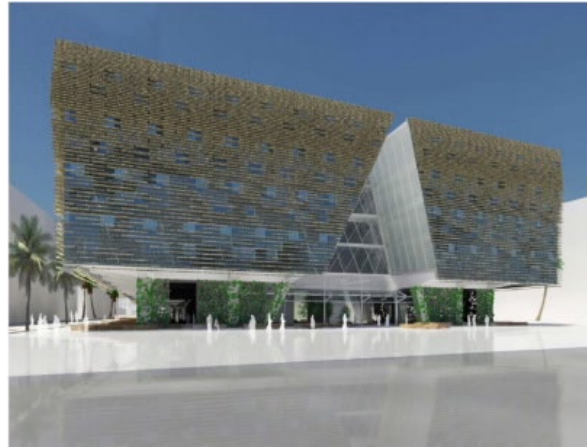
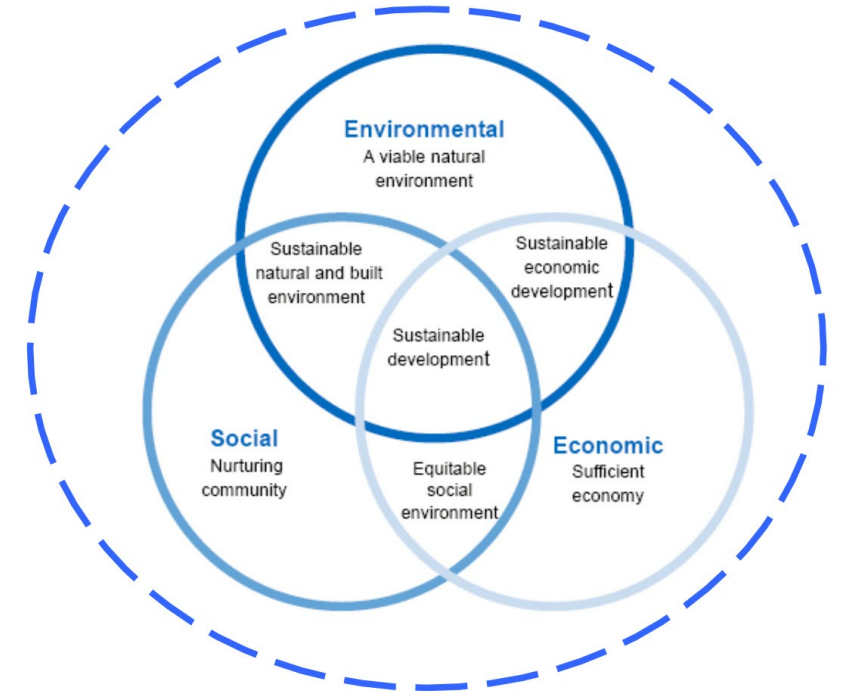
- Sabah Al-Salem University City Kuwait University





# Sabah Al-Salem University City - Kuwait University

- Sustainability Aims
  - Promote sustainable practices in campus development with sensitivity to the natural environment
  - Promote sustainable practices in campus operations: including recycling, energy conservation, mass transportation systems, water conservations
  - Encourage sustainability initiatives: by education and awareness programs, in use of water and energy



# New Campus

- Sabah Al-Salem University City Kuwait University
  - Environmental Sustainability Objectives
    - Water
    - Global Atmospheric Impacts and Local Air Quality
    - Energy
    - Outdoor Environments
    - Indoor Environments
    - Land Use and Ecology
    - Materials and Waste





# SDGs in Academic Courses



# College of Engineering & Petroleum

## Engineering Design Projects

### Industry and Building:

It focuses on the innovation in the field of Industrial Revolution, by increasing the industry processes, the building materials and their methods.

### Clean energy and natural resources:

Having plenty of Innovative Engineering Solutions, towards a clean renewable energy and to create methods of achieving the maximum benefits from the natural resources.

### Infrastructure:

To achieve the sustainability, related to the infrastructure, roads, transportation, facilities and basic services, integrated with all the details of life.

### The technical and digital sciences & communications:

The digital computing techniques and safe linking to communication networks and establishing a safe environment in the data centers and digital applications, serving the life.

### Artificial intelligence and robots:

Perceptual techniques of Artificial Intelligence for increasing the welfare and living level, in order to reach to an organized mechanism through the developed robots.

### Mechanization and Engineering Productivity:

To produce new scene and build a distinct and intelligent future, through the accurate mechanizations and machines.

### The sustainable environment:






To use the processes for achieving a distinguished living for the human being in conformity with the sustainability, by engineering solutions and restoring the original relationship between the man and the nature, seeking for the good health and welfare.



# College of Engineering & Petroleum

## Priorities

Special Needs Projects	
Health Care	
Education	
construction and Housing	
mobility and Traffic	
manufacturing	

Cybersecurity	
water and Food	
Climate Change	
Recycle	
Quality of work and living	

# Engineering Design Projects

Chemical



## Tyrenergy

Eng. Husain Rowyan  
Eng. Othman Al-Humaidi  
Eng. Salem Al-Atefi  
Eng. Nasser Al-Khattaf

Supervised by

Prof. Sami Ali  
Dr. Hala Al-Fulaij

This Chemical Engineering plant is designed in a specific way to deal with one of the most important environmental matters and that is solid tire waste. Tires are gathered, shredded and reacted to create Diesel.

هذا المصنع مصمم بطريقة ليحل أهم  
أزمات البيئة و ذلك الإطارات المهملة في  
الصحراء. الإطارات تجمع و تقطع و  
تفاعل لتنتج وقود الديزل.

Chemical

## Biogas Amines

Eng. Taiba Khaled Al-Tuwaitan  
Eng. Taif Mufreh Al-Subaie  
Eng. Abeer Jaber Al-Azmi

Supervised by

Prof. Sami Ali  
Dr. Hala Al-Fulaij

Landfills endanger environmental life by releasing harmful gases into the atmosphere. Methane gas is the primary compound of the natural gases emitted from landfills roughly forming 50% of the gas emissions. We utilize the released methane gas to produce methylamines, which are highly important compounds that are used in numerous chemical processes, especially gas sweetening and wastewater treatment.

تشكل مدافن النفايات خطر على الحياة  
البيئية بسبب انبعاثها للغازات الضارة  
تقريباً بحيث يشكل غاز الميثان 50%  
من الغازات المنبعثة.  
نهدف الى وضع حد لهذه المشكلة  
حيث نقوم بالاستفادة من غاز الميثان  
المنبعث لتحويله الى أمينات الميثيل  
وهي مركبات في غاية الأهمية بسبب  
استخداماتها الكثيرة في المصانع وأهمها  
معالجة المياه وتحلية الغاز.



# Polyethylene

Eng. Dana saif Alotaibi  
Eng. Rabab Ali Alsayegh  
Eng. Fatma yousef Almuhanha

Supervised by

Dr. Sami Ali  
Dr. Hala Alfulaij

Polyethylene is a very environmentally friendly material. It is manufactured by fermenting algae and extracting glucose from it. It can be combined with food residues such as date kernels to produce a polymer. It is recycled and burned without any residue. It is the most widely used type of plastic in the world, used in everything from clear food wrap and shopping bags to detergent bottles and car fuel tanks.

البولي إيثيلين مادة صديقة للبيئة للغاية ويتم تصنيعها عن طريق تخمير الطحالب واستخراج الجلوكوز منه ويمكن دمجه مع بقايا الطعام كنواة التمر لإنتاج البوليمر، ويعاد تدويره ويحترق بدون أي بقايا. إنه أكثر أنواع البلاستيك استخدامًا في العالم، حيث يُستخدم في منتجات كثيرة منها أغلفة الطعام الشفافة وأكياس التسوق إلى زجاجات المنظفات وخزانات وقود السيارات.



## Chemical

# Green Hydronia



Eng. Mariam Bujarwah  
Eng. Hajer Alharbi  
Eng. Shoug Alenezi

Supervised by

Prof. Sami Ali  
Dr. Hala Alfulaij

What happens to plastic waste? Plastic pollution is one of the greatest environmental challenges worldwide. Kuwait is currently facing a crisis in dealing with plastic waste, which is increasing year after year. The aim of our project is to convert plastic waste into green hydrogen, which is both an environmentally friendly and a renewable energy source. It is expected that during 2030, all transport vehicles will start using hydrogen as fuel instead of gasoline. Green hydrogen is another product that comes from the treatment of plastic waste, which plays a huge part in the fertilizer industry. Green hydrogen production could provide more options in reaching carbon neutrality by 2050.

ماذا يحدث للبلاستيك النفايات؟ البلاستيك التلوث هو واحد من أكبر التحديات البيئية العالمية. الكويت تواجه أزمة في التعامل مع النفايات البلاستيكية والتي تزداد سنوياً. هدف مشروعنا هو تحويل النفايات البلاستيكية إلى هيدروجين أخضر، وهو مصدر طاقة متجدد وصديق للبيئة. من المتوقع أنه بحلول عام 2030، ستبدأ جميع المركبات باستخدام الهيدروجين كوقود بدلاً من البنزين. الهيدروجين الأخضر هو منتج آخر يأتي من معالجة النفايات البلاستيكية، والذي يلعب دوراً هاماً في صناعة الأسمدة. إنتاج الهيدروجين الأخضر يمكن أن يوفر خيارات إضافية في تحقيق الحياد الكربوني بحلول عام 2050.

## Chemical

# Grease to Green



Eng. Faisel Alshaib  
Eng. Majed Alfahad  
Eng. Abdullah Alajmi  
Eng. Ahmad Alosaimi  
Eng. Farhan Alajmi

Supervised by

Prof. Sami Ali  
Dr. Hala Alfulaij

This project converts waste cooking oil (WCO) into biodiesel using esterification and transesterification. The WCO is first collected and filtered, and chemically processed to produce biodiesel. Biodiesel is a renewable and sustainable alternative to fossil fuels that emits fewer greenhouse gases and pollutants than petroleum diesel, making it a more environmentally friendly fuel option.

يهدف هذا المشروع بتحويل زيت الطهي المستخدم إلى الديزل الحيوي، حيث يتم جمع زيت الطهي المستخدم أولاً وتصفيته ثم يتم معالجته كيميائياً لإنتاج الديزل الحيوي. الديزل الحيوي هو بديل متجدد ومستدام للوقود الأحفوري ونسبة الانبعاثات الناتجة عن حرقه قليلة مقارنة مع الديزل البترولي مما يجعله خياراً آمناً للبيئة كوقود.



## Chemical

# MED-ERGY



Eng. Duha Boland  
Eng. Sara Al-Ajmi  
Eng. Fay Mane  
Eng. Rema Al-Mubarak

Supervised by

Prof. Amir Al-Haddad  
Dr. Ghanima Al-Sharrah

The percentage of medical waste in Kuwait increases annually due to the increase in health precautions. Medical waste in Kuwait is disposed of by incineration or landfill, which leads to air and soil pollution. This project aims to convert medical waste into energy sources, including synthetic natural gas and methanol instead of burning them.

تزداد نسبة المخلفات الطبية بالكويت سنوياً نظراً لزيادة الاحتراطات الصحية. يتم التخلص من المخلفات الطبية في الكويت عن طريق الحرق أو الردم مما يؤدي إلى تلوث الهواء والقربة. يهدف هذا المشروع إلى تحويل المخلفات الطبية إلى مصادر للطاقة منها الغاز الطبيعي المصنع والميثانول بدلاً من حرقها.

## Civil

# Integrated Stormwater Management in Shadadiya



Eng. Dalal Salah Almatooq  
Eng. Lolwah Khalid Abaalkheel  
Eng. Rafif Bander Alharbi  
Eng. Retaj Bander Alotaibi

Supervised by

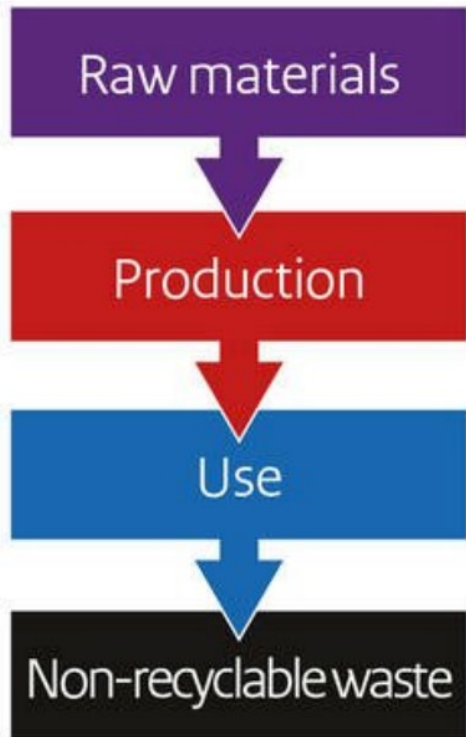
Dr. Mosaed Alrashidi  
Eng. Reem Aljeraiwi

Kuwait suffers annually from floods, especially flash floods resulting from heavy rains in a short period with little or no warning. These floods are caused by the inability of the current stormwater network to drain flows from the surrounding area, as a result of connecting the stormwater network of the surrounding areas to the same network. The most affected areas are urban areas due to the high proportion of paved surfaces. This project aims to find solutions to the inability of the stormwater network in the Sabah Al-Nasser city, as a result of connecting the stormwater network of Al-Shadadiya, by implementing various applicable strategies by using a storage located on the Sixth Highway and designing drainage pipes using rational method and the (StormCAD) program. As well as treating what is known as the "first flush" that is discharged into Kuwait Bay and mitigating the impact of rainwater on the infrastructure and environment on Kuwait Bay.

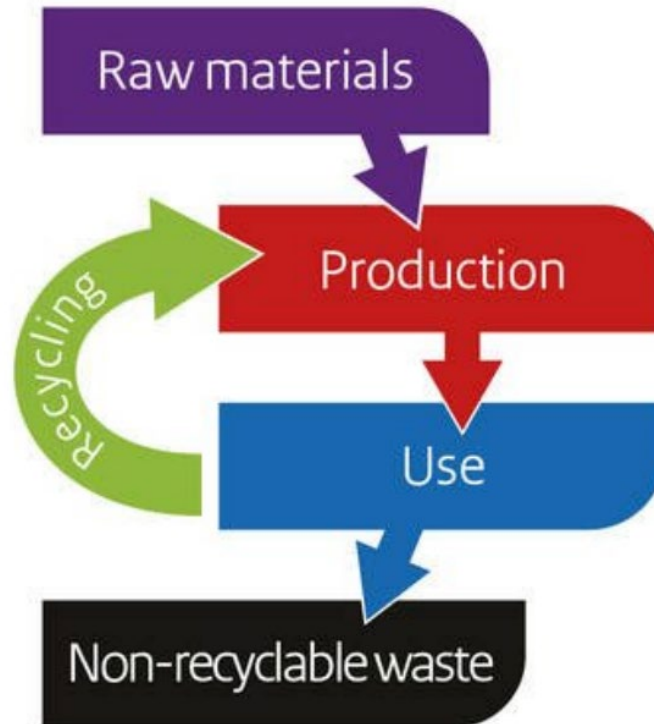
تُعاني الكويت سنوياً من الفيضانات وخاصة الفيضانات المفاجئة الناتجة عن هطول أمطار غزيرة في فترة وجيزة مع قليل من التحذير أو بدون تحذير. هذه الفيضانات ناتجة عن عدم قدرة شبكة مياه الأمطار الحالية على تصريف التفتقات من المنطقة المحيطة وذلك نتيجة لربط شبكة مياه أمطار المناطق المحيطة بها لنفس الشبكة. وأكثر المناطق المتأثرة هي المناطق الحضرية وذلك لارتفاع نسبة الأسطح المرصوفة. يهدف هذا المشروع إلى إيجاد حلول لعدم قدرة تحمل شبكة مياه أمطار مدينة صباح الناصر وذلك نتيجة لربط شبكة مياه أمطار مدينة الشاذلية بها، من خلال تنفيذ استراتيجيات مختلفة قابلة للتطبيق باستخدام خزان يقع على الطريق السادس السريع وتصميم أنابيب الصرف باستخدام برنامج (ستورمكاد). وكذلك معالجة ما يعرف بـ "التفتق الأول" الذي يتم تصريفه في جون الكويت وتخفيف تأثير مياه الأمطار على البنية التحتية والبيئة على جون الكويت.

# Circular Economy

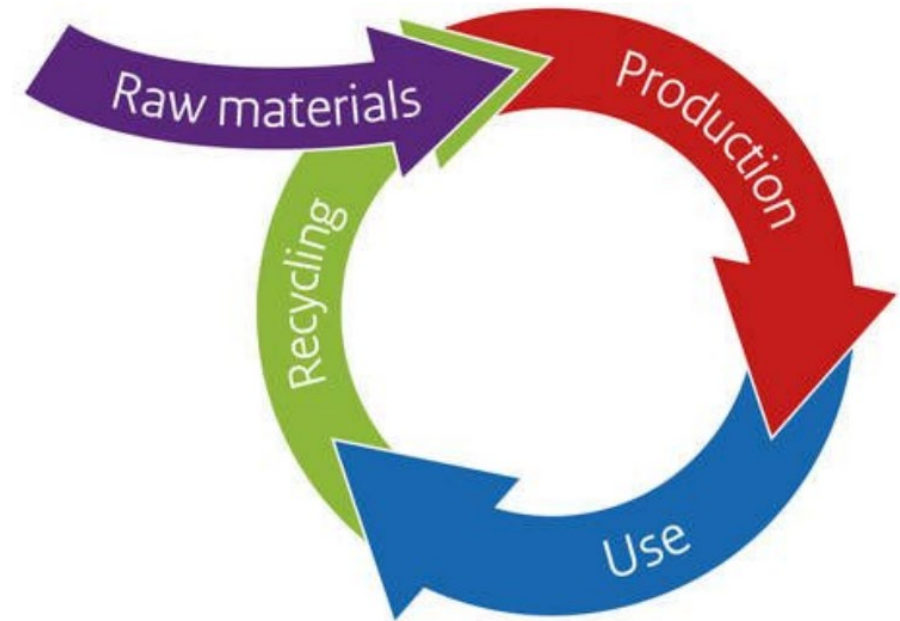
Linear Economy



Reuse Economy



Circular Economy







# Conclusion

- KU is committed to integrating SDGs into its campus operations, student engagement, research and community activities
- KU is cooperating with different sectors in Kuwait, such as General Secretariat of the Supreme Council for Planning and Development, and United Nations to adopt SDGs.
- The elements and practices are well established – what is needed is closing the communication gap between KU Administration and Academic Colleges
- Resources in Sabah Al-Salem University City will be utilized in academic courses and research projects.

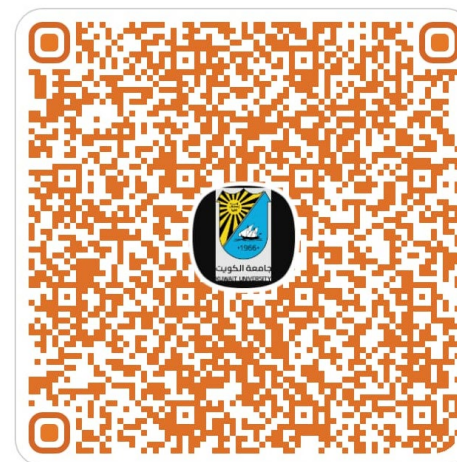
# Thank You

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