

## Building Mutah University Energy Management

The world is increasingly compelled to adopt more stringent and innovative practices to conserve and manage university energy resources. Mutah University's Energy Management Vision has become a growing focus for university management and technical staff in response to the global and local energy crises. Various university units and centers collaborate to put this vision into action, as illustrated in Figure 1:

1. Training, Consultation, and Communication Center
2. Maintenance and Sustainable Unit
3. Prince Faisal Center for Dead Sea, Environmental and Energy Research
4. Entrepreneurship Center
5. Community and Development Center





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Energy management activities are paralyzed by *fragmentation and the absence of an integrated vision* to accommodate multiple activities of multiple units and centers at Mutah University. *The energy Solution Factory Framework is the most important framework that can unify energy management efforts under one umbrella, and it* can be moved easily to serve many contexts, as illustrated in **Figure 1**. Academic institutions are globally considered policies, technologies, and know-how generation environments that can be incubated to fruit developments in all fields. The philosophy considers university centers and units as factories that can convert challenges into opportunities to transfer know-how and technologies and produce solutions. Mutah University's energy management vision is mainly based on this crucial Factory Solution Perspective, as illustrated in **Figure 1**.

### **Integrated Picture of Mutah University Energy Management Activities**

Energy Management Practices integration is one of the most important added values to the developed *Energy Management Vision*. This vision is based on gathering the Energy Management Practices offered by the five main university centers and units listed above as one continuum that aims to achieve the big goal of these efforts of converting Mutah University into a green Energy Surplus University, as illustrated in **Figure 2**. The importance of combating the negatives of fragmentation of these diverse efforts is reflected in constructing an integrated picture of the whole university's energy management activities, as illustrated in Figure 2. Seeing the big picture of these collaborative practices is paramount to Energy Management Integration.

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## Constructing Far Reaching Road Map of Mutah University Energy Management Activities based on Seed to Fruit Framework

**Solution Factory Framework** adopted before helped create a generic template that helped put all energy management efforts in a generic solution production form that can be easily moved to be implemented in all contexts, as illustrated in **Figure 1**. The construction of an integrated picture was a second critical step in shifting our thinking in Energy Management from the fragmented mode to the integrated and continuum mode, as illustrated in **Figure 2**. It is time now to go deep into *micro integration* by deeply looking at energy management activities from a seed growth perspective that classifies these activities as one of four types, see **Figure 3**:

1. Seed Activities
2. Root Activities
3. Branches Activities
4. Fruit Activities

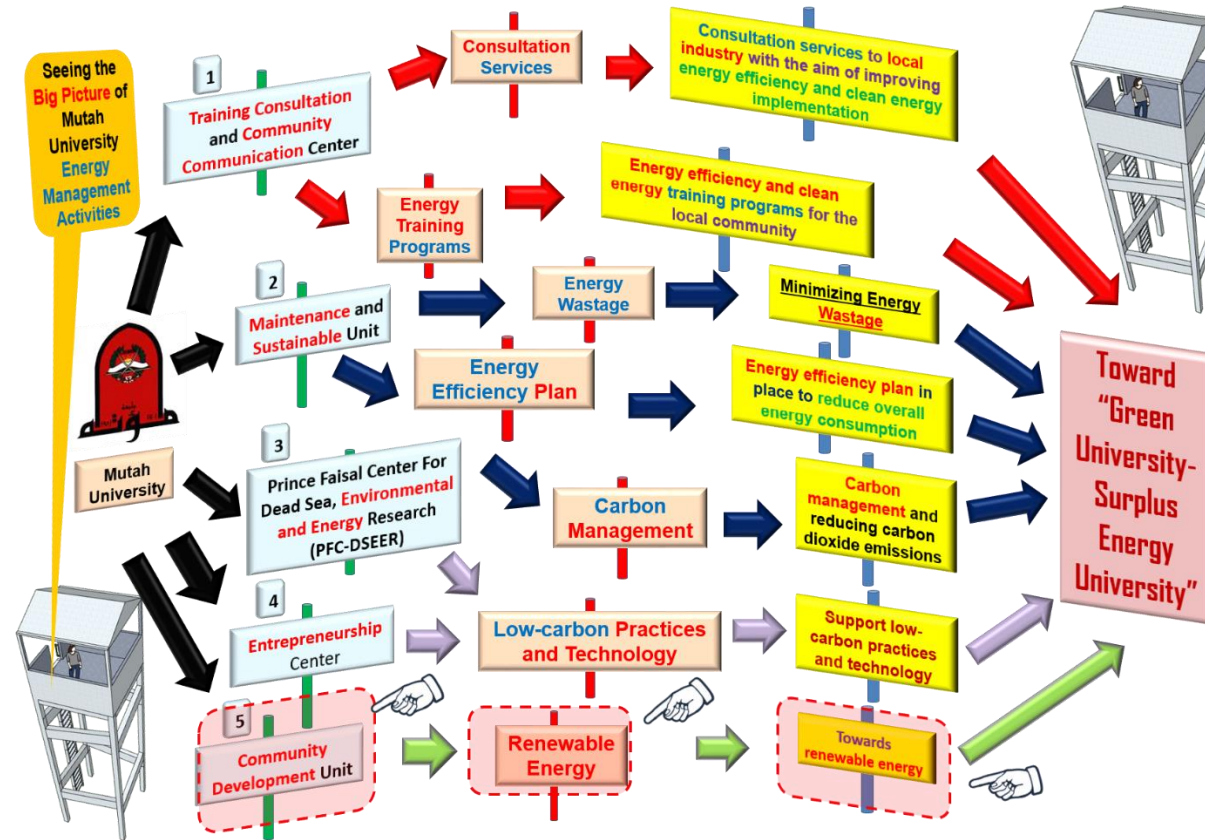


Figure 2: A Visual Big Picture of Mutah University Energy Management Activities

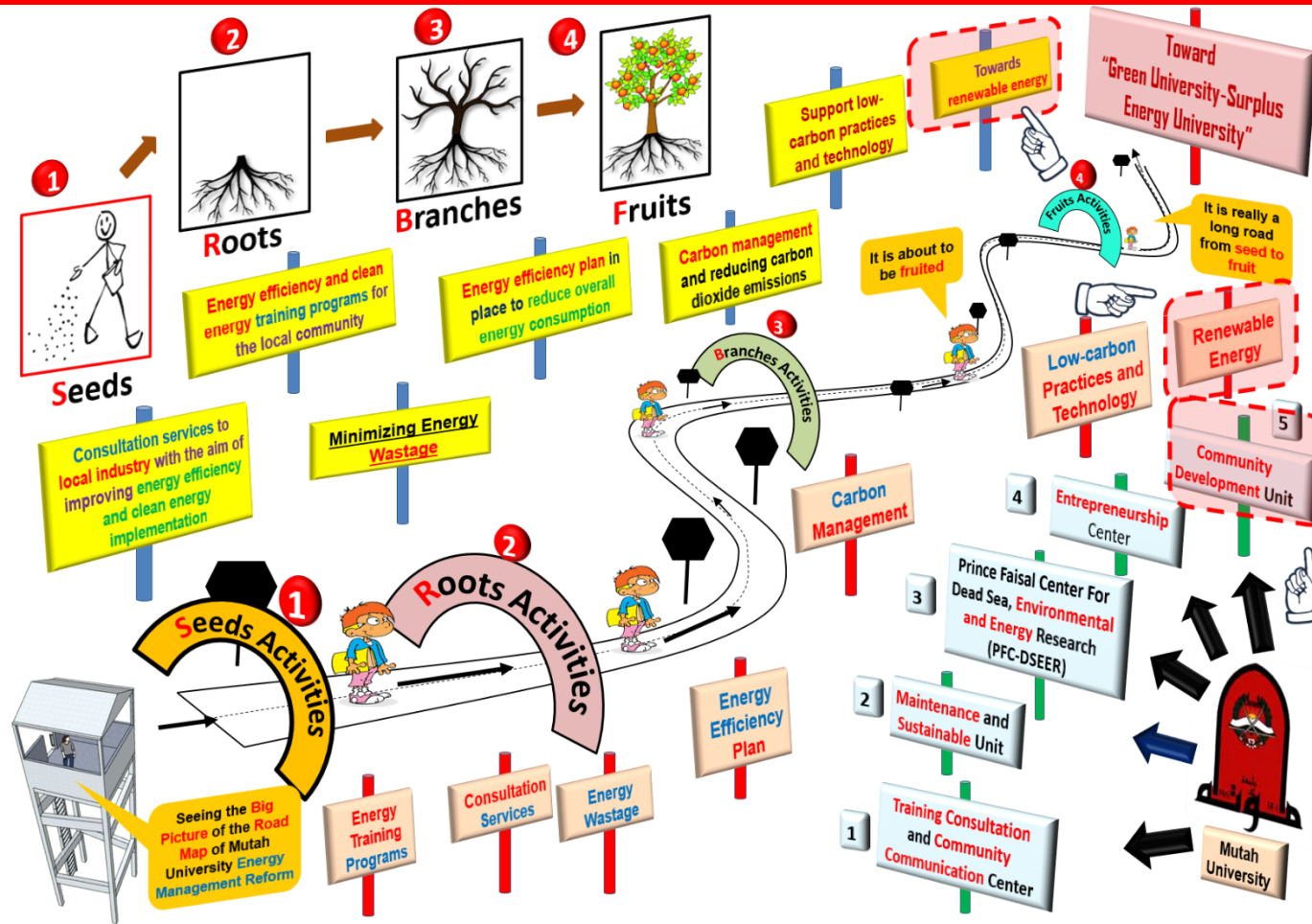


Figure 3: A Visual road map of Mutah University Energy Management Activities based on seed to fruit framework

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This seed-to-fruit framework will add an instrumental relationship to the network of these activity fragments and help shift Energy Management Thinking to the instrumental mode that gives meaning to these series and parallel network of practices (**Figure 3**).

## **Community Development Unit**

Serving the local community through the resources and expertise of the university as a scientific and cultural institution forms the foundation for societal unity. This approach fosters solidarity, equality, and integration, enabling increased individual and collective productivity within a relationship framework that enhances participation and ensures personal and societal security. These efforts take into account current realities while addressing future needs and opportunities. Based on this concept, the Community Development Unit at Mutah University, established in 2002, has worked to implement positive changes in both individual and community life.

Its development programs and initiatives include:

- Organizing development programs such as lectures, workshops, seminars, and conferences to support the local community's cultural, social, and economic growth, identifying its needs, and creating mechanisms to address them.

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- Facilitating coordination between the university and the local community to identify needs and establish appropriate mechanisms to serve them, particularly in transitioning to renewable energy and supporting its adoption in place of traditional energy sources.
  - Preserving the Jordanian heritage, especially in the southern region, and undertaking initiatives that deepen the authenticity and appreciation of this cultural legacy.

The Community Development Unit held several meetings with local community representatives and leaders to raise awareness about the importance of environmental preservation, the risks posed by climate change, and the need for a complete transition to renewable energy sources to meet various energy demands. These meetings included:

- Discussions with the local community on the importance of energy conservation and environmental protection.
- A meeting with local community school students and raising awareness about the importance of energy and the need to conserve it, support renewable energy sources, and keep creative ideas.
- A meeting with the local government to support switching to renewable energy, providing studies and consultations, and putting forward ideas such as lighting roads with solar energy green gardens.



The Community Development Unit has adopted some creative ideas to switch to solar energy, such as:

Project Name	Definition
<b>The Solar Umbrella Project</b> It started in 2020 and is still expanding in 2023	It is a project that deploys waiting for seats equipped with chargers that operate on solar energy.
<b>Solar heaters project</b> It started in dormitories in 2020 and is still expanding in 2023	a project through which the university divided the local community into sectors and distributed free solar heaters to spread awareness and promote the idea.
<b>Solar Lighting Project</b>	This project aims to convert the lighting of all roads in the local community area and off-grid communities to operate with solar energy. The university distributed, installed, and maintained the distributed units, and 60% of the project was implemented until 2020 and is expected to be completed by 2025.

The plan has addressed the following themes and actions:

- Green building initiatives: refurbishment of municipal buildings to achieve energy efficiency.
- Energy-efficient Street Lighting: 5000 units will be replaced with LED units in 2023.
- They are replacing diesel cars and machinery in the municipality with hybrid/electric cars by installing three electric vehicle charging stations in vibrant urban areas in Karak city. This service is free to encourage people to use electric/hybrid cars.
- It established a training center in collaboration with **Mutah University** that acts as a knowledge hub and aims to train technicians from the local community, including university students, and document the work and studies on renewable energy and energy efficiency.

<https://www.mutah.edu.jo/en/pfc/Pages/EnergyConservationProgram.aspx>

<https://www.mutah.edu.jo/Pages/LocalCommunityDevelopment.aspx>