



SDG 7: Affordable and Clean Energy



7.1 Research on clean energy

The University has significantly contributed to advancing research in energy and energy efficiency, as demonstrated by its growing number of publications in high-impact journals. These publications reflect the scale and impact of the university's research output in fields such as optical conductivity, energy storage technologies, and sustainable waste management. For example:

Xie, S. et al. (2024) investigated the hydrothermal treatment's effect on phosphorus transition in swine manure, enhancing sustainable waste management practices, published in 'Results in Engineering.'

Mostafa, A.M. et al. (2024) advanced battery technology by developing stable electrode-electrolyte interfaces, a breakthrough featured in 'Electrochimica Acta.'

These studies reflect the university's commitment to addressing global challenges related to energy efficiency and sustainability through cutting-edge research.

7.2 University measures towards affordable and clean energy

7.2.1 Energy-efficient renovation and building

The University of Tabuk, through its Vice Presidency and specialized units, is committed to promoting energy efficiency by implementing energy-saving standards in all renovations and new constructions. Specialized units such as the Center for Renewable Energy and Environmental Technology, along with the energy conservation team, actively contribute by raising awareness about the importance of energy conservation. They regularly disseminate informative messages to university staff and students via official emails, encouraging responsible energy use across campus.

Agreement document UT and the National Energy Efficiency Services Company

<https://www.spa.gov.sa/947b6479d5q>

Awareness campaigns

<https://www.ut.edu.sa/ar/administration/Agency/Energy-rationalization-team/Pages/default.aspx>

اتفاقية تعاون بين جامعة تبوك والشركة الوطنية لخدمات كفاءة الطاقة "ترشيد".

توفير البيانات والمعلومات المطلوبة لتنفيذ المشاريع.

تقديم الدعم والمساعدة لشركة ترشيد لتمكين من تنفيذ مهامها والتزاماتها.

إعداد الدراسات والتصاميم الهندسية وتركيب تدابير كفاءة الطاقة وتشغيلها.

تأهيل مباني ومرافق الجامعة لتكون أكثر كفاءة وأفضل أداء في استهلاك الطاقة.

U_Tabuk www.ut.edu.sa Public Relations and Media

7.2.2 Upgrade buildings to higher energy efficiency

The National Energy Services Company "Tarshid" and the University of Tabuk have launched a project aimed at improving energy efficiency across the university's buildings and facilities. The project seeks to enhance energy performance and reduce consumption in 54 buildings, covering a total area of 238,000 square meters, adhering to international standards.

The project will implement 12 key energy efficiency measures, focusing on control systems, air conditioning, and lighting. These measures include the partial replacement of chillers with more energy-efficient models, installing control systems for air conditioning and air handling units, upgrading traditional lighting to energy-efficient LED systems, and adding motion sensors in offices and facilities to optimize energy use.

Agreement document UT and the National Energy Efficiency Services Company

<https://www.spa.gov.sa/947b6479d5q>

7.2.3 Carbon reduction and emission reduction

The University of Tabuk has implemented a comprehensive process for carbon management and reducing carbon dioxide emissions. This includes:

- **Energy Efficiency Projects:** In collaboration with 'Tarshid', we are upgrading HVAC systems, replacing traditional lighting with energy-efficient LED systems, and implementing smart control systems to optimize energy usage across all buildings
- **Renewable Energy Integration:** The University of Tabuk, through the Renewable Energy and Environmental Technology Center, aims to transform the university from a consumer of electricity into a self-sufficient institution by powering campus facilities with an integrated renewable energy system, including solar and wind energy. This initiative positions the University of Tabuk as the first university in Saudi Arabia to operate on renewable, eco-friendly energy.
- **Sustainable Transportation Initiatives:** We are promoting carpooling and public transportation for students and staff to further reduce our carbon footprint

Agreement document UT and the National Energy Efficiency Services Company

<https://www.spa.gov.sa/947b6479d5q>

Renewable Energy and Environmental Technology Center

<https://www.ut.edu.sa/en/Centers/reec/Pages/default.aspx>

University transportation services

<https://www.ut.edu.sa/en/E-Services/Pages/Services32.aspx>



7.2.4 Plan to reduce energy consumption

The university has implemented a campus-wide energy efficiency plan that includes upgrading to LED lighting, installing energy-efficient HVAC systems, and retrofitting buildings with improved insulation to reduce overall energy consumption.

Agreement document UT and the National Energy Efficiency Services Company

<https://www.spa.gov.sa/947b6479d5q>

7.2.5 Energy wastage identification

The University of Tabuk regularly undergoes comprehensive energy reviews to identify areas where energy waste is highest. Our dedicated energy efficiency team conducts thorough energy audits and detailed assessments of campus buildings and facilities. Through this collaborative process, we analyze energy consumption patterns, pinpoint inefficiencies in systems such as HVAC, lighting, and equipment, and develop strategies to optimize energy use. The results of these reviews help guide our energy conservation efforts and prioritize areas for improvement, such as upgrading to energy-efficient technologies and implementing more effective energy management practices

Agreement document UT and the National Energy Efficiency Services Company

<https://www.spa.gov.sa/947b6479d5q>

Renewable Energy and Environmental Technology Center

<https://www.ut.edu.sa/en/Centers/reec/Pages/default.aspx>

7.2.6 Divestment policy

At the University of Tabuk, the contract for the building maintenance and operation project specifies that the contractor is responsible for protecting the environment and adhering to all environmental regulations and guidelines.

The contract for the building maintenance and operation project at the University of Tabuk

https://drive.google.com/drive/u/0/folders/1jknf8MnkcZJ0hAEKo7b_75GTXI78aGc1

7.4 Energy and the community

7.4.1 Local community outreach for energy

The University of Tabuk, represented by the Center for Renewable

Energy and Environmental Technology, offers programs for the local community to learn about the importance of energy efficiency and clean energy. The Center has been approved by the King Abdullah City for Atomic and Renewable Energy as a site for conducting training courses in the field of solar photovoltaic energy

Renewable Energy & Environmental technology center

<https://www.ut.edu.sa/ar/Centers/reec/Pages/NewsDetails.aspx?NewsID=10#>

The Center for Renewable Energy and Energy Efficiency at Tabuk University has been accredited as a center for providing specialized training courses in the field of solar energy system design

https://x.com/u_tabuk/status/1477634849968214018?s=46&t=TRyN4HDvhNuZLwM4viTAoQ

Issuance of training certificates in the field of solar photovoltaic energy and the inclusion of the Center for Renewable Energy and Environmental Technology at Tabuk University among the centers accredited by King Abdullah City for Atomic and Renewable Energy

<https://www.kacare.gov.sa/ar/FutureEnergy/RenewableEnergy/Pages/ri.aspx>

Solar Energy Systems Design Course

<https://www.ut.edu.sa/ar/Centers/reec/Pages/NewsDetails.aspx?NewsID=13>

Solar Photovoltaic Design

<https://www.ut.edu.sa/ar/Centers/reec/Pages/NewsDetails.aspx?NewsID=12>

Partnerships with Local Organizations:

https://x.com/u_tabuk/status/1774394979760185570?s=48

<https://www.ut.edu.sa/ar/administration/vrgssr/Partnerships-and-International/Documents/Partnership%20Agreements%202.pdf>

<https://www.ut.edu.sa/ar/administration/vrgssr/Partnerships-and-International/Documents/Partnership%20Agreements%201.pdf>

Workshops:

https://x.com/ut_dgs/status/1719279471226655189?s=46&t=TRyN4HDvhNuZLwM4vITAoQ

7.4.2 100% renewable energy pledge

The University of Tabuk has adopted a plan to operate some of its facilities using renewable energy sources, specifically wind and solar energy. It has also approved the operation and identity of the Center for Renewable Energy and Environmental Technology. Additionally, the University of Tabuk is working on signing contracts to monitor the performance of the supercapacitor storage system and to evaluate the PERC technology in solar panels under extreme environmental conditions

The university's plan to operate using renewable energy

https://x.com/u_tabuk/status/1049554211330056192?s=46&t=TRyN4HDvhNuZLwM4vITAoQ

Cooperation agreement to implement rehabilitation works for Tabuk University buildings and public facilities to rationalize energy consumption

https://x.com/u_tabuk/status/1464241726424551424?s=46&t=TRyN4HDvhNuZLwM4vITAoQ

<https://www.spa.gov.sa/947b6479d5q>

https://x.com/u_tabuk/status/1464609607201009674?s=46&t=TRyN4HDvhNuZLwM4vITAoQ

The Research and Consulting Institute, in cooperation with the Deanship of Research and Graduate Studies at Tabuk University, signed contracts to implement services for the competition to

evaluate and monitor the performance of the supercapacitor storage system, as well as the competition to evaluate PERC

technology in solar panels under harsh environmental condition

https://x.com/event_ut/status/1812568564290703615?s=46&t=TRyN4HDvhNuZLwM4vITAoQ

Partnerships with Local Organizations:

https://x.com/u_tabuk/status/1774394979760185570?s=48

Workshops:

https://x.com/ut_dgs/status/1719279471226655189?s=46&t=TRyN4HDvhNuZLwM4vITAoQ

Conducting joint research with international institutions

<https://www.ut.edu.sa/ar/administration/vrgssr/Social-Responsibility/Documents/%D9%82%D8%A7%D8%A6%D9%85%D8%A9%20%D8%A7%D9%84%D8%A7%D8%A8%D8%AD%D8%A7%D8%AB%20%D8%A7%D9%84%D9%85%D8%AC%D8%AA%D9%85%D8%B9%D9%8A%D8%A9.pdf>

7.4.3 Energy efficiency services for industry

The University of Tabuk cooperates with governmental and industrial sectors specialized in finding clean energy solutions by sharing its scientific, research, and technical expertise. This collaboration aims to develop clean energy solutions that promote sustainable environmental development with higher efficiency and lower costs. The University of Tabuk's Center for Renewable Energy and Environmental Technology has been approved by the King Abdullah City for Atomic and Renewable Energy as a headquarters for conducting training courses on solar photovoltaic energy.

Public Lectures and Seminars (Free)

https://x.com/ut_dgs/status/1719279471226655189?s=46&t=TRyN4HDvhNuZLwM4vITAoQ

<https://www.ut.edu.sa/ar/Centers/reec/Pages/default.aspx>

Training (Free)

Free- Solar Photovoltaic Design

<https://www.ut.edu.sa/ar/Centers/reec/Pages/NewsDetails.aspx?NewsID=12>

The Center for Renewable Energy and Energy Efficiency at Tabuk University has been accredited as a center for providing specialized training courses in the field of solar energy system design

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Training (paid)

<https://www.ut.edu.sa/ar/Centers/reec/Pages/NewsDetails.aspx?NewsID=13>

كفاءة الطاقة
المركز السعودي لكفاءة الطاقة
Saudi Energy Efficiency Center

يسر عمادة البحث والدراسات العليا دعوتكم لحضور سيمينار علمي بورقة علمية منشورة ضمن مخرجات مشروع تخرج لدرجة الماجستير في هندسة الطاقة المتجددة (جامعة تبوك) بعنوان:
MATLAB Simulation of an Electric Vehicle Charging Station Supplied by Photovoltaic Energy
ضمن ساعة مبادرة بحثية

يسر كلية الهندسة ومركز الطاقة المتجددة وكفاءة الطاقة بالتعاون مع المركز السعودي لكفاءة الطاقة دعوتكم لحضور محاضرة بعنوان
كفاءة الطاقة
يقدمها
م / ماجد الفرغان / احتفالي تنمية قدرات بشرية
أ / ماجد بن عبدالله الهويمل / مستشار نوعية وعلقات عامة

يوم الثلاثاء الموافق 2022/11/1
الوقت 01.00 - 02.00 مساءً
كلية الطب - مدرج رقم 4

البحث
السيمانار

عمادة البحث والدراسات العليا

الفئة المستهدفة
طلبة وخريجي الدراسات العليا
طلبة وخريجي البكالوريوس
العمهتين في مجال البحث

يوم الثلاثاء 01 - 03 - 2022م
أداء 850

يوجد شهادات للحضور

تأصل على درجة الماجستير في هندسة الطاقة المتجددة من كلية الهندسة بجامعة تبوك مع مرتبة الشرف الولى عام 2022م
عمل حاليا مهندس حماية في شركة (ابو) يوم المخصصة بحال الطاقة والبيئة
نشر الباحث خلال فترة دراسته بجامعة تبوك ورقة علمية في قواعد بيانات سكوبس Scopus

7.4.4 Policy development for clean energy

The University of Tabuk collaborates with government sectors specialized in developing clean energy solutions by sharing its scientific, research, and technical expertise. This partnership aims to promote sustainable environmental development with higher efficiency and lower costs. For example, the university works with the Ministry of Energy and Tarshid (the National Energy Services Company) to optimize energy consumption and enhance its efficiency in university buildings. Additionally, the University of Tabuk's Center for Renewable Energy and Environmental Technology has been approved by the King Abdullah City for Atomic and Renewable Energy as a venue for conducting training courses on solar energy.

Renewable Energy & Environmental technology center

<https://www.ut.edu.sa/ar/Centers/reec/Pages/NewsDetails.aspx?NewsID=10>

https://x.com/u_tabuk/status/1774394979760185570?s=46&t=TRyN4HDvhNuZLwM4viTAoQ

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<https://www.ut.edu.sa/ar/Centers/reeec/Pages/NewsDetails.aspx?NewsID=13>

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https://x.com/event_ut/status/1812568564290703615?s=46&t=TRyN4HDvhNuZLwM4viTAoQ

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7.4.5 Assistance to low-carbon innovation

The University of Tabuk works to adopt sustainable technologies that reduce environmental damage. For example: The University of Tabuk - Center for Research on Artificial Intelligence and Sensor Technologies cooperated with the Saline Water Conversion Corporation, represented by the Water Technology Innovation and Research Development Company (WTIIRA), in publishing a research paper.

Improving charge transfer properties and performance of solar cells by doped TiO₂ as an efficient photovoltaic code for dye sensitized solar cells (DSSCs) as an alternative to conventional solar energy for its high ability to absorb energy from sunlight more efficiently and less expensively. This enhances the university's role in promoting scientific cooperation between the industrial and academic sectors in the field of sustainable energy in line with the Kingdom's Vision 2030 and achieving the goal of zero carbon neutrality in the Kingdom.

The new edition of the Water Research Community, organized by the Saline Water Conversion Corporation and represented by the Water Technology Innovation and Advanced Research Institute, targeted important projects and innovative initiatives, including developing a chain of operations to reduce carbon emissions and supporting ongoing efforts to enhance the use of sustainability solutions and renewable energy.

<https://www.spa.gov.sa/N2094781>

A delegation from the Water Technology Innovation and Advanced Research Institute visits Tabuk University

https://x.com/wtiira_ksa/status/1772237286865784977?s=46&t=TRyN4HDvhNuZLwM4viTAoQ

<https://www.swcc.gov.sa/ar/News/NewsDetails/1193>

<https://www.swcc.gov.sa/uploads/watira%20news.pdf>

