KAPSARC
مركز الملك عبدالله للدراسات والبحوث البترولية
King Abdullah Petroleum Studies and Research Center

Unlocking Energy Efficiency: Perspectives and Catalysts in the GCC Built Environment

August 2024

Doi: 10.30573/KS--2024-WB10

Acknowledgment

We are deeply grateful to the nascent group team and all the contributors who have put their expertise into creating and publishing this significant report. The insights on energy efficiency's role in decarbonizing the GCC-built environment are critical to understanding the low-carbon energy transition.

In particular, we would like to gratefully recognize and acknowledge the instrumental support provided by **Jamila Elmir** (High-Level Climate Champions – COP280). Her perceptive input and constructive feedback significantly influenced the course of this Initiative.

We sincerely appreciate **Mohamad Hejazi**, Executive Director of KAPSARC's Climate & Sustainability team, whose review significantly enhanced the Workshop Brief's arguments and clarity.

Finally, special recognition goes to the **Expo City Dubai** team for hosting the workshop and providing assistance with logistics.

About KAPSARC

KAPSARC is an advisory think tank within global energy economics and sustainability providing advisory services to entities and authorities in the Saudi energy sector to advance Saudi Arabia's energy sector and inform global policies through evidence-based advice and applied research.

This publication is also available in Arabic.

Legal Notice

The final COP28 agreement has set an ambitious target by calling for a doubling of the average annual rate of energy efficiency improvement by 2030. To achieve this goal, the current 2% improvement in energy efficiency needs to grow steadily, reaching and maintaining a growth rate of over 4% by 2030. If successful, a remarkable increase in economic output per unit of energy would be achieved by the end of the decade. However, realizing these commitments demands a comprehensive approach that unites policymakers, the private sector, and the research community.

Recognizing the pivotal role of building energy efficiency in addressing climate change and fostering sustainable development, the COP28 discussions emphasized its potential benefits. Efficient building practices can reduce greenhouse gas emissions, reduce costs and energy bills, generate employment opportunities, and increase indoor comfort and the overall quality of life. Countries can significantly advance their climate targets by actively implementing and promoting building energy efficiency strategies.

Against this backdrop, this article briefly encapsulates the insights shared during a workshop jointly hosted by the King Abdullah Petroleum Studies and Research Center (KAPSARC) and High-Level Climate Champions. The workshop aimed to raise awareness about the critical role of energy efficiency policy in the Gulf Cooperation Council (GCC)-built environment. By offering a platform for participants to exchange experiences and ideas, the workshop provided a comprehensive overview of the existing gaps and potential in the energy efficiency of the built environment. The discussion also explored the policy mix needed to increase energy efficiency in the GCC region.

Key takeaways from the workshop underscored the importance of designing energy-efficient buildings, increasing energy efficiency standards, increasing public awareness, and implementing policies that actively promote energy conservation. The participants engaged in thoughtful discussions about the opportunities and challenges associated with achieving energy efficiency goals and explored policy options to improve energy efficiency in the GCC-built environment.

1. Key Points

On March 5, 2024, King Abdullah Petroleum Studies and Research Center (KAPSARC) and High-Level Climate Champions cohosted a workshop titled "Unlocking Energy Efficiency: Perspectives and Catalysts in the GCC Built Environment." The workshop was held alongside the Sustainable Cities in Action Forum held in Expo City Dubai on March 5 and March 6.

The workshop was part of KAPSARC's Buildings Energy Efficiency project, which aims to identify low-energy demand pathways across the whole value chain in the building sector and key opportunities for decarbonizing the built environment in Saudi Arabia. The workshop focused on the current status and key energy efficiency opportunities in the GCC's built environment, explored the latest developments in related policies and strategies and their performance in the GCC, and covered current best practices of member countries in the GCC.

The main objectives of this workshop were as follows:

1. To increase the recognition of **energy efficiency in the built environment** as a critical measure for climate action in the GCC region.

2. To **showcase transformational collaboration within the energy and research sectors by enabling the "shared voice" of business leaders to highlight leading regional case studies ahead of COP29**.

3. To launch **a working group that can collaborate on energy efficiency policy and identify enablers in the GCC**.

4. To devise a plan for generating **an annual report** that comprehensively assesses the state of energy efficiency in the built environment in the GCC, highlighting achievements and addressing key challenges.

The workshop comprised a main session featuring four presentations. A brief survey followed the main session to gather insights from the participants regarding their perceptions of the role of energy efficiency.

Zooming in on the GCC context, the first presentation focused on the context of the built environment and associated challenges. It also explored the opportunities and challenges related to accelerating the implementation of energy efficiency measures, as well as the importance of collaboration. The second section considered energy efficiency from a climate perspective. This presentation underscored the importance of mobilizing nonstate actors for climate action and decarbonizing the built environment. The third presentation emphasized the role of the building sector in achieving the objective of net-zero

emissions in the GCC countries. Finally, the last presentation extended the focus to encompass policy and market enablers crucial for unlocking the full potential of energy efficiency in the GCC, which is an integral aspect of the region's journey toward achieving a net-zero economy.

The key takeaways from the presentations and subsequent discussions during the main session are outlined below:

- **Despite the significant emission reductions achievable through improved building energy efficiency, economic actors often underinvest, limiting these potential benefits**. Bridging this gap requires implementing coordinated demand-side approaches that involve collaboration among governments, industry, and civil society.

- **Achieving climate sustainability requires a significant push for energy efficiency**. By implementing energy-efficient policies, we can both reduce energy consumption and greenhouse gas (GHG) emissions and unlock economic and social benefits.

- **Buildings are essential for achieving net-zero emissions, especially in the GCC, where energy consumption is particularly high**. The built environment accounts for nearly half of regional emissions (47%) in the MENA region and thus is a critical sector for decarbonization. Opportunities for energy savings include passive design, renewable energy integration, building renovations, energy-efficient appliances, and the promotion of sustainable occupant behavior.

- **Efforts to increase energy efficiency in the GCC-built environment face several challenges, which impede its realization. Limited data** make tracking progress and identifying improvement areas difficult. **Unclear authority** creates confusion about responsibility for implementing efficiency measures. **Weak collaboration** hinders the development and implementation of effective strategies. Moreover, **missing policies** for energy-intensive sectors create loopholes and limit progress.

- Energy efficiency hinges on the national context and is influenced by factors such as socioeconomics, building design, construction practices, operation, technology adoption, and individual lifestyles. Solutions often require a regional lens. There are **ample examples of enabling policies and best practices available within the GCC region** that present a strong case for regional collaboration.

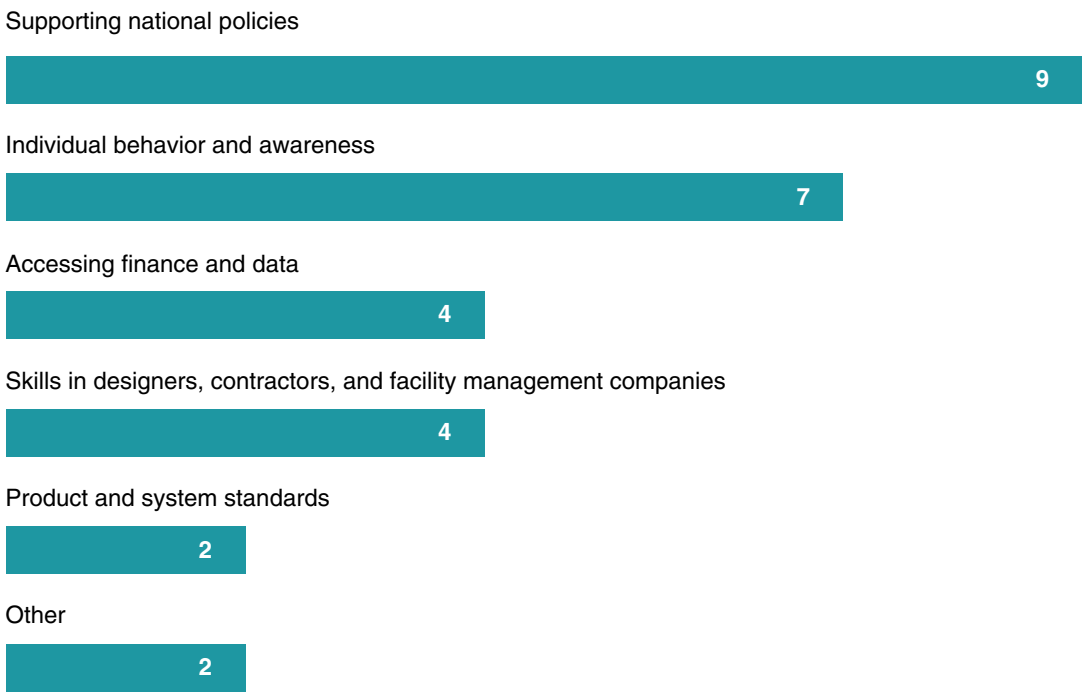
During the workshop, we also conducted a short survey among workshop participants to gather insights. The key findings regarding the main challenges to and opportunities for unlocking greater energy efficiency in the GCC are as follows.

1. Key Points

- Main challenges to unlocking greater energy efficiency in the GCC:

The primary challenges identified were the lack of supportive energy policies; issues related to individual behaviors; and skill sets among suppliers, designers, and building operators, as well as challenges in accessing finance and data (Figure 1). With respect to product and system standards, while some participants acknowledged the potential difficulty in establishing GCC-wide standards, others recognized their importance, particularly in the context of cooling equipment. Additionally, the discussion emphasized the need to consider operational efficiency alongside design efficiency in buildings. Factors such as the urban heat island effect and the energy grid were also highlighted as contingent factors impacting energy demand in buildings.

Figure 1. The main challenges to unlocking more significant energy efficiency in the GCC countries.



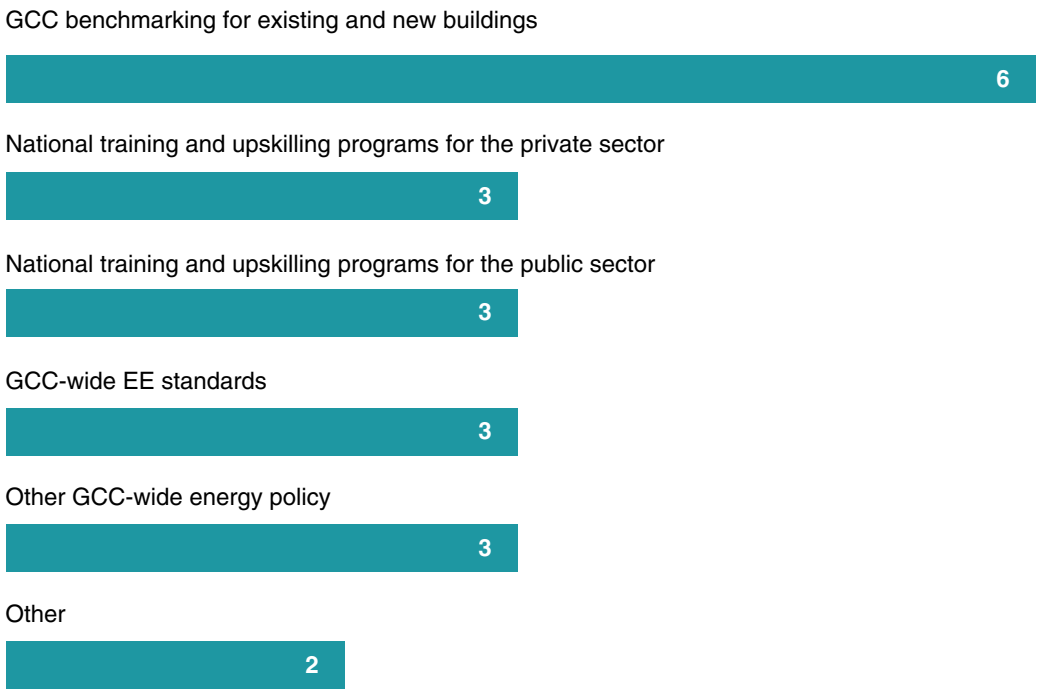
Source: Author's design.

Key opportunities to unlock greater energy efficiency in the GCC:

The most promising opportunity identified was the implementation of GCC benchmarking for both existing and new buildings, followed by the establishment of GCC-wide energy efficiency standards and national training programs for both public and private sector stakeholders (Figure 2). The discussion also underscored the significance of storytelling and culturally responsive nudges for behavioral change, leveraging lessons learned within the region. Finally, ensuring a common language regarding definitions and key performance indicators (KPIs) for moving forward was emphasized.

To summarize, the session facilitated an open dialog among regional and international experts. It also explored the prospect of establishing a working group that could serve as a platform for enhancing knowledge sharing among peers in the GCC. Such a platform would aim to support both policymakers and private sector entities in adopting effective energy efficiency measures.

Figure 2. The key opportunities to unlock energy efficiency at the regional level in the GCC countries.



Source: Author's design.

2. Unlocking Energy Efficiency in the Built Environment: Fostering Collaboration Efforts in the GCC

In the context of the GCC, where urbanization is rapidly reshaping landscapes, the built environment has emerged as a pivotal arena for addressing energy efficiency. From residential dwellings to sprawling infrastructure networks, its influence on energy consumption is profound. As the global urban population surges and is anticipated to reach 70% by 2050 (World Bank 2024), the challenges of sustainable urban development intensify. These challenges include environmental degradation, rising temperatures, increased energy demands, affordability and security issues, and the need for infrastructure expansion and accessible housing.

The built environment also significantly contributes to global GHG emissions, accounting for approximately 14.4 metric gigatons of carbon dioxide equivalent ($GtCO_2e$) annually (Brodie et al. 2023). Construction and operational activities within this sector contribute to approximately 26% of all GHG emissions and 37% of combustion-related emissions globally (Brodie et al. 2023). In this domain, there is an increasing emphasis on understanding energy demand dynamics and enhancing energy efficiency (Belaïd 2022a). Policymakers worldwide are prioritizing these efforts in the fight against climate change (Lovins 2018; Belaïd and Fikru 2024). Investing in energy efficiency within the built environment, particularly in the GCC region, holds immense potential to yield numerous benefits for individuals and society.

Recognizing the impact of the built environment on carbon emissions, the session covered several crucial aspects of energy efficiency in the GCC region. While acknowledging the value and various benefits of energy efficiency, speakers emphasized the importance of collaborative efforts in improving energy efficiency and discussed its wider context from a climate perspective, highlighting its essential role in addressing environmental challenges. In addition, they examined the building sector's significant contribution to achieving net-zero emissions in GCC countries, highlighting its potential and importance in the transition to sustainable practices. Finally, speakers explored the various barriers, policies, and priorities affecting energy efficiency initiatives in the GCC, recognizing the need for strategic interventions to overcome challenges and drive progress.

The speakers and participants also highlighted the following five key takeaways:

While improving energy efficiency in buildings offers significant emissions reduction, a gap exists where economic actors often underinvest, hindering these potential benefits. Given that buildings account for a substantial portion of global energy consumption and CO_2 emissions, increasing their energy efficiency can curtail energy consumption and emissions, thereby helping alleviate the adverse effects of climate change. Moreover, increasing energy efficiency in the built environment can lead to cost savings, lower energy bills, and increased affordability. Furthermore, improving energy efficiency in buildings can generate new employment opportunities in the green economy. For example, installing energy-efficient systems and materials necessitates manufacturing, installation, and maintenance jobs. Additionally, renovating existing buildings to increase energy efficiency can create employment prospects for local contractors

and skilled workers. Energy-efficient buildings can improve occupant comfort and overall quality of life. They provide healthier indoor environments with improved ventilation, lighting, and temperature control, resulting in better health outcomes, heightened productivity, and enhanced well-being. Despite the many benefits of energy efficiency in the built environment, economic agents often underinvest for reasons commonly referred to as the "energy efficiency gap" (Gillingham, Newell, and Palmer 2009; Labanca and Bertoldi 2018; Belaïd, Youssef, and Lazaric 2020). These include limited awareness and information about the benefits of energy efficiency, concerns regarding upfront investment costs, insufficient access to financing, lack of trust in the energy efficiency sector, uncertainty surrounding investments, principal-agent issues, and competing priorities. Many individuals may not recognize the long-term benefits of energy efficiency investments in terms of reduced energy bills, improved indoor comfort, and the mitigation of climate change impacts due to a lack of awareness and information. The high initial cost of energy-efficient upgrades can pose a significant barrier for some individuals, as not everyone may have the financial means to make these investments. Limited access to financing further complicates matters by making it challenging to spread out the cost of energy-efficient upgrades over time. Concerns about the quality and reliability of energy-efficient products and services may also deter individuals from investing in energy efficiency (Bakaloglou and Belaïd 2022). Some individuals may hesitate to invest without concrete evidence of promising energy savings. Finally, competing financial priorities may divert attention from energy efficiency investments for some individuals, who may prioritize other financial obligations over energy upgrades.

Climate sustainability requires a significant effort in terms of energy efficiency. Over the past few decades, energy efficiency has proven to be a critical factor in achieving carbon neutrality, and its importance is set to grow considerably in the future. Projections indicate that energy efficiency could contribute up to 40% of carbon neutrality efforts in different scenarios. This underlines the essential role that energy efficiency plays in mitigating climate change and moving toward sustainable practices. In a landmark move for climate action, the final COP28 agreement calls for a global doubling of the average annual rate of energy efficiency improvement by 2030. This ambitious target requires the current yearly growth rate for energy efficiency improvement of 2% to reach and maintain a rate of over 4% by 2030. If this goal is achieved, the economic output per unit of energy would be significantly increased by 2030. Specifically, for the built environment, the 2030 breakthrough aims to ensure that all new projects completed from 2030 onward are net-zero carbon in operation and are accompanied by a significant reduction of over 40% in embodied carbon. Furthermore, recognizing the potential for coordinated international action on sustainable cooling to save 78 billion tonnes of CO_2e by 2050, improve the lives of hundreds of millions of people, and deliver substantial financial savings, the Global Cooling Pledge commits to reducing cooling-related emissions across all sectors by at least 68% worldwide from 2022 levels by 2050. Nevertheless, many challenges lie ahead regarding the implementation of these commitments. Overcoming these issues requires targeted and nuanced strategies.

Buildings are crucial for achieving net-zero emissions, especially in the GCC region, where energy use in buildings is particularly intensive. Residential buildings in the GCC, for example, consume approximately 350 kWh/m^2, which is significantly higher than the rate of other regions. This situation represents a significant yet underexplored potential for reducing carbon

emissions in the region. A multifaceted policy approach is essential to achieve net-zero carbon emissions in the GCC-built environment. This approach should encompass a range of strategic actions aimed at reducing the carbon footprint throughout the lifecycle of buildings (Figure 3). First, ecoefficient construction and design practices play a pivotal role. These practices include implementing innovative building techniques and materials that minimize environmental impact while maximizing energy efficiency. Strategies such as passive solar design, optimal insulation, and efficient HVAC systems can significantly reduce energy consumption and carbon emissions from the outset of a building's construction. Second, integrating renewable energy sources into the built environment can help reduce reliance on fossil fuels. These actions can include the widespread adoption of solar panels, wind turbines, and geothermal systems to generate clean energy onsite. Furthermore, renovating the existing building stock is essential for achieving net-zero carbon goals. Retrofitting older buildings with energy-efficient technologies and upgrading insulation, windows, and lighting systems can drastically improve energy performance and reduce emissions. This process not only extends the lifespan of buildings but also ensures that existing infrastructure aligns with recent sustainability standards. In addition to physical upgrades, smart energy management systems are instrumental in optimizing energy use and reducing waste. The implementation of advanced building automation systems, energy monitoring tools, and demand-response strategies can increase efficiency and minimize carbon emissions while maintaining occupant comfort and functionality. Finally, fostering behavioral changes among building occupants and stakeholders is crucial for long-term sustainability (Belaid and Flambard 2023, Belaïd 2024). Encouraging sustainable practices, such as energy conservation and waste reduction, can complement technological solutions and further reduce the

Figure 3. Key strategies for decarbonizing the built environment.

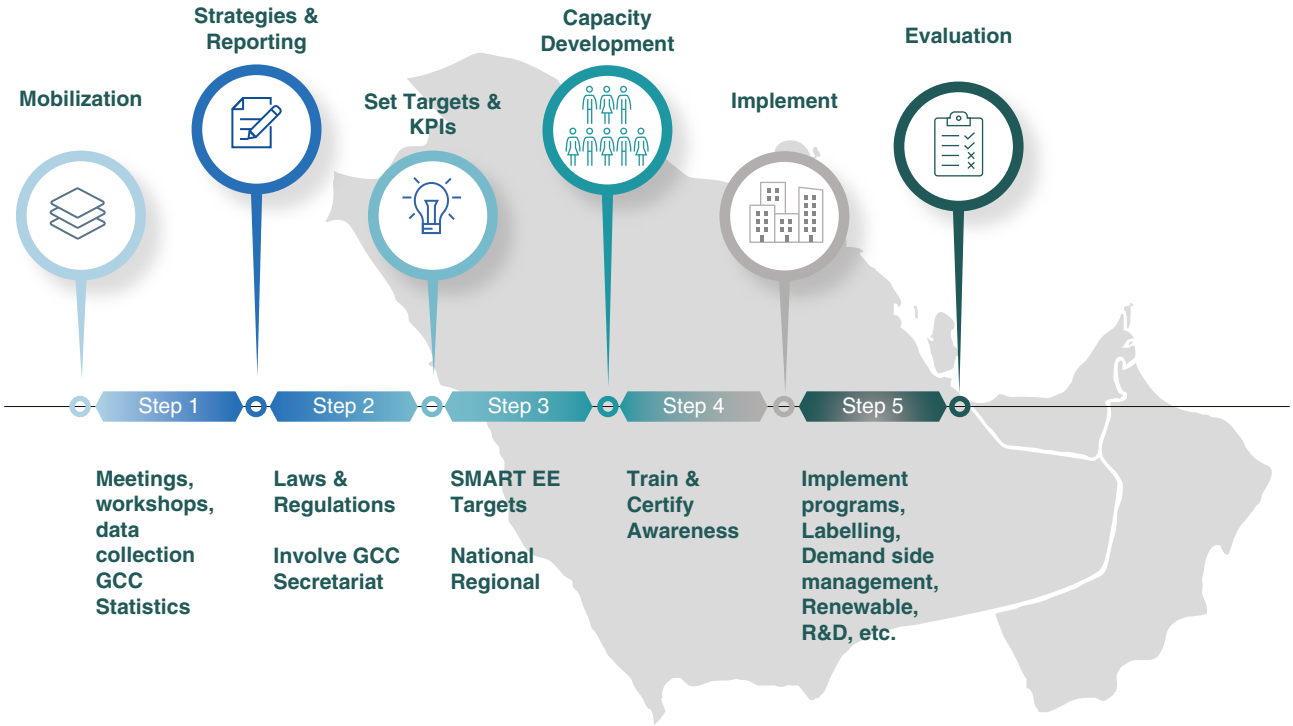
Construction and Design	Renewable Integration	Building Renovations	Energy Management	Behavioral Change
				
• Eco-efficient designs • Building orientation • Sustainable materials	• Solar and wind power • Solar thermal system • Energy storage system	• Maintenance and upgrades • High-performance systems	• Smart technologies • Building automation • Smart grids	• Proactive measures • Feedback and information • Social norms

Source: Author's design.

carbon footprint. Education, awareness campaigns, and incentive programs can promote a culture of sustainability within the built environment.

Efforts to increase energy efficiency in the GCC-built environment face several challenges that impede the realization of its full potential. These obstacles include insufficient comprehensive databases, ambiguous authority structures, and inadequate stakeholder collaboration. Moreover, the lack of clear policies for energy-intensive sectors and efficiency indicators exacerbates this issue. Addressing these challenges requires a cooperative and comprehensive strategy (Figure 4). This process entails establishing unified data reporting mechanisms, developing efficiency indicators, and formulating comprehensive EE strategies with SMART (i.e., specific, measurable, achievable, relevant, and time-bound) targets. Prioritizing sector-specific energy intensity targets is crucial, as is fostering collaboration among the government, business, and academic sectors. Facilitating knowledge sharing through workshops, investing in workforce development, and promoting regional cooperation in research and development are also imperative. Leveraging available resources such as the United Nations Development Programme (UNDP), the Economic and Social Commission for Western Asia (ESCWA), and professional organizations further bolsters EE improvement efforts in the GCC-built environment.

Figure 4. Strategy to realize the full potential of EE in GCC countries**.**



Source: Author's design.

Importantly, energy efficiency solutions are often specific to individual countries or regions. Therefore, the GCC requires a tailored policy mix adjusted to the unique context of the region. This approach underscores the importance of collaboration, joint efforts, and synergies among GCC states to expedite the achievement of the net-zero target in the built environment.

The GCC energy efficiency group is poised to act as a facilitator to promote knowledge sharing and increase awareness of energy efficiency best practices among peers within the GCC. Its role extends to supporting policymakers and private sector stakeholders in effectively adopting and implementing energy efficiency measures.

3. Future Work and the Way Forward

As the significance of energy efficiency in the GCC built environment continues to grow, collaboration among researchers and policymakers in the region to identify key opportunities for increasing energy consumption and promoting conservation presents a unique chance to expedite knowledge sharing and adopt measures that will support the GCC countries' decarbonization targets.

To spearhead this collaboration and address the GCC region's built environment energy efficiency challenges, the GCC Energy Efficiency Working Group will bring together leading research organizations associated with the Gulf Cooperation Council. This collaboration aims to conduct research on critical challenges and opportunities, generating meaningful market and policy recommendations. These recommendations will support the region's climate transition toward net zero, ensuring inclusivity and alignment with regional and national priorities.

The group will actively pursue various objectives aimed at fostering transformative change in the region, as follows.

Elevating the recognition of energy efficiency: Increase awareness and acknowledgment of energy efficiency in the built environment as a crucial measure for effective climate action within the GCC region.

Showcasing transformational collaboration: Demonstrate groundbreaking collaboration within the energy and research sectors, emphasizing a unified voice among regional experts leading up to COP29 and beyond. Highlighting regional case studies will underscore the transformative potential of such collaborations.

Annual report generation: Develop a comprehensive annual report that assesses the state of energy efficiency in the built environment in the GCC. This report will highlight achievements, critical challenges, and key opportunities, serving as a valuable resource for regional stakeholders.

To further amplify its impact, the group could undertake additional activities on the basis of demands identified by the members of the working group and their national stakeholders, as follows.

Capacity-building workshops: Organize workshops focused on enhancing and sharing knowledge in the energy and built environment sectors to foster a community of experts equipped to drive sustainable practices.

Collaborative research projects: Encourage community-based research projects that bring together experts from diverse fields to explore innovative solutions and technologies for improving energy efficiency.

Policy recommendations: Promote supportive policies at both the regional and national levels and actively engage with policymakers to influence the development and implementation of energy-efficient measures.

Through this comprehensive and collaborative approach, the GCC Energy Efficiency Working Group aims to not only address existing challenges but also proactively contribute to shaping a more sustainable and energy-efficient built environment for the GCC region.

References

Bakaloglou, Salomé, and Fateh Belaïd. 2022. "The Role of Uncertainty in Shaping Individual Preferences for Residential Energy Renovation Decisions." *The Energy Journal* 43 (4). http://doi.org/10.5547/01956574.43.4.sbak.

Belaïd, Fateh. 2022a. "How Does Concrete and Cement Industry Transformation Contribute to Mitigating Climate Change Challenges?" *Resources, Conservation & Recycling Advances* 15 (November): 200084. https://doi.org/10.1016/j.rcradv.2022.200084.

Belaïd, Fateh, and Véronique Flambard. 2023. "Boosting Buildings Energy Efficiency: The Impact of Social Norms and Motivational Feedback." *Journal of Economic Behavior & Organization* 215 (November): 26–39. https://doi.org/10.1016/j.jebo.2023.09.003.

Belaïd, Fateh, Adel Ben Youssef, and Nathalie Lazaric. 2020. "Scrutinizing the Direct Rebound Effect for French Households Using Quantile Regression and Data from an Original Survey." *Ecological Economics* 176 (October): 106755. https://doi.org/10.1016/j.ecolecon.2020.106755.

Belaïd, Fateh. 2024. "Decarbonizing the Residential Sector: How Prominent is Household Energy-Saving Behavior in Decision Making?" *The Energy Journal* 45 (1): 125–148. http://doi.org/10.5547/01956574.45.1.fbel.

Belaïd, Fateh, and Mahelet Fikru. 2024. "How the U.S. Inflation Reduction Act Supports Energy Efficiency and Low-Carbon Buildings." Riyadh: King Abdullah Petroleum Studies and Research Center (KAPSARC). https://www.kapsarc.org/research/publications/how-the-u-s-inflation-reduction-act-supports-energy-efficiency-and-low-carbon-buildings/.

Brodie Boland, Shailesh Lekhwani, Sebastian Reiter, and Erik Sjödin. 2023. "Building Value by Decarbonizing the Built Environment." https://www.mckinsey.com/industries/engineering-construction-and-building-materials/our-insights/building-value-by-decarbonizing-the-built-environment.

Gillingham, Kenneth, Richard G. Newell, and Karen Palmer. 2009. "Energy Efficiency Economics and Policy." *Annual Review of Resource Economics* 1 (July): 597–620. http://doi.org/10.1146/annurev.resource.102308.124234.

Labanca, Nicola, and Paolo Bertoldi. 2018. "Beyond Energy Efficiency and Individual Behaviours: Policy Insights from Social Practice Theories." *Energy Policy* 115 (April): 494–502. https://doi.org/10.1016/j.enpol.2018.01.027.

Lovins, Amory B. 2018. "How Big is the Energy Efficiency Resource?" *Environmental Research Letters* 13 (9): 090401. http://doi.org/10.1088/1748-9326/aad965.

The World Bank. 2024. "Urban Development." https://www.worldbank.org/en/topic/urbandevelopment/overview#:~:text=Today%2C%20some%2056%25%20of%20the,billion%20inhabitants%20%E2%80%93%20live%20in%20cities.

About the Workshop

KAPSARC held a workshop in collaboration with the High-Level Climate Champions as part of KAPSARC's Building Energy Efficiency project. The event was held on Wednesday, March 5, 2024, at Expo City Dubai in the UAE. The workshop featured a panel of experts in the field of energy efficiency policy who shared their knowledge and experiences with the participants.

The meeting included more than 35 participants.

The speakers at the workshop were as follows:

Fateh Belaïd, Principal Fellow, KAPSARC

Jamila Almir, Principal, Senior Adviser, High-Level Climate Champions

Foutouh Al-Ragom, Energy Efficiency Technologies Program Manager (KISR), AEE 2022 President

Isam Shahrour, Professor, Lille University

Participants

Abdulatif Al Bitaw – Director of Emirates Green Building Council, UAE

Abdulla Isa Al Abbasi – Director of the Energy and Environment Program, Derasat, Bahrain

Adnan Shihab-Eldin – Senior Visiting Research Fellow, Oxford Institute for Energy Studies, Arab Energy Club

Ahmad Mesallem – Advisor, UAE Ministry of Energy and Infrastructure, UAE

Alessandro Sapio – Professor, Naples University, Italy

Alida Saleh – Senior Advisor, Climate Champions Team, Built Environment, UAE

Ana Margarida Costa – Head of Sustainability, Office of the President, KAUST, KSA

André de Palma – Professor, CY Cergy Paris University

Andrea di Gregorio – Executive Director of the Renewable Energy and Efficiency Office at Ras Al Khaimah Municipality.

Anna-Laura Petrucci – Professor, King Saud University

Anvita Arora – Executive Program Director, KAPSARC, KSA

Arman Eshraghi – Professor, Cardiff University, American University of Sharjah

Benoit Lebot – Senior Expert, French Ministry of Energy

Boumediene – Ramdani, Professor, Qatar University

Dina Nakib – Program Manager for the Flagship Projects Program, Kuwait Foundation for the Advancement of Science, Kuwait

Fateh Belaïd – Principal Fellow, KAPSARC

Fotouh Al-Ragom – Energy Efficiency Technologies Program Manager (KISR), AEE 2022 President, Kuwait

Isam Shahrour – Emeritus Professor, Arab Scientific Community Organization

Jamila El-Mir – Senior Adviser, High-Level Climate Champions

Kapil Narula – Senior Analyst Breakthrough Agenda, Climate Champions Team, UAE

Lama Zakzak – Principal Researcher, Mohammed Bin Rashid School of Government

Lara Dronjak – Associate Professor, American University of Sharjah

Luciano Caratori – Energy Cluster Lead, UN Climate Champions, Argentina

Mahelet Fikru – Associate Professor, Missouri University S&T

Mahmoud Abdellatif – Professor, Qatar University

About the Workshop

Majd Fayyad – DSM Strategy & Policy Lead, Supreme Council of Energy, UAE

Mohammad Jumea – Senior Consultant, Emirates Green Building Council, UAE

Mustafa Ansari – Economic Affairs Officer, UNESCWA

Paolo Bertoldi – Senior Expert, EU Commission

Princess Mashael AlShalan – Co-Founder, AEON Collective, AEON, KSA

Princess Noura Al-Saud – Co-Founder, AEON Collective, KSA

Radia Sedaoui – Chief, Energy Section, Sustainable Development Policies Division, UNESCWA

Róisín White Barrett – Managing Director, Clean Energy Business Council, MENA, UAE

Sami Al-Ghamdi – Professor, KAUST

Sana Alghareeb – Director of Engineering Programming, Ministry of Electricity and Water and Renewable Energy, Kuwait

Notes

About the Team

Fateh Belaïd

Fateh was a full Professor of Economics at Lille Catholic University and the director of the Smart and Sustainable Cities research unit. Fateh has also held various positions at the French Scientific and Technical Center for Building and led multiple collaborative projects for the French Ministry of Ecological Transition and the European Commission. He is an energy and environmental economist who draws from the fields of applied microeconomics, energy modeling and econometrics. He has published widely on household energy consumption, energy-saving behaviors, individual preferences and investments in energy efficiency, energy poverty, renewables and energy policy. He received a habilitation for supervising doctoral research from Orléans University, a doctorate in economics, a Master of Science in Applied Economics and Decision Theory from Littoral University, and an Engineering degree in Statistics. His work has been published in journals including *Ecological Economics*, *The Energy Journal*, *Energy Economics*, *Economic Surveys*, *Energy Policy*, and *Environmental Management*.

About the project

This workshop is part of KAPSARC's ongoing Building Energy Efficiency project. The primary purpose of this project is to implement a holistic approach covering the whole value chain to identify low-energy demand pathways in the building sector that are needed to meet the challenges associated with reducing energy demand emissions in Saudi Arabia. The project aims to cover a broad range of topics via innovative approaches and empirical studies to answer the following questions: (i) What are the challenges, barriers, and drivers of improving building energy efficiency in Saudi Arabia? (ii) What are the key enablers of building energy efficiency in the Kingdom? How can we effectively federate and engage with the whole community of stakeholders and accelerate the adoption of new business models for energy-efficient buildings in the Kingdom? (iii) What are the critical social and economic benefits of energy efficiency investments in buildings, and who will benefit from these investments?

www.kapsarc.org