ASIA LOW CARBON BUILDINGS TRANSITION | PROJECT
Life Cycle Assessment for Transitioning to a Low-Carbon Economy

Summary Report

Workshop on Regional Building Energy Efficiency Database and Investment Matching Platform

28 November 2024
Jakarta, Indonesia

Background

The building sector plays a significant role in ASEAN's energy landscape, accounting for 22% of ASEAN's total energy consumption in 2022. With increasing population and urban expansion, the 8th ASEAN Energy Outlook projects that energy demand from the building sector will rise by 56% from 95.52 MTOE in 2022 to 144.13 MTOE in 2050. The sector's energy demand is primarily met by electricity, accounting for 55% of consumption for electrical appliances and contributing around 21% of greenhouse gas emissions.

While investing in low-carbon, efficient, and resilient buildings offers a cost-effective way to reduce carbon emissions, several barriers hinder energy efficiency implementation in buildings. These include high initial costs, limited access to financing for energy efficiency projects, lack of standardised tools for assessing energy efficiency potential, and difficulties in matching building projects with potential investors.

To address these challenges, the ASEAN Centre for Energy (ACE) organised a Stakeholder Workshop on Regional Building Energy Efficiency Database and Investment Matching Platform on 28 November 2024, at JS Luwansa Hotel, Jakarta, Indonesia. The workshop aimed to gather perspectives and initiatives from key stakeholders to develop a regional one-stop shop platform that will host project databases, standardised tools, and accelerators for assessing energy efficiency, carbon emission, and financing matchmaking.

The workshop was organised under the Asia Low Carbon Buildings Transition (ALCBT) project, funded by the International Climate Initiative (IKI) of the German Federal Ministry for Economic Affairs and Climate Action (BMWK). The project is implemented by a consortium led by the Global Green Growth Institute (GGGI) with ACE, Energy Efficiency Services Limited (EESL) of India, and HEAT International as implementing partners. The workshop brought together about 130 participants including government officials, financial institutions, building associations, project developers, technology providers and experts participating both in-person and virtually to discuss market assessment findings and proposed platform features that will help accelerate energy efficiency investment in ASEAN's building sector.

Goals and Objectives

The workshop aimed to accelerate the regional transition toward energy-efficient buildings by developing tools to bridge the gap between building owners and financial institutions. Specifically, the workshop sought to present, discuss, and validate the findings of the market assessment for developing a regional energy efficiency database and investment platform. This included examining green building standards and frameworks, carbon standards, building performance metrics, and financing options for low-carbon buildings across ASEAN.

A key objective was to validate the proposed features and functionalities of the platform with key stakeholders to ensure it would effectively serve their needs. The workshop also discussed data requirements, sharing mechanisms, and potential challenges in populating and maintaining the platform across ASEAN member states. Through interactive sessions, participants exchanged information and views on potential use cases for platform utilisation to support energy efficiency project development and financing in the building sector.

Highlights of the Workshop

Opening Session

The Workshop began with remarks from **Hendro Gunawan, Deputy Director for Technical Cooperation of Energy Conservation, Directorate General of New and Renewable Energy and Energy Conservation, Ministry of Energy and Mineral Resources (MEMR), Indonesia**, outlined Indonesia's ambitious energy conservation goals and recent policy developments, emphasising Indonesia's commitment to developing a one-stop digital platform providing access to vendor portfolios, databases, and success stories while encouraging online reporting for energy management.

Picture 1. Hendro Gunawan, Deputy Director for Technical Cooperation of Energy Conservation, Directorate General of New and Renewable Energy and Energy Conservation, Ministry of Energy and Mineral Resources (MEMR), Indonesia deliver his opening remarks

Fajar Santoso Hutahaean, Head of Data and System Development Sub-Directorate, Ministry of Public Works of Indonesia, emphasised the critical role of buildings in decarbonising the energy sector. He outlined the Ministry's key initiatives including the implementation of green building regulations requiring at least 25% energy conservation and 10% water conservation in buildings. The Ministry also explored innovative financing mechanisms, including green funds through grants and low-interest loans, and piloting retrofitting projects through partnerships with various institutions.

Picture 2. Fajar Santoso Hutahaean, *Head of Data and System Development Sub-Directorate, Ministry of Public Works of Indonesia deliver his opening remarks*

Rizky Aditya Putra, Programme Manager of ALCBT at ACE, presented the workshop's strategic importance in the broader regional context. He highlighted the importance building sector in ASEAN's energy landscape, which accounts for 22% of ASEAN's total energy consumption and contributes to 21% of energy-related greenhouse gas emissions. He reiterated that the ALCBT project aims to catalyse the transition towards low-carbon buildings through its four key components - standardised tools development, enhanced industrial capacity, financial pathways establishment, and regional knowledge sharing. The proposed platform will serve as a crucial tool in bridging the gap between building projects and potential financiers while providing a comprehensive framework for assessing and monitoring building performance across the region.

Picture 3. Rizky Aditya Putra, *Programme Manager of ALCBT deliver his opening remarks*

Session 1: Introductory Session

The session began with **Ambolas Manalu** from GGGI Indonesia presenting the Asia Low Carbon Buildings Transition (ALCBT) project, a five-year regional initiative being implemented across Cambodia, India, Indonesia, Thailand, and Vietnam. He outlined the project's targets, including reducing 1.76 million tons of CO_2 equivalent emissions and mobilising 140 million euros of investment. He also shared the plans for establishing green finance networks in project countries as well as developing building taxonomy and green public procurement frameworks.

Picture 4. Ambolas Manalu deliver his presentation

Herlin Herlianika from HEAT International introduced the Building Emission Assessment Tools (BEAT), a comprehensive platform designed to assess both embodied and operational carbon in buildings. She detailed the tool's scalable and user-friendly design, highlighting its capability to perform detailed embodied carbon calculations for both structural and non-structural components. The presentation outlined the tool's four-step approach, encompassing data entry, modelling elements, modelling items, and results generation, demonstrating its practical application in the field.

Rizky Aditya Putra then presented the plan for the development of ASEAN Energy Efficiency Database and Investment Matching Platform, as a web-based platform designed to bridge the gap between project developers and potential financial partners with a target of mobilising EE finance mechanism in ASEAN building sector. The platform's design includes four key features: a low carbon building database, accelerator and calculators/tracker, project matching capabilities, and knowledge sharing functions. He outlined a five-step user journey from initial information collection to implementation monitoring, with the platform scheduled for launch by the third quarter of 2025.

Dr Deven Chhaya and Mr. Gaurav Pandey from KPMG presented the market research findings for the platform's development. The market research aims are to understand key barriers to energy efficiency adoption in buildings and identify solutions through the proposed platform.

Picture 6. Dr Deven Chhaya deliver his presentation

The first focus area examined green building standards and frameworks across ASEAN member states and global best practices. The research revealed varying levels of green building standards development, with countries like Singapore having comprehensive frameworks while others are still developing their standards. A key finding was the significant overlap in benchmark values across different standards, suggesting the possibility of regional harmonisation. The study specifically analysed standards in the four pilot countries - Indonesia (GREENSHIP), Vietnam (LOTUS), Thailand (TREES), and Cambodia (under development) - while also considering global standards like LEED and EDGE for reference. Carbon standards and emission factors formed the second major research component, focusing primarily on operational carbon emissions from buildings.

The study found varying grid emission factors across countries, reflecting different energy mixes. For example, Thailand and Cambodia showed lower grid emission factors due to higher renewable energy penetration. The research also examined the evolution of refrigerant standards, noting the transition from HCFCs to HFCs and the push towards refrigerants with lower Global Warming Potential (GWP) values. Building performance analysis revealed variations in Energy Use Intensity (EUI) across different building types and countries. The research identified key energy efficiency measures with their typical savings potential and payback periods. For instance, variable speed drives showed potential savings of 15-50% with payback periods of 1-4 years.

The analysis also highlighted the importance of building envelope design and passive cooling strategies in tropical climates. A critical component of the research focused on financing mechanisms and market barriers. The study identified various financing models, including government grants, bank loans, equity participation, and performance guarantees. It was noted an emerging trend of blended finance approaches combining concessionary capital with commercial financing. The research also revealed the correlation between electricity tariffs and energy efficiency investment interest, with higher tariffs generally driving greater interest in efficiency projects.

Session 2: Case Studies of Existing Energy Efficiency Platform

The session highlighted three (3) Building Energy Efficiency platforms currently operating in the ASEAN region: Singapore's SLEB Smart Hub, IFC's EDGE Platform, and Thailand's Digital Platform. Each case study provided valuable insights into different approaches to implementing energy efficiency platforms.

Singapore's SLEB Smart Hub

Dr Jin Guang Yu, Senior Manager of Green Mark Department, Environmental Sustainability Group, Building and Construction Authority of Singapore, shared the key features of the Singapore's SLEB Hub. The Super Low Energy Building (SLEB) Smart Hub, launched in 2019, represents a significant advancement in digital platforms supporting building energy efficiency.
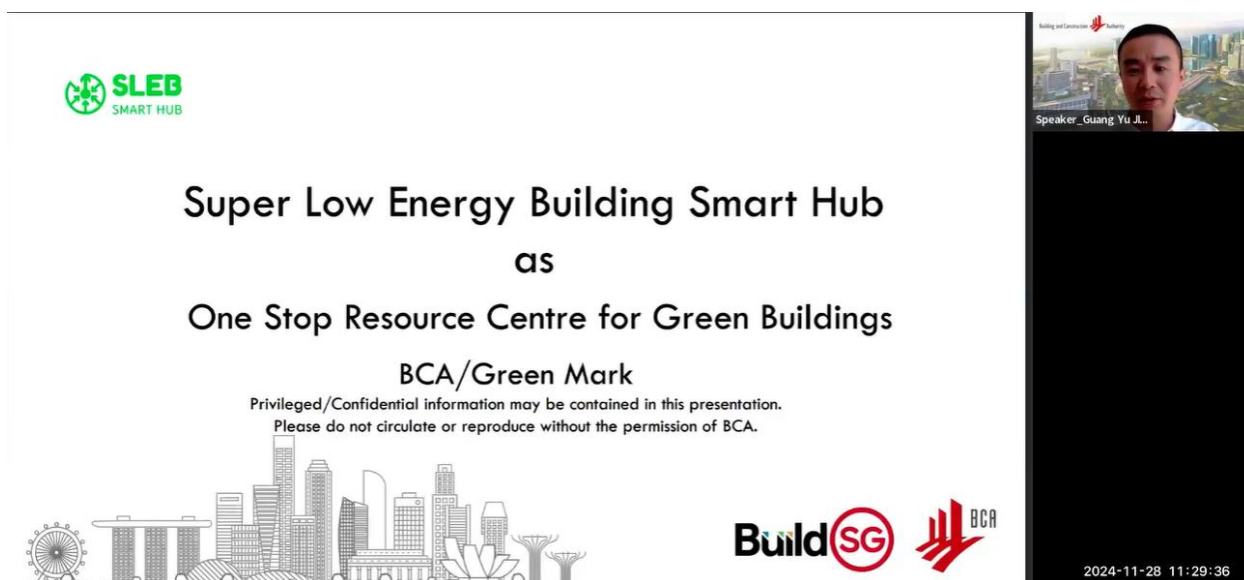
Picture 7. Dr Jin Guang Yu deliver his presentation

The platform's core mission aligns with Singapore's green building masterplan, which sets ambitious national targets including greening 80% of buildings and achieving super low energy building status (defined as 60% energy savings from 2005 baseline) by 2030. The SLEB Smart Hub integrates multiple digital services into a unified platform, including technology directories, building databases, and smart tools. A key feature is that all tools and applications are linked to the same database, enabling comprehensive building performance analysis and recommendations.

One of the platform's most innovative features is its *AI-driven energy assessment tool*, developed in collaboration with Singapore's central bank, the Monetary Authority of Singapore (MAS). This tool can quickly predict building energy performance using only 30-40 inputs, significantly simplifying the traditional energy modelling process that typically takes weeks. The AI model is calibrated to handle real-time or dynamic data, enabling verification of actual performance against design predictions and helping to close the gap between simulated and actual performance.

The platform offers specific benefits for building owners through its *smart advisor feature*, which allows benchmarking against high-performing buildings and provides tailored recommendations for energy efficiency improvements. It can assess or verify projects' energy efficiency levels under various frameworks and predict potential savings from implementing different technologies. The

platform also supports green financing by providing banks with tools to evaluate and monitor their clients' building performance.

A central feature of the SLEB Smart Hub is its *comprehensive building directory* that includes certified buildings' key information, making knowledge and data publicly accessible. The platform benchmarks key energy performance indicators, including Energy Use Intensity (EUI), cooling system efficiency, and other critical parameters. It also maintains a technology directory where suppliers can showcase their solutions, with each technology being labelled based on performance, adoption rates, and cost considerations.

The platform has evolved to include an integrated monitoring and verification capabilities, supporting green mark certification, bank monitoring requirements, and sustainability-linked loans. It allows building owners to set performance targets and track progress, integrating with various reporting requirements and national sustainability goals. Looking ahead, BCA is working to expand the platform's reach beyond Singapore, harmonising local standards to cover regional countries like Malaysia, Hong Kong, and Indonesia.

The EDGE Platform

Farida Lasida Adji from IFC's Climate Business Department presented the key features of EDGE (Excellence in Design for Greater Efficiencies) platform. EDGE was introduced as an open-source software platform, designed to help assess and improve building energy efficiency. The platform focuses on three key areas: energy, water, and embodied carbon in materials, taking a quantitative approach to demonstrate potential savings and returns on investment.

Picture 8. Farida Lasida Adji deliver her presentation

The platform has been implemented across multiple ASEAN countries since 2015, with significant adoption in Indonesia where it has certified close to 200 buildings covering approximately 3.2 million square meters. A notable achievement has been the certification of nearly 20,000 home units, including 42 Jakarta social housing towers. Despite challenges such as relatively low electricity prices in Indonesia and challenging solar panel policies, EDGE has seen consistent growth in adoption, even during the pandemic.

The platform's methodology involves analysing building designs against local climate conditions, and providing clear metrics on potential savings in energy, water, and materials. Users can input building specifications and receive detailed calculations of potential savings and environmental impact. EDGE offers three certification levels, with the standard level requiring 20% improvement in energy, water, and embodied carbon savings. While Indonesia currently has only one zero-carbon certified project, other countries like the Philippines have achieved approximately 20 certified buildings, attributed to higher electricity prices and more flexibility in renewable energy policies.

IFC works with various certification partners globally, including Green Building Council in Indonesia. The platform has certified various building types, from high-rise offices and apartments to smaller branch offices and health clinics. EDGE's success is particularly notable in the social housing sector, where it has helped establish sustainable building practices in affordable housing projects.

11

Thailand's Digital Platform

Ratchaphak Tantisanghirun from the Energy Regulation and Conservation Division Department of Alternative Energy Development and Efficiency (DEDE) of Thailand, presented the Thailand's energy efficiency digital platform, which was developed in response to the declining ratio of private investment in energy efficiency projects and the challenges in reducing energy intensity and greenhouse gas emissions. The platform aims to bridge the gap between energy efficiency projects and investors by creating a comprehensive digital ecosystem for project monitoring, verification, and financing.

The platform is structured around three primary modules. The first module focuses on digitalised Measurement & Verification (M&V), which enables automated data collection and verification of energy savings. Module B concentrates on e-incentives for energy efficiency projects, while Module C facilitates energy efficiency investment matching between project owners and potential investors. This integrated approach helps address the key barriers to energy efficiency investment, particularly supporting financial institutions in understanding and evaluating energy efficiency projects.

Regarding implementation results, it has successfully onboarded 11 private companies, with five organisations actively connecting their energy data to the platform. The cumulative impact has annual total savings of approximately 0.5 ktoe (thousand tonnes of oil equivalent) per year, equivalent to about 6 gigawatt hours of energy savings. The total investment value across these projects has reached 83 million Thai baht (approximately US$2.5 million).

A key feature of the platform is its ability to support entrepreneurs in sharing data through Module A, which then performs online M&V to verify and provide data to Modules B and C. The platform has been designed with a project value estimation of about 5 million Thai baht per project, with the intentions to scale up. The platform serves as a crucial intermediary, helping investors better understand project risks and returns while providing project owners with access to potential funding sources.

The platform highlighted the technological solution as a comprehensive approach to market transformation, addressing both technical and financial barriers to energy efficiency implementation. The platform's modular design allows continuous improvement and adaptation based on user feedback and market needs.

Discussion

Picture 9. Rio moderate the discussion

For Thailand's Digital Platform, a significant feature highlighted was the platform's approach to measurement and verification (M&V). To ensure data credibility, it utilise smart meters and sensors for real-time data collection, incorporating digital M&V processes to verify energy savings - a crucial element in building trust with financial institutions. it was clarified that the platform serves primarily as a matchmaking tool rather than directly providing financing solutions. The platform aims to visualise M&V data to make it more obvious to investors, helping them better understand the potential returns and risks of energy efficiency projects. Regarding challenges, it was acknowledged that getting consistent, high-quality data remains an ongoing issue, particularly for smaller projects. The platform team continues to work on simplifying data input processes while maintaining data integrity and reliability, while also exploring ways to incorporate more automated data collection methods to reduce the burden on project developers.

Dr Jin Guang Yu from BCA Singapore highlighted SLEB Smart Hub's regional scalability potential. He explained that Singapore, despite its small size, has a strong finance industry and has already worked to harmonise the platform's assessment tools with other countries including Malaysia, Hong Kong, and Indonesia. He emphasised that SLEB Smart Hub has integrated local standards into its assessment tools, allowing benchmarking based on each country's or region's specific requirements. The platform currently processes about 100 assessments monthly, with growing

adoption in newly covered regions. **Dr Yu** also highlighted their collaboration with Singapore's Central Bank to expand regional reach and expressed interest in working with ACE to build a regional ecosystem that facilitates green financing for the building sector.

Farida from IFC highlighted IFC's significant investment portfolio in green buildings globally and specifically in Indonesia, mentioning a recent investment of 500 million USD in SMBC bank, with 200 million USD earmarked for green developments. She indicated openness to exploring different collaboration models with the technical team at IFC, noting that EDGE is currently developing new features for operational building assessment, which is expected to launch in 2025.

Session 3: Energy Efficiency Financing

Danish Perspectives on Facilitating Energy Efficiency Financing in Buildings

Line Victoria Blirup Jensen, Project Lead for Energy Efficiency in Buildings, Indonesia-Denmark Energy Partnership Programme (INDODEPP), provided insights into Denmark's extensive experience with promoting sustainable building standards and energy efficiency. She highlighted Denmark's comprehensive policy framework developed over 40 years, which has made it a leader in building energy efficiency. She emphasised that Denmark's approach focuses on new and existing buildings, with particular attention to the latter since annual building renewal rates are only 1-2% of total building stock.

A key component of Denmark's strategy is the Energy Performance Certificate system, which requires certified auditors to assess buildings and provide detailed improvement action plans. These certificates are mandatory for building sales and valid for 10 years. The system has proven particularly effective as it impacts property values, creating a strong financial incentive for building owners to improve energy performance. There are even stricter regulations for public buildings - government institutions are not allowed to rent buildings below a "B" energy performance certificate level.

She highlighted Denmark's digital tools and platforms that support implementation. These include publicly available databases with building information, technical installations, measured consumption data, and energy performance certificates. These digital platforms serve multiple stakeholders - municipalities use them to target communication and incentives to building

owners, while private sector companies use the data to develop innovative solutions. The Danish approach emphasises transparency, with all building data publicly accessible through their Building and Housing Register.

She also discussed Denmark's effective public-private partnership approach, particularly highlighting a 2019 government initiative establishing 14 sector-specific climate partnerships. The construction industry partnership has been particularly successful in proposing concrete actions to reach Denmark's 70% carbon reduction target by 2030. Jensen emphasised that while regulation is important, having strong cooperation between public and private sectors is crucial for driving actual implementation of energy efficiency measures.

Lastly, she highlighted the importance of having both strong regulatory frameworks and supportive tools and platforms to enable implementation. Jensen noted that while Denmark's specific approach might not be directly transferable to all ASEAN contexts, the principles of combining clear policy direction, digital tools, and public-private cooperation could be valuable for developing regional energy efficiency initiatives.

UOB's U-Energy programme

Vivian Yang, SVP and Head of Construction, UOB Group presented the UOB's U-Energy program, the Asia's first integrated energy efficiency platform operating across Southeast Asia. She explained that the programme was developed in response to the projection that by 2050, global building floor space is expected to double, with buildings currently accounting for about 40% of global CO_2 emissions.

The programme is structured to serve the entire energy efficiency ecosystem through multiple financing approaches. For energy service providers (ESCOs), UOB offers both project-based and portfolio financing, with payments typically generated from post-retrofit energy savings. For M&E contractors, the bank provides working capital financing through their U-Green program. End-users in the commercial and industrial segments can access packages of up to $10 million with seven-year terms for equipment purchases and service payments. For residential customers, UOB offers a 36-month interest-free credit card instalment plan for energy-efficient products and solutions.

The financing mechanisms are supported by two key contracting models. The first is a direct purchase or **"CAPEX Model"** where building owners finance the project directly and own the

assets immediately. The second is an **"energy as a service"** model where ESCOs make the initial investment and recover costs through shared savings arrangements over 5-7 years. UOB provides financing solutions for both models, positioning itself as a comprehensive solution provider rather than just a financial institution.

The program extends beyond traditional energy efficiency to include a broader "U-series" of green financing solutions. This includes U-Build for green building development, U-Solar for solar installations, and U-Drive for electric vehicle adoption. UOB aims to support comprehensive sustainability initiatives through these integrated offerings while making green financing more accessible to various stakeholders in the ASEAN region. The bank has already established partnerships with 35 energy service companies across Singapore, Malaysia, Thailand, and Indonesia, demonstrating the programme's regional reach and practical implementation.

She emphasised that U-Energy is not just a financing programme but a comprehensive platform that connects technical expertise with financial solutions. This integrated approach helps address one of the key challenges in energy efficiency projects: bridging the gap between technical project development and financial feasibility assessment.

Thailand's ESCO Market

Peerasut Thirakomen, Vice President of the Thai ESCO Association, presented the ESCO business model and its role in facilitating energy efficiency projects. He emphasised that ESCOs differ fundamentally from general contractors through three core components: energy performance contracts (EPC), standardised measurement and verification protocols, and compensation mechanisms for performance shortfalls. ESCOs provide integrated services including energy analysis, design, construction, investment grade audits, financial arrangements, equipment warranties, and guaranteed project efficiencies.

Picture 10. Peerasut Thirakomen deliver his presentation

Three main ESCO business models, includes guaranteed savings, shared savings, and guaranteed rebate. In the guaranteed savings model, customers typically invest using their own capital or loans, while ESCOs provide performance guarantees. The shared savings model involves ESCOs seeking funding and implementing projects, with savings shared between ESCOs and customers over a 5-10 year contract period. The guaranteed rebate model, similar to solar PPAs or district cooling, involves ESCOs investing in large-scale plants and selling utilities to customers at discounted rates over longer contract periods of 20-25 years.

Thirakomen particularly emphasised the critical importance of measurement and verification (M&V) protocols in ESCO projects. He advocated for the International Performance Measurement and Verification Protocol (IPMVP) as a standardised approach to validate energy savings. Given that savings cannot be directly measured, he stressed the importance of having certified professionals conduct M&V to ensure accurate reporting and build stakeholder trust. Drawing from Thailand's 24 years of ESCO market experience, he highlighted how professional M&V has been a key success factor in market development.

He also discussed how ESCOs serve as risk mitigation tools for building owners and investors. By providing performance guarantees and assuming technical risks, ESCOs help overcome common barriers to energy efficiency investments. These barriers include uncertainty about project deliverability, savings achievement, and technical performance.

Session 4: Focus Group Discussion

Picture 11. Images of the discussion

On data collection and validation approaches

The workshop's discussed the challenges and approaches for data collection and validation on the proposed platform. KPMG presented the proposed initial approach, suggesting that building owners would be the primary data providers, as they possess the most accurate building information and operational data.

The workshop highlighted the need to balance platform accessibility, data collection, and accuracy. The data collection process will initially start with a focus on basic, easily accessible building information to encourage widespread participation. This would include fundamental data points such as building location, type, gross floor area, and operational schedules. As building owners become more engaged with the platform and see potential value, they would be encouraged to provide more detailed technical information in subsequent tiers. This approach was designed to balance the need for comprehensive data with the challenges of voluntary data collection.

To address *data credibility and validation* concerns, the discussion explored various validation mechanisms. It was suggested to allow building owners to upload supporting documentation such as electricity bills, meter readings, and energy audit reports as evidence. This would provide an additional layer of verification while recognising that energy audit report formats vary across different countries and regions. The group also discussed the role of financial institutions in the verification process, understanding that while the platform could provide initial screening and assessment, banks and other financiers would likely conduct their own due diligence and verification processes before making investment decisions. Another suggestion is incorporating a flagging system to indicate the level of data verification, allowing users to understand the reliability of the information.

The discussion also touched on the challenges of *data standardisation* across different ASEAN member states. Participants noted that varying levels of building technology adoption and data collection capabilities across countries would need to be considered. For instance, some buildings might have advanced building management systems providing detailed real-time data, while others might rely on manual readings and basic utility bills. It is suggested that the platform should be flexible enough to accommodate these differences while maintaining a consistent framework for data collection and assessment. This led to a broader conversation about the potential role of the platform in encouraging better data collection practices across the region and potentially driving the adoption of more sophisticated building monitoring systems.

On challenges of standardising benchmark values across different ASEAN countries

The discussion on *standardising benchmark values* across ASEAN countries revealed several complex challenges and potential solutions. The discussion highlighted that efficiency standards, particularly for cooling systems, was suggested be differentiated based on equipment capacity.

One suggestion is to utilise ASHRAE standards as a foundation since most countries already reference these in their local regulations. This approach would allow for standardisation while accounting for technical specifications like tonnage and capacity that affect efficiency ratings.

While standardisation is important for regional comparison and investment decisions, the platform needs to maintain enough **flexibility to account for local contexts** while still driving improvements in building energy efficiency. It is also noted that many national standards were adopted based on international standards (such as ASHRAE), with adjustment to align with local conditions. It was further noted that international standards can sometimes be too stringent for developing countries, leading country to develop its standards through stakeholder consultations. This highlights the need for flexibility in the platform to accommodate both international benchmarks and local adaptations. The discussion also noted that different climate zones within countries, particularly in geographically diverse nations like Indonesia, further complicate the standardisation process.

The workshop suggested a **tiered approach to benchmarking**, where EDGE and LEED certifications could serve as upper bands while allowing for country-specific lower thresholds. The discussion acknowledged that factors such as ambient temperature, operating parameters, and local manufacturing capabilities all influence achievable efficiency levels. For example, Indonesia's local chiller manufacturers must meet parameters different from those of imported equipment. The session suggested using the lower range of benchmark values initially to encourage broader participation, with the option to make standards more stringent as markets mature.

On the economic calculation aspects of the platform

The economic calculation aspects of the platform generated discussion during the focus group session, particularly regarding methodology and standardisation across ASEAN countries.

A key point of discussion centred around the **determination of appropriate discount rates** for financial calculations. The participants discussed varying risk profiles across different ASEAN countries - for instance, Singapore would typically have a lower risk profile compared to other countries in the region. Industry participants suggested that while engineering calculations typically use a 5% discount rate, financial viability often requires at least 10% to be considered attractive to investors. The platform is designed to provide reference discount rates based on

country and project type, while still allowing building owners to input their preferred rates for calculations.

The session also explored the challenges of establishing accurate **cost databases for energy efficiency measures** across different countries. Using the example of chiller systems, where Singapore's cost benchmark is approximately $2,000 per refrigeration ton, participants discussed how these costs can vary significantly by country, market conditions, and specific requirements. The discussion acknowledged that while calculating energy savings can be relatively straightforward, developing and maintaining an accurate database of implementation costs across different countries and technologies presents a more complex challenge. As a solution, the platform plans to develop this cost database gradually over time, incorporating real project data and market feedback to improve accuracy.

The **implementation of different financial instruments** was also discussed, particularly how government funding versus private financing affects expected returns and discount rates. Participants noted that government-funded projects typically accept lower returns than private financing, suggesting the platform needs to accommodate these variations in its calculations. The session concluded with agreement that the platform should provide flexibility in financial calculations while maintaining transparency about the assumptions and methodologies used, allowing stakeholders to make informed decisions based on their specific circumstances and requirements.

Next Steps

For next steps, ACE and KPMG will refine the data collection templates based on stakeholder feedback, particularly focusing on priority parameters for financial institutions and building owner/project developer data availability. Follow-up consultations will be conducted with key stakeholders to further detail the platform's technical requirements and implementation approach.

Moving ahead, the project will continue to the platform development phase, and it is expected that the platform to be ready for operation by Q3 2025.

Picture 12. The Workshop Group Photo

APPENDIX A. List of Participants

APPENDIX B. Presentation Materials

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