



Asia-Pacific
Economic Cooperation

PROJECT SUMMARY REPORT

**PUBLIC-PRIVATE DIALOGUE (PPD)
ON DEVELOPMENT OF STRATEGIES FOR
HARMONIZING STANDARDS AND CONFORMITY
ASSESSMENT ON ELECTRONIC HOUSEHOLD
APPLIANCES IN THE APEC REGION**



**APEC Sub-Committee on Standards and Conformance
December 2025**



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Economic Cooperation**

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Conformity Assessment on Electronic
Household Appliances in the APEC Region**

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Produced by
National Standardization Agency of Indonesia (BSN)

For
Asia-Pacific Economic Cooperation Secretariat
35 Heng Mui Keng Terrace
Singapore 119616
Tel: (65) 68919 600
Fax: (65) 68919 690
Email: info@apec.org
Website: www.apec.org

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EXECUTIVE SUMMARY

This project established a collaborative platform for APEC economies to strengthen regulatory cooperation on Electronic Household Appliances (EHA) through research, capacity building, and the exchange of best practices. The initiative sought to develop strategic approaches for harmonizing standards and conformity assessment procedures, promoting good regulatory practices, and advancing regional alignment in risk-based product regulation.

Building upon the background studies and insights shared by APEC economies, the workshop facilitated in-depth discussions on product risk categorization, conformity assessment schemes, and the application of international standards, particularly those developed by international standardization bodies and implemented through MRAs. Participants also explored practical approaches to streamlining market access, including the potential application of conformity assessment regimes based on product risk levels, complemented by robust post-market surveillance mechanisms.

The project outcomes demonstrated significant progress in enhancing participants' understanding of harmonization strategies and best practices for ensuring product compliance with technical regulations. It also fostered stronger coordination between regulators, conformity assessment bodies, and industry stakeholders to reduce technical barriers to trade and enhance mutual recognition among APEC economies.

Ultimately, this project contributed to advancing regulatory coherence and trust across the APEC region. The lessons learned and recommendations developed through this initiative will serve as valuable inputs for future work under the APEC Sub-Committee on Standards and Conformance (SCSC) and the Joint Regulatory Advisory Committee (JRAC), reinforcing APEC's shared commitment to transparent, efficient, and inclusive trade facilitation through standards and conformity assessment.

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I. INTRODUCTION

The project *“Public-Private Dialogue (PPD) on Development of Strategies for Harmonizing Standards and Conformity Assessment on Electronic Household Appliances (EHA) in the APEC Region”* was initiated under the APEC Sub-Committee on Standards and Conformance (SCSC) to support regulatory coherence and trade facilitation among member economies. Recognizing the increasing role of EHA in modern households and the growing complexity of global supply chains, the project aims to promote alignment in regulatory frameworks, strengthen mutual recognition of conformity assessment results, and enhance consumer protection through the application of international standards.

Indonesia, as the project proponent, led a comprehensive program involving background research, survey-based analysis, and multi-stakeholder dialogue to identify challenges and opportunities for harmonization. The initiative served as a platform for APEC economies to share experiences, exchange technical insights, and formulate practical strategies to reduce unnecessary trade barriers caused by regulatory divergence. It also addressed the importance of risk-based regulation and post-market surveillance as complementary mechanisms to ensure product safety, efficiency, and quality in the EHA sector.

Through this project, participating economies reaffirmed their commitment to advancing good regulatory practices and fostering cooperation between public and private sectors. The project directly contributes to APEC’s broader goals of promoting inclusive and sustainable economic growth through enhanced quality infrastructure and coherent standards and conformance systems.

II. OVERVIEW

The project was designed to develop a strategic approach for harmonizing standards and conformity assessment procedures for Electronic Household Appliances across APEC economies. It involved a combination of research work and a three-day Public-Private Dialogue (PPD) workshop that brought together regulators, conformity assessment bodies, industry representatives, and international organizations.

The research phase included a background study and questionnaire survey distributed to participating economies to map existing regulatory frameworks, identify differences in product risk categorization, conformity assessment schemes, and the level of alignment with international standards, particularly those of the International Electrotechnical Commission (IEC). The findings revealed diverse domestic practices in standardization and conformity assessment, emphasizing the need for a coordinated regional strategy.

The workshop further explored these findings through expert presentations, case sharing, and focused group discussions. Over three days, the program featured presentations from APEC and non-APEC economies, panel discussions, technical sharing, and Workshop's group discussion to assess potential risks and identify suitable conformity assessment regimes for various EHA products. These sessions not only deepened participants' understanding of international best practices and regional frameworks but also provided a platform for sharing domestic experiences and fostering practical cooperation. Participants discussed best practices in implementing IEC standards, mutual recognition arrangements (MRAs), and the role of risk-based regulation in determining appropriate conformity assessment modules. The dialogue also highlighted the significance of integrating Suppliers Declaration of Conformity for low-risk products, supported by effective post-market surveillance, while maintaining third-party certification for higher-risk categories.

Overall, the project established a strong foundation for ongoing collaboration among APEC economies. The importance of international frameworks such as APEC MRA, the International Electrotechnical Commission System for Conformity Assessment Schemes for Electrical Equipment and Components (IECEE) Certification Bodies (CB) Scheme, the ASEAN Electrical and Electronic MRA best practices in facilitating mutual recognition and reducing duplication. The outcomes of this initiative provide actionable recommendations for advancing harmonization, improving regulatory transparency, and enhancing consumer trust in the EHA sector across the APEC region.

III. RESEARCH FINDINGS AND ECONOMY BEST PRACTICES

The research findings underscored the importance of harmonizing regulatory frameworks and conformity assessment procedures for Electronic Household Appliances (EHA) across APEC economies. The study and survey results revealed that although many economies have implemented regulations addressing product safety, energy efficiency, and environmental protection, significant variations persist in regulatory approaches, conformity assessment mechanisms, and levels of implementation, often leading to redundant testing, increased compliance costs, and technical barriers to trade. In Indonesia, a Focus Group Discussion (FGD) involving regulators, conformity assessment bodies (CABs), and industry stakeholders was conducted to collect inputs and practical insights on existing regulatory gaps and challenges. The outcomes of the FGD were consolidated into a background paper and used to develop a draft questionnaire designed to support the formulation of strategies for harmonization, including the identification of relevant standards, risk levels, and conformity assessment approaches. Additional findings were derived from APEC member economies' feedback on the background paper and survey results, which provided comprehensive information on existing harmonized standards, identified product risk levels, and the conformity assessment regimes currently applied across APEC economies. These findings were further reaffirmed through workshop discussions, where participants emphasized the need for greater regulatory coherence, enhanced mutual recognition of conformity assessment results, and strengthened collaboration among APEC economies to promote efficient market access and ensure consumer safety.

The International Electrotechnical Commission (IEC) and its Conformity Assessment Scheme were recognized as key global mechanisms supporting harmonization. The mutual recognition of test reports and certificates helps reduce duplication, accelerate market access, and improve trust in regulatory compliance. The IEC further emphasized the importance of building technical capacity among regulators, testing laboratories, and conformity assessment bodies to maximize the benefits of international systems and ensure alignment with global best practices.

At the regional level, the Chair of the ASEAN Joint Sector Committee on Electrical and Electronic Equipment (JSC EEE) from Lao PDR, presented the ASEAN Electrical and Electronic Mutual Recognition Arrangement (EE MRA) as a successful model of regional regulatory cooperation. The scheme enables mutual recognition of conformity assessment results and promotes transparency and trust among ASEAN member states. The ASEAN experience also underlined the value of establishing a centralized database of Listed Conformity Assessment Bodies (CABs) to improve traceability and validity of certificates. However, challenges remain in encouraging industries to fully utilize MRAs, as many businesses continue to pursue redundant certifications in export markets.

Best Practices from APEC economies offered valuable insights into diverse domestic practices. People's Republic of China (PRC) shared the implementation of the China Compulsory Certification (CCC) scheme, energy and water efficiency labelling, and RoHS compliance, all designed to strengthen regulatory alignment and consumer protection. Republic of Korea presented its framework for energy efficiency labelling and Minimum Energy Performance Standards (MEPS), emphasizing that effective regulations combined with consumer education can drive innovation and market transformation. Japan highlighted its progressive alignment of product safety standards with international norms, demonstrating how gradual harmonization reduces trade barriers. Malaysia and Singapore showcased their reliance on third-party laboratories and MRAs to enhance efficiency and credibility in conformity assessment, illustrating how technical infrastructure and international cooperation can strengthen regulatory systems.

The workshop's Group Discussions conducted as part of the Day 3 activities, explored risk-based approaches in regulating EHA products. Participants from different APEC economies agreed that high-risk products should be subject to stricter regulatory oversight and third-party certification, while Self Declaration of Conformity may be suitable for low and medium risk categories when supported by effective post-market surveillance. This approach allows economies to balance safety assurance with trade facilitation and administrative efficiency.

Overall, the research findings and discussions confirmed that integrating global mechanisms like the IEC and IECEE CB Scheme with regional frameworks such as the APEC MRA, ASEAN EE MRA provides a clear and practical pathway toward greater regulatory convergence in APEC. By leveraging these complementary systems and learning from domestic experiences, APEC economies can enhance market transparency, build consumer trust, and strengthen cooperation in the EHA sector contributing to the broader APEC goals of reducing technical barriers to trade and promoting inclusive economic growth.

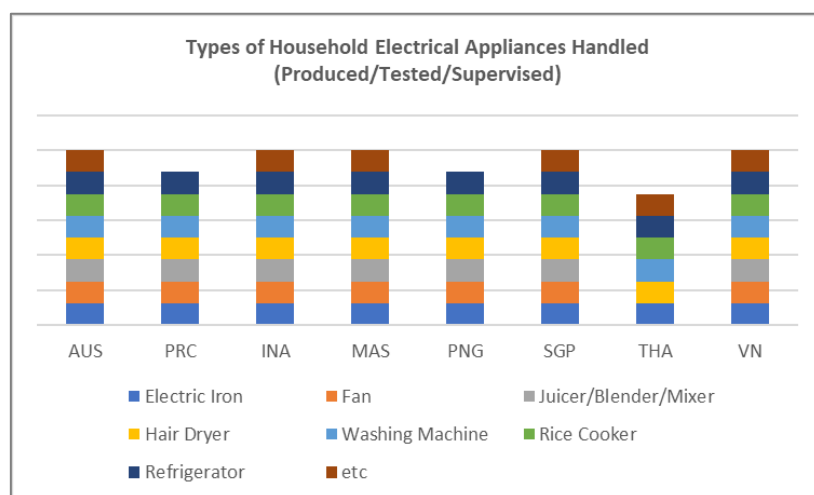
IV. SURVEY AND RESULT ANALYSIS

Research activities were conducted through a survey among APEC economies, using assessment tools that included questionnaires and a background paper. The research components consisted of:

1. Background Paper on Strategies for Harmonizing Standards and Conformity Assessment for Electronic Household Appliances in the APEC Region
2. Questionnaire on the Identification of Standards, Product Risk Levels, and Conformity Assessment Regimes for Electronic Household Appliances in APEC Economies
3. Questionnaire on Strategies for Harmonizing Standards and Conformity Assessment for Electronic Household Appliances in the APEC (Asia-Pacific Economic Cooperation) Region

The assessment tools developed in this project were designed to provide a systematic and comprehensive mechanism for collecting and analyzing information on strategies for harmonizing standards and conformity assessment of electronic household appliances (EHA) across APEC economies. These tools combined structured data gathering with contextual analysis, thereby ensuring comparability across diverse regulatory systems. The primary tool was a survey questionnaire distributed to APEC economies, aimed at mapping existing practices, identifying regulatory gaps, and capturing perspectives on future harmonization. The questionnaire included a detailed tabular framework that required economies to provide information on their domestic standards and corresponding IEC or international references, future IEC standards to be considered, the scope of regulated products, and the classification of products into high, medium, or low risk based on safety, health, or environmental impact. Furthermore, it sought details on the conformity assessment regimes applied ranging from inspection, licensing, and product certification under different types, to listing or registration, Supplier's Declaration of Conformity (SDoC), and essential safety requirements, while also accommodating additional information such as relevant regulatory acts, requirements for conformity assessment bodies, and public access to standards and regulations. To complement the questionnaire, a background paper was developed to consolidate survey responses with desk study and literature review, providing a broader context on regulatory divergence, duplication of testing and certification, and variations in risk classification and adoption of IEC standards across the region. Through these tools, participating economies also provided qualitative feedback, which enriched the analysis by highlighting practical challenges and opportunities. The tools were further strengthened by direct feedback from participating economies including regulators, conformity assessment bodies, and industries, which provided practical insights and reinforced the robustness of the overall assessment framework. Collectively, the assessment tools ensured the systematic capture of both quantitative and qualitative data, enabling a robust evidence base to inform public-private dialogue and to shape strategic recommendations for advancing harmonization in the APEC region.

➤ Type of Household and Export-Import Activities



Picture 1. Types of Household Electrical Appliances Handled (Produced/Tested/Supervised)

The survey findings revealed diverse regulatory practices and trade patterns for electronic household appliances (EHA) across APEC economies. Each economy applies different scopes of regulation to household appliances, reflecting variations in domestic priorities, consumer safety concerns, and market conditions.

In terms of regulated product categories, the scope differs widely. Australia regulates all household appliances that fall under the Electrical Equipment Safety System (EESS), with examples including electric irons, fans, hair dryers, washing machines, rice cookers, and refrigerators. Malaysia requires prior approval for 34 categories of electrical equipment before they can be imported, manufactured, displayed, sold, or advertised, which includes products such as juicers, blenders, and mixers. Singapore classifies EHA products as controlled goods under the Consumer Protection (Safety Requirements) Registration Scheme, with details listed in the official List of Controlled Goods. Indonesia regulates a broad range of appliances, including electric kettles, vacuum cleaners, hair and skin appliances, microwaves, contact grills, air conditioners, water pumps, toasters, water heaters, showcases, induction cookers, choppers, and batteries. Thailand focuses on specific categories such as microwave ovens, electric frying pans, and deep fat fryers. Viet Nam regulates PVC-coated wire with rated voltage up to 450/750 V, storage water heaters, instantaneous water heaters, kettles, and electric grillers or roasters. Chile reported no applicable regulatory body in this sector.

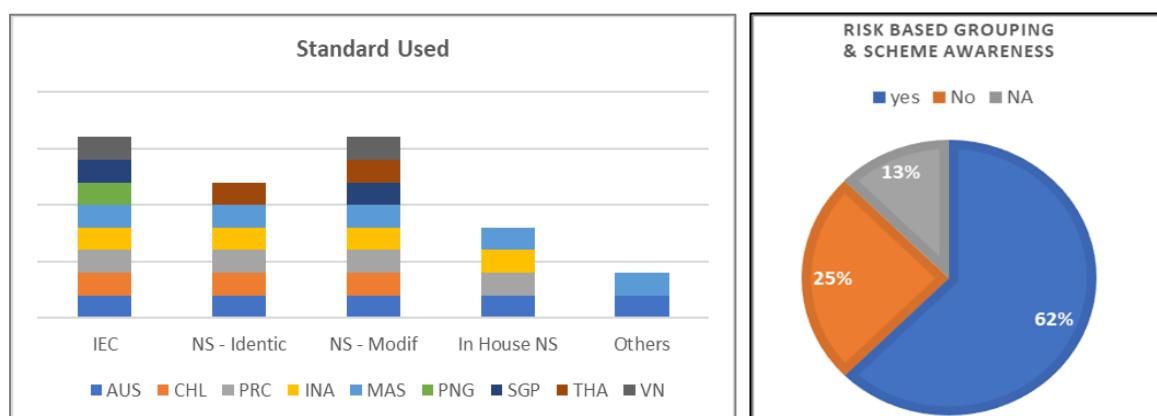
Trade activities further highlight the interconnectedness of EHA markets in the region. On the export side, Australia supplies products primarily to New Zealand and other APEC economies. PRC confirmed significant export activity across a wide range of appliances. Indonesia exports televisions to Malaysia; Thailand; and Viet Nam;

refrigerators to the Philippines; and other products including to Canada; Republic of Korea; and United States, demonstrating its role as both a regional and global supplier. Thailand reported active engagement in both import and export of EHA products within the APEC region.

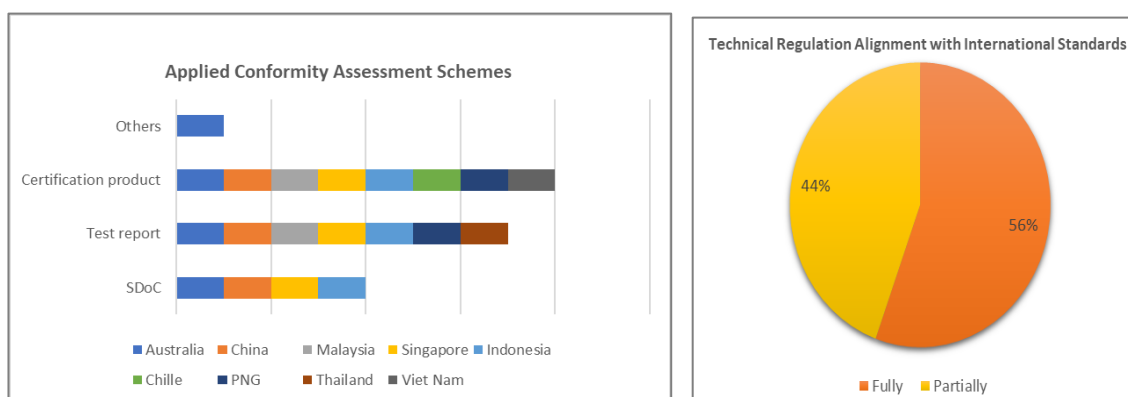
Imports are equally significant. Australia relies heavily on imports from PRC. PRC itself sources hair dryers and dishwashers from Japan, washing machines from Republic of Korea, and ovens and cooking machines from the United States. Malaysia allows imports but only through registered importers holding Certificates of Approval (COA). Singapore, as regulator, does not engage in import or export activities. Indonesia imports a wide array of appliances: washers, refrigerators, chest freezers, rice cookers, blenders, and mixers from PRC and Thailand; air conditioners, washing machines, and ovens from PRC; and water dispensers from both China and Korea. Papua New Guinea (PNG) reported that its domestic market imports nearly all regulated EHA products from Australia; China; Indonesia, and Malaysia.

These patterns illustrate the complex and highly integrated nature of trade in EHA across the APEC region. The coexistence of diverse domestic regulatory requirements with active import and export flows emphasizes both the opportunities and challenges of harmonization. On one hand, there is significant potential to facilitate trade by aligning standards and conformity assessment regimes. On the other, the differences in product scope and risk classification approaches across economies underline the need for a strategic framework to minimize technical barriers while ensuring consumer safety and fair competition.

➤ Technical regulations and standardization policies



Picture 2. Standard Use; and Risk Based Grouping & Scheme Awareness



Picture 3. Applied conformity Assessment Schemes; and Technical Regulation Alignment with International Standards

The survey results highlighted the diversity of technical regulations and standardization policies applied by APEC economies to electronic household appliances (EHA). While many economies refer to international standards, particularly those of the IEC, the degree and method of adoption vary significantly. Australia reported that IEC standards are applied in cases where no domestic standards exist, though full alignment remains challenging due to differing domestic needs. Malaysia continues to use British Standards (BS) for certain categories, while Thailand develops almost all of its Thai Industrial Standards (TIS) based on IEC standards. PRC noted that its household appliance regulations largely adopt IEC standards, albeit with variations reflecting domestic requirements.

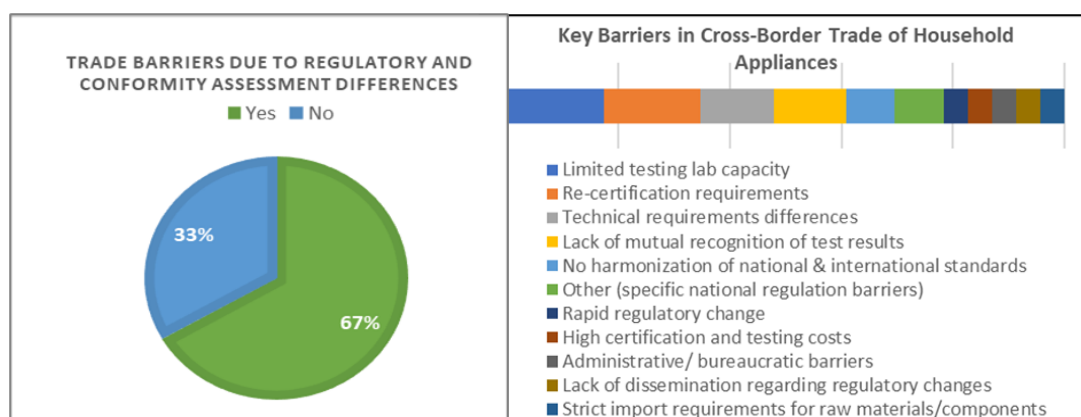
Economies also differ in how they implement risk-based categorization and conformity assessment (CA) schemes. Australia's Electrical Equipment Safety System (EESS) applies risk-based product categorization, while PRC CCC certification is mandatory for 20 categories of household appliances, such as refrigerators and freezers. In Malaysia, Certificates of Approval (COA) are required for low-voltage EHA imports. Singapore, through the Consumer Protection (Safety Requirements) Registration Scheme (CPSO), applies defined risk levels and CA methods, combining Type-testing, certification, and SDoC for lower-risk appliances. Indonesia predominantly applies Type 5 and Type 1a certification schemes for EHA. Papua New Guinea (PNG) reported that its risk-based categorization and CA schemes remain under development in collaboration with the national energy authority.

The survey also examined alignment with international standards. Australia acknowledged difficulties in achieving full alignment due to varying domestic conditions. PRC reported that its EHA standards mainly adopt IEC standards with modifications, while Malaysia confirmed that its technical regulations are largely based on international standards such as IEC, BS, and ISO. This indicates progress toward convergence, although practical differences remain.

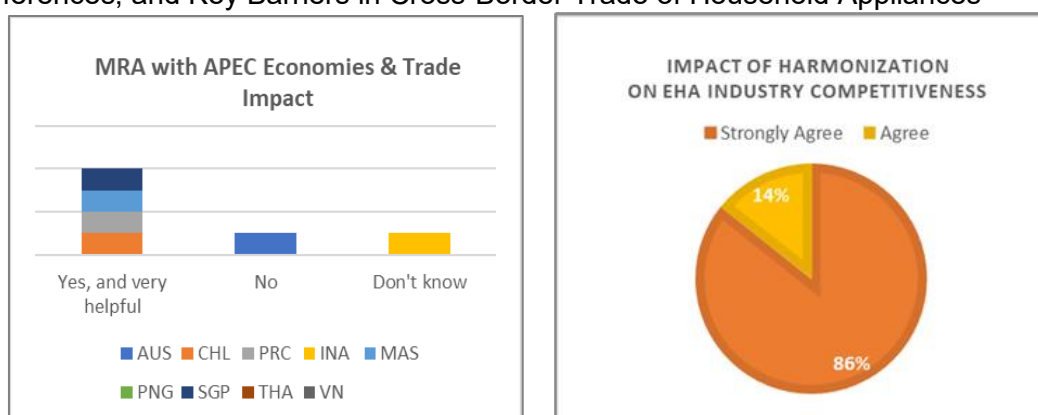
In addition, the role of domestic institutions is critical in ensuring compliance. For example, in Indonesia, the enforcement of technical regulations involves multiple stakeholders: technical ministries periodically review mandatory SNI regulations; the Ministry of Trade issues product registration numbers and monitors compliance; Conformity Assessment Bodies (CABs) issue certificates (SPPT SNI) and provide test reports; and law enforcement agencies take action against non-compliant producers or distributors. These overlapping roles ensure comprehensive oversight but also underline the importance of coordination to avoid inefficiencies.

Finally, respondents reflected on the impact of regulatory changes. Economies acknowledged positive impacts such as improved legal certainty, better product quality, and stronger consumer protection. However, challenges remain, including the persistence of non-compliant products in markets, high certification costs, and limited testing laboratory capacity and technical expertise. These findings illustrate that while significant steps have been taken toward international alignment, differences in regulatory frameworks, institutional roles, and resource capacity continue to present barriers to harmonization in the APEC region.

➤ Acceptance of Technical Regulations



Picture 4. Trade Barriers Due to Regulatory & Conformity Assessment Differences; and Key Barriers in Cross-Border Trade of Household Appliances



Picture 5. MRA with APEC Economies & Trade Impact; and Impact of Harmonization on EHA Industry Competitiveness

The survey results indicate that the acceptance of technical regulations and conformity assessment results across APEC economies remains uneven, with varying degrees of mutual recognition and different barriers impacting cross-border trade in electronic household appliances (EHA). Economies such as Australia; China; Malaysia; Papua New Guinea; Singapore; Thailand; and Viet Nam reported recognizing technical regulations to some extent, while Chile indicated no practice in this area.

A number of key barriers to acceptance were highlighted. These include limited testing laboratory capacity, differences in re-certification requirements, and technical requirement divergences. Lack of mutual recognition of test results and limited harmonization of domestic and international standards were also cited as persistent challenges. Other obstacles include high certification and testing costs, burdensome administrative procedures, rapid regulatory changes, and limited dissemination of updated regulatory information. Furthermore, strict import requirements for raw materials or components add another layer of complexity for manufacturers and exporters.

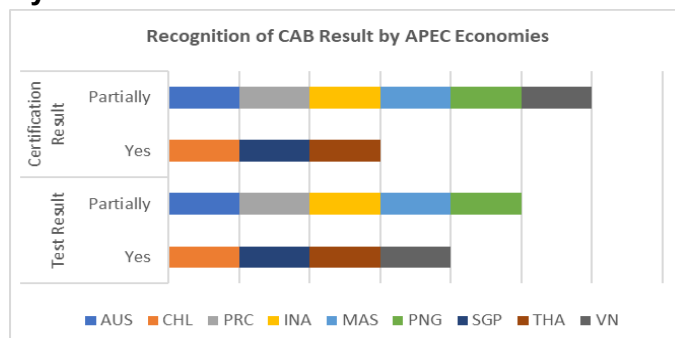
Additional challenges relate to differences in domestic regulatory frameworks. Importers and manufacturers often rely solely on international standards without fully understanding local requirements, leading to compliance gaps. Mandatory requirements such as local domicile, use of domestic personnel, or registration in domestic systems can create administrative barriers to cross-border recognition of conformity assessment bodies (CABs). Moreover, recognition of conformity assessment results is often restricted to specific regional Mutual Recognition Arrangements (MRAs) and may only apply to products originating from within those regions.

Despite these challenges, several economies reported active engagement in MRAs or recognition mechanisms to facilitate acceptance. Australia participates in the APEC EEMRA Part I (Information Interchange). PRC has a bilateral MRA with New Zealand, allowing CCC certificates and dual CCC/NZ marks. Malaysia recognizes IECEE CB Scheme Type Test Reports and accepts test results under ILAC and APLAC MRAs. Singapore accepts test results through ILAC MRA. Indonesia participates in APEC EEMRA and ASEAN MRAs, while also being represented in PASC, APLMF, APMP, and APAC, and is a member of the IHAF MRA for halal accreditation. Chile emphasized authorization and accreditation of CABs, though without explicit participation in APEC MRAs.

The results also demonstrate a strong consensus on the benefits of harmonization, including creating a level playing field for exporters and importers, enhancing safety assurance and product quality, reducing costs, accelerating innovation adoption, and improving consumer and regulator confidence. However, challenges and considerations remain, such as potential pressure on local industries and SMEs, the complexity of monitoring and consumer protection, and the difficulty of aligning diverse domestic regulatory systems.

Overall, the findings highlight that while mechanisms for mutual recognition exist and are being utilized, they remain fragmented and limited in scope. To advance harmonization, APEC economies will need to expand participation in MRAs, strengthen trust in international conformity assessment systems, and ensure that regulatory alignment balances both trade facilitation and consumer protection.

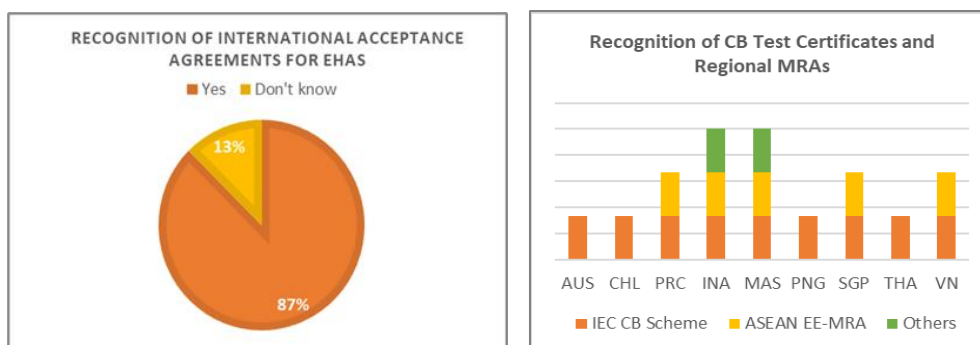
➤ Role of Conformity Assessment Bodies



Picture 6. Recognition of CAB Result by APEC Economies

The survey underscored the central role of Conformity Assessment Bodies (CABs) in ensuring product compliance and supporting cross-border trade in electronic household appliances (EHA). However, recognition of CABs across APEC economies remains highly variable, depending on participation in Mutual Recognition Arrangements (MRAs), domestic regulatory requirements, and domestic accreditation schemes. While all CABs in the region are required to implement international standards such as ISO/IEC 17025 (testing laboratories) and ISO/IEC 17065 (certification bodies), differences in domestic practices limit the extent of mutual recognition.

Several challenges were identified as key barriers to international recognition of CAB results. Economies noted a lack of international cooperation, which reduces opportunities for alignment and mutual trust. Many economies also face limited laboratory capacity, restricting their ability to conduct tests across the wide range of EHA products. Additionally, variations in test methods and standards, along with diverse accreditation rules, hinder comparability and acceptance of conformity assessment outcomes across borders.



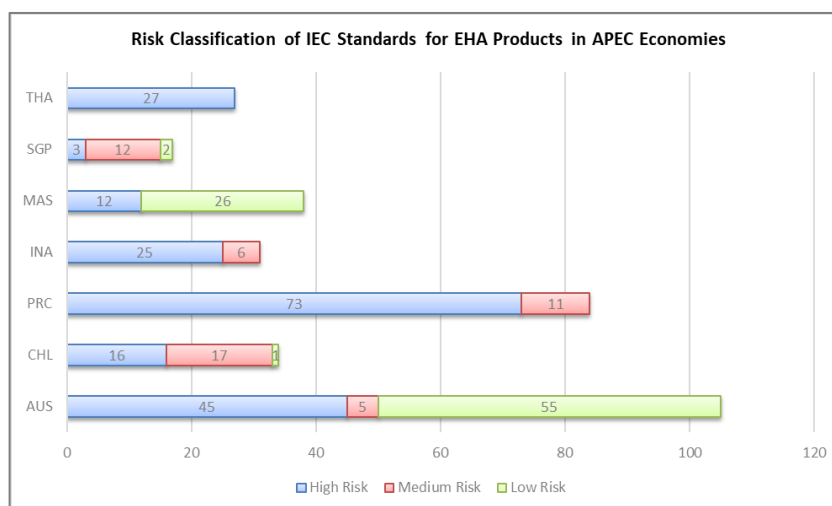
Picture 7. Recognition of International Acceptance Agreements for EHAs; and Recognition of CB Test Certificates and Regional MRAs

Despite these challenges, existing MRAs and multilateral arrangements were acknowledged as effective mechanisms for facilitating harmonization. Recognition frameworks mentioned by economies include the ASEAN MRA on Electrical and Electronic Equipment (JSC EEE), the IEC CB Scheme, and the APEC Electrical and Electronic Mutual Recognition Arrangement (EEMRA). These instruments help streamline compliance by reducing redundant testing and certification requirements. However, the survey also revealed gaps in implementation: some economies remain uncertain about the scope and impact of MRAs, while others expressed willingness to cooperate provided that arrangements remain consistent with domestic regulations.

Specific recognition practices vary by economy. For example, Australia accepts CB reports and certificates as valid evidence of compliance, while Malaysia and other economies recognize ILAC and APAC MRAs to facilitate Certificates of Approval (CoA) processes and provide greater flexibility to industry. Indonesia indicated conditional acceptance, noting that recognition is possible when the issuing CAB is accredited in accordance with relevant international standards.

Overall, the findings highlight that while CABs across the APEC region adhere to international best practices, fragmented recognition mechanisms continue to constrain their effectiveness in supporting harmonization. Strengthening cooperation on MRAs, expanding participation in multilateral recognition frameworks, and aligning domestic accreditation practices are therefore critical strategic steps for advancing regulatory coherence and trade facilitation in the APEC region.

➤ Risk Classification Practices of IEC Standards in APEC Economies



Picture 8. Risk Classification of IEC Standards for EHA Products in APEC Economies

The survey results demonstrated considerable variation among APEC economies in how electronic household appliances (EHA) are classified according to risk when referencing IEC standards. The chart indicates that economies apply different balances of high, medium, and low-risk classifications, which directly influence the conformity assessment schemes required.

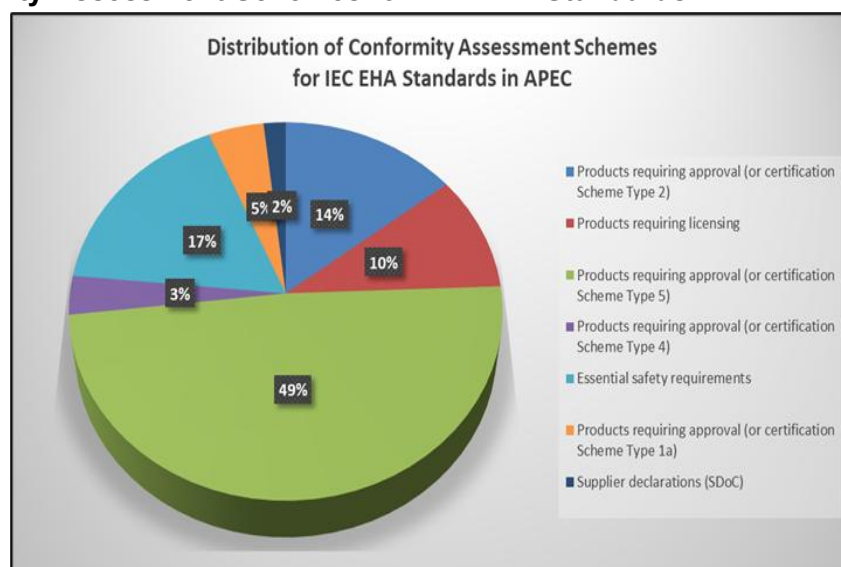
PRC reported the highest number of high-risk classifications, with 73 products considered high risk and 11 medium risks, reflecting a strong emphasis on consumer safety and strict regulatory oversight. By contrast, Australia showed a more balanced approach, with 45 products categorized as high risk but a larger number, 55, designated as low risk, and only five considered medium risk. This suggests a dual approach where critical appliances are heavily regulated while lower-risk products benefit from lighter requirements.

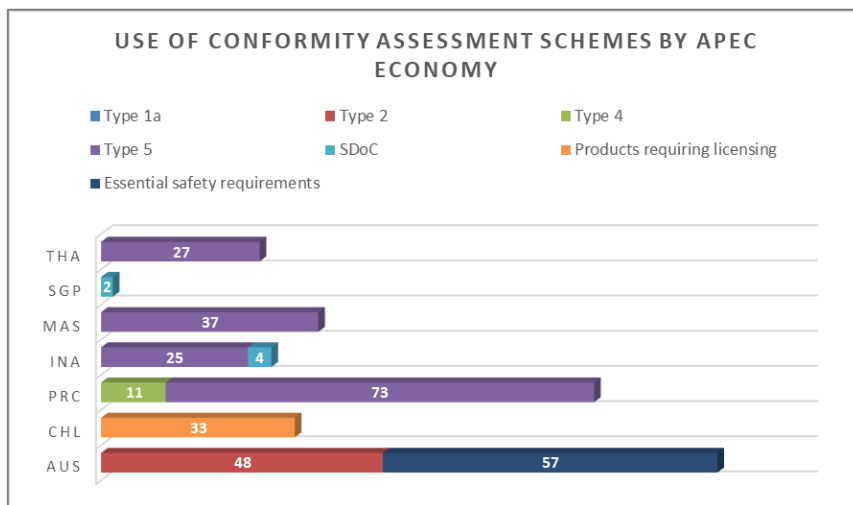
Indonesia and Thailand both emphasized high-risk classifications, with 25 and 27 products respectively in this category. Indonesia also identified six medium-risk products, underscoring the recognition of different levels of regulatory stringency. Singapore, in comparison, classified only three products as high risk, 12 as medium risk, and two as low risk, showing a greater reliance on mid-range regulation.

Malaysia presented a more diverse spread, with 12 high-risk, no medium-risk, and 26 low-risk products, indicating a selective but risk-proportionate regulatory system. Chile reported 16 high-risk and 17 medium-risk classifications, along with one low-risk product, positioning its framework as highly cautious, with limited reliance on low-risk categorization.

These findings highlight the lack of consistency across the region in defining product risk categories, even when referencing IEC standards. While some economies adopt a strict stance, classifying most products as high risk, others demonstrate greater differentiation, allowing broader use of low-risk or medium-risk categories. This inconsistency creates challenges for manufacturers and exporters, as the same product may be subject to very different regulatory requirements depending on the economy. At the same time, the results confirm that IEC standards provide a common foundation for risk-based regulation, which could serve as an entry point for harmonization efforts. Establishing shared principles for classifying products based on risk would significantly reduce technical barriers to trade, enhance predictability for industry, and maintain consumer safety across APEC economies.

➤ Conformity Assessment Schemes for IEC EHA Standards in APEC





Picture 9. Distribution of CA Schemes for IEC Standards; and Use of CA Schemes in APEC Economies

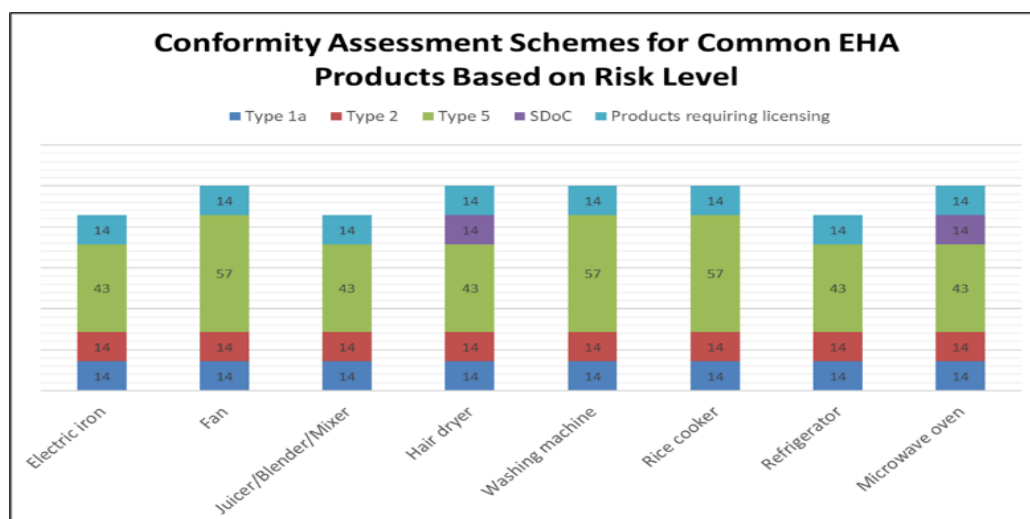
The survey results provide a clear overview of how conformity assessment (CA) schemes are applied to electronic household appliances (EHA) across APEC economies when referencing IEC standards. The regional distribution indicates that product certification under Type 5 schemes is the most widely used approach, accounting for nearly half of the reported cases (49%). This reflects a strong reliance on comprehensive third-party certification as the primary mechanism to ensure product safety and regulatory compliance. Other certification types, including Type 1a, Type 2, and Type 4, are used but represent a much smaller share, highlighting their more limited application. Supplier's Declaration of Conformity (SDoC) and essential safety requirements were identified but remain relatively less common, generally reserved for lower-risk products or specific regulatory contexts.

At the economy level, practices vary significantly. PRC reported the heaviest reliance on Type 5 certification, with 73 cases, underscoring its emphasis on rigorous compliance assurance. Australia similarly applied a large number of Type 5 schemes (57), but also demonstrated a diversified approach by using Type 1a and SDoC for certain products. Indonesia and Malaysia showed reliance on both Type 5 certification and selected alternative schemes, while Singapore leaned toward a mix of Type 1a and SDoC, reflecting greater flexibility. Thailand primarily applied Type 1a certification, and Chile adopted a balanced combination of Type 5 and licensing-based requirements.

These findings reveal that while Type 5 certification is the dominant scheme across the region, economies adopt different mixes of assessment regimes to address their domestic regulatory needs and product risk considerations. This diversity presents challenges for harmonization, as the same product may undergo different conformity assessment procedures in different markets. At the same time, the widespread use of IEC-based schemes, particularly Type 5 certification, provides a strong foundation for

regional alignment. Promoting greater convergence in the application of conformity assessment schemes, while allowing flexibility for low-risk products through SDoC or simplified schemes can significantly reduce technical barriers, enhance mutual recognition, and foster consumer confidence in electronic household appliances across the APEC region.

➤ **Conformity Assessment Schemes for Common EHA Products Based on Risk Level**



Picture 10. CA Schemes for Common EHA Product Based on Risk Level

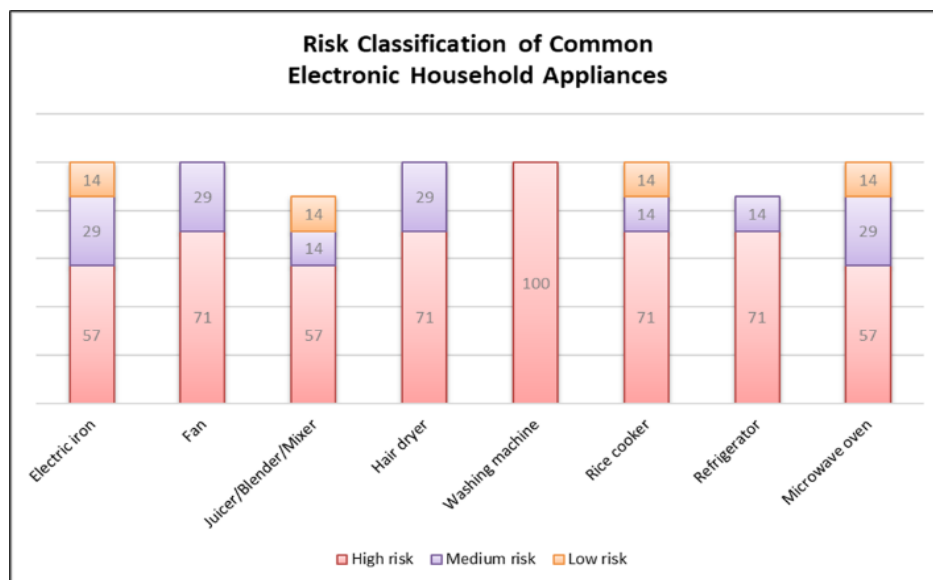
The survey results show how APEC economies apply different conformity assessment (CA) schemes to common electronic household appliances (EHA) according to their risk levels. The chart illustrates that Type 5 certification is the most dominant scheme across almost all products, reflecting its position as the preferred mechanism for ensuring comprehensive third-party assurance and consumer safety. For products such as washing machines, rice cookers, and refrigerators, Type 5 is especially prevalent, underscoring the recognition of these appliances as high-risk items with significant safety implications.

In addition to Type 5, Type 1a certification and SDoC are also applied, particularly to products with lower or moderate risk profiles, such as fans, juicers, blenders, and mixers. These schemes provide greater flexibility and reduce compliance burdens while still maintaining regulatory oversight. Type 2 certification appears less frequently but remains relevant for certain categories, while licensing-based requirements are only applied in a limited number of cases.

The overall pattern indicates that while there is broad agreement on using stringent certification (Type 5) for high-risk appliances, economies retain flexibility by employing a mix of CA schemes for lower-risk products. This diversity demonstrates the balancing act between safeguarding consumer safety and facilitating market access. At the same time, the reliance on different schemes across economies highlights the need for greater harmonization. Establishing common guidance on the application of CA

schemes according to risk level would reduce inconsistencies, support mutual recognition, and create a more predictable regulatory environment for manufacturers and exporters across the APEC region.

➤ Risk Classification of Common Electronic Household Appliances



Picture 11. Risk Classification of Common Electronic Household Appliances

The survey findings illustrate how common electronic household appliances (EHA) are classified by risk level across APEC economies. The results show that the majority of appliances fall into the high-risk category, reflecting strong regulatory emphasis on consumer safety for products that are frequently used in households and have direct electrical or thermal functions.

Products such as washing machines were identified as 100% high risk, indicating a universal consensus among economies that these appliances require the strictest regulatory oversight. Other appliances, including electric irons, juicers/blenders/mixers, hair dryers, rice cookers, refrigerators, and microwave ovens, were also predominantly classified as high risk, with percentages ranging between 57% and 71%. This highlights the recognition of their potential hazards, including fire, shock, or overheating risks, which warrant comprehensive conformity assessment requirements.

At the same time, some appliances were categorized into medium and low-risk groups by certain economies, showing regulatory differentiation. For example, fans and microwave ovens were classified as medium risk by up to 29% of respondents, while a small proportion of appliances such as electric irons, rice cookers, and refrigerators were placed in the low-risk category (14%). This variation demonstrates that while there is broad agreement on the critical safety concerns of these appliances, economies differ in their threshold for assigning risk levels, often depending on local regulatory priorities and infrastructure capacity.

Overall, the classification pattern emphasizes both the convergence and divergence across APEC economies. While there is general agreement on treating most major EHA products as high risk, differences in medium and low-risk assignments indicate opportunities for greater harmonization. Establishing common criteria for risk classification could reduce inconsistencies, align regulatory expectations, and create a more predictable framework for manufacturers and exporters, while maintaining strong consumer protection standards in the region.

➤ **Preferred CA Schemes and Strategic Actions to Advance Harmonization in APEC**



Picture 12. Preferred Conformity Assessment Schemes

The survey identified the preferred conformity assessment (CA) schemes applied across APEC economies, alongside strategic actions proposed to advance harmonization. The findings indicate that product certification is the most preferred approach, providing formal assurance of compliance and widely accepted by regulators. Test reports, particularly those recognized through international arrangements such as ILAC or APAC MRA, are also valued as essential tools for streamlining cross-border acceptance. Production process verification was noted as an important mechanism to ensure consistent quality at the manufacturing stage, while Supplier's Declaration of Conformity (SDoC) was recognized as suitable for low-risk products but with lower assurance compared to third-party certification.

To address the challenges of fragmented practices, economies proposed several strategic actions. First, the need to increase inter-economy collaboration was emphasized, encouraging open dialogue and joint initiatives among regulators, industry stakeholders, and CABs. Second, economies highlighted the importance of adopting international standards (IEC, ISO) as globally recognized benchmarks to reduce technical barriers and ensure comparability. Third, establishing regional harmonization bodies or working groups was recommended to provide dedicated resources, coordination, and sustained engagement across relevant levels. Fourth, respondents stressed the necessity of improving awareness and training for business operators, enabling industries to better understand evolving requirements and comply more effectively. Finally, ensuring the sustainability and continuity of harmonization

efforts was identified as crucial, with adequate funding, staffing, and long-term commitment required to avoid delays or misalignment.

Despite these recommendations, several key challenges remain. Differences in regulations between economies, limited coordination among stakeholders, and constrained resources were consistently highlighted as barriers to harmonization. Addressing these issues will be essential for achieving a coherent and predictable regulatory framework across APEC.

➤ **From Barriers to Solutions: Advancing Mutual Recognition in APEC**

The survey identified several opportunities and strategic actions that can help APEC economies move beyond existing barriers and strengthen mutual recognition in the regulation of electronic household appliances (EHA). A central pillar highlighted is the IECEE CB Scheme, which provides a robust international platform to support the harmonization of standards and practices. By leveraging the CB Scheme, economies can reduce duplication, streamline certification processes, and foster greater trust in cross-border compliance.

Another key opportunity lies in strengthening cooperation under Mutual Recognition Arrangements (MRAs) and Multilateral Recognition Arrangements (MLAs). Enhanced participation and collaboration in these mechanisms will broaden acceptance of test results and certification outcomes, ultimately facilitating smoother trade across the region. Complementing this, the survey emphasized the importance of promoting regulatory harmonization based on international standards, particularly those developed by IEC and ISO, to simplify compliance requirements and increase efficiency.

Equally critical is the need to improve transparency and access to regulatory information. Making regulatory requirements more easily accessible will enable industries to navigate complex systems more effectively, reduce compliance errors, and build confidence in regulatory processes. Finally, the results underscored the importance of closer collaboration among regulators, industry players, and conformity assessment bodies (CABs). Such collaboration is essential for building mutual trust, addressing technical challenges, and ensuring the smooth implementation of conformity assessment systems.

Together, these actions represent a shift from addressing barriers in isolation to building structured and cooperative solutions. By strengthening recognition frameworks, aligning with international standards, and enhancing transparency and collaboration, APEC economies can move closer toward achieving mutual recognition and advancing regulatory coherence in the EHA sector.

V. DISCUSSION AND FINDINGS FROM THE WORKSHOP

The workshop on 24-26 June 2025, attended by 60 participants and from which served as a comprehensive platform for economies to exchange perspectives on regulatory approaches, conformity assessment practices, and cooperation mechanisms related to Electrical Household Appliances (EHA). Drawing from the background study conducted by Indonesia, the discussion reaffirmed that although many APEC economies already apply regulatory measures for safety, energy efficiency, and environmental protection, differences in frameworks and levels of implementation persist. These variations often lead to unnecessary duplication and higher compliance costs for industries, underscoring the need for closer regulatory cooperation and greater alignment of conformity assessment practices.

The role of the IEC was emphasized as essential in providing international standards and conformity assessment schemes that serve as global benchmarks. In particular, the IECEE CB Scheme was presented as an effective mechanism to facilitate mutual recognition of test reports and certificates, thereby reducing duplication, compliance costs, and time-to-market for industries. The IEC also highlighted the importance of capacity building for regulators and laboratories to ensure that economies can maximize the benefits of international systems. This perspective demonstrated how leveraging global mechanisms can both strengthen domestic regulatory frameworks and support broader APEC objectives of reducing technical barriers to trade.

At the regional level, the representative of the ASEAN Joint Sector Committee on Electrical and Electronic Equipment (JSC EEE) shared the ASEAN EE MRA, which provides a pathway for mutual recognition of conformity assessment results among ASEAN member states and directly supports regulatory cooperation and market integration. One key finding was the importance of establishing a centralized certificate database of Listed Conformity Assessment Bodies (CABs) to enhance the validity and traceability of issued certificates. Discussions also noted challenges in encouraging industries to make full use of existing MRAs, with many businesses still choosing redundant certification in export markets. The ASEAN experience demonstrated that the success of MRAs depends not only on government-to-government agreements but also on building trust and awareness among industry stakeholders.

PRC presented its regulatory framework for EHA, which includes the China Compulsory Certification (CCC) scheme, the China Energy Label, the China Water Efficiency Label, and RoHS compliance. PRC also described mechanisms for accepting conformity assessment results for electrical and electronic equipment, while acknowledging challenges in ensuring consistency across diverse product categories. It was noted that future policies will focus on enhancing international alignment and improving mutual recognition, offering valuable lessons for APEC economies on building more resilient and transparent regulatory systems. Republic of Korea shared its experience in implementing energy efficiency labeling and minimum energy performance standards (MEPS), emphasizing that strong regulatory frameworks can drive market transformation and innovation. A key lesson from Republic of Korea experience is that integrating consumer awareness campaigns with regulatory requirements enhances compliance and accelerates the adoption of efficient products. Japan also emphasized the

importance of aligning product safety requirements with international norms and progressively harmonizing with regional frameworks, showing how gradual alignment reduces trade barriers and fosters smoother market access.

Japan; Malaysia; and Singapore further shared experiences in leveraging third-party laboratories and conformity assessment systems to strengthen trust and efficiency in regulatory oversight. Malaysia presented its approach to recognizing conformity assessment results for electrical and electronic appliances, demonstrating how regulators can make use of existing international and regional agreements to streamline certification and enhance market surveillance. Singapore described its journey toward full reliance on third-party laboratories, highlighting the importance of technical infrastructure and the gradual transition from in-house to independent testing to strengthen consumer trust and international credibility. Japan shared its regulatory practices that prioritize alignment with international standards and progressive harmonization with regional frameworks. Collectively, these experiences illustrated how economies at different stages of regulatory maturity can adopt pragmatic approaches to strengthen conformity assessment, ensure safety, and facilitate cross-border trade.

Participants also raised important questions about how regulatory frameworks in economies such as China and Singapore are evolving to address the rapid growth of EHA sold through e-commerce platforms. These exchanges underscored the urgent need for policies that ensure consumer protection while enabling digital trade. In addition, Japan, through discussions under the JSC EEE, was asked to share insights on how its database of certificates issued by listed CABs can enhance validity, traceability, and market surveillance, and how industries can be encouraged to make greater use of MRAs to expand market access.

The Workshop's Group Discussion provided participants with an opportunity to explore risk-based approaches in regulating EHA. Economies exchanged perspectives on classifying products into high-, medium-, and low-risk categories based on safety implications, market size, and consumer exposure. There was a broad consensus that high-risk products should be subject to stricter regulatory control and mandatory third-party certification, supported by regulatory cooperation to ensure safety and consumer trust. For low and medium-risk products, economies explored the potential of adopting Suppliers Declaration of Conformity (SDoC), combined with effective post-market surveillance, as a more efficient mechanism to reduce unnecessary compliance burdens while maintaining adequate levels of consumer protection.

Overall, the workshop demonstrated the value of combining global frameworks such as IEC systems with regional initiatives like the ASEAN EE MRA, complemented by domestic lessons from individual APEC economies. These complementary approaches provide a clear pathway for economies to strengthen regulatory cooperation, adopt risk-based frameworks, and expand the use of mechanisms such as SDoC. By continuing to share experiences and lessons learned, APEC economies can move toward greater harmonization of standards and conformity assessment for EHA, thereby reducing trade barriers and creating a more inclusive, competitive, and consumer-oriented market environment.

VI. OVERALL IMPACT AND LESSON LEARNED

The project had a significant impact on advancing regional cooperation in the area of standards and conformity assessment (STRACAP) for electronic household appliances (EHA) within the APEC region. By providing a structured platform for dialogue between public and private stakeholders, the project successfully highlighted the importance of harmonizing standards, technical regulations, and conformity assessment schemes to reduce unnecessary trade barriers.

The outcomes of the research work and workshop contributed to a deeper understanding of differences in product risk categorization, the application of IEC standards, and existing conformity assessment practices among APEC economies. This enabled participants to identify both challenges and opportunities for mutual recognition arrangements (MRAs) and regulatory alignment.

Through its activities, the project enhanced technical knowledge and policy capacity across participating economies, particularly developing members. It also promoted inclusivity, as gender balance targets were achieved and a broad spectrum of stakeholders including regulators, industry associations, conformity assessment bodies, and international organizations actively contributed.

The strategic recommendations produced will serve as a reference point for APEC economies in aligning their domestic regulations with international practices, thereby facilitating trade, improving consumer safety, and strengthening regional supply chains.

The project highlighted several important lessons for future initiatives. First, early-stage research through desk studies, surveys, and focus group discussions proved essential in identifying regulatory gaps and ensuring that workshop discussions were well-informed and targeted. Second, engaging a broad range of stakeholders such as government regulators, industry associations, conformity assessment bodies, and international organizations, greatly enriched the dialogue and ensured that the strategies developed were both practical and inclusive. Third, flexibility in planning was critical, as adjustments to schedules and interpretation services helped maintain strong participation despite logistical challenges. Fourth, while developing economies actively participated, the experience showed that providing additional preparatory support and simplified technical materials would enable them to engage more effectively in highly technical discussions. Finally, achieving gender balance in both participation and expert representation demonstrated the value of inclusive approaches, which not only support APEC's priorities but also strengthen the quality of outcomes.

VII. CONCLUSION AND RECOMMENDATIONS

The Project SCSC 202 2024T Public-Private Dialogue on Harmonizing Standards and Conformity Assessment for Electronic Household Appliances in the APEC Region successfully convened regulators, industry representatives, conformity assessment bodies, and international organizations to address the ongoing challenges and opportunities in aligning standards and conformity assessment procedures for electronic household appliances (EHA).

Over three days, the program featured presentations from APEC and international organization, panel discussions, technical sharing, and the Workshop's group discussion to assess potential risks and identify suitable conformity assessment regimes for various EHA products. These sessions not only deepened participants' understanding of international best practices and regional frameworks but also provided a platform for sharing domestic experiences and fostering practical cooperation.

Discussions revealed that while several economies have adopted or are in the process of aligning with IEC standards for EHA, differences remain in regulatory approaches, testing requirements, and mutual recognition arrangements. Participants emphasized the need to strengthen technical capacity, enhance transparency, and expand cooperation mechanisms to facilitate trade, reduce technical barriers, and ensure consumer safety.

The exercise allowed participants to collectively evaluate product categories against potential hazards and determine the most appropriate conformity assessment regimes, bridging perspectives from both regulatory and industry viewpoints. The results offer a practical reference for policymakers and stakeholders when formulating or updating regulatory frameworks.

This project has reinforced the importance of harmonization as a tool for improving market access and consumer protection while supporting innovation and sustainable development in the EHA sector. By building on the momentum created through this dialogue, APEC economies are well-positioned to advance alignment with international standards, deepen cooperation, and strengthen the quality infrastructure that underpins safe, reliable, and energy-efficient products in the region.

Recommendations for APEC Economies

From the workshop discussions and its outcomes, and shared experiences, the following recommendations are proposed to support the harmonization of standards and conformity assessment for electronic household appliances:

1) Strengthen Regional Cooperation and Information Exchange

Enhance collaboration among APEC economies through regular technical dialogues, information-sharing platforms, and joint activities that promote alignment with IEC standards and facilitate the recognition of conformity assessment results.

2) Promote the Use of International Standards

Encourage wider adoption of IEC standards as the basis for domestic regulations, ensuring that product requirements are consistent with global best practices and facilitate cross-border trade.

3) Develop and Implement Mutual Recognition Arrangements (MRAs)

Expand the scope and participation in bilateral or multilateral MRAs to reduce duplication of testing and certification, lower compliance costs, and accelerate market entry for compliant products.

4) Enhance Technical Capacity and Infrastructure

Invest in upgrading testing laboratories, metrology facilities, and technical skills to support the full implementation of harmonized standards and ensure reliable conformity assessment.

5) Integrate Risk-Based Approaches in Regulation

Utilize risk assessment frameworks, such as those applied during the Workshop's discussion, to determine appropriate conformity assessment regimes, focusing regulatory controls on higher-risk products while allowing more flexible approaches for low-risk categories.

6) Engage Industry and Consumers in Policy Development

Foster multi-stakeholder engagement by involving manufacturers, importers, retailers, and consumer groups in the formulation and review of technical regulations, ensuring that perspectives from the market are considered alongside safety and quality objectives.

7) Encourage Continuous Learning and Knowledge Sharing

Organize follow-up training sessions, case study exchanges, and capacity-building programs to maintain momentum, share lessons learned, and adapt to evolving technologies and market needs in the EHA sector.

By implementing these recommendations, APEC economies can move toward a more harmonized, transparent, and efficient regulatory environment for electronic household appliances enhancing consumer trust, improving market efficiency, and supporting sustainable economic growth across the region.

ANNEX

Annex 1. Background Paper on Strategies for harmonizing standards and conformity assessment on Electronic Household Appliances in The APEC region

Annex 2. List of Identification Standards for Electronic Household Appliances, Level of Risk Products and Conformity Assessment Regime in APEC Economies

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