



U.S.-ASEAN Smart Cities Partnership

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SEMI-ANNUAL NEWSLETTER

U.S.-ASEAN Water Smart Engagements

U.S. Water Partnership,
Global Ties U.S.,
Water Environment Federation,



Branch Manager of the Phuket Provincial Water Authority (PWA), Sukrid Klinson, and key staff brief Water Council President and CEO, Dean Amhaus from Milwaukee, and Stacy Vogel Davis, Communications Director for Water Council, on PWA's response to the severe drought conditions in Phuket Province. Also pictured are the Water Environment Federation International Programs Director Laila Shukariyyah and U.S. Water Partnership Executive Director Chris Rich. *Phuket, Thailand (June 2024)*

As the [Water Smart Engagements](#)₄ (WiSE) program entered the final six months of funding under the U.S.-ASEAN Smart Cities Partnership, the program solidified relationships between the five pairs of U.S. and ASEAN water and wastewater utility partners to endure beyond the program period. The WiSE water utility partnerships between U.S. and ASEAN cities promoted water security through sustainable water management solutions, knowledge sharing and capacity building, and access to industry practices, science, and technology. The WiSE partnerships include:

- [San Francisco Public Utilities Commission](#)₅ and [Saigon Water Corporation](#)₆ of Ho Chi Minh City, Vietnam
- The [Water Council of Milwaukee](#)₇ and the [Provincial Waterworks Authority](#)₈ of Phuket, Thailand
- [DC Water](#)₉ and [Permodalan Darul Ta'zi](#)₁₀ of Johor Bahru, Malaysia
- [Clean Water Services](#)₁₁ of Hillsboro,

Oregon and [Vientiane City Office for Management and Services](#)₁₂ of Vientiane, Laos

- [Miami-Dade Water and Sewer Department](#)₁₃ and [Metro Cebu Water District](#)₁₄ of Cebu, Philippines

The beginning of 2024 was devoted to consultations with WiSE utility partners for the planning of the final round of

in-person site visits by U.S. delegates to their ASEAN counterparts in June 2024. Priority issues included water quality testing technology, nature-based solutions in urban settings, non-revenue water mitigation, infrastructure planning, and drought resilience, as well as strategic communications with local stakeholders, regional training, and capacity building resources.

WiSE Pilot Project in Vientiane, Lao PDR



Biohabitats Senior Engineer, Pete Muñoz, with the Clean Water Services team from Hillsboro, Oregon, gathers water samples at the proposed site for a pilot nature-based wetland wastewater treatment facility with partner Vientiane City Office for Management and Service (VCOMS). *Vientiane, Lao PDR (February 2024)*

program prioritizes building capacity in Vientiane for low-cost, low-maintenance wastewater treatment solutions using natural processes to mitigate surface water pollution and soil contamination in the face of increasing urbanization.

While in Vientiane, USASCP and the WiSE delegation made a site visit to the Hungarian-built wastewater treatment plant. They learned Vientiane's city infrastructure is limited, as few buildings have piped wastewater services. The Hungarian wastewater treatment plant began construction last year to increase Vientiane's treatment capabilities, but additional treatment services are still needed to meet the city's overall demand. The proposed USASCP pilot project would complement ongoing water treatment efforts.

In February 2024, USASCP and WiSE partners visited the proposed site for a nature-based wastewater treatment pilot project in Vientiane, Lao PDR. The proposed trickling filter system will be built at the site of a lake in the city center in Sikhottabong Park. The Vientiane City Office for Management and Service (VCOMS) was joined by the USASCP Program Manager, WiSE Program Manager, two representatives from Clean Water Services, and a technical expert from [Biohabitats](#)₁₅, a U.S. ecological engineering firm whose projects work to restore and conserve natural habitats. This project seeks to improve local water quality and address public health concerns. The WiSE



The scoping team comprised of USASCP, WiSE, and Biohabitats members, tour the Hungarian wastewater treatment plant to learn about the city's water treatment capabilities. *Vientiane, Lao PDR (February 2024)*

2 WiSE also set the stage with the [Public Utilities Board](#)¹⁶ (PUB) in Singapore for final participation in [Singapore International Water Week](#) (SIWW)¹⁷, the Southeast Asian anchor for the WiSE program. WiSE delegates convened at SIWW for four days of productive interactions, focused on continued sharing of best practices and networking, including a CEO-centered



WiSE partners, San Francisco Public Utility Commission (SFPUC) and Saigon Water Corporation (SAWACO), pose for a photo during a break in their meetings in Ho Chi Minh City. SFPUC General Manager Dennis Herrera is flanked by SAWACO's Deputy Directors General Thanh Su Nguyen, right, and Van Dang Nguyen, to the left. Ho Chi Minh City, Vietnam (June 2024)

roundtable with other international utilities, building upon discussions from SIWW 2023. Other activities included wide-ranging sessions on innovation, urban water challenges, and circular water economy, where several of our partners gave presentations and guided field visits to Singapore's state-of-the-art advanced tech water treatment plants and assets. Most importantly, delegates strengthened the regional ties between the five ASEAN utilities, further cementing their connections as peer-to-peer mentors.

Research & Innovation

National Science Foundation

[Pennsylvania State University](#)¹⁸

[Prarie View A&M University](#)¹⁹

[University of Dayton](#)²⁰

[University of Virginia](#)²¹

[University of Washington](#)²²

The [National Science Foundation's](#)²³ (NSF) [Smart and Connected Communities](#)²⁴ effort aims to advance our understanding of our cities, as well as improve their efficiency and quality of life through innovations in computing, engineering, and the physical and social sciences. The USASCP cooperation with NSF has established partnerships

between U.S. and ASEAN universities to promote research and innovation to address the region's urbanization challenges. To accomplish this goal, NSF held the [2024 Smart and Connected Communities Principal Investigators' Meeting](#)²⁵ (S&CC PI Meeting '24) at Vanderbilt University February 28-29, 2024. The meeting included U.S. University program partners under the US-ASCP-NSF program such as Virginia Tech, Prairie View A&M University, and the University of Dayton, in addition to the program implementer for the US-ASCP Green Buildings Innovation Program, the University of North Carolina-Charlotte. USASCP met with the program partners to explore continuing research interests and future programming. USASCP briefed the audience of NSF Japanese research partners on its USASCP portfolio and underscored the [U.S.-Japan Circularity Initiative](#) with the Japan Ministry of Environment focused on e-waste.



A team of NSF researchers traveled to Makassar to support the installation of solar panels in three of the garden alleys to power aquaponics and fish farms. Makassar, Indonesia (May 2024)

NSF's [Smart Garden Alleys Project](#)²⁶, led by Penn State University and [Gadjah Mada University](#)²⁷ in Indonesia, advances efforts to create carbon neutral communities in Makassar City, the capital of the South Sulawesi province in Indonesia. With a population over 1.5 million, the NSF project contributes to Makassar City's transformation into an economic hub, promoting sustainable living and environmental conservation. The NSF project is collecting micro-climatic data with sensors in the city alleyways to support urban planning and work toward carbon neutral goals through several initiatives, including sustainable tourism alleys, community gardens, waste management programs, educational workshops, and establishing urban forests in vacant lots across the city. A supplement to the current project includes the installation of solar panels in three of the garden alleys

in place of a diesel generator to power aquaponics and fish farm facilities and spur economic development among low-income communities.

Integrated Urban Services

National Renewable Energy Laboratory²⁸ Regenerative Impact Ventures²⁹

The [Integrated Urban Solutions](#)³⁰ (IUS) program aims to help ASEAN cities build resilience in their energy, water, and food provisioning systems. The program is premised upon increasing understanding of the value of systems' integration across critical city services to improve resource efficiencies and promote sustainable practices. This strongly focused capacity building program worked with multi-disciplinary city authorities and local stakeholders to raise awareness and share knowledge of integrated urban planning, vertical governance structures, and novel and affordable technologies to address food security in two distinct pilot projects in ASEAN. The program provided technical assistance to the Iskandar region in Johor Bahru, Malaysia, and Cagayan de Oro, Philippines, to implement integrated food, energy, and water system pilot projects with the aim to encourage private sector investment and broader national and international support to advance projects to the next phase of their respective trajectories.



The IUS Consultative Workshop at IRDA headquarters introduced agri-tech project investment opportunities to a wider audience comprised of both public and private sector participants. Iskandar, Malaysia (February 2024)

During the first quarter of FY24, the IUS team focused on the development and promotion of business plans for both pilot cities: [Iskandar Regional Development Authority](#)³¹ (IRDA) in Johor Bahru and Cagayan de Oro. The IRDA Steering Committee, comprising repre-

sentatives from government, academic, and private sector organizations, completed and reviewed IRDA’s business plan draft. Key stakeholders included the Ministry of Finance, Ministry of Economy, Ministry of Agriculture and Food Security, and the Sustainable Energy Development Authority (SEDA). The IUS team finalized IRDA’s business plan and traveled to Johor and Kuala Lumpur to present it to the Steering Committee, receiving strong support for the Agri-Tech Park Model.

The IUS team also began drafting Cagayan de Oro’s business plan and presented it to local and regional stakeholders in February. A final site visit to Cagayan de Oro by the Regenerative Impact Ventures technical team was undertaken in June 2024, to refine the business plan, solidify the vision for the next project phase, and meet with potential funders and stakeholders, including USAID and U.S. Embassy Manila.



IUS participates in the Smart City Seminar on Tri-lateral Collaboration in Putrajaya, which convened stakeholders from Japan, Malaysia and the U.S. Kuala Lumpur, Malaysia (March 2024)

The team worked on developing a program impact report and video to highlight the outcomes of the IUS pilot projects and promote future investment. Stay tuned to view the [final projects](#)³² on our website!

Circular Entrepreneurship

Rochester Institute of Technology

The [Circular Entrepreneurship program](#)³³ works with its ASEAN partners to advance circular economy principles through two programmatic components: circular entrepreneurship education and a material flow analysis study. During the first half of 2024, the team at [Rochester Institute of Technology](#)³⁴ (RIT) focused on rolling out the Train-the-Trainer pillar of their circular entrepreneurship education. The



RIT Partner Map as of May 2024.

Train-the-Trainer workshop equips the next generation of business leaders with the knowledge and skills to promote sustainable practices within their future ventures. Train-the-Trainer has hosted a total of four cohorts, and as of June 2024, it will have trained more than 150 trainers from partner universities and incubators across the ASEAN Region. This program continues to expand as RIT prepares to welcome nearly 40 more young professionals in their fifth cohort. As of May 2024, Train-the-Trainer works with 50 partners, and continuously explores further opportunities to collaborate with new partners.

The material flow analysis study identifies intervention opportunities to improve the circular economy of Southeast Asia and better inform entrepreneurs under the Train-the-Trainer program. Researchers have been conducting interviews in Indonesia, Malaysia, and the Philippines to investigate both the external barriers and enablers for circular economy entrepreneurs interested in entering the e-waste sector within ASEAN. These interviews seek a comprehensive understanding of the challenges and opportunities entrepreneurs face in this sector by exploring the regulatory, economic, and social factors impacting the e-waste sector. Ultimately, the findings hope to inform policy recommendations and strategic initiatives that support the growth and development

of a sustainable e-waste management ecosystem in the ASEAN region. RIT is in the process of expanding interviews and data collection to Thailand and Cambodia.

Energy Modeling

Pacific Northwest National Laboratory

Thammasat University³⁵ University of Technology Malaysia³⁶



Loon Wei Chau of University Teknologi Malaysia hosts a session at the 2023 UNFCCC Asia Pacific Climate Week. The session featured overviews of PNNL, UTM, and TU’s energy modeling work as well as presentations from Thai and Malaysian stakeholders. (Johor Bahru, Malaysia, November 2023)

[Pacific Northwest National Laboratory](#)³⁷ (PNNL) published two open-access articles in *Frontiers in Energy Research* under the research topic, “Stakeholder-Engaged Integrated Assessment Modeling for Global Scenarios in a Changing World.” These articles are a culmination of PNNL’s collaboration with Thammasat University (TU) and Universiti Teknologi Malaysia (UTM)

4 on modeling the role of cities in decarbonization for [Malaysia](#)³⁸ and [Thailand](#)³⁹. The articles describe the impact of cities' contributions on a country's climate targets and national determined contributions, particularly in the building and transportation sectors. Bangkok and Kuala Lumpur authorities, as well as other city and national level stakeholders, were involved throughout the research process and highlight key insights from the analyses.

PNNL, in collaboration with TU and UTM, presented results from the modeling analysis to an international audience at a hybrid session of the United Nations Framework Convention on Climate Change (UNFCCC) at Asia-Pacific Climate Week in Johor Bahru, Malaysia, in November 2023. About 40 UTM colleagues attended the session in-person while 15 PNNL and TU colleagues attended virtually. Aine Shiozaki of the U.S. Department of State's Bureau of Energy Resources delivered an introductory speech followed by presentations from PNNL, UTM, TU, and Thai and Malaysian stakeholders.



The audience at the 2023 UNFCCC Asia Pacific Climate Week session comprised of approximately 40 in-person attendees and 15 online attendees. Johor Bahru, Malaysia, (November 2023)

In Thailand, researchers highlighted the role iterative stakeholder engagement plays in producing integrated analysis on the country's goal of reaching net neutrality by 2050. Through decision-maker engagement, the researchers created and analyzed carbon neutral scenarios for Thailand with an emphasis on Bangkok's contributions. These insights are intended to inform Thailand's continued decarbonization plans by prompting officials to update national power development, enforce building energy codes, and generate future climate action plans.

Likewise, researchers found Malaysia

can reduce its carbon intensity and reach carbon neutrality by 2050, with the city of Kuala Lumpur playing a significant role. Major drivers to mitigate emissions include the decarbonization of the power sector paired with extensive electrification, energy efficiency improvements in various types of infrastructure, and the use of advanced technologies such as carbon capture and removal strategies.

Green Buildings Innovation Program

University of North Carolina at Charlotte

The [University of North Carolina Charlotte](#)⁴⁰ (UNCC) developed nine course modules on green building design with topics covering sustainable materials, circularity, resilience, renewable energy integration, dynamic facades, and building performance simulation. In total, UNCC has developed [15 course modules](#)⁴¹ upon the request of our ASEAN partners. Based on the developed materials, UNCC delivered five online lectures to our ASEAN partners in this reporting period and a total of 10 online lectures and two in-person lectures. These lectures have trained 687 students, of which 56% are female students. UNCC and the ASEAN partners are working on three joint research projects: passive building design for naturally ventilated low-income housing in Indonesia, hempcrete performance tests, and green wall design and construction. USASCP funded the three research projects conducted by UNCC's local partners. Learn more about the work of two of these projects:

Hempcrete Project: [Chulalongkorn University](#)⁴² will perform an experimental study to support the development and applications of Thailand-sourced hempcrete. This project aims to achieve three objectives: 1) explore the use of different binder materials (e.g., Thailand-sourced clay and lime) for hempcrete, 2) analyze the performance (e.g., thermal conductivity and compressive strength) of hempcrete created from Thai-sourced hemp hurds and various binding materials, and 3) disseminate knowledge about hempcrete capabilities to various stakeholders, including students, hemp farmers, and processors. The test results obtained from this research will be used in building a test

house in Thailand for long-term data collections.

Green Walls Project: [Gadjah Mada University](#)⁴³ (GMU) will study the impact of vegetated vertical walls (i.e., green walls) on building performance and the micro-climate. This project supports the design and construction of green walls in Indonesia through two major objectives. First, GMU will build a green wall on one of their institutional buildings and investigate its thermal performance based on field measurements. Second, GMU will investigate the potential of wide application of green walls to improve the microclimate in large cities based on modeling and simulation. The research findings will be incorporated into coursework and professional training materials to educate the next generation of architects, landscape designers, and urban planners regarding green wall applications.

U.S.-ASEAN Smart Mobility Program

U.S. Department of Transportation



Representatives from the 2024 Technology Workshop in Phuket. Phuket, Thailand (March 2024)

The USASCP [Smart Mobility Program](#)⁴⁴ has established four U.S.-ASEAN city partnerships to promote knowledge sharing and develop targeted, tactical toolkits to address mobility related challenges in the ASEAN cities. The program seeks to promote a dual-learning approach, where all cities understand the value and impact of sustainable transportation through integrated policy and planning to guide the application of technology and systems. The four city pairings of

- Jakarta, Indonesia – Los Angeles CA
 - Johor Bahru, Malaysia – Portland, OR
 - Phuket, Thailand – Las Vegas, NV
 - Phnom Penh, Cambodia – Boston, MA
- are deepening the relationship-building between U.S. and ASEAN cities and



The 2024 Technology Workshop fostered robust discussions. Phuket, Thailand (March 2024)

promoting stronger understandings of transit and different mobility environments as a result of technical site visits and in-person workshops and development of workplans. The [U.S. Department of Transportation](#)⁴⁵ (DOT) has also established a cooperative agreement with [METTRANS](#)⁴⁶, a transportation consortium within the University

of Southern California (USC). METTRANS' research will support the city pairings by gathering key data, managing survey and design work, and informing policy and planning on the priority workplan issues.

In December 2023, U.S. DOT representatives traveled to Phnom Penh to advance the city's pairing work with Boston. A representative from the City of Boston accompanied the DOT team, where they met with the Vice Governor of Phnom Penh, the City Bus Authority, Office of Urban Planning, the Department of Public Works, the Traffic Control Center, and the Traffic Policy Office.

The program held its in-person workshops in Jakarta (December 2022), Los Angeles (July 2023), and Phuket (March

2024), with a fourth workshop scheduled for September 2024 in Boston. In-person engagement between city pairs has led to enhanced productivity and the ability to leverage the input of wider audiences in each urban setting.



Site visit from the 2024 Technology Workshop Phuket, Thailand (March 2024)

Second Symposium on Accelerating Science, Technology, and Circular Innovation in Southeast Asia

The U.S.-ASEAN Smart Cities Partnership (USASCP) hosted the second annual [Symposium on Accelerating Science, Technology, and Circular Innovation](#)⁴⁷ in Southeast Asia in cooperation with Arizona State University, Rochester Institute of Technology, the National University of Laos, and other partners July 17-19, 2024, in Vientiane, Lao PDR. The Symposium was structured in three mutually reinforcing tracks: smart city innovation, biotechnology, and circularity. By harnessing the synergies and networks of three State Department initiatives, the Symposium highlighted the mutually reinforcing programming by socializing knowledge, program experiences, pilot city studies, lessons learned, new ideas, and best practices. The Symposium engaged participants from public, private, and academic sectors, and provided a platform for participants to socialize new ideas and innovation among professional networks. It explored cross-sector economic opportunities in science, technology, circular entrepreneurship and innovation, and sustainability practices through capacity building, training, workshops, grant competitions, and demonstrations of pilot projects.



Heather Variava, U.S. Ambassador to Lao PDR provides opening remarks at the Symposium. Vientiane, Lao PDR (July 2024)

Smart Cities Business Innovation Fund: Launch of \$3 Million Request for Proposals for Business Innovation Fund 2.0

In the coming months, USASCP will build upon its 2022 Smart Cities Business Innovation Fund through a new funding partnership with Enterprise Singapore to further advance carbon neutral urban innovation. Pending the availability of funding, the U.S.-ASEAN Smart Cities Partnership (USASCP) will launch a [\\$3,000,000 call for proposals](#)⁴⁸ for small and medium ASEAN entities pioneering innovative, carbon neutral solutions to urban challenges under the Smart Cities Business Innovation Fund 2.0 (BIF 2.0). The 2022 call for proposals offered a total of \$1,000,000 worth of awards, with six winning proposals selected from Cambodia, Lao PDR, Indonesia, Malaysia, the Philippines, and Vietnam. BIF 2.0 aims to facilitate private sector partnerships and deeper cross-border collaborations between enterprises from Singapore and ASEAN cities focused on science, technology, and innovation. It also reinforces the U.S.-Singapore Strategic Partnership by collaborating with Enterprise Singapore's Co-Innovation Program (CIP). The call will promote ASEAN-Singapore business partnerships developing new sustainable products and/or solutions with strong market potential. The CIP will support Singapore-based companies' collaboration with ASEAN entities through joint activities to bring projects to market. ASEAN entities can use Enterprise Singapore's platforms to identify Singaporean partners.

Smart Cities Business Innovation Fund: Awardee Updates

KLOUDTECH Bataan, Philippines



The Kloudtech team was selected from 3,000 applications worldwide to exhibit their project at Prototypes for Humanity in Dubai, in conjunction with COP28. Dubai, United Arab Emirates (December 2023)

From October 2023 to March 2024, [Kloudtech](#)₄₉ made significant progress in product development, partnerships, and community engagement to develop smarter and more livable cities. The company focused on research and development to provide [reliable, community-centered technology](#)₅₀, earning international recognition. Notably, the team presented three research articles at the Seventh International Conference on Low Carbon Asia in October 2023, that were subsequently published in the journal Chemical Engineering Transactions. These articles showcased advancements in weather and hydrologic monitoring systems, coastal flood monitoring devices, and ultrasonic wind anemometers.



In February Kloudtech participated and won the pitching competition of Founders Live in advancing to the Prime-Time Global event of Founders Live in November 2024. Manila, Philippines (February 2024)

The Kloudtech team was selected from 3,000 global submissions to exhibit their technology at the Prototypes of Humanities in Dubai during COP28. In addition to international exposure,

Kloudtech strengthened local collaborations, signing a memorandum of agreement with the government of Balanga City for the deployment of weather stations. The team's active participation in regional and local events, such as the National Innovation Agenda and Strategy Document (NIASD) kickoff and the Spark Kagitingan Bootcamp, boosted the startup's popularity and expanded its community of supporters.

In January 2024, Kloudtech represented the startup ecosystem in Bataan at a pitch event hosted by the Bataan Public-Private Partnership and Investment Center, presenting to Block Dojo, a London-based incubator specializing in blockchain technology and Web3. The team also won the Founders Live Manila pitching competition, advancing to the Prime-Time Global event of Founders Live in November 2024. These achievements reflect Kloudtech's growing influence and recognition within the startup community.



From October 2023 to March 2024, the team deployed a hyper-localized weather monitoring station and a coastal flood monitoring station in their partner community and continues to improve the technology. Bataan, Philippines

Kloudtech's growth has been marked by the addition of new team members, bringing fresh perspectives and expertise to further drive the company's mission. With ongoing research and development, strategic partnerships, and a growing network of supporters, Kloudtech is well-positioned to lead the transformation towards smarter, more sustainable urban environments.

PATIHOUB Luang Prabang, Lao PDR

Pa-ti means “reform” or “revolution”, and Houb means “design” or “image” in the Lao language, emblematic of the company's mission to redesign plastic waste into valuable products and revolutionizing the plastics value-chain.



A waste management training was provided to the monks at a local temple. Luang Prabang, Lao PDR (March 2024)

[PatiHoub](#)₅₁ has transformed over 20,000 kg of low-value plastic waste, diverting it from landfills, and turning it to versatile construction boards and other household products. Their product line features furniture, construction materials, household and business items, and more. The signature boards are currently distributed at three major construction shops in Luang Prabang.



Sample products made from Patihoub boards

PatiHoub continues to chart out avenues for future growth. The company has provided waste management training to over 50 business and community partners from whom they regularly collect recyclables. PatiHoub also established five community recycling collection points at several schools and temples in the area. Looking ahead, Pa-

tiHoub will focus on strengthening its relationships with the hospitality sector and augmenting partnerships with local organizations to raise awareness and advocacy in the region.



PatiHoub supported an initiative of Precious Plastic Vientiane which collected plastic waste and turned them into 15 sets of desks and chairs for a local school. Luang Prabang, Lao PDR (June 2024)

**AGROECOLOGY GARDENS FOR THE FUTURE (AG4F)
Phnom Penh, Cambodia**

Within the first six months of 2024, the [Agroecology Gardens for the Future \(AG4F\)](#)⁵² project team worked closely with all four partner schools to incorporate a new food forest theme into the garden. In the previous year, the AG4F team and schoolteachers worked together to grow annual crops in the garden through companion planting. During these six months, the project team incorporated perennial fruit trees and shrubs into the existing garden design to maximize the green space in the garden and minimize the labor needed to manage the garden.



Students and teachers promoting vegetables grown in their agroecology garden at Chaktomuk Primary School. Phnom Penh, Cambodia (March 2024)

In January, the project team organized an event for participating schools and teachers to share their knowledge and experiences managing the gardens with

Patihoub Site Visit



PatiHoub factory staff sort and arrange the shredded plastic for the design of the board before it is pressed. Luang Prabang, Lao PDR (June 2024)

and uses the plastics for its operations. USASCP's collaboration with PatiHoub continues to sustain clean and sustainable communities in Lao PDR.

USASCP Program Manager, Helen Santiago Fink, visited [Patihoub's factory](#)⁵² in Luang Prabang, Lao PDR. While in Luang Prabang, USASCP met with partner hotels, schools, and temples to learn more about Patihoub's plastics collections process and current application of products. Local stakeholders provide separated recycled materials to PatiHoub, including metal cans, cardboard, and plastics. PatiHoub then sells the metal and paper for revenue



Students share knowledge on crop propagation with delegates from the Ministry of Education, Youth and Sport during the Agroecology Field Day at Preah Sisowath High School. Phnom Penh, Cambodia (March 2024)

one another. The greatest challenge AG4F faces is the lack of student and teacher participation, as their agricultural class is only offered as a one-hour extracurricular activity each week. In March, the team organized a field day at Preah Sisowath High School to promote the agroecology garden concepts to interested stakeholders. The event drew nearly 50 delegates from the Ministry of Education, Youth and Sports (MoEYS), local authorities, NGOs, Embassies, high schools and primary schools in the city, and journalists. Over 150 Preah Sisowath High School students also participated in this event and presented various agroecological topics to delegates. After an official opening ceremony rewarding outstanding students in a planting competition, the Undersecretary of State from MoEYS and other honorable guests took a tour

in the school's Agroecological garden and visited the "Knowledge Booths" where students shared their research on agroecology, nutrition, and non-communicable diseases that they learned throughout the project.



Students share nutrition knowledge with their classmates at Chaktomuk Primary School. Phnom Penh, Cambodia (February 2024)

**BIOPAC
Tangerang, Indonesia**

[Biopac](#)⁵³ is a company aiming to combat single use plastic waste pollution by manufacturing seaweed-based packaging. Their mission and product line addresses fourteen of the sustainable development goals across social, economic, and environmental sectors. Biopac has recently secured the required product certificates including: a Certificate of Conformity from TUV Rheinland, that confirms their products have passed rigorous testing against 219 substances of very high concern; a Food

Packaging Certificate from Japan Food Research Laboratories; and a Certificate of Compostable Materials, assuring consumers that Biopac meets the Biodegradable Products Institute's standards and can be recycled through a composting program.



Biopac has developed a coating powder for bananas and avocados. The micro coating functions to keep the freshness and extend the shelf life of bananas and avocados during storage and distribution. The coating powder is expected to be applicable for other fruits and vegetables, such as apple, orange, cucumber, eggplant, etc.

GREENER WHEELS Penang, Malaysia

In October 2023, [Greener Wheels](#)⁵⁴, a project of Whiteroom, a digital agency, joined the International Electric Mobility Showcase (IEMS) in conjunction with International Greentech & Eco products Exhibition Malaysia (iGEM). Malaysian Green Technology and Climate Change Corporation (MGTC), a government agency under the Ministry of Natural Resources, Energy and Climate Change, hosted a showcase and invited Greener Wheels to give a talk about Environment, Social, and Governance (ESG) standards in transportation. Greener Wheels invited their partners, GPS Fleet and SafeTruck, to participate and engage potential customers. The Greener Wheels booth



Minister of Transportation (middle) with Greener Wheels Penang, Malaysia (October 2023)

received a special visit from the Minister of Transportation, H.E. Mr. Loke.

In January 2024, Greener Wheels spoke to a group of engineers and professionals at the Institute of Engineers Malaysia in Penang about green logistics. They shared the relationship between ESG and transportation, including the impact and policies announced in Malaysia as well as existing efforts to reduce carbon in transportation through Greener Wheels and other decarbonization solutions. During this visit, Greener Wheels learned of a proof-of-concept project that converts old fuel hybrid cars to fuel cell hybrid cars using hydrogen. This opens up new opportunities for hydrogen as an alternative energy source for net zero transportation.



From left to right: Dr. Chong (USM), Dr. Kang (Think-City), Dr. Yeoh (USM), Mr. Aaqib (SL2), Mr Gooi (White Room) participate in a panel discussion. Penang, Malaysia (March 2024)

During a March 2023 policy dialogue, hosted by Universiti Sains Malaysia, Greener Wheels outlined their work to prepare logistics companies to be ESG-ready, as well as ensured these companies were up to date on government policies and existing solutions for working towards net zero operations. Through these opportunities, Greener Wheels provided knowledge and suggestions to local regulators, NGOs, think tanks, and industry experts on data sharing and artificial intelligence in regard to a net zero goal.

5RTECH Da Nang, Vietnam

[5RTECH](#)⁵⁵, a solar panel reuse and recycling startup based in Da Nang, has completed the machinery design and

installation of all five modules in their recycling assembly line. 5RTECH has completed the mechanical processing of the solar panel evaluation machine and is currently conducting tests to assess solar panel performance, where panels must meet a 70% efficiency threshold for reuse. Through this testing process, the team has identified the need for further refinement with the two-pronged goal of meeting recycling industry requirements while upholding environmental sustainability standards. The team continues to research new materials to be created from the recycling chain.



The solar panel recycling modules were successfully completed at 5RTECH's facility. Da Nang, Vietnam (June 2024)

Members from the Office of Multilateral Affairs Foreign Assistance team visited the Da Nang Hi-Tech Park in Vietnam and the 5RTECH facility. 5RTECH began as an idea in the Da Nang Hi-Tech Park incubation program. Its participation has seen so much growth that 5RTECH moved to a nearby facility to continue to test and build out the five modules of their solar panel reuse and recycling technology. During the Foreign Assistance visit, the Hi-Tech team expressed its desire to engage more U.S. companies and welcomed U.S. policy recommendations for incubation programs and environmental standards.

1. [1. https://uswaterpartnership.org/uswp-in-action/](https://uswaterpartnership.org/uswp-in-action/)
2. [2. https://www.globaltius.org/programs/water-smart-engagement/](https://www.globaltius.org/programs/water-smart-engagement/)
3. [3. https://www.wef.org/topics/practice-areas/utility-management/wise-program/](https://www.wef.org/topics/practice-areas/utility-management/wise-program/)
4. [4. https://www.usascp.org/programs/wise/](https://www.usascp.org/programs/wise/)
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