



ASEIC

Eco-Innovation Watch

e - Newsletter



World Bank funds Lao PDR's green growth reforms

Thailand plans to ban single-use plastic

International hydrogen initiative launched

Solar power project rapidly expands in Viet Nam

First integrated hydrogen production plant in Malaysia



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I Policy

Chemical Recycling Plants to be built in West Java, Indonesia

- Indonesia, the biggest plastic waste producer next to China, prioritized marine plastic agenda policies such as aiming to reduce marine plastic debris by 70% by 2025.
- Meanwhile, ‘Plastic Energy limited’, a company based in England which recycles plastic waste on a global and commercial scale, agreed to construct five chemical recycling plants in West Java with local government.
- Currently, the plastic management sector in Indonesia is still in its early development phase, and development of relevant infrastructure faces many challenges.
- ‘Plastic Energy’ is planning to make this commitment a show case for other regions in Indonesia by implementing plant constructions through the partnerships of various public and private sectors.
- The CEO of Plastic Energy stated that the company - through the construction of the chemical recycling plants - would support the Indonesian government with pursuits such as reductions and recycling of plastic waste and reductions in marine pollution.
- Furthermore, Indonesia would not only receive environmental benefits, but local economic benefits through direct and indirect employment, and establishment of a blueprint for waste management.

(References: Asia Biz News, “[Plastic Energy Reaches Agreement To Build Five Chemical Recycling Plants,](#)” 12 Apr. 2019; REB Market Intelligence, “[Five chemical recycling plants to be built in Indonesia by UK firm,](#)” 16 Apr. 2019)

World Bank funds Lao PDR’s green growth reforms

- The World Bank’s Board of Executive Directors decided to provide 40 million dollars of credit

for Lao PDR's transition into a sustainable green growth model.

- The Vice Minister of Planning and Investment, Lao PDR claimed that this operation will aid the finances to achieve the green growth vision from the 8th National Socio-Economic Development Plan - which started this year - and the National Green Growth Strategy for 2030.
- Through implementation of this second program after the First Programmatic Green Growth Development Policy Operation in 2017, the World Bank supports policy reforms in each sector that prioritizes the green growth principle. The World bank announced that this program would reinforce the climate resilience of social infrastructures, promote the management of pollution that harms the health and productivity of locals, and advance the management of water resources and forests.
- Lao PDR enacted a series of reformation actions such as building the first national park in the country, planning the water resources law for river basin management, limiting illegal logging, and providing laws for managing pollution hazardous to human resources.
- The World Bank is supporting Lao PDR's financial stability to facilitate the implementation of these reformation actions and solve debt burden and fiscal deficits.

(References: World Bank, "World Bank, Lao PDR's Green Growth Reforms Get \$40 million Boost with Credit from World Bank," 28 May 2019.; ANN, "World Bank to finance Lao green growth reform," 30 May 2019)

Thailand plans to ban kinds of plastics by the end of this year

- The Thai government plans to ban three types of plastic including microbeads, cap seals, and oxo-degradable plastic by the end of 2019.
- Along with the ban, Thailand plans to ban the use of four other types of single-use plastics by 2022. This includes plastic bags, plastic cups, plastic straws, and styrofoam food containers.
- Through the 'Plastic Waste Management Road Map 2018-2030', the Thai government plans to increase plastic recycling to 100% by 2027, with various methods of turning plastic waste into

energy.

- Following the roadmap, the Natural Resource and Environment Ministry is devising a draft action plan for plastic waste management in line with the 20 year national strategy. The Cabinet also demanded a clarification on each sector's role and the increase in participation from the private sector.
- According to the Thai Ministry of Environment, one person in Thailand produces 1.14 kg of wastes per day, which amounts to 27.04 million tons of waste per year. Furthermore, one person uses approximately 8 plastic bags a day, which amounts to 500 million plastic bags per day nation-wide. Such plastic waste accounts for 16% of the garbage in the seas.

(References: The Thaiger, "Thailand to ban three kinds of plastic by end of this year," 21 Apr. 2019.; The Nation, "Thailand to junk three kinds of plastic by end of this year," 19 Apr. 2019.)

Malaysia to return illegally imported plastic waste

- Yeo Bee Yin, the Minister of Energy, Science, Technology, Environment, and Climate Change declared that the 450 tons of contaminated plastic waste exported from the US, UK, Canada, Japan, China, Saudi Arabia, Bangladesh, and the Netherlands will be returned to their respective country of origin.
- Since July last year, Malaysia shut down 150 factories to prevent the overcrowding of illegal plastic recycling facilities and has returned five waste containers back to Spain in early May.
- According to the recent report, the amount of imported plastic waste from the US to Malaysia up until July, 2018 has doubled compared to the amount of plastic waste from the previous year. The government launched a joint task force in April to tackle to problem of illegally imported plastic waste.
- Ever since China has banned the import of plastic waste, Southeast Asian countries such as Malaysia have been inundated with plastic waste, and these countries have been attempting to reduce waste smuggling.

- With the dynamic actions taken to ban waste movement, last year 187 countries, including Malaysia, agreed to add plastic to the Basel Convention which regulates the movement of hazardous material between countries.

(References: CNN, "[Plastic waste dumped in Malaysia will be returned to UK, US and others](#)," 29 May 2019.; Safety4sea, "[Malaysia starts shipping back plastic waste to foreign countries](#)," 29 May 2019)

ASEAN establishes new facility for green infrastructure investments

- In early April, the Association of Southeast Asian Countries (ASEAN) and the Asian Development Bank (ADB) announced the establishment of a 1 billion dollar facility that will proliferate the green infrastructure investment within Southeast Asia.
- According to the statements of the ADB, the ‘ASEAN Catalytic Green Finance Facility’ announced during the ASEAN financial ministers and central bank governors would grant a loan and provide technical assistance for governmental projects such as sustainable transportation and clean energy in Southeast Asia.
- \$75 million dollars from the ASEAN infrastructure fund (AID), \$300 million from ADB, € 300 million (\$336 million) from KfW, € 150 million from the European Investment Bank, and € 150 million from Agence Française de Développement are to be provided for the 1 billion dollars financial resource.
- The establishment of such facility is a part of the pursuit for the new ‘Green and Inclusive Infrastructure Window’ under the ASEAN Infrastructure Fund (AIF), a regional financing initiative organized by the ADB in 2011. OECD and Global Green Growth Institute (GGGI) plans to contribute through sharing knowledge and capacity building on green finance.
- The event also launched the ‘Inclusive Finance Facility’, which funds crucial infrastructure construction in Cambodia, Laos, and Myanmar.

(References: ADB, "[New Facility to Mobilize \\$1 Billion for ASEAN Green Infrastructure](#)," 4 Apr. 2019; Bangkok Post, "[Asean launches \\$1bn facility for green infrastructure](#)," 4 Apr. 2019)

EU coordinates € 100 million fund for clean energy investments

- At the Fourth Mission Innovation Ministerial meeting in Vancouver, Canada, the European commission (EC), the European Investment Bank (EIB), and Breakthrough Energy Ventures (BEV) agreed to organize a € 100 million fund for Europe's clean energy investment
- The EC announced that the funds will help innovative European companies introduce clean energy technology into the market, allowing groundbreaking solutions to reduce greenhouse gases.
- The investment fund will consist of € 50 million contribution from the European Investment Bank and € 50 million contribution from Breakthrough Energy Ventures, which supports companies with cutting edge technology in the energy sector.
- The Chairman of Breakthrough Energy Ventures, Bill Gates, declared that the cooperation will serve as an example that provides innovative ways for private and public sectors to collaborate and create meaningful outcomes by guaranteeing flexible deployment.
- The cooperation will focus on five areas that are necessary for response to climate change including electricity, transportation, agriculture, manufacturing, and buildings. Following the beginning of the operation in the second half of 2019, EU Member States and countries associated with Horizon 2020 will be able to apply for funding.

(Reference: New Europe, "EC, EIB and BEV set up €100 million fund for clean energy investments," 30 May 2019)

Japan's roadmap for marine biodegradable plastic development

- Japan's Ministry of Economy, Trade, and Industry announced the 'Roadmap for Popularizing Development and Introduction of Marine Biodegradable Plastics' as a response to the marine plastic pollution problem and a mean to promote the development of alternative material through collaborations of the industry, government, and academia.

- The newly announced roadmap expands on the future practical uses of marine biodegradable plastic and organizes the necessary technological, political assignments and measures in terms of technological and economical perspectives.
- According to the roadmap, the first phase, ‘implementation of technological society for commercialization’ targets changes in material for plastic wrappers and containers. This includes implementing the proposition for international standard and ISO standard of biodegradability on the biodegradable functioning by National Institute of Advanced Industrial Science and Technology (AIST) and Japan’s Bioplastic Association, and the improvements in the production process of biodegradable plastic and the expansion of biodegradable plastic demand by 2020.
- The second phase is an ‘integrated material technology development’ phase which targets expansion mold forming products. It aims to reduce production costs and improve product development technology of cellulose nanofibers from 2020.
- The third phase is a ‘innovative material research and development’ stage that targets fishing gear, which constitutes a large portion of marine plastic pollution. It consists of identifying biodegradable mechanism, developing and introducing alternative materials for fishing gear with the development of new technology such as biodegradable time function contribution, and the tasking the discovery of new micro-organisms from 2019.

(Sources: 経済産業省, “[海洋生分解性プラスチック開発・導入普及ロードマップ](#),” 7 May 2019; Sustainable Japan, “[経産省、海洋生分解性プラスチック開発・導入普及ロードマップ策定](#),” 8 May 2019)

China NEA announces ‘Circular on wind and PV power projects in 2019’

- China’s National Energy Administration(NEA) announced the ‘Circular on the construction of wind and PV power generation projects in 2019,’ suggesting tasks to stipulate the technology, cost, and quality of wind and solar power generation business.
- First of all, in order to expedite the grid access system at a reasonable price, the energy

administration and energy supervisory offices of each region must collaborate to research the terms of price for a wind and solar power grid access system, and expedite the appropriate price program based on the condition of capacity and sale, autonomously determined by electric power companies.

- Second, the energy administration of each region must consider the electricity sales capacity of each region. The administration must also decide the items that are funded by government subsidiary as per the wind and solar power project subsidiary allocation business plans. The subsidiary allocation priorities should be placed on price competition.
- Third, the energy administration of each region consider new wind and solar power constructions based on the electric grid access project already confirmed by existing electrical grid, after verifying the condition of sales for the expansion suggested by the company.
- Finally, in order to optimize investment and business environment, the energy administration of each region must see if the relevant land is within the bounds of local tax collection and check if the respective regional government offers unreasonable conditions for supporting the businesses pursuing the project or collects commissions.

(Sources: China Energy Portal, "Circular on the construction of wind and PV power generation projects in 2019," 28 May 2019.: 中国政府网, "《国家能源局关于2019年风电、光伏发电项目建设有关事项的通知》解读" 4 Jun. 2019)

V20 declares of new financial instrument for climate-proof growth

- V20 finance ministerial meeting, a group comprising of countries vulnerable to climate change, hosted a collaborative meeting in Washington with World Bank and the International Monetary Fund (IMF) and announced a new financial plan to maintain economic growth under the increasing threat of climate change, reduce the cost of capital, and introduce systems that allow large capital flow.
- The V20, which consists of 48 developing countries including Barbados, Cambodia, Honduras, Vietnam, Philippines, share a view that there must be a strong response to increasing dangers

of climate change like continuous floods and draughts that allows the sustainable climate-proof growth.

V20 meeting of Finance Ministers



- According to the UN Environment Programme, V20 countries had to yield an additional \$62 billion of interest payments in the last 10 years due to their climate vulnerability. In the next 10 years, the interest payment is expected to increase up to \$168 billion.
- V20 also proposed the Accelerated Financing Mechanism (AFM) to guarantee blended finance methods from public and private capital and a new instrument within MDBs and other developmental banks for climate adaptation, climate resilience, and renewable energy project.
- Furthermore, the participating countries also proposed the Sustainable Insurance Facility (SIF) to allow SMEs to respond to the dangers of climate change. The instrument is a form of financial protection to strengthen the resilience of various vulnerable supply chains including SMEs.

(References: V20, "Vulnerable countries and partners to climateproof economic growth," 11 Apr. 2019: Eco Business, "Shunned by investors, poorer nations seek to climate-proof growth," 15. Apr. 2019)

International hydrogen initiative was announced in CEM10

- During the 10th Clean Energy Ministerial (CEM10) hosted in Canada, the international hydrogen initiative was launched with participation from USA, Japan, Canada, Netherlands, the European Commission, Korea, and other countries.
- According to the reports, the launch of the initiative will allow policies and various programs that forward the commercial deployment of hydrogen and fuel cell technologies in all sectors of the economy.

- The newly launched initiative seeks opportunities and developments in the hydrogen industry to transition into a clean, affordable, and reliable energy sector, by including new global supply chains.
- The initial tasks of the initiative are the following
 - Supporting the successful deployment of the hydrogen application in each industrial sector
 - Exploring the possibility of hydrogen technologies in transportation (freight, mass transit, light-rail, marine)
 - Examining the role of hydrogen that could meet the energy demands of communities
- Mark Menezes, the Under Secretary of the US Department of Energy, claimed that, in consideration of the current partnership, hydrogen will fulfill an important role in all energy sectors and will contribute to the creation of a promising energy future that is bountiful, clean, secure, and free.

(References: Safery4sea, "[Global partners launch hydrogen initiative](#)," 30 May 2019.; Hydrogen Council, "[Hydrogen Council Joins Energy Ministers in Support of Hydrogen Initiative](#)," 29 May 2019)

II Industry

OCBC bank of Singapore excludes funding new coal power plants

- OCBC Bank, one of Singapore's largest banks, announced that they would not be funding the construction of new coal-fired power plants for the first time in Southeast Asia.
- Despite such announcement, OCBC would support funding the two coal power plants in Vietnam, as per contract obligations.
- OCBC is strengthening financial support for more profitable projects such as new renewable energy projects. In 2018, the bank has funded more than 20 solar power plants in Asia and the wind power business in Australia and Taiwan.
- Two days after the announcement, DBS - Singapore's biggest bank - also declared that they would stop funding new coal power.
- DBS claimed that they would stop funding new coal power projects upon the completion of their current commitments regardless of any technological developments in coal power. The current project financed by DBS is expected to be completed in 2021.

(References: Eco-Business, "OCBC is Southeast Asia's first bank to rule out funding new coal power plants," 2019.4.18.; Straits Times, "No new funding for coal plants, says OCBC," 2019.4.17.)

Southeast Asian energy companies rapidly transition into green energy

- With the rapid and recent development in Southeast Asian regions and the subsequent surge in energy demands, energy companies that were previously dependent on fossil fuels are rapidly transitioning into renewable energy.
- Indonesia's Star Energy is looking to make use of geothermal resources from the more than

100 active volcanos dispersed in the region. The company used the steam from the volcanoes to generate 875,000 kW of power and plans to increase capacity above 1 million kW in the future.

- Thailand's Banpu derives 90% of its profits from the coal industry but constructed 150,000 kW worth of solar generators to diversify profitability. The company is currently constructing solar power plants and wind farms in Japan and Vietnam.
- Vietnam has long coastlines with ideal conditions for wind farms. From last year November, the Vietnamese government are actively applying feed-in tariffs to help the wind farm industry.
- Malaysian state-backed power company Tenaga Nasional Berhad (TNB) started commercial operations of a 50,000 kW solar plant from last November. The Malaysian government predicted that renewable energy would occupy up to 20% of the country's energy mix by 2025.
- The International Renewable Energy Agency (IRENA) estimated that Indonesia, Thailand, Vietnam, Malaysia, and the Philippines generated a total of 51.14 million kW worth of electricity from renewable energy in 2017. This is a 130% increase from 2007 and the equivalent of 50 nuclear reactors. It was predicted that power production will increase by threefold (up to 161.8 million kW) by 2025.

(Reference: Nikkei Asian Review, "[Southeast Asia's energy majors pivot sharply to green power](#)," 14 Apr. 2019)

Solar power project rapidly expands in Viet Nam

- Solar power projects are flourishing in Vietnam two years since the Vietnamese government started administering incentives.
- Last year April, three solar power plants with the total capacity of 330 MWp started production in the south central province of Ninh Thuan, with investments from Vietnam's BIM Energy and the Philippine's AC Energy. The power plant complex is currently the biggest solar plant in Southeast Asia.

- In January, the Solar 1 plant in Ninh Thuan with the capacity of 46 MWp officially started generating electricity for the national grid through the access system, producing 75 million kWh annually.
- Furthermore, the solar rooftop panels installed on many households started producing electricity, contributing to the daily use of household and national grid. The solar power is bought at VND 2,134(USD 0.09) per kWh and acts as a source of income for the households.
- Ho Chi Minh City Power Corporation connected 1,432 rooftop solar power systems, scaling up to 17.46 MWp, to the city's grid. The amount of electricity produced reached to 4 million kWh and the sector has spent more than 8.5 billion VND on buying the produced electricity.

(Reference: CPV, "Solar power projects mushroom in Vietnam," 24 May 2019)

Waste-to-power plant constructed in Bac Ninh, Viet Nam

- Constructions for a waste-to-power plant worth 1.35 trillion VND (approximately 57.6 million USD) started in the Que Vo district, the northern province of Bac Ninh.
- Commercial operations for this plant - spanning 5 ha- are expected to start in the first quarter of 2021. The plant was designed to treat 500 tons of waste to generate 11.7MWh of energy daily.
- During the ground breaking ceremony, the permanent Vice Chairman of the provincial People's Committee claimed that Bac Ninh was struggling with environmental pollution – more specifically, solid waste

Groundbreaking of waste-to-power plant in Bac Ninh



※ Photo: VNA

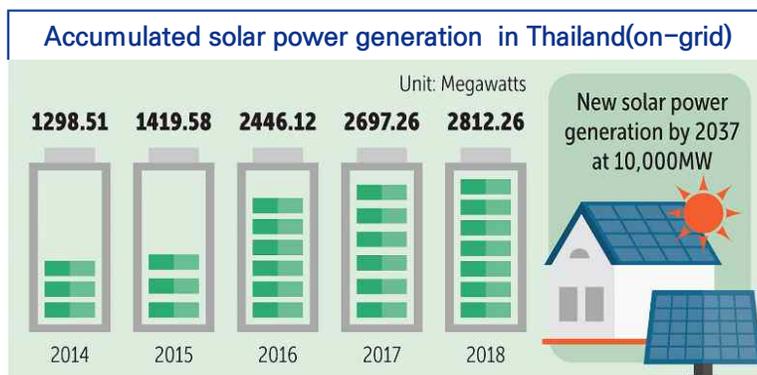
pollution.

- According to the statistics, 870 tons of waste is being produced in Bac Ninh daily, and this figure is predicted to rise to more than 1,000 tons in 2020.

(References: Vietnam+, “Work starts on waste-to-power plant in Bac Ninh”, 29 May 2019.: MICT, “Work begins on Binh Ninh wind waste-to-power plant,” 31 May 2019)

Solar power market invigorated by private investment in Thailand

- Recently, the solar power market is heating up with the surge in private investments, which is expanding the distribution channels for solar panels, as well.
- Thailand’s national power development plan (PDP) for 2018- 37 revised its goals for the next 20 years, with the household rooftop scheme contributing 10,000 MW and the floating solar farms operated by the state-run Electricity Generating Authority of Thailand (Egat) contributing 2,725 MW.



※Source: Bangkok Post

- Many companies are participating in the solar power industry since the government announced in the PDP that they plan to expand solar power production in April.

- As per the PDP, 100MW has been allotted for the

household solar program, and developments of the Egat-run floating solar panels for 46 Mw started in 2019. State-run Metropolitan Electricity Authority (MEA) and Provincial Electricity Authority (PEA) are responsible for purchase agreements, with electricity being sold at fixed rates of 1.68 baht per kilowatt-hour.

- Furthermore, aside from the electricity produced by the national grid, generation capacities from off-grid independent power supply (IPS) firms started increasing, as well.
- According to many energy experts, a total of 3,500 MW of solar power is expected to be generated by the end of 2019.
- Thailand's SCG, the research firm, expects that with the expansion of the solar rooftop market and the invigoration of the solar panel distribution channels, the market would reach 40-50 billion baht in 2019.

(Reference: Bangkok Post, "Solar power drawing private-sector interest after new PDP," 2019.5.27)

First integrated hydrogen production plant in Malaysia

- For the first time in Southeast Asia, an integrated hydrogen production plant combining hydrogen production, refueling station, and hydrogen vehicles was launched in the city of Cuching in Sarawak, Malaysia.
- Sarawak pursued the hydrogen production project since 2017 with the goal to become the center of hydrogen economy. State-run Sarawak energy provided RM 10 million to construct the hydrogen plant.
- The plant, which was constructed in a two year time span by state-run Sarawak Energy(SEB), consists of a facility that produces hydrogen through electrolysis and a refueling station for hydrogen fuel cell buses. The plant is collaboratively managed by SEB and the

Integrated hydrogen production plant in Sarawak



※Source: Malaymail

subsidiary of Linde Malaysia, Linde EOX Sdn Bhd, a gaseous and engineering company.

- Sarawak will test run three buses and two cars run by hydrogen fuel cell. The vehicles chosen for the test run are the Hyundai 'Nexo' and buses from Foshan Automobile.
- As per the Sarawak's plan for a green public transportation system, Sarawak Economic Development Corporation (SEDC) and Foshan Feichi Automobile Manufacturing cooperated to acquire three hydrogen fuel cell buses, and will start commercial operations once approved by the ministry of public transportation and other relevant establishments.
- The plant is able to produce 130 kgs of hydrogen at the purity of 99.999%, fueling 5 hydrogen fuel cell buses and 10 hydrogen fuel cell cars a day.
- The Chief Minister of Sarawak announced that the state would construct five more hydrogen production plants in the upcoming year.

(References: Malymail, "Sarawak CM launches South-east Asia's first integrated hydrogen production plant," 27 May 2019.; Borneo Post, "S'wak launches first integrated hydrogen production plant, refueling station in Southeast Asia," 27 May 2019)

III Technology

New material for more efficient electronic devices were developed

- The researchers at the University of Bristol developed a new material with high thermal conductivity that can be safer and more efficient for devices such as mobile phones, radars, and electric cars.
- The research team at the CDTR (Central for Device Thermography and Reliability) led by Dr. Martin Kuball discovered that an ultra-pure version of Boron Nitride has the thermal conductivity of 550W/mk, which is twice the thermal conductivity of copper.
- Professor Martin Kuball explained that most semiconductor electronics heat up with use. The performance diminishes as the electronic heats up, so it is important to find materials with high thermal conductivity that can extract waste heat.
- Professor Kuball then claimed that the next step was to make active electronic devices and integrate semiconductor materials with Boron Nitride, creating high-performance and high-efficiency electronics.
- With this discovery, it is expected that using materials such as Boron Nitride for products such as mobile phones and electric cars will increase the performance of mobile phone communication networks and is expected to be safer and more efficient.

(References: University of Bristol, "New material to pave the way for more efficient electronic devices," 2 May 2019.; Science Daily, "High thermal conductivity of new material will create energy efficient devices," 2 May 2019)

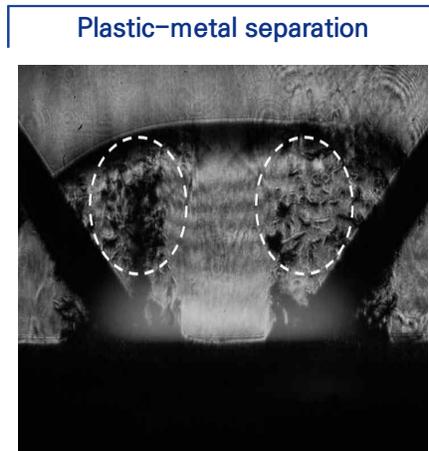
Japanese Researcher design to recycle e-waste by pulsed power

- Every year, about 50 million tons of electronic waste (e-waste) is produced, only 20% is recycled, and 80% goes to landfill which raise environmental problems. Moreover, the current

e-waste recycling process consists of chemical baths and manual labor, which may lead to serious health and environmental problem.

- The researchers from Kumamoto University in Japan have been using pulsed power in order to develop a cleaner and more efficient recycling method.
- Research has previously shown that pulse power has been successful in processing various waste material from concrete to wastewater. The researchers explored whether pulse power would be effective on electronic waste by testing it on the most prolific type of e-waste, CD ROMs.
- The research team previously found that using around 30 pulses at about 35 J/pulse allows plastic to separate completely from metal. If converted into the current price of electricity, then the procedure only costs 0.4 yen for recycling 100 CD ROMs.
- E-waste is one of the most important waste recycling problems. This research shows the importance of shock waves when using pulse power for elimination and separation process during e-waste recycling. Consequently, the research is an important milestone for the development of future recycling projects.

(Reference: EurekAlert, "Clean and effective electronic waste recycling," 15 May 2019)



※Source: EurekAlert(Schlieren image)

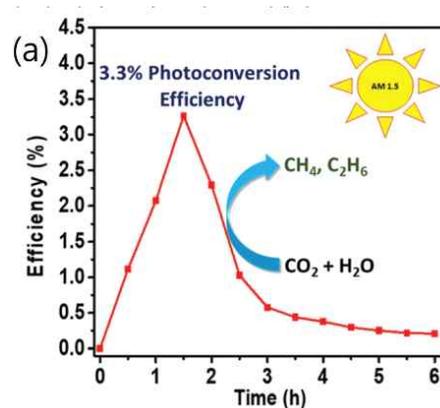
Korean researchers develop photocatalyst transforming CO2 into energy >>>

- Photocatalyst is an environmentally friendly material that can solve global warming and energy problems by transforming carbon dioxide – a contributor to global warming - into hydrocarbon fuel such as methane and ethane.
- The research team from the Daegu Gyeongbuk Institute of Science and Technology (DGIST)

developed a new catalyst made from copper, platinum, and blue titania (Cu1.00%-Pt0.35%-BT) that transforms carbon dioxide into methane and ethane.

- The standard photocatalyst had problems with energy efficiency due to the re-combination of the electron and positive holes on the surface of the catalyst as well as problems with by-product formation as the electrons are transferred onto another material. Research has been attempting to solve this problem by developing a promoter that prevents this re-combination and improve the electron transfer efficiency for the catalyst.

Photoconversion efficiency of new photocatalyst



※Source: DGIST

- The recently developed promoter is an alloy of copper - which absorbs carbon dioxide - and platinum stacked on top of titanium dioxide. It is structured so that the electrons created from light is transferred to copper particles, and methane and ethane is created by the absorption of carbon dioxide on the copper surface.
- This created catalyst is expected to be used for future industry technology development as its photoconversion efficiency reaches an excellent rate of 3.3%. Future research is expected to explore ways to sustain the photoconversion efficiency.

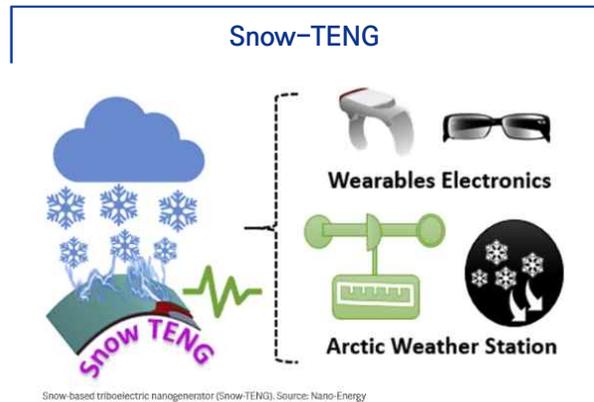
(References Science Daily, "One-two-punch catalysts trapping CO₂ for cleaner fuels," 7 Jun. 2019; DGIST, "DGIST 연구팀, 이산화탄소를 에너지로 전환하는 고효율 광촉매 개발," 26 May 2019)

New device for generating electricity from falling snow

- Recently, UCLA biochemists used silicone to design a device that captures electric charge from snow to create electricity. The newly designed device is simple, small, thin, and flexible and can generate electricity without using batteries.
- Snow has a positive charge and the synthetic silicone material has a negative charge, so the

device generates electricity when snow comes in contact with silicone.

- The invention is still a “proof of concept” experiment, as its power output is very low. Nonetheless, it has large potential with further improvements and readjustments.
- By using 3D printing technology, the scientists designed the Triboelectric Nanogenerator (or ‘snow-TENG’) that uses friction electricity. The device was made by stacking silicone rubber and another layer of conductive plastic.



※Source: Nano-Energy

- The silicone device can be used for mobile climatological stations and wearable devices that measures exercise capacity for athletes. Furthermore, if integrated with solar power plants, the device can generate additional electricity during snow storms.

(Reference: Eco-Business, “Could snow be the next source of clean energy?,” 31 May 2019)

IV ASEIC NEWS

[1] Luxembourg Accelerating Boot Camp – ICT Spring

- ASEIC, the Korea Institute of Startup & Entrepreneurship Development(KISED), and the Luxembourg Trade and Invest Office Seoul facilitated the participation of 9 Korean startups in the “Luxembourg Acceleration Boot Camp and ICT Spring 2019” - hosted in Luxembourg between May 20th to May 23rd - for the expansion of promising Korean startups into the European market.
- The “Luxembourg Acceleration Boot Camp and ICT Spring 2019”, supervised by the Luxembourg house of startup and the Luxembourg Chamber of Commerce, introduced the financing and startup ecosystem in Luxembourg and delivered sessions with information on European market expansion strategies from local experts. Furthermore, the bootcamp provided opportunities to network with successful Luxembourgian startups, local VC, and accelerators to expand promising startups into the European market.
- On May 21st and 22nd, the ICT Spring Conference and exhibition was held. The 10th ICT Spring Europe is an annual event that allows ICT companies and experts all over the world to communicate based on their motto of digital innovation. This year, the event focused on four various programs including FinTech, Digital, Space, and Artificial Intelligence.
- Amusetravel Co.Ltd, Cast-U, Cookie Langs, Data Driven Cares, Dtonic Corporation, IoTrust Co., Ltd., Mindslab, NOTA Inc., Ratio LLC were some of the ICT based startups that were selected to participate in the program.



[2] Korea–Norway Business Networking Day hosted in Norway

- On June 12th, ASEM SMEs Eco-Innovation Center (ASEIC) hosted the Norway-Korean Business Networking Day in Oslo, Norway along with Innovation Norway
- The program comprised of 1:1 business meetings with 8 Korean SMEs, and 20 startups from Norwegian and Korean participated IR pitching events for securing investments from investment companies of both countries.
- Minister of SMEs and startups, Youngsun Park said that “the driving force of Norway’s marine industry, fishing industry, and oil and gas industry is based on the entrepreneurial spirit of Vikings who used to face the sea to find opportunities” and claimed that “the Ministry of SMEs and Startups will be a strong supporter until Korean SMEs expand their business to Northern Europe and the world based on the venturesome, entrepreneurial spirit of Norway.”
- State Secretary of the Norwegian Ministry of Foreign Affairs, Marianne Hagen, said that she “welcome Korean startups, SMEs, and investors and hope that Korean companies actively use Norway as means for expansion into the European and Global market”
- Shipping, new renewable energy, IT, bio, and environmentally friendly startups participated in the event. The Korean Venture Capitalist Association and the Norwegian Venture Capitalist Association also participated in the event, seeking out investment attraction consultation sessions and communications between the two association after pitching from the startups.

Korea–Norway Business Networking Day



Congratulatory address from Minister Young-sun Park



Opening address from Secretary General, Sejong Kim



1:1 business meeting



Participant group picture

[3] Korea–Sweden Startup Meetup Day hosted in Sweden

- On June 12th, ASEIC, Korean Trade-Investment Promotion Agency (KOTRA), Business Sweden hosted the Sweden-Korea Startup Meetup Day in Stockholm, Sweden
- Startup meetup day is a ‘business partnership’ event that aims to expand Korean SMEs into Sweden coinciding with the Korean president’s tour of Northern Europe. 16 Korean startups, 12 Swedish startup businesses, 20 local and domestic investments companies, and 60 staffs attended the event.
- Sungmin Ahn, the CEO of O2O, who attended the pitching for attracting investment in Meetup day, said that “through the investment pitching and networking opportunities targeting Swedish investors in the event, we were able to sound out the pre-test bed application possibilities for AI/IOT products from Sweden and were able to gain the confidence for overseas expansion in developed countries.”
- On June 15th, the Korean Ministry of SME and Startup hosted a business meeting - attended by Minister Youngsun Park in Stockholm - with SMEs and startups that participated in the Sweden Business partnership. During the meeting, the participating startups voiced their opinions on the difficulties and supporting policies on domestic and foreign startup promotions and looked for support plans with the Korean Ministry of SME and Startups.

[4] Eco-innovation seminar held in Norway

- On June 13th, ASEIC, the Korean Technopark Association, and DNV-GL hosted an Eco-innovation seminar to support the expansion of Korean ship building, shipping, new renewable energy, ICT electric vehicles, and health and bio industries in Norway and collaborations between Korean and Norway businesses.
- The seminar was hosted as a part of SME visiting event to Norway, following the Norway-Korea Networking Day event and industrial visits.
- DNV-GL, who collaborated with the Korean Technopark Association, is a global company that provides technical standard quality and certification services for shipping, oil refining and gas, and new renewable energy industries and technical advice services through software.
- The seminar comprised of an introduction of Korean Technopark Association and the Norway green marine program, which realizes a sustainable model through the collaboration among related organizations such as government, finance, and private companies, and briefings of the current technology and policies of both countries following the presentation of exemplary cases, and current technological advancement regarding digitalization, and an active discussion on future collaborations related to the program.
- Seven SMEs – KHAN Precision Industry Co., Ltd., DAEHAN ENGINEER Co., Ltd., World Energy Co. Ltd., DSP Co., Ltd., CMT Co., Ltd., ECOPRO Co., Ltd, Techheim Co., Ltd. – participated in the seminar.

