October 2018, Edition 7

Asian Council on Water, Energy and Environment

Confederation of Asia-Pacific Chambers of Commerce and Industry

My dear colleagues:

It is a pleasure to present to you the "Asian Council on Water, Energy and Environment (ACWEE)" newsletter, edition 7, 2018. This publication is a compendium of relevant news, reports, and analyses on recent developments in the water, clean energy and environment sector in Asia Pacific countries.

The articles contained in this issue show that there are economic benefits in addressing climate issues and in the countermeasures against Carbon driven pollution. In fact, Australia and South Korea are implementing Hydrogen technologies to reduce carbon pollution while Indonesia is building technology alliances with advanced countries to address its carbon problems.

Many articles present ideas about the future of energy and the business opportunities it presents.

Sustainable Asian economic growth will depend on many new energy projects aimed at producing more efficiently, such as bio-energy in Korea and new nuclear power projects.

On the water sector, India is implementing water harvesting systems for human usage and agriculture, while Vietnam is developing large hydropower projects. Enjoy reading!

Mr. Gyanendra Lal Pradhan
Executive Chairman, Hydro Solutions
Chairman, SAARC CCI Council on Climate Change, Energy and Water Resources
Chairman, Energy Committee, Federation of Nepalese Chambers of Commerce and Industry

Table of Contents

ADB's Clean Energy Financing Partnership Facility: Annual Report 2017

ADB, August 2018

Manila - Total project allocations of $43.8 million in 2017 is expected to leverage about $520.6 million of ADB clean energy investments.

The Clean Energy Financing Partnership Facility (CEFPF or the Facility) was established by ADB in April 2007, to assist developing member countries (DMCs) improve energy security and transit to low-carbon use through cost-effective investments, particularly in technologies that result in greenhouse gas mitigation. CEFPF is composed of the Clean Energy Fund (CEF), the Asian Clean Energy Fund ACEF), the Carbon Capture and Storage Fund (CCSF) and the Canadian Climate Fund for the Private Sector in Asia (CFPS).

The Facility contributes to the energy sector in achieving the scaled up ADB's annual target set in September 2015, ADB pledged to double its annual climate financing to $6 billion by 2020, with $4 billion for climate mitigation and $2 billion for climate adaptation. The energy sector aims to contribute about $3 billion to climate mitigation.

This annual report provides CEFPF's operational results and overall implementation progress from 1 January to 31 December 2017.

The economic case for climate action is strong

Editorial, Sydney Morning Herald, 10 October 2018

Sydney - If you do not trust the International Panel on Climate Change, you should probably not trust the Nobel Prize for economics.

Yale economist William Nordhaus has just won the highest honour in his profession partly for his work on the economics of climate change.

His modelling calculated the costs of investing to reduce greenhouse gas emissions and then compared them to the social and economic costs of doing nothing and just allowing temperatures to rise. The bottom line was that investment in emissions reduction was a lot better value.

By coincidence, Professor Nordhaus' work provided the economic foundation for the International Panel on Climate Change report also released which urged the world to take more "rapid and far reaching" measures to cut emissions.

The IPCC report found that it still worth taking the fairly drastic action required to limit the increase in global temperatures to a rise of 1.5 degrees by 2050 as a result of global warming as compared to going slow and allowing for a bigger rise in temperature.

Yale University Professor William Nordhaus (Credit AP)

“Limiting global warming to 1.5°C compared with 2°C would reduce challenging impacts on ecosystems, human health and wellbeing," the IPCC report found.

The obvious big cost for Australia is that if the rise in global temperatures can be kept to below 1.5 degrees as much as a third of the Great Barrier Reef could still be alive in 2100 but if it rises by 2 degrees the reef will die.

So when Prime Minister Scott Morrison claims to be arguing from a hard-headed economics perspective in dismissing the IPCC, the Nobel committee respectfully disagrees.

Mr. Morrison's response to the IPCC report confirms that the next election will pose one of the clearest choices on climate change policy in over a decade.

Mr. Morrison has responded by repeating his nonsense claim that Australia will meet targets for cutting emissions under the Paris treaty "at a canter" despite data from his own Ministry of Environment that emissions are rising and not falling as the government has promised.

Government ministers responded to the IPCC by deploying the straw-man argument that Australia cannot survive without coal. True. It is impossible to do it tomorrow. But that choice is false. Australia's old coal-fired electricity generators will inevitably give up the ghost over the next few decades. The issue is how fast they drop out of operation and what they are replaced with. With a time horizon of a couple of decades drastically reducing coal emissions is very possible.

Unfortunately, because Australia and the world have been slow to act, greenhouse gases have built up and it has become more expensive to stop global temperature rising at a dangerous pace. But the costs of doing nothing are ever more onerous. The smartest economist in the world says so.

https://www.smh.com.au/environment/climate-change/the-economic-case-for-climate-action-is-strong-20181009-p508l7.html

Australia's top scientist calls for hydrogen revolution to replace fossil fuels

Nicole Hasham, The Sydney Morning Herald, 10 October 2018

Sydney - The federal government’s top scientist Alan Finkel says Australia could

slash global carbon emissions and create a multi-billion dollar export industry by developing hydrogen as an everyday energy source to replace fossil fuels used in vehicles, homes and industry.

A major climate report identified hydrogen, which can be produced with virtually no emissions, as among fuel options that must be developed if the planet is stay below the critical 1.5 degrees warming threshold and avoid the worst climate change disasters.

The report by the UN's climate science body, the Intergovernmental Panel on Climate Change, called for a coal phase-out

by 2050 and predicted a substantial decline in the use of natural gas – two export industries upon which Australia is heavily reliant.

Chief scientist Alan Finkel says a massive hydrogen export industry could help the global transition away from fossil fuels.

The report distilled 6000 scientific references and was authored by 91 scientists across 40 countries.

Environment Minister Melissa Price rejected the key findings of the report, despite not having read the full report, and said the call to eliminate coal-generated electricity was a "long bow".

https://www.smh.com.au/politics/federal/australia-s-top-scientist-calls-for-hydrogen-revolution-to-replace-fossil-fuels-20181009-p508mj.html

Pollution the killer

The Daily Star, 17 September 2018

Dhaka - Bangladesh saw around 234,000 deaths, including 80,000 in urban areas, due to environmental pollution and related health risks in 2015, making it one of the worst affected countries in the world, reveals a World Bank report.

The number was more than 10 times that of deaths the same year from road accidents, which was 21,286, it pointed out. Some 18,000 lives and 578,000 years of potential life were lost in Dhaka city in 2015 -- the second least livable city in the world, showing the urgency to immediately address the city's environmental issues.

Deaths due to various causes totaled 843,000 in the country that year. Of those, nearly 28 percent were caused by environmental pollution -- the highest among South Asian nations, according to the report released.

The average rate of such deaths in South Asia is nearly 26 percent, while it is 16 percent worldwide. The World Bank said this in this year's country environmental analysis report titled "Enhancing Opportunities for Clean and Resilient Growth in Urban Bangladesh" unveiled at a hotel in the capital.

Air pollution in South Asian countries is the highest in the world with fine particulate matter measuring 2.5 microgram both outdoor and indoor. This is by far the most leading environmental risk in Bangladesh, causing about 21 percent of all deaths in the country, according to the report.

Nearly one million people in Bangladesh, mostly poor, are at risk of lead contamination, which can lead to IQ loss and neurological damage, especially for children, and can increase the risk of miscarriage and stillbirth among pregnant women, the report cited.

In greater Dhaka, the sites contaminated by heavy metals are mostly in poorer neighbourhoods.

The report focuses on three areas: cost of environmental degradation; clean and resilient cities; and institutions for clean industrial growth.

Based on data gathered from 11 air quality monitoring stations in eight urban areas, concentration of 2.5 microgram particulate matter from 2013 to 2015 was estimated five times the Bangladesh standard and eigth times the World Health Organisation standard.

Household air pollution disproportionately affects women and young children, who spend most of the time inside houses. Pregnant women are especially vulnerable to this hazard.

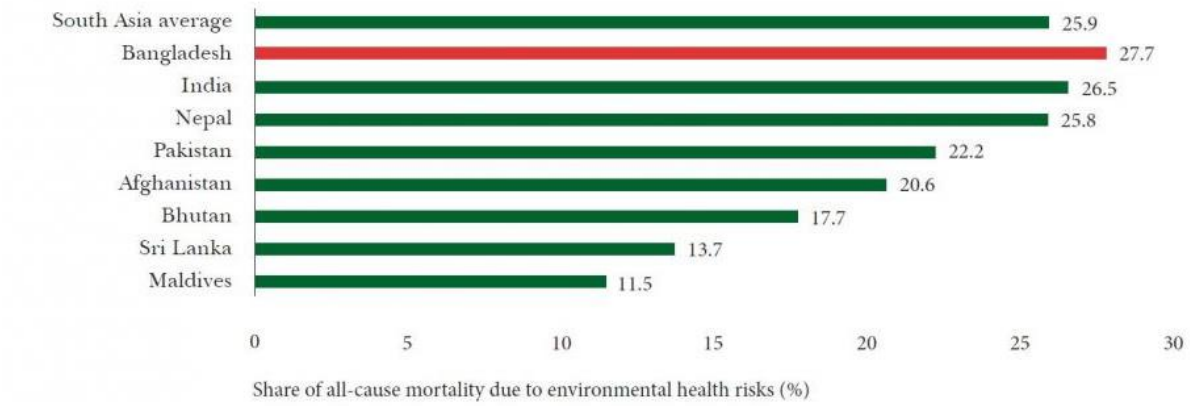
“Bangladesh pays a high price for environment degradation and pollution in its urban areas. This puts its strong growth at risk,” said Rajashree Paralkar, acting WB country director for Bangladesh.

Addressing the programme, Anisul Islam Mahmud, minister for environment, forest and climate change, said 58 percent of air pollution are caused by illegal brick kilns, 10 percent by vehicles, 20 percent by construction activities, and the rest by various other factors, including industries.

Anisul said his ministry is working on a new law likely to be passed during this government's tenure. Kseniya Lvovsky, WB practice manager for environmental and natural resources, said environmental conservation is doable if there are strong will and planned urbanisation.

According to the WB report, parts of Dhaka city are more susceptible to flood inundation due to filling-up of wetlands and construction of high-rises on sand-filled areas.

FIGURE - 1-1: DEATHS ATTRIBUTED TO ENVIRONMENTAL RISKS IN SOUTH ASIAN COUNTRIES, 2015 (%)



Source: IHME 2017.

Unplanned urbanisation is also taking a toll on smaller cities as well as towns like Pabna. Since 1990, Pabna lost half of its wetlands, and its lifeline, the Ichamati river, is dying.

ECONOMIC LOSS

The economic cost of the deaths and disability in terms of labour output has been estimated at $1.4 billion in all urban areas of Bangladesh and at 310 million in Dhaka city alone, equivalent to 0.6 percent and 0.1 percent of the country's GDP in 2015.

RECOMMENDATIONS

- Institutional reforms for urban governance
- Revision of Environment Conservation Rules
- Improving transparency of environmental clearance process
- Holding environment officials accountable
- Making environmental information public

Given the growing environmental challenges that Bangladeshi cities face, the WB analyses the impacts and causes of pollution levels and degradation of natural resources in Dhaka and other rapidly growing cities.

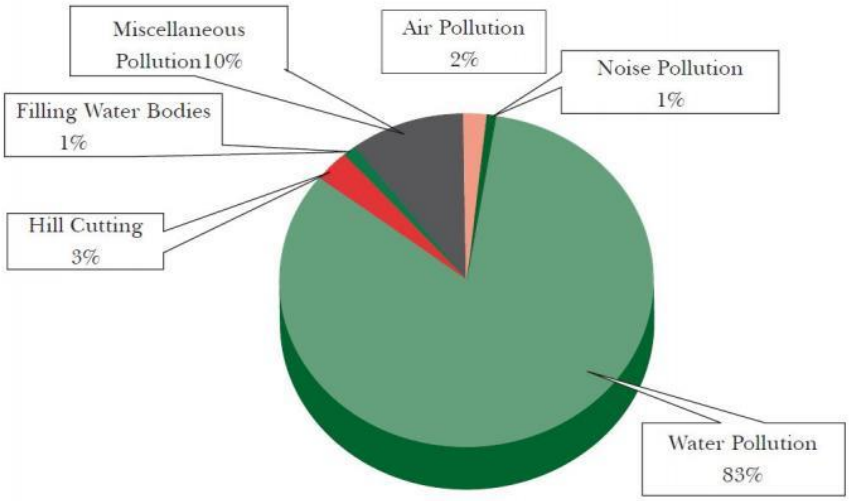
Over the past three decades, Bangladesh has experienced dramatic increase in pollution linked to urbanisation. Rapid growth of readymade garment industry and increase in urban population from less than 40 million in 2006 to more than 55 million in 2015 had been key factors in exposing the growing urban population to environmental hazards.

CANCER RISK

Workers in the country's industrial establishments, including micro, small, and medium facilities that use harmful materials as inputs, face the risk of cancer, chronic respiratory disease, and other

health impacts due to the lack of mitigation practices, including the use of personal protective equipment.

FIGURE - 2-7: DOE ENFORCEMENT BASED ON NATURE OF POLLUTION, 2014–15



2015-2016 Fiscal Year Enforcement Activities (based on nature of pollution)

Source: DoE 2016.

The WB report mentioned that occupational pollutants such as asbestos, polycyclic aromatic hydrocarbons and silica are used as industrial inputs. The other pollutants include sulfuric acid, trichloroethylene, arsenic, benzene, beryllium, cadmium, chromium, diesel exhaust, formaldehyde, and nickel in the form of gases and asthmagens.

WOMEN IMPACTED

Women and girls bear a disproportionate burden of limited access to clean and safe water. Water pollution and water scarcity affect women's health, nutrition, workload, and, consequently, their opportunities to overcome poverty.

Poor sanitation, lack of safe water supply and arsenic contamination in groundwater lead to diarrhoeal and other diseases causing deaths.

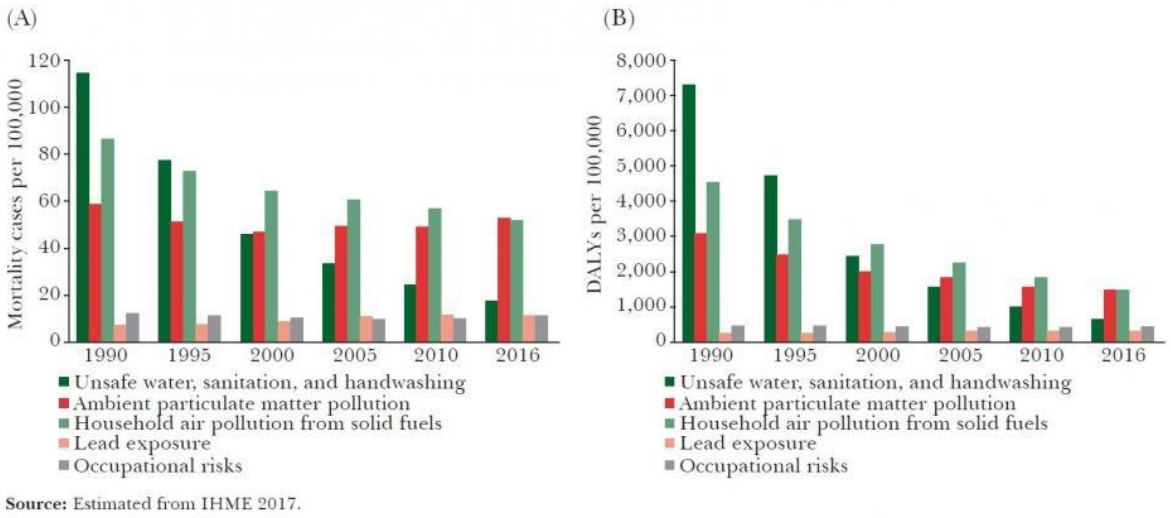
Urbanisation and industrialisation have increased the amount of waste generation. Without proper collection and disposal, solid waste clogs channels, leading to urban floods. Unsafe recycling of hazardous waste such as used lead-acid batteries poses a growing public health hazard.

An estimated 22,000 workers in Bangladesh's ship-breaking industry are exposed to increased levels of asbestos, polychlorinated biphenyls, cadmium, lead, and mercury in the naval and merchant ships they dismantle.

DISAPPEARING WETLANDS, RIVERS

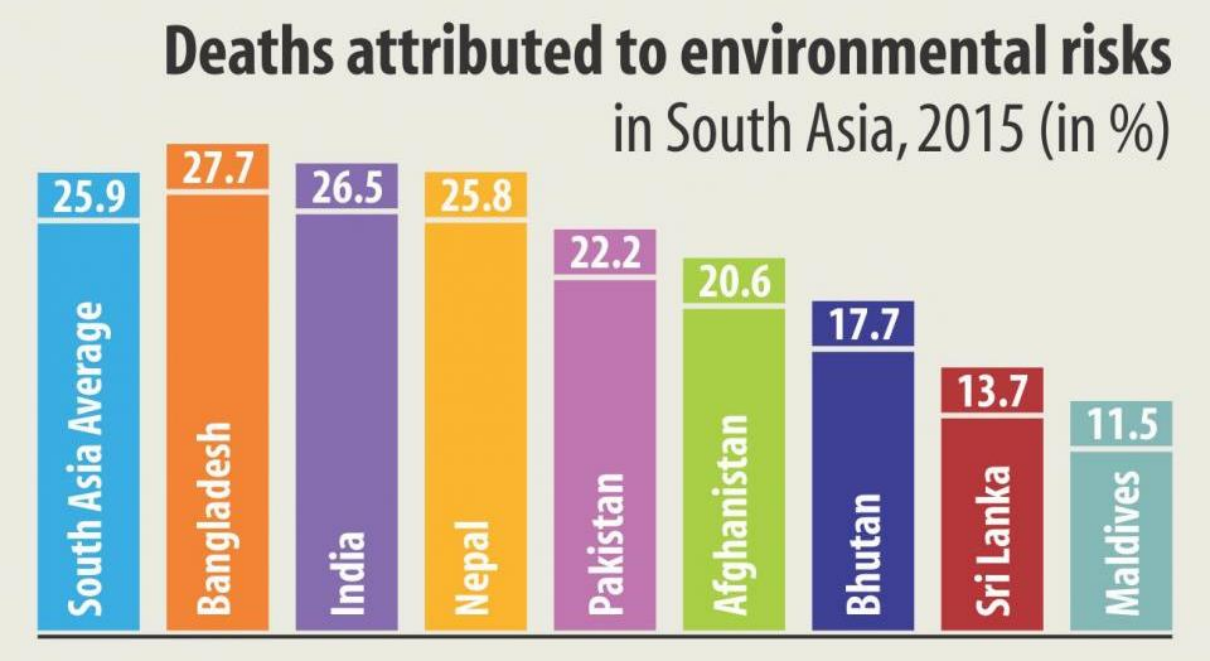
Dhaka, ranked as the ninth largest megacity in the world, has seen its population rise by about three times from 6.8 million to 18.2 million over the past quarter of a century, the report cited.

FIGURE - 1-3: EVOLUTION OF MORTALITY AND DISABILITY ATTRIBUTED TO ENVIRONMENTAL RISKS IN BANGLADESH OVER TIME



Source: Estimated from IHME 2017.

Continued unplanned urbanisation, filling-up of wetlands and rivers, and shrinking of a canal network across the city has exacerbated urban flooding and contributed to various environmental problems.



Flooded roads contribute to traffic congestion and health hazards from the spread of vector-borne diseases.

Dhaka's Detailed Area Plan identified and recommended protection of 30,252 hectares of flood flow zones and 2,240 hectares of water retention areas to reduce the risk of flooding.

But in just eight years since 2010, 41 percent of flood flow zones and 21 percent of water retention areas have been converted, raised, and used for other purposes, including settlements, industries and brick kilns.

At least 100 hectares of four rivers around Dhaka city -- Buriganga, Balu, Turag and Shitalakkhya -- have been encroached upon to make way for various commercial and residential settlements.

WAYS OUT

To put Bangladesh on a greener growth trajectory, the WB recommended that the government strengthen policies and institutions, and enforce environmental standards with a shift to cleaner technologies to contain the increasing air, water and soil pollution as well as industrial pollution.

Bangladesh had its first-ever legal framework “National Environment Policy” on governing environmental conservation in 1992. Since then, more than 25 laws, policies, guidelines, and regulations have been formulated to regulate the environmental footprint.

https://www.thedailystar.net/environment/environment-pollution-in-dhaka-bangladesh-18000-died-world-bank-report-1634566

The Future of Energy

Thomas Brent, Southeast Asia Globe, 26 September 2018

Why now is an exciting time for Cambodia’s clean energy market

Phnom Penh - EnergyLab Asia is an organisation that aims to facilitate the growth of the clean energy market in Cambodia, with a particular focus on startups and innovation. Southeast Asia Globe sits down with director of emerging markets Bridget McIntosh to discuss new technologies in renewable energy and the future of the sector in Cambodia.

Tell me a little bit about what EnergyLab Asia does

We play a role in supporting the whole [clean energy] ecosystem here in Cambodia and act as a landing pad for international companies, to help facilitate their entry here. We have a coworking space so that entrepreneurs, startups, freelancers and [international businesses] can come and work with us, but also then we can introduce them to all the different companies that are already here, as well as [familiarising] them with government policy, institutions or development agencies in order to optimise the time that they are going to spend looking at Cambodia’s market.

The huge Aeon Mall, situated in central Phnom Penh, is covered in solar panels

We also do things like holding events to raise awareness of clean energy and to raise awareness of all the different technologies and opportunities that are happening worldwide. EnergyLab also

works to stimulate startups and entrepreneurs to participate in the clean energy market in Cambodia. For example, we are holding a smart energy hackathon at the end of October. There is a two-fold intention behind that: one is to bring in people with ITC skills and expose them to what is happening in clean energy. Most ICT people think renewable energy is not interesting for them, but actually there is a lot that they can do that is related. The other objective is to see if we can support people who are interested in starting a new idea and then possibly help them connect with another person who is interested in exploring [a similar idea].

What new advancements have there been in renewable energy technology recently?

The clean energy market is so interesting at the moment because of the convergence of cheaper renewable energy – including solar – but also cheaper things like sensors, digitisation, communications, the Internet of Things and access to individual consumers. When you put all that together, it takes energy from being really boring – how the industry used to be – to how it is now. As a result of those [developments], there are a lot of chances for startups or businesses to create innovations that can be in the hands of consumers.

So one example [of an advancement in technology] is around commercial buildings. Typically, commercial buildings use a lot of energy and they're usually slow to react to what is happening inside and outside. But if you wire up a commercial building to be smart, so that you can monitor the air temperature outside, the humidity outside, the number of people in the building, and the number of people in all the segments of the building, and then you connect that with all the controls and sensors of valves, chillers, fans, and blowers, then you can establish how the building is performing compared to how it should be performing.

An example of a new innovative company is Village Energy. It is an Australian company that has come out of Horizon Power – which is one of Australia's largest utility companies. [Village Energy] is about working with grid operators in developing countries to help them optimise their grid. For example, what they do is use artificial intelligence, machine learning and blockchain for the payment system, and have meters in all the houses and businesses within a certain part of the grid. Then they have controls on certain loads; for example, households can nominate which loads in their house they would be willing to lose if the power was looking like it was going to be cut and which loads in their house they definitely need to keep. And then [consumers] can say, for example, "I'm happy to lose the fridge for two hours, but I'm not happy to lose the fridge for 10 hours". With the machine learning it then learns how it can distribute power across the grid more effectively to avoid blackouts and manage the voltage.

Bridget McIntosh (L), director of emerging markets at EnergyLab Asia, holds a poster advertising a hackathon even aimed at encouraging IT specialist to get involved in the clean energy sector

Have you noticed younger Cambodians taking more of an interest in renewable energy as an option?

We have been running an internship programme based out of Australia for the last four years – this year was the fifth year. So we have worked with 50 students at universities studying engineering or science, to offer them an opportunity to work at clean energy companies in Cambodia through an internship during their summer holidays.

When we first came to involve the Institute of Technology Cambodia, they said “I don’t think anyone will be interested in working for a renewable energy company, they all want to work with big Thai and Chinese building developers and do the electrical work”. Anyway, [in the first year] we got seven applicants and last year, when we put it out we had 21 applicants. So it is growing. One of the reasons we are holding Clean Energy Week is that we realise how few people know what clean energy is. So why would they go and do an internship for a clean energy company when they don’t know what it is or why it would be interesting?

Cambodia’s energy demand is growing rapidly – almost 20% per year. Do you think Cambodia can keep up with these demands?

Cambodia still imports over 15% of its electricity from neighbouring countries, down from over 60% in 2010. There is new supply coming on line but large power stations take a long time to build. Solar is the only large-scale technology that can move quickly enough to fill the shortages. It’s possible to build a solar farm in six months, although of course it takes time to contract the sale and financing. But it certainly doesn’t take six, seven, or even eight years like a hydro dam or coal-fired power station. So actually, as demand increases, those increments can be by achieved with solar. And wind too, would be great.

It seems like it is not worth investing in coal right now?

Coal is already more expensive. Just based on pure economics, solar is more competitive than coal.

What’s the most exciting project that EnergyLab Asia has worked with in the last year? I would definitely say Okra Solar. I think the advancement in technology for rural off-grid opportunities is massive. The smarts that they are developing are going to be so valuable to making sure that microgrids become a viable solution for off-grid households. Their technology allows people who have already invested in a solar home system to connect and optimise them.

My big concern about solar home systems is that they always limit a household to the amount of power that they have in that one system. But as [homeowners] develop economically, they should be able to buy another appliance, and that gets tricky [with solar home systems]. However, Okra allows the sharing of electricity by connecting these systems across a grid to manage the variations in who is doing what. Then the operator of that grid can see there needs to be more demand here or there, so [the operator] can invest in another solar panel. So the fact that it is scalable is a big difference. Before, solar home systems were limited.

How valuable is it for local or international companies to come together to discuss renewable energy on a regular basis?

I think networking and understanding what’s happening elsewhere in the industry is highly valuable. For example, I introduced two people: one who is working a lot in producing electronics and controls for large commercial buildings, and another who has a lot of experience in designing technology and understanding what is happening in smart commercial buildings. There is a perfect partnership between those two.

https://sea-globe.com/why-now-is-an-exciting-time-for-cambodias-clean-energy-market/

Bhutan is the world's only 'carbon negative' country but can it preserve its pristine environment while it grows?

South China Morning Post, 10 October 2018

Thimphu - Being able to afford staying on a green path depends on Bhutan receiving outside funding, something in doubt since US President Donald Trump announced his country's withdrawal from the 2015 Paris climate accord

The gentle whirring of the wind turbine speaks volumes for Bhutan's record as the world's only carbon negative country, but major challenges stand in the way of the Himalayan kingdom's decision to follow a green path over rampant economic expansion.

The mountainous state, holding only its third election on October 18, absorbs three times more CO2 than it emits, thanks mainly to the lush forests covering 72 per cent of its land.

Famed as the "last Shangri-La" for using happiness as a measure of success, Switzerland-sized Bhutan has been careful to keep its environment pristine, often by sacrificing profits.

In May, Bhutan opted out of an India-backed regional road connectivity project mainly over concerns that trucks coming in from other countries will pollute its air. The constitution stipulates that at least 60 per cent of Bhutan must be covered in forest, putting a brake on farming and a potentially lucrative timber industry.

"There was a great temptation to dig into our forest wealth but we thought of the longer term," said Dasho Paljor Dorji from Bhutan's National Environment Commission.

The nation of 800,000 has restricted tourist numbers with a daily fee of US$250 per visitor in high season, helping keep at bay the kind of boom that has ravaged other scenic hotspots.

Under its 11th five-year plan, Bhutan aims to reduce "substantially" its forest fuel imports by 2020. It has just 100 electric cars so far but wants to increase numbers and plans to introduce a nationwide network of charging stations. In 2016 it installed its first wind turbines.

A walk through spick and span Thimpu – Asia's only capital city with no traffic lights – gives a glimpse of Bhutan's green commitment. A rare sight in South Asia, heavy road-cleaning vehicles sweep the streets in slow circular motions, while trucks collect organic waste from households.

Just two hours away in Punakha district earthmovers and bulldozers are chugging away at a hydropower project. It is one of the 10 the country aims to build as part of its plan to remain

carbon neutral. All existing and future hydropower projects are financed by its friend and biggest partner India.

Hydropower was also Bhutan's largest export in 2016, accounting for 32.4 per cent of the country's total exports and 8 per cent of its GDP, according to the Asian Development Bank.

All of the energy currently goes to India but there are plans to export also to Bangladesh. But concerns have been growing over the impact of dams on biodiversity especially as Bhutan shifts from low-impact "run-of-the-river" dams, which do not require large reservoirs, to larger-scale barriers that do.

Being able to afford staying on a green path depends on Bhutan receiving outside funding, something in doubt since President Donald Trump announced last year that the US would withdraw from the 2015 Paris climate accord.

Under that accord, wealthy nations agreed to establish an annual US$100 billion fund to help developing nations adapt to a heating planet.

Bhutan is keenly feeling the ravages of climate change, from melting glaciers, changing crop patterns to the spread of mosquito-borne diseases. Temperatures have started touching 30 degrees Celsius, alarming locals unused to heat and humidity.

"Even the snowfall pattern has changed. Earlier it would snow for a few days, now it doesn't even last a day," said Tenzin Wangmo, Bhutan's chief environment officer. Wangmo said the warmer climes meant paddy fields dot places like Bumthang that never grew rice in the past.

"Climate change is not in our control. We haven't done anything but we are paying a heavy price," she said. Furthermore, new drainage systems required to prevent flooding downstream require the deployment of workers in remote areas high in the mountains, Wangmo explained.

"A lot of money and manpower is needed for such measures," she said. "But where is the funding and capacity-building?"

A Green Climate Fund (GCF) delegation that visited Bhutan in August said it would help the country's progress on a low-emission and climate-resilient path.

"I think Bhutan's contribution to the global community through keeping its carbon sinks intact, its nature as pristine as possible is a great one," Dorji said. "Our cause is worth supporting. We should be rewarded equally, if not more."

This article appeared in the South China Morning Post print edition as: 'Last Shangri-La' counts cost of staying on the green path

https://www.scmp.com/news/asia/south-asia/article/2167787/bhutan-worlds-only-carbon-negative-country-can-it-preserve-its

Rainwater harvesting system model to be replicated in state, a law in the offing

Hindustan Times, 29 April 2018

New Delhi - The structure can help collect 831,000 liters of rainwater annually whereas the capacity of its subsurface storage tank comes to 30,000 liters. On an average, per day 600 liters of water can be drawn from the rainwater harvesting structure.

In a bid to “conserve” the fast depleting ground water in Uttarakhand, the state government will soon make rooftop rainwater harvesting mandatory for all private houses that will be built in future.

It has also come up with a model on which rooftop rain water harvesting system would be based.

The rooftop rainwater harvesting model has been devised by state planning commission advisor HP Uniyal, who was formerly the chief general manager of Uttarakhand Jal Sansthan.(HT File (Representative picture))

“The model has been described in detail in the manual for rainwater harvesting and recharge, which was submitted to us by the state planning commission,” water resource minister Prakash Pant said.

“The proposed water conservation law and the related policy currently being framed would be based on that manual only.”

The rooftop rainwater harvesting model has been devised by state planning commission advisor HP Uniyal, who was formerly the chief general manager of Uttarakhand Jal Sansthan.

“I have already equipped my residential premises with the rainwater harvesting system based on that model,” Pant said. Under the proposed water policy, it would be mandatory to have all old and new government buildings equipped with rooftop harvesting system recommended by the planning body.

“Similar rules will also be applicable to all private buildings which will be coming up in future,” Pant said. “Maps for all such houses will be passed on condition that they will be equipped with the rooftop rainwater harvesting system.”

Pant, however, said the proposed law would have no provision to penalise the people. “Instead, there would be a provision for incentives for those who would have their proposed houses equipped with rooftop rainwater harvesting system.”

Under the new law, people owning old houses would be under no legal compulsion to have the latter equipped with the rooftop rainwater harvesting system.

The leniency “is being observed as the premises of old houses may not have enough space for a rooftop rainwater harvesting system”. Uniyal said he devised the rooftop rainwater harvesting model during his tenure with Jal Sansthan.

“The rooftop rainwater harvesting structure was built on the 500 sq metre roof area of Jal Bhawan, the spacious building that houses the office of Jal Sansthan in Dehradun,” he said.

The structure can help collect 831,000 liters of rainwater annually whereas the capacity of its subsurface storage tank comes to 30,000 liters. On an average, per day 600 liters of water can be drawn from the rainwater harvesting structure.

As per the manual, annually, 649, 500 liters of rainwater that overflows from the structure passes into the soak pit, which helps recharge ground water.

According to Uniyal, rooftop rainwater harvesting model he has devised would help save the precious potable water which is harnessed from the fast depleting groundwater resource and natural springs.

“Replicating such a model is, therefore, a must for a state like Uttarakhand where 80% of potable water goes waste in flushing toilets or in activities like cleaning and gardening,” he said.

“All such activities can be carried out using rainwater, if rainwater harvesting model is properly replicated.”

Uniyal said only 5% of the total annual rainfall of 74876.2 billion litres is consumed through drinking, irrigation and industries. “The remaining huge quantity goes waste as the run off results in depletion of groundwater and natural springs,” he clarified.

“Conserving the run off through a mechanism like rooftop rainwater harvesting could help prevent the recurring water crisis in the state especially during the lean seasons.”

Uniyal also underlined the need for reviving the age-old indigenous system of rainwater harvesting by digging earthen ponds, which helps recharge ground water rejuvenating natural springs.

“Artificial recharge of ground water could also help augment water levels in the streams originating from the region,” suggested the manual for rainwater harvesting and recharge authored by the planning commission advisor.

The flow in natural springs and streams, it notes, has “declined sharply in recent years due to the accelerated deforestation caused by construction of roads or factors such as development or forest fires”.

https://www.hindustantimes.com/dehradun/rainwater-harvesting-system-model-to-be-replicated-in-state-a-law-in-the-offing/story-iFgrRDQmyoo8PkPXRADXEJ.html

Indonesia, Finland seeks further partnership in renewable energy

Riza Roidila Mufti, The Jakarta Post, 11 October 2018

Renewable energy progress in Indonesia to-date has been underwhelming and the policy and regulations remain uncertain. (Shutterstock/File)

Jakarta - Indonesia is seeking assistance from Finland to develop renewable energy, which is currently in its early stages.

Energy and Mineral Resources Minister Ignasius Jonan said Indonesia had recently begun turning to renewable energy, adding that it would be a long-term project that Finland could help develop.

“Finland has among the cheapest electricity in the Europe, so this gives us hope that using Finnish technology might make it more competitive here [in Indonesia],” Jonan said during a forum that brought together energy companies from Finland and Indonesia. The event was organized by the Energy and Mineral Resources Ministry and Business Finland.

Finland is listed as the greenest country in the world, according to the Environmental Performance Index in 2016 and has been applauded for its advanced renewable energy sector. Forty percent of its national energy comes from renewables that include biomass, hydro, wind and solar power.

Finnish Minister for Foreign Trade and Development Anne-Mari Virolainen said the country was eager to share their experience and explore further opportunities with Indonesia.

A number of Finnish companies had worked on various energy projects in Indonesia, including in remote areas.

“This is a sign of our commitment to support the Indonesian government’s efforts to make the energy accessible to all of its citizens. At the same time, we also want to ensure that energy can be produced in a sustainable and clean manner while also using energy production as part of its management,” Virolainen said.

Gulontam Situmorang, senior advisor of Business Finland for Indonesia, said a number of projects on renewable energy had been jointly undertaken by Indonesian and Finnish companies, including the development of the Intermediate Treatment Facility (ITF) in Sunter, North Jakarta, which turns waste into energy. The project is a partnership between city-run company PT Jakarta Propertindo (Jakpro) and Finnish clean energy company Fortum.

Jonan hoped that cooperation between Indonesia and Finland in renewable energy development would not only deal with the business aspect, but human capital development as well. “I hope that the Finnish government offers our people training in renewables to strengthen our relationship,” he said.

http://www.thejakartapost.com/news/2018/10/11/indonesia-finland-seeks-further-partnership-in-renewable-energy.html

How the legacy of dirty coal could create a clean energy future

Iran Daily, 20 January 2018

Tehran - Energy from coal is now being linked to global warming and pollution on a global level. In fact, it has been estimated that coal contributes to 25 percent of green house gases.

Coal use has caused severe negative environmental impacts, from its mining and processing, to its transportation and combustion, leading to high levels of pollution. In October 2017, a UN weather agency report indicated that levels of carbon dioxide surged at ‘record-breaking speed’ compared to 2016, theconversation.com wrote.

Around the world, coal mining contributed historically to the industrial revolution and

played an important part in the development of modern society. But many mines have since been closed in the UK and Europe. In the UK, this led to hard financial times and unemployment in many communities, including the miners' strikes of the 1970s and 1980s, an impact recorded in the 1996 movie Brassed Off.

theconversation.com

But what happens inside the coalmines after their closure? Surprisingly, most disused coalmines start producing methane — known as Coal Mine Methane (CMM) — which can be a clean source of energy. It can be used to generate electricity via gas engines or, with some technical processing, be fed into the gas grid. Over time, however, the mines will begin to fill with water and the methane will almost entirely disappear.

But this will create yet another opportunity. The UK's historic coal mines have an approximate residual void space of a billion cubic meters. When flooded, that's the equivalent of 400,000 Olympic swimming pools of water at a stable temperature. This vast volume of water can be used for efficient heating and cooling applications and reduce carbon emissions.

But how? A recent publication by the team at Nottingham Trent University explains. The water in the coalmines is generally at a stable temperature — normally between 12°C and 20°C depending on the location — which makes it perfect for warming, or cooling, buildings or industrial processes.

We developed and tested a new technology for several years using two systems, one at Markham Vale and one at the National Coal Mining Museum for England, and found it can use this water to provide green, sustainable energy to homes and businesses in the UK.

Opportunities and challenges

The technology, which is based on using water source heat pumps, is simple and straightforward and works along similar lines to a refrigerator or air-conditioning system. It produces no noise or local air pollution and is also three or four times more efficient than a standard electric heater or gas boiler.

To understand how heat pumps in general work, consider the refrigerator in your kitchen. This extracts the heat from the food and drinks inside it, and diverts it into the surrounding environment via a condenser (which is simply a radiator) on the fridge's exterior. Our technology employs a similar system. In this case, we extract the heat from the coalmine water and use it to warm buildings.

In the UK, coal mining technology programs already pump nearly 112m megaliters of water for environmental reasons, such as avoiding the pollution of drinking water, springs and rivers. The new technology could use this water, which is being pumped anyway, potentially generating 63 megawatts of heat per year.

But the technology has its own challenges, specifically a lack of investment and 'champion' organizations to lead the process. In part, this is because it remains a little-known or understood technology by many investors.

There is also a lack of a clear model to follow in the UK when implementing new technologies such as this, not just commercially, but contractually and legally as well. Most housing developers in the UK

and Europe, for example, prefer to rely on well-established technologies such as gas boilers or electric heaters, even in areas where coalmines are available. If such new, green technologies are to succeed, comprehensive strategies are needed to get developers — and the general public — on board.

Hot topic

On the positive side, the technology can be integrated with other heating technologies, and in many cases existing building infrastructure can be used to implement it. The technology can also reduce carbon emissions and energy use and support compliance with the EU Energy Efficiency Directive and UK ESOS regulations.

We also have excellent, large-scale case studies, showing how effective it can be. In Asturias, north-west Spain, for example, a hospital and a university building are already being heated using coalmine water.

Our research shows this technology could give the world's disused coal mines a new, green, lease of life. What a fitting legacy for the industry that would be.

** Amin Al-Habaibeh is the professor of Intelligent Engineering Systems, Nottingham Trent University.*

http://www.iran-daily.com/News/208387.html

Firms promote greenery at factories

Japan Times, 23 August 2018

Shizuoka - With a goal of preserving nearby ecosystems, Japanese manufacturers are stepping up efforts to create areas of greenery within the premises of their factories, which are gradually becoming resting places for birds and insects as a result.

Some 30 species of birds, including thrushes, have visited a green area at Canon Inc.'s headquarters in Tokyo's Ota Ward.

Mitsubishi Electric Corp. started creating a green area at its factory in the city of Shizuoka in spring 2016 in order to better integrate the facility with local biodiversity.

Satoyama, or managed woodlands near populated areas, are dotted around the factory, located some 3 km from Shizuoka Station.

The company hopes to make the green area at the factory a spot where wild birds and insects can rest during their travel from one Satoyama to another.

Local plant species, including longstalk holly and wild pansy, comprise the green space. The company also transferred plants that were likely to be removed due to housing developments near the factory.

Plants in the 360-sq.-meter area have different heights and blooming seasons to attract various creatures.

"I was surprised to see many butterflies (at the green area) last autumn," a company official said.

Within the premises of Canon Inc.'s headquarters in Tokyo's Ota Ward, there is an area called Shimomaruko no Mori (Forest of Shimomaruko), which is visited by some 30 species of birds, including thrushes and starlings.

"We created the greenery area as we aimed to make our office a place accepted by local residents, and we now see a lot of birds coming," said Junko Kimura, a corporate social responsibility official with Canon.

The company set up a watering place for birds at Shimomaruko no Mori following advice from the Wild Bird Society of Japan. It also started to conduct biological research on birds there four years ago.

Fukushima powers toward 100% goal on renewables

Eric Johnston, Osaka, The Japan Times, 12 March 2018

Grid and cost woes still preventing prefecture from ending reliance on atomic energy

Fukushima - Seven years after the triple meltdown at the Fukushima No. 1 nuclear plant, Fukushima Prefecture remains committed to becoming an international center for renewable-energy research and a domestic pioneer by meeting 100 percent of its energy demand via renewables by 2040.

But grid connection issues, investment costs and a government policy that still favors investment in other energy sources -especially nuclear -continue to present challenges to researchers, businesses and Fukushima policymakers with an interest in renewable energy.

In 2014, the prefecture announced it was aiming to have renewables supply 40 per- cent of its energy demand by 2020, two- thirds by 2030 and 100 percent by 2040.

As of April 2017, renewable energy accounted for 28 percent of the prefecture's energy needs and about 60 percent of its electricity consumption.

Fukushima's installed capacity in renewables, excluding large-scale hydropower, had reached nearly 1.4 gigawatts by early 2017, equivalent to one large nuclear reactor. This included 925 MW of solar power, 209 MW of biomass and 174 MW of wind, with small shares for geothermal (65 MW) and small- scale hydro (17 MW).

The prefecture also hosts several organizations promoting renewable energy, including the Fukushima Renewable Energy Institute in Koriyama, which is part of the National Institute of Advanced Industrial Science and Technology. There, researchers look into improving the technology, efficiency and use of several forms of renewable energy, including photovoltaic, wind, shallow geothermal and geothermal. The institute also does research on using hydrogen obtained from renewable energy sources.

The prefecture also hosts several organizations promoting renewable energy, including the Fukushima Renewable Energy Institute in Koriyama, which is part of the National Institute of Advanced Industrial Science and Technology. There, researchers look into improving the technology, efficiency and use of several forms of renewable energy, including photovoltaic,

wind, shallow geothermal and geothermal. The institute also does research on using hydrogen obtained from renewable energy sources.

Diplomatic officials from the U.S., South Korean, Pakistani, Colombian and Myanmar embassies receive a briefing at the Fukushima Reneable Energy Institute in Koriyama, Fukushima Prefecture, last August

The prefecture also hosts several organizations promoting renewable energy, including the Fukushima Renewable Energy Institute in Koriyama, which is part of the National Institute of Advanced Industrial Science and Technology. There, researchers look into improving the technology, efficiency and use of several forms of renewable energy, including photovoltaic, wind, shallow geothermal and geothermal. The institute also does research on using hydrogen obtained from renewable energy sources.

"With technological support from the institute, a support program for local businesses in the quake- and tsunami-damaged areas is being carried out and human resources are being developed in collaboration with local universities. As a result, there have been 107 joint research projects implemented and nine successful examples of commercialization," said Masaru Nakaiwa, the institute's director-general, in an e-mail interview with The Japan Times.

"As a research institute playing a role in a new energy society for Fukushima, the Fukushima Renewable Energy Institute has been tying up with local business, and it's gratifying to see the results," said Masayoshi Hamada, state minister for reconstruction, after a third tour of the institute in February. Yet while official and public enthusiasm over renewable energy has grown since 2011, and while over 15 percent of Japan's electricity was generated by renewables in fiscal 2016, Nakaiwa said that does not mean that renewable energy is spreading compared with other OECD countries.

"The big problems remain cost and grid connection capacity, although it's remarkable that we've seen a recent movement in the manufacturing industry, the backbone of support for Japan, to

steadily expand its use of renewable energy. The United Nations Sustainable Development Goals have drawn international attention, and the fact that visible consideration for the environment is greatly reflected in a firm's value is thought to be the main reason" for the shift, he said.

In September 2016, the central government created a renewable energy plan for Fukushima that meant additional sup- port for maximizing its use in Fukushima, including the development of "smart" communities.

The plan gave a particular boost to long- standing government and industry efforts at storing and using hydrogen produced from other renewable energy sources.

In January, Tadashi Mogi, a senior official at the Ministry of Economy, Trade and Industry's Energy Efficiency and Renewable Energy Department, updated a meeting of the International Renewable Energy Agency on what was going on in Fukushima.

"The potential of solar and wind power in Fukushima is maximized. Currently, delivering the electricity produced by such renewable sources to the large power-consumption areas like Tokyo is unfeasible due to a lack of transmission capacity. But development of transmission lines will begin at a high pace from next year," he said.

Mogi also noted that pilot projects had been initiated at so-called smart communities in five cities and towns in Fukushima. These include Shinchi, Soma, Namie, Naraha and Katsurao. In those projects, electricity and heat from distributed power sources and renewable energy are supplied to public facilities or even an entire urban district. The government sees Fukushima-generated hydrogen in particular as a key energy source and plans to promote it internationally in 2020.

"The Fukushima Plan for a New Energy Society, which is the pioneer of this basic strategy, has already begun its activities," Prime Minister Shinzo Abe said in December at a meeting of the Ministerial Council on Renewable Energy, Hydrogen and Related Issues. "In Namie, a hydrogen production project of the world's largest scale, using renewable energy with zero C02 emissions, started last summer. Clean hydrogen made in Fukushima will be used for the Tokyo Olympic and Paralympic Games."

Wind, particularly offshore wind, is another renewable energy source that Fukushima is pursuing. The Fukushima Offshore Wind Consortium is supported by MET! and includes major firms like Marubeni, Mitsubishi Heavy Industries and Hitachi Ltd. The project now has three turbines: 2-MW and 5-MW turbines from Hitachi and a 7-MW turbine from MHI.

The japan Wind Power Association has proposed that onshore and offshore wind power provide 36GW of electricity by 2030, equivalent to the output of about 30 nuclear power plants. The central government has set a target of generating 820 MW from off- shore wind turbines by 2030. As of February 2017, there were nine offshore wind projects nationwide, including fixed and floating off- shore turbines that were generating nearly 60 MW.

In March 2017, the association identified a number of problems with offshore wind power in japan, including cost and poor electric grid infrastructure in areas with good wind like Hokkaido and Tohoku. The more populated central and western parts of japan, where grid infrastructure is often better, have only moderate wind speeds, malting it difficult for wind farms to turn a profit.

Also cited as hurdles were legal issues over the common use of sea areas as well as concerns from politically powerful fishing unions.

In Fukushima itself, a 2017 prefectural sur- vey showed support for renewable energy remained strong, with 54 percent of respondents saying they wanted to keep using it in their daily lives and 14 percent saying they did not.

Between local efforts to meet the 2040 goal of 100 percent use, and central government and business support for Fukushima to become a testing ground for renewable energy technologies, the march toward moving Fukushima from a nuclear past to a renewable future continues.

This is a part in a series looking at how the Tohoku region is attempting to rebuild itself seven years after the March 11, 2011, disasters.

Carbon Pricing

Highlighting economic solutions to cut global emissions

The Japan Times, 30 April 2018

Tokyo - Kae Takase, the senior manager of the Car- bon Disclosure Project (CDP) Worldwide-Japan gave a lecture on carbon pricing at Academy Hills in Tokyo's Minato Ward on April 3. CDP is an international non-governmental organization that provides a disclosure system for investors, companies, municipalities and countries to monitor and manage their environmental impact

She is also a researcher at the Japan Science and Technology Agency and the University of Tokyo, as well as vice-president of Governance Design Laboratory, Inc.

In her presentation she included global trends and examples of some of the leading countries' approaches to emissions reduction to raise awareness and provoke thought on how Japan should develop its own car- bon pricing strategy.

Audience members included individuals from major manufacturers and financial institutions, as well as researchers.

The lecture, organized by The Japan Times, opened with a greeting from The Japan Times President Takeharu Tsutsumi. Following this and a brief self-introduction, Takase explained the concept of carbon pricing.

Carbon pricing is, as the term suggests, putting a price on carbon emissions. Carbon pricing regulation consists of a carbon tax and cap-and-trade system, often referred to as emissions trading.

After it was first introduced in northern Europe in 1990, all European Union nations gradually followed suit by 2005, the year the European Union Emissions Trading System was launched Today, carbon pricing regulation exists in various forms in 41 nations.

What is the major difference between carbon tax and emissions trading? In the case of a carbon tax. the total tax is calculated after carbon dioxide emission amounts from the past year are finalized.

Kae Takase, senior manager of the Carbon Disclosure Project (CDP) Worldwide-Japan, delivers a presentation on carbon pricing in Tokyo on April 3 (Yoshiaki Miura)

In emissions trading, a cap is set on each company before it starts anew year. In most cases, this cap is determined based on an estimate of how much emissions can be reduced in comparison with the reference year. This way, it is ensured that the total amount the nation produces continues to decrease.

In fact, since 2010, Japan has been partially introduced to emissions trading. "Tokyo implemented the system to include large- scale companies that maize up 20 percent of all companies in Tokyo in 2010. Saitama Prefecture followed suit in 2011. Emission allowances can be traded inter-prefecturally between the two," said Takase.

In 2012, the global warming countermeasures tax came into effect, a tax imposed proportionally on carbon content. The question is fit is enough. As for the carbon tax, Japan charges ¥289 per

ton of carbon dioxide, while Sweden, the leader in this field charges about ¥14,000 per ton of carbon dioxide.

When it comes to emissions trading, only two prefectures are participating and both have a market price around ¥1,360 per ton of carbon dioxide, whereas the highest figure of ¥2,400 per ton of carbon dioxide comes from the province of Alberta in Canada as of December.

However, there is an argument that Japan's energy tax is high enough to maize up for the insufficiency of carbon pricing coverage. The energy tax is imposed on fuels at the time of purchase, as opposed to basing it on the amount of emissions produced after burning the fuel.

The point is that the energy tax system is not proportional to the level of emissions created by each energy source. For example, coal produces much more carbon dioxide than gasoline when burned. However, the energy tax rate for coal is not set proportionately higher than that of gasoline.

The imbalance becomes even clearer when looking at the tax rate per one ton of carbon dioxide using the effective carbon price of each energy source. The effective carbon price consists of the energy tax, the carbon tax and the price for emission allowances. The result is that the tax rate ends up being extremely low for coal.

Takase addresses audience questions following her presentation (Yoshiaki Miura)

The same can be said for heavy oil, kerosene and natural gas, whereas the tax rate is much higher for light oil, aircraft fuel and liquefied petroleum gas. Additionally, gasoline holds the highest tax rate, listed at almost 25 times the price of coal. Conversely, coal has the lowest tax rate, despite being the leading source of carbon dioxide emissions.

This disparity will continue as long as Japan relies heavily and almost exclusively on the energy tax instead of carbon tax and emission cap and trade.

However, the core of the whole discussion should not be forgotten The idea of reducing carbon emissions collectively and glob- ally for the future of the earth is where it all started If Japan intends to be part of it, "we should consider what the most efficient and sustainable way is," said Takase.

Today's predominant view is that carbon pricing is the most cost-effective method and this cost-effectiveness is one of the most important factors of sustainability.

Takase pointed out that the European Commission clearly stated: "Emissions trading systems are among the most cost-effective tools for cutting greenhouse gas emissions. In contrast to traditional command and control regulation, trading harnesses market forces to find the cheapest ways to reduce emissions."

Explicit carbon pricing, including the cap- and-trade system that puts prices directly on carbon emissions, uses market principles to draw out convincing prices for emissions on its own. However, implicit carbon pricing-typically represented by the previous example of Japan's tax rate for coal -can be more complicated and inefficient.

It is also becoming increasingly difficult for Japan to continue down its own path when some countries with higher goals start looking for ways to engage other nations in a collective effort for faster arid better achievements.

Quoting French President Emmanuel Macron's view shared during the European Commission's high-level conference on sustainable finance in Brussels on March 22, Takase said, "He stressed that the carbon price floor should be set at EU level, and that a border tariff should be imposed on the countries that did not sign the Paris agreement."

The Paris agreement was created in 2015 within the United Nations Framework Convention on Climate Change. Having been a successor to the Kyoto Protocol, first enforced in 2005, its focus is the reduction of carbon emissions, but it includes more countries than the Kyoto Protocol.

Japan is a signatory of the Paris agreement. And how much impact Macron's statement will have on EU's policies is unknown. However, what is clear is that the world is accelerating arid reinforcing efforts to reduce carbon emissions and address the climate change that is recognized as a global risk today.

The trend cannot be ignored, even more so when the global economy's favor is increasingly shifting in favor of greener businesses. Environmental, social and governance (ESG) investing began to gain prominence around 2005, the year the emission trading system was launched in the EU.

CDP, foreseeing the shift, has sent an annual questionnaire to close to 5,600 companies around the world, including 500 enterprises in Japan, since 2003.

Information and data about each company's environmental efforts are analyzed and disclosed mainly to institutional investors and asset owners. Whether a company is making environmental choices or not is becoming a progressively significant factor in making investment decisions.

Climate Action 100+ is an initiative based on the statements addressed by 409 investors from around the world. Throughout the program, the emissions reduction efforts of 100 large-scale companies from various countries are monitored, disclosed and improved.

Out of the 100 companies, 10 are from Japan and include Nissan Motor and Panasonic.

Besides Climate Action 100+, there are a few other rating and certification organizations that examine whether companies belonging to a particular value chain are in line with the environmental policies addressed by the top of the value chain, as well as if they are committed to reducing emissions.

"For example, Dell, a computer company, has a guideline for its suppliers. They do not work with those who do not meet their environmental requirements," said Takase.

Other big players such as Apple, IKEA and BT are demanding their suppliers shift to renewable energy and reduce carbon emissions. The fear of losing business-to-business opportunities provides enough motivation for the entire length of global value chains to make greener choices.

One way companies can start acting to reduce emissions is to use internal carbon pricing, a method that puts a price on emissions by a company.

This helps employees understand the concept of carbon pricing that is often more difficult to grasp at a macroscopic level. It is also much easier to try to reduce something clearly visible.

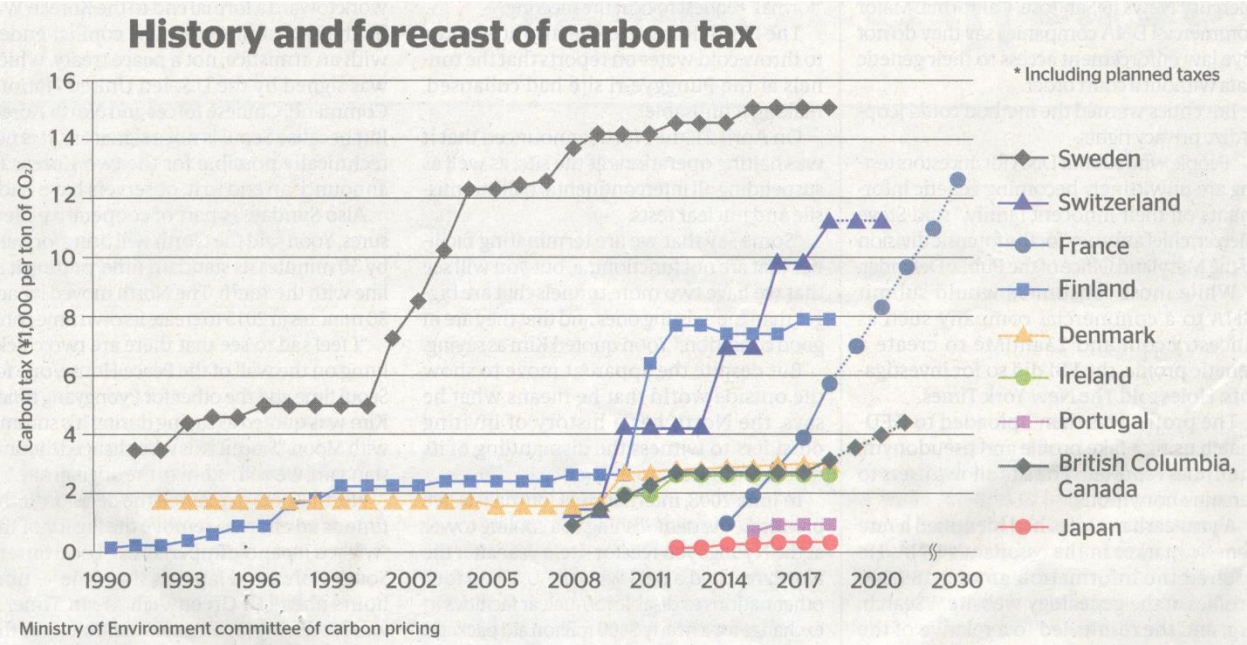
Arguably more important is that the result can be reflected in a company's financial reporting, which is influential in regards to attracting investments.

According to ari analysis on the CDP questionnaire, 66 out of 590 companies surveyed have already implemented internal carbon pricing in Japan, while 65 more are planning to adopt it in the next two years.

How to set an internal carbon price depends on each company, but Takase introduced two basic methods. One is to estimate the level of regulation that may be imposed by the government in the future. The other is to quantify the environmental damage caused by the company's business activities, and come up with a carbon price that would mal<:e up for the damage.

Partly due to corporate efforts, Tokyo and Saitama, the two prefectures where carbon pricing regulation of an inclusive cap-and- trade system is already in place, achieved greater emissions reduction rates beyond their initial targets.

Tokyo's reduction rate by 2016 was 26 per- cent over the average amount of the reference years (three consecutive years selected from 2002 to 2007), which was approximately 10 percentage points more than their target.



Though it may still appear challenging to continue simultaneously growing and reducing carbon emissions for both companies and the country as a whole, reduction efforts can make positive impacts on the economy, too.

In British Columbia, Canada, a change in the economic structure has occurred since the carbon tax was introduced in 2008. The shift from energy-intensive industries to service industries generated more employment as a result.

This raises a question of whether advanced countries will have to give up high-emission manufacturing. "In a country like Japan where labor cost is extremely expensive, only high value-added industries can survive anyway. As ESG investments continue to become more and more active, they will be an option for manufacturers to utilize low carbon technologies and manage in an efficient way, but the production sites don't have to be inside Japan," said Takase.

Another merit is that there are countless ways in which carbon pricing revenue can contribute to society. For example, it can be invested in support activities, research and innovation for enhancing low-carbon energies, energy conservation or infrastructure improvements.

In some countries, tax cuts in various forms for individual households and enterprises have been enacted by virtue of the extra income.

Japan is blessed with the opportunity to use examples and ideas from the rest of the world in creating its own carbon regulatory policies for domestic companies to remain competitive, and for the society as a whole to receive the benefits of a cleaner environment accompanied by additional financial resources.

This page has been produced with the support of the Ogasawara Foundation for the Promotion of Science and Engineering, which was founded by the late Toshiaki Ogasawara, the former chairman and publisher of The Japan Times.

Korea takes steps toward hydrogen economy

Shin Ji-hye, The Korea Herald, 12 September 2018

Hydrogen to be included in nation's third energy plan this year

Seoul - South Korea has launched a joint private- and public-sector committee to create a roadmap for the hydrogen economy as part of the nation's move to shift to clean energy, according to officials.

The hydrogen economy recently gained momentum in Korea as the government set the energy source as one of the three key investment areas alongside data and block chain in August. The government set aside 110 billion won ($97 million) for next year, a rise from 42.2 billion won this year, with the aim of boosting the hydrogen industry and developing energy technologies for cars, buses, railways and vessels as well as power generation.

The joint committee launched will be chaired by vice minister of the energy ministry, comprising of ministries from transportation, environment, fisheries, finance and science. Participating companies include Hyundai Motor, Posco Energy, Doosan Fuel Cell and Hyosung.

During the committee meeting, the participating members shared the view that the hydrogen is a driving force to lead the clean energy shift, according to the Energy Ministry. In November, Korea set a goal of the energy shift to increase the portion of green energy to 20 percent in 2030 to replace nuclear and coal.

The Energy Ministry said it would include the role and application of hydrogen energy in the nation's third energy plan slated to be mapped out by the end of this year. The plan is expected to include measures to give the hydrogen economy a legal

foundation, institutions and a strong enough eco-system for hydrogen-powered cars to gain momentum.

A hydrogen charging station in Mapo-gu, Seoul (Yonhap)

The energy plan mapped out every five years is the nation's top administration plan in the energy area. The third plan will be a base for the nation's energy policies from 2019 to 2040.

The energy plan mapped out every five years is the nation's top administration plan in the energy area. The third plan will be a base for the nation's energy policies from 2019 to 2040.

The government also said it was reviewing legislation related to the hydrogen economy in order to systemically foster the industry, efficiently run the hydrogen market and safely manage hydrogen energy.

Currently, four bills related to the hydrogen economy were proposed by both the ruling Democratic Party and the main opposition Liberty Korea Party. The bills are widely expected to be passed this year.

"The hydrogen economy is a promising business area for promoting innovative growth and replacing fossil fuel as an eco-friendly energy source," said Lee In-ho, vice minister of the Energy Ministry.

In line with the move, a special purpose company called Hydrogen Network will also be set up in Korea this year. When the organization is established in the form of a company limited by shares, it will operate around 100 hydrogen charging stations by 2020 with the investment of around 200 billion won.

Currently, 15 companies, including Hyundai Motor, Hyosung Heavy Industries, SK Gas and Linde Korea, are reviewing to participate in the company.

http://www.koreaherald.com/view.php?ud=20180912000721&ACE_SEARCH=1

South Korea to generate electricity with bio-heavy oil

Kim Bo-Gyung, The Korea Herald, 10 September 2018

Seoul - South Korea's Trade Ministry announced legislation approving the use of bio-heavy oil made with animal fat to produce electricity here, in a move toward the Moon Jae-in administration's goal to boost the use of clean energy.

According to the ministry's enforcement of regulations on petroleum and its substitute fuel, power stations here will be allowed to use bio-heavy oil starting as early as January.

The government has conducted test runs and research using bio-heavy oil made with animal fat, leftover cooking oil and biodiesel by-products since 2014 at five power stations that run on bunker-C oil, and has found the renewable energy to be adequate as a substitute, the ministry said.

This comes as the Moon administration has pledged to cut down the use of nuclear

energy to 23.9 percent and raise renewable energy to 20 percent by 2030.

(Pixabay)

“Electricity generated using renewable energy will increase once bio-heavy oil is commercialized. This will contribute to reaching the government’s ‘Renewable Energy 2030’ goal, cutting down on fine dust and greenhouse gas emissions,” the Trade Ministry said.

Details on quality standards of bio-heavy oil will be finalized by the end of the year.

Power plant-exclusive bio-heavy oil produces almost no sulfur oxides, and when compared to heavy oil it emits 39 percent less nitrogen oxide, 28 percent less fine dust and 85 percent less greenhouse gases, according to research from the Korea Petroleum Quality and Distribution Authority.

It also has lower initial investment than other renewable sources, as it could be used at existing facilities that use bunker-C oil.

http://www.koreaherald.com/view.php?ud=20180910000672&ACE_SEARCH=1

Nuclear power is our green future

Dr. Mohd Syukri Yahya, The Strait Times, 5 October 2018

Kuala Lumpur - Nuclear power was Malaysia’s last energy option during Tun Dr. Mahathir Mohamad’s first tenure as prime minister. The policy was rescinded by his two successors, who studied nuclear as a possible part of our energy mix in the peninsula.

However, now that Dr Mahathir is back at the helm, nuclear power is again out of any energy policy consideration.

He declared during his address at the Conference of the Electric Power Supply Industry (Cepsi 2018) that Malaysia would instead explore full use of domestic coal reserves for baseload power generation.

His stand against nuclear power is not surprising. In a number of his blog posts, he lamented over disturbing experiences with radioactive materials called “amang” during the Asian Rare Earth Bukit Merah controversy.

He claimed that until today, scientists had failed to offer an acceptable solution to the radioactive waste conundrum. Be it in office or out, he said that nuclear power should never be an option for Malaysia. It, however, feels like we are unwittingly turning the clock back to the 1980s.

When he opts for coal, a number of prominent people — such as Bill Gates, former United States president Barack Obama and former Greenpeace Canada president Patrick Moores — embrace nuclear power.

This is because nuclear power is accepted as the only proven solution for a carbon-free base-load electricity generation.

Nuclear power was so unexpectedly popular in the last decade that there was even a brief period of global nuclear renaissance when climate change felt inevitable and crude oil price hikes seemed unending. Almost immediately, unfortunately, the Fukushima nuclear accident occurred in 2011.

In spite of the accident, 436 nuclear power reactors are in operation in 31 countries, while 55 new reactors are under construction. Even Japan, which experienced Fukushima first hand, as well as the Hiroshima and Nagasaki atomic bombings, is gradually restarting its nuclear power plants to meet domestic electricity demands. Germany, on the other hand, shut down nuclear-powered plants post-Fukushima.

In place of the domestic nuclear power, Germany imports electricity from, ironically, nuclear-powered France, while sweating over a creeping increment of carbon index due to their higher reliance on fossil fuels.

While coal is cheap and abundant, making it the most widely-used source of energy for power generation, one cannot but notice greyish thick smog arising from the chimneys of coal-fired power plants in operation.

The smoke pollutes surrounding air and water, and affects the health of the neighbouring communities.

Exposure to coal and its by-product at these plants possibly contaminates the food chain.

The burning of coal emits humongous amount of greenhouse gases to the atmosphere.

Even the “clean coal” technology, according to the guidelines of International Finance Corporation and the World Bank, as championed by Tenaga Nasional Bhd, is not clean as it emits poisonous greenhouse gases, albeit at a much reduced amount.

Since we are fast approaching the breaking point of greenhouse gases at 425 parts per million, we should accept only zero carbon emission instead of a mere reduction.

Coal is not the answer for our future energy needs. On the other hand, nuclear industry offers proven solutions to radioactive waste problems. The first approach is by closing the fuel cycle loop as in recycling nuclear spent fuels as what France has done for decades and what Gates’ TerraPower is working on

The second option is by storing the high-level radioactive wastes in a long-term underground repository, just like in Finland, Sweden and France.

One should note that this radioactive-waste repository is like a treatment facility where we store and monitor the activated nuclear materials. Unlike chemical waste, which remains the same forever, radioactive waste decays according to its various half-lives. With time, its radioactivity abates and becomes manageable.

Nuclear power is neither popular nor easy. But nuclear power, in tandem with renewable energy and long-term power storage, offers a solution for a greener future. It should, therefore, remain an option for Malaysia.

Dr Mohd Syukri Yahya, Bandar Baru Bangi, Selangor

https://www.nst.com.my/opinion/letters/2018/10/418304/nuclear-power-our-green-future

‘Deep decarbonization’ needed

Lin Chia-Nan, Taipei Times, 23 August 2018

Fiery future? Academia Sinica’s Research Center for Environmental Changes is drafting a road map to help the nation take drastic action against climate change

Taipei - If Taiwan continues to emit green-house gases at the same rate, its average temperature is likely to exceed 40°C·one day, said Wang Pao-kuan, director of the Academia Sinica's Research Center for ·Environmental Changes, adding that the center plans to release a white paper with a·road- map for implementing "deep decarbonization" in the nation. A fiery weather scenario is not far-fetched.

The Central weather Bureau on July 10 registered a record- high temperature of 40.3°C for the year at its monitoring station in Hualien County's Tiansiang when Typhoon Maria swept hot wind into the area.

The bureau on June 15 began using a three-color warning system to issue high-temperature alerts, with "yellow" signaling a temperature of 36°C; "orange" a temperature of 36°C or above for three consecutive days, or 38°C for one day; and "red" a temperature of 38°C or above for three consecutive days.

The scorching heat in the northern hemisphere this summer demonstrates that climate change is exacerbating weather severity, and that the weather is becoming even more variable, Wang told the Taipei Times in an interview on August 10.

The bureau on June 15 began using a three-color warning system to issue high-temperature alerts, with "yellow" signaling a temperature of 36°C; "orange" a temperature of 36°C or above for three consecutive days, or 38°C for one day; and "red" a temperature of 38°C or above for three consecutive days.

The scorching heat in the northern hemisphere this summer demonstrates that climate change is exacerbating weather severity, and that the weather is becoming even more variable, Wang told the Taipei Times in an interview on August 10.

While scientists world- wide have been working on models to forecast temperature change over the next 100 years, most models. can only register average weather conditions, not predict extreme conditions, he said.

Some people remain skeptical about climate change, because it varying, phenomena are difficult to explain using sirnplified models, as meteorologists cannot replicate natural conditions In the laboratory as physicists and chemists do, Wong said.

Moreover, scientists are still trying to understand the motion of air, the transmission and transformation of various energy forms and solar activity, factors pertinent to climate science, he said.

Increasing emissions of carbon dioxide' are held to be the primary cause of climate change, as the gas traps heat in the Earth's atmosphere, he said.

In 2015, carbon dioxide made up about 95.21 percent of the nation's total greenhouse gas emissions, followed by methane (l.91 percent), nitrous oxide (1.58 percent), sulfur hexafluoride (0.4 percent), perfluorocarbons (0.33 percent), nitrogen trifluoride (0.22 percent) and hydrofluorocarbons (0.35 percent), Environmental Protection Administration data showed.

Academia Sinica President Makes Liao, center, and some of the 21 newly elected academics pose for a photograph at the post-election news conference in Taipei after the 33rd Convocation for Academicians

In the same year, the nation promulgated the Greenhouse Gas Reduction and Management Act, in which it pledged to cut the amount of green- house gas emissions it produced in 2005, or 284.643 million tonnes, by 2 percent by 2020, 20 percent by 2030 and 50 percent by 2050.

The act's goals are not feasible, so the center later this year would release a white paper with recommendations on how the nation can achieve "deep decarbonization," Wan said.

The·drafting of the white paper began in 2015, when Wong Chi-huey was president of the Academia Sinica, he said, adding that the center had briefed former president Ma Ying-jeou on the project.

The paper's first edition would explain why the nation must take more "drastic". action against cli- mate change and even achieve "negative emissions" to meet the goals of the Paris climate deal, · even though Taiwan is not a UN member, he said.

Due to its limited size, Taiwan should form "strategic alliances" with other nations to achieve climate goals, Wang said, identifying the Netherlands, the UK, Canada and Australia as potential collaborators.

Asked about Chinese National Federation of Industries chairman William Wong's remark that as Taiwan is too polluted to develop tourism, its economy must rely on manufacturing, Wang said that manufacturing could become "not dirty."

Industry should increase energy efficiency while reducing carbon emissions, enabling the nation to "decouple GDP growth from car- bon emissions," he added.

The white paper would not include recommendations for specific industry sectors - that would require more research - but it would sketch out an optimal energy picture for the nation and ·ways to transform industry, as well as how a carbon tax might benefit Taiwan, he said.

"Petrochemical companies cannot continue to operate in the same old way," Wang said. "If they want to stay in Taiwan, they should improve their production techniques."

Manufacturers of electronics should follow Apple Inc.'s example and adopt green energy sources, he added. Other projects related to examining aspects of decarbonization are being conducted by sociology, economics and chemistry re- searchers at the Academia Sinica, Wang said.

While the center receives more resources than other institutions in the nation, Wang said that its budget, equipment and personnel are not adequate for studying climate change.

"Scientists have a very limited understanding of how the oceans store far more heat than the atmosphere," he said. "Taiwan should establish an independent research center to study climate change, and elevate the center to the national policy level."

Apart from environmental issues, climate science comprises atmospheric science and ocean physics, which require powerful computers that can accurately and efficiently analyze large amounts of data, he said.

The center has asked to purchase such computers, but has been instructed to instead use the facilities at the National Center for High-Performance Computing, Wang said. However, the computing center cannot always accommodate the research center's needs.

EPA increasing subsidies for energy saving efforts

Taipei Times, 20 August 2018

Taipei - To encourage local goverrtmets to do more to reduce carbon emissions, the Environmental Protection Administration (EPA) said that next year it would provide subsidies of up to NT$10 million (US$324,654) for about 10 carbon-reduction proposals.

The EPA has been offering annual subsidies to promote energy saving and carbon reduction, but most has gone to promotional efforts, Department of Environmental Sanitation and Toxic Substance Management Director-General Yuan Shaw-ying said.

To inspire more comprehensive and creative projects, it decided to increase the money, he said.

About 3,000 boroughs and villages have joined the EPA’s carbon-reduction program, and it expects local governments to connect the efforts of separate units by proposing integrative projects, he said.

For example, those in urban areas could submit proposals on how to reduce the energy consumed by neon lights and billboards in a specific area, such as Taichung’s Situn District or New Taipei City's Banciao District where there is a lot of scope for energy-cutting measures, he said.

Improving building ventilation systems by growing vegetables on rooftops and walls or developing aquaponics systems would also help save energy, he said.

Local governments could also develop low-carbon emissions reduced would be estimated by the amount of electricity saved, which would have to be verified by independent agencies recognized by the EPA, he said.

Applications should have been filed by end of September, and 10 or so winner would be announced before the end of this year, Yuan said.

Vietnam's clean energy in need of a just transition

VietNamNet Bridge, 20 September 2018

Hanoi - In two years time, Vietnam could stop building new coal plants, while maintaining a safe, affordable and secure energy system.

This is a result of a draft report themed "Ensuring justice in the energy transition in Vietnam" composed by the Viet Nam Sustainable Energy Alliance (VSEA).

The report was published in cooperation with Green Innovation and Development Centre (GreenID) under the framework of the International Conference: Fostering Cooperation to Ensure a Just Energy Transition hosted by GreenID and Friedrich Ebert Stiftung Vietnam (FES Vietnam) and Union of Science and Technology Associations (VUSTA).

By increasing the share of renewable energy and using power in the more sustainable way, Vietnam can avoid building about 25 coal power plants to embrace the national energy security thus saving US$60 billion of expecting investment for the plants and $7 billion per year spending on imported coal. (VNA/VNS Photo)

Developing sustainable energy is a priority in many countries including Vietnam. However, how to ensure employment for affected workers and peacefully switch from fossil fuel to renewable energy and avoid any social unrest has not attracted much attention.

Nguyen Thi Hoang Nguyen from Ministry of Labour, Invalids and Social Affairs, a member of the research group, stressed the significance of vocational training for workers and accelerate civic engagement into developing energy policies to ensure just transition.

Also, by gathering a variety of regional and international experts on the topic of just transition ranging from academia to trade unions and policy makers, the workshop provides a platform for an in-depth exchange on the status quo of just transition efforts in Asia and beyond.

"Our goal is to conceptualise a just transition in such a more comprehensive way to shape a more sustainable and humane version of tomorrow's economy. So how can we unite these different approaches to build alliances for a just transition in Asia and beyond? That is one of the key issues we would like to discuss

during the conference," said Yvonne Blos, President of FES Vietnam.

The research also considers three scenarios including the State-issued Power Development Plan VII (PDP7) revised, the renewable energy scenario and the renewable energy combined with energy efficiency, both were proposed by GreenID.

Under the revised PDP7, Vietnam's power industry is expected to meet socio-economic development objectives with an average yearly GDP growth of 7 per cent during the period 2016-30, 1.5 per cent lower than the GDP forecast in the original PDP7. Meanwhile, the scenario of renewable energy combined with energy efficiency promises better benefits.

VSEA suggests that, by increasing the share of renewable energy and using power in the more sustainable way, Vietnam can avoid building about 25 coal power plants to embrace the national energy security thus saving US$60 billion of expecting investment for the plants and $7 billion per year spending on imported coal.

The proposed scenario is also expected to reduce 116 million tonnes of CO2 emissions per year compared to the PDP7 revised and help the country to be accordance with Paris Agreement targets.

https://english.vietnamnet.vn/fms/science-it/208730/vietnam-s-clean-energy-in-need-of-a-just-transition.html

Vietnam to develop Luang Prabang hydropower project

Ekaphone Phouthonesy, Vientiane Times, 26 April 2018

Hanoi - The Lao and Vietnamese governments have agreed in principle to continue support for development of a Luang Prabang hydropower project, one of the largest power plants on the Mekong mainstream, according to an official statement.

The Lao government issued the statement after its monthly meeting on April 24. The one-day meeting, chaired by Prime Minister Thongloun Sisoulith, discussed a wide range of issues including cooperation between Laos and Vietnam.

According to a section of the statement, which was accessed by Vientiane Times, the cabinet agreed to assign the Lao-Vietnam joint commission to contact its Vietnamese counterpart to discuss the possibility of accelerating the development of cooperation projects that top leaders of the two sides had agreed on recently.

This includes Luang Prabang hydropower project in Laos and Yung Ang seaport in Vietnam.

According to technical data from the Lao Energy Business Department under the Ministry of Energy and Mines, the Lao government has allowed Vietnam Petro Power Corporation t o develop the Luang Prabang hydropower project since 2007.

This facility has the capacity to generate 1,410 MW and can produce 7,380 Gwh a year. The cost of the project and the power purchaser have not yet been made public.

However, it has become clear that Vietnam is now looking for more electricity to support its policy of turning the country into a key manufacturing centre in the region.

Earlier, Vietnam's Minister of Industry and Trade, Mr. Tran Tuan Anh, met the Lao Minister of Energy and Mines, Mr. Khammany Inthirath, to discuss the possibility of importing more electricity from

Laos as part of efforts to secure supplies against a backdrop of growing demand for power.

According to data from Vietnam 's state agencies, the demand for electricity in the country is expected to increase by 37 percent by 2025 and 58 percent by 2035. Growing power consumption in Vietnam has turned the country from an electricity exporter to an importer.

Vietnam views Laos as a potential supplier as it has the capacity to generate up to 10,000 MW a year. Currently, Laos supplies most of its power to Thailand.

According to Mr. Tran Tuan Anh, Laos and Vietnam need to develop a legal framework and connect their power grids so that the two countries can engage in greater power trade. A number of Vietnamese energy officials have suggested to their government that Laos could be one of the potential suppliers of electricity, according to media reports.

About CACCI:

Founded in 1966, the Confederation of Asia-Pacific Chambers of Commerce and Industry (CACCI) is a regional non-governmental association principally composed of the national chambers or associations of commerce and industry in Asia and the Western Pacific. Its current membership of 28 countries and independent economies cuts across national boundaries to link businessmen and promote economic growth throughout the Asia-Pacific region. CACCI holds Consultative Status in the Roster Category of United Nations' Economic and Social Council (ECOSOC)

Published by: **The Secretariat, Confederation of Asia-Pacific Chambers of Commerce and Industry**
Ernest Lin - Director General; Amador Honrado Jr. - Editor; Mig Moreno - Assistant Editor
7F-2, No. 760, section 4, Bade road, Songshan district, Taipei 10567, Taiwan; Tel. (886 2) 2760-1139, Fax (886 2) 2760-7569
Email: cacci@cacci.biz Website: www.cacci.biz