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Together, we commit to act for nature

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EDITOR'S NOTE

Dear Reader,

The resource-intensive practices of today can no longer sustain the world. Each year, the earth gets warmer and its effects reverberate throughout the world. Rising sea levels, unpredictable climate patterns and extreme weather events have become the norm, instead of outliers. Even the rise in zoonotic diseases has been found to have linkages to unsustainable practices. World Environment Day this year is thus, significant on several levels. This is because the world is currently combating daily with the COVID-19 pandemic, with efforts to revive economies and rebuild the society underway. While we cannot diminish the vast toll that this disease has exacted from the society as a whole, it now presents an opportunity for the governments and other stakeholders across the world to rebuild sustainably.

This issue of the newsletter, in the backdrop of World Environment Day 2020, seeks to explore several pathways to climate change mitigation. In 'Mitigating Climate Change Through Integrated Energy Networks', we take a look at how a more integrated and holistic approach to energy generation can greatly elevate climate action. 'A brief look at climate change mitigation measures and best practices from across the globe' takes us across some potential measures and ongoing endevours that are at the centre of our efforts to combat climate change. The article 'Mitigating climate change by overhauling the urban transport system' shines a light on two cities that have set a gold standard in preventing ecological deterioration by building a sustainable urban transport system. 'Cooling of tomorrow: Sustainable, cross-sectoral & energy efficient' examines the deep linkages between the rising cooling demand and climate change and creates a roadmap for meeting this demand in an ecologically viable manner.

We are at a crucial juncture of our efforts to mitigate climate change. While, the COVID-19 pandemic has forced a rethink of global climate targets and redirected capital to avenues of immediate relief, it has also presented the world an opportunity to re-build sustainably. An integrated, cross-sectoral approach to climate change mitigation can help stem the tide of environmental deterioration and enable us in moving towards a cleaner, better tomorrow.

With Regards,

Soumya Prasad Garnaik
Business Unit Head (Lighting)
Energy Efficiency Services Limited (EESL)

O P Agarwal
CEO
WRI India

Mitigating climate change by overhauling the urban transport system

The ongoing COVID 19 pandemic is a harsh reminder that preserving the ecological balance is critical. Unfortunately, we have been draining our planet way beyond the resources it produces for us and have been taking away what rightfully belongs to our future generations. There is no better opportunity than the World Environment Day to pledge a correction in our ways and move towards more sustainable living.

Transport systems in cities around the world have been the major contributors towards carbon emissions. This has largely been due to the fact that we have become enamoured with our personal motor vehicles and the freedom it gives us to move around. However, they consume far too much fuel and emit far too many pollutants. This needs to change, especially when viable alternatives are available.

Policies in several countries around the world have advocated the use of public transport and non-motorised modes of travel, like cycling and walking, instead if personalised motor vehicles like cars and motorbikes. Despite the existence of such policies, people continue to buy personal motor vehicles and their use is going up day by day. One of the reasons has been that public transport systems have not received the kind of attention that they need. Especially in India, they have been built as standalone and fragmented systems, even though people need integrated systems to move from one place to another. Besides, we have paid scant respect to building safe walking and cycling infrastructure, often allowing footpaths to be narrowed down to offer an additional lane for cars. Two cities, namely Singapore and Seoul, offer examples of how things can be done right and set a precedent that other cities around the world need to emulate.

In Singapore, vehicle ownership policies make it extremely difficult, and expensive, to own a personal motor-vehicle. Not only does one have to buy the right to purchase a personal motorcycle, at fortnightly auctions, but one also has to pay a very heavy vehicle registration fee. All these costs, together, typically triple the cost of the car. As a complement to such stringent policies against vehicle ownership, Singapore has put in place a very good public transport system. It has also designed its land use in such a manner that most people living in the city have very easy access to an extremely efficient Metro rail system. The combination of good public transport and the high cost of owning a personal motor-vehicle has persuaded people to predominantly use sustainable forms of transport.

Seoul has also got an outstanding public transport system, comprising of Metro rail and a very well-structured bus system. Seoul's uniqueness is the excellent integration between these modes. Systems have been designed to allow interchange between modes with a single ticket. Schedules are also integrated to ensure good connections between one mode and the other. To complement its public transport system, Seoul has invested in building an outstanding environment for walking and cycling with wide footpaths and very pleasing landscaping that enhances the walking experience. They are one of the few cities in the world that is willing to reduce space for car use and provide more for walking. They have reduced the width of roads to widen footpaths, and not the other way round. They also demolished

over 40 flyovers and a long-elevated road running through the middle of the city in order to discourage car use and improve the landscape for walking. These are indeed bold measures.

Other cities need to learn from the experience of Singapore and Seoul and adopt sustainable modes of travel. The pandemic has shown us how beautiful our planet is and this is the time to pledge that we keep it that way. As someone said, our planet has enough for our needs, but not for our greed.

Sudhir Sharma
Program Management Officer
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A brief look at climate change mitigation measures and best practices from across the globe

The COVID-19 pandemic has shown that the current development model of removing forests and squeezing wild spaces into smaller and smaller corners of the planet has increased the vulnerabilities to zoonotic diseases and exposed us to major economic disruptions. We should also remember that COVID-19's effects on health, jobs and economies are simply an acute version of what climate change is predicted to bring about – and in places already has. Economies are building back, and it is an opportunity to build back in a way that brings us closer towards a more sustainable normal. The UN determined that climate action could trigger $26 trillion in economic benefits by 2030, create more than 65 million new jobs and avoid 700,000 premature deaths from air pollution. Some key pillars of mitigation and climate action that the world is currently focusing on are:

(i) **Phasing down Coal and fossil fuel use,** as it is clear in India that renewable energy is cost competitive with coal. Investment in new coal and coal mining facilities are no longer economically prudent as these assets will have to be subsidised to keep them operational. A study shows 62% of operational and under-construction coal power plants are costlier than new renewable sources.

(ii) **Scaling up investments in Smart grids** is enabling greater efficiency in system, reducing outages, enabling consumers to unlock energy efficiency possibilities, along with increasing the use of renewable energy to enable kicking the fossil fuel habit. Smart grids comprise a broad mix of technologies based on web-based communication technologies for managing the grids, better and real time data collection such as through smart meters and enabling more real time management. Between 2017 and 2023, the global market for smart grids is expected to triple in size reaching some 61 billion USD.

(iii) **The Energy Efficiency** potential in appliances, buildings, industry, transport, can save up to 1010 TWH of energy by 2030, equivalent to 150 GW coal capacity, and an investment potential of about 120 Billion USD.

(iv) **Electrification of demand** in transport sector is the biggest transformation to enable greening of transport sector. Electric Vehicle technologies and future potential of using renewable energy to generate hydrogen fuel are the key transformative technologies. The global Electric Vehicle market is estimated to grow from 3,269,671 Units in 2019 to reach 26,951,318 units by 2030, with several countries adopting targets of transforming to zero emission vehicles between 2030 and 2040.

The COVID-19 pandemic is a message from nature and so is the ongoing climate crisis. The crises can be an opportunity to move towards sustainable development.

Dr. S. Padmanabhan
Ex-Advisor
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Mitigating Climate Change Through Integrated Energy Networks

To meet global demand for increased energy use, while reducing emissions significantly, it will be necessary to produce energy (electricity) in a much more integrated way and use it more efficiently. This cannot be achieved by focusing separately on electricity, coal, oil, gas and renewable forms of energy. It will require an integration of all energy sources with electricity produced from renewable energy, nuclear power, and fossil fuels with carbon capture and storage. The 'Integrated Energy Network' or Sector Coupling as it is also referred to, is the convergence of four system elements: customer engagement with energy resources and providers; dramatic emissions reductions through clean energy (renewable and efficiency); application of information and telecommunications technologies, and, an integrated grid enabling further economy-wide emissions reductions through end-use electrification.

Why do we need an Integrated Energy Network (IEN)? What are its benefits?

IEN advances deep decarbonisation through electrification obtained through an optimal mix of conventional energy, renewable sources and energy efficiency. Deep decarbonisation is the process of mitigating and finally totally eliminating the use of carbon in all its forms in the generation and utilization of energy. To reach a fully decarbonised economy by 2050 we need to eliminate emission from power utilities as well as difficult- to- abate, carbon intensive, end-use sectors such as industry (steel, cement and petro-chemicals) and freight transport by road, shipping and aviation. These sectors currently account for 30 percent of total global emissions. For India carbon emitted on the demand side of the energy equation, namely, in industry, transport, buildings and farms is greater than on the supply side through coal-fired power generation.

A clean energy network that comprises grid- connected renewable with electricity used to electrolyze water to produce hydrogen can be used to produce bio-fuels to substitute petroleum fuels in transport and industry. It involves major tectonic shifts in the manner we generate electricity and create the smart grid infrastructure to deliver it for the production of clean carriers like hydrogen as feedstock for the manufacture of bio-fuels. Although IEN is a futuristic concept, its seeds have been planted and technologies, such as hydrogen manufacture, storage and conversion to bio-fuels including fuel cells, battery storage and electric vehicles are either at an embryonic or near commercial stages. A global level IEN program to collectively transition to cleaner technologies on both sides of the energy equation is central to meeting the global target of net zero emissions by 2050.

Mark Lister
Managing Partner
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Cooling of tomorrow: Sustainable, cross-sectoral & energy efficient

As we approach World Environment Day, it is imperative that we take a moment to stop and reflect on all the complex relationships between our environment and our individual well-being. Our need for thermal comfort, and in particular, our growing need for cooling clearly exemplifies this deep linkage. While cooling is a key cog of the climate action machinery, it also spans across a wider set of economic and social issues, along with being an enabler of better quality of life. Energy efficient and sustainable cooling is pivotal towards curbing greenhouse gas emissions and climate change. Furthermore, access to cooling is critical for achieving a number of Sustainable Development Goals, including for storage and transport of food, through effective 'cold chains' that can enhance the viability of agriculture in many areas.

In light of the COVID-19 pandemic that has gripped almost every corner of the globe, the return to normalcy hinges of the creation of an effective vaccine. Currently, the focus is rightly on research and development of the vaccine. However, little has been said about effectively delivering and administering the vaccination to all the people around the world that will demand it. This will be a considerable logistical exercise, not least because like other vaccines and medicines, any COVID-19 vaccine will likely need to be stored and transported in temperature-controlled conditions. Demand for effective medicine cold chains will therefore skyrocket. So, for very far-reaching health, economic and environmental reasons, improving access to cooling and reducing its environmental impact has never been more critical.

The need is immediate: in 2020, more than a billion people do not have adequate access to cooling. As temperatures and incomes rise, so will the demand for cooling and higher levels of comfort. This will translate into a rise in energy demand for cooling, which is set to triple by 2050. How will we meet this rapidly surging demand for cooling? Right now, the fast-growing $130bn market for cooling is dominated by relatively inefficient air-conditioners. It is imperative that the cooling industry and other stakeholders work towards meeting the expected upswing in cooling demand as efficiently as possible. Strong policies around minimum energy performance standards are essential, as are buyer incentives to choose efficiency, and better information about the technology options. More importantly, there is a need to examine the cooling resources that we already have, because meeting the entire cooling demand electrically will leave us with an enormous electricity supply requirement, and ever-growing emissions. We need to begin devising avenues to integrate sources of heat and cold that are already there in our ambient environment, and better harness them towards the thermal requirements of our growing communities.

Air conditioners and fans account for nearly 20% of the total electricity used in buildings around the world today; globally, energy related emissions from cooling are roughly equally split between space cooling, stationary refrigeration, and mobile cooling (refrigerated transport, vehicle air-conditioners and so on). There is also the added multiplier of so-called 'F-gases' used for refrigerants that damage ozone and are also powerful greenhouse gases. In 2016, the Kigali Amendment to the Montreal Protocol acknowledged the global warming potential of refrigerant gases and recognised the linkages between the dual goals of reducing harmful refrigerants in cooling and energy efficiency. Through the Kigali Cooling Efficiency Program (K-CEP), many organisations are now working concertedly towards these goals.

Under K-CEP, Asia Clean Energy Partners is acting as a cooling advisor and coordinator for the Private Financing Advisory Network (PFAN), hosted by UNIDO. PFAN is a global investment facilitation network that seeks out and assists early-stage investment projects and technologies in developing countries, coaching them through development of their business plans and improving investment feasibility, and helping to match them with investors. Our work with PFAN will help mainstream and normalise the uptake of new efficient cooling solutions. Asia Clean Energy Partners is also working with EESL to accelerate investments in the cooling market in Thailand, with a view to upgrade the cooling facilities for properties in the country's large hotel and resort industry. We are developing models to transfer EESL's world-leading bulk procurement and market transformation approach from India to the Thai market and create new markets for cooling technologies in the process.

If you have a sustainable cooling technology or business model that could be more widely deployed, in Thailand, Asia or across the world, then we would be interested to hear from you, in the interests of creating a cooler world.

This World Environment Day, its time for nature.

EESL's JV becomes the fastest-growing Indian owned company in the UK

EPAL ranked at the top among the 842 Indian-UK companies by a Grant Thornton & CII tracker

Delhi, May 22, 2020: Energy Efficiency Services Limited (EESL), a home-grown Super Energy Service Company (ESCO) under the administration of Ministry of Power, Government of India has set a remarkable global precedent in low carbon development. EESL's Joint Venture (JV), EnergyPro Assets Ltd (EPAL) has emerged as the fastest-growing Indian company in the United Kingdom (UK) in the "India meets Britain Tracker 2020", developed by Confederation of Indian Industry (CII) and Grant Thornton.

The JV, between Energy Efficiency Services Ltd (EESL) and British impact focussed energy efficiency firm EnergyPro Asset Management Ltd (EPAM)) has grown at a rapid clip, further reaffirming India's role as a global energy efficiency pioneer. EPAL bridges the energy transitions in India and the UK and marks an important chapter in the UK Energy Alliance endorsed by Prime Minister Narendra Modi in 2015. EPAL began its journey when EESL and EPAM joined together to acquire energy service company (ESCO) operations in the UK quickly followed by clinching a share in a grid-scale battery project in Canada. Since then, it has invested INR 633cr in the UK and has become a success story for Indian owned companies globally.

Speaking on the success of the JV, **Saurabh Kumar, MD-EESL** said "Through EPAL, we have crafted a global brand that consorts closely with the Prime Minister's appeal for fostering local businesses. It is another testament to our vision of building a world class energy service business that delivers economic, environmental and social benefits locally. The success of EPAL also marks a significant stride towards achieving India's overall energy transition, aided by the exchange of technology and best practices between India and the UK. This feat would not have been possible without the contribution of each and every member of the EESL family."

Adhering to the motto of being vocal about local with global aspirations, EPAL was at the top of the list of the fastest-growing 842 Indian-UK companies in the Grant Thornton & CII tracker. EPAL's watershed moment was in 2018 when it acquired Edina, UK's leading supplier, installer and maintenance provider for Combined, Heat and Power (CHP) solutions. Edina was the first-ever acquisition of an overseas company, by an entity administered under Ministry of Power, Govt. of India. For EESL, Edina has become a steadfast vehicle for technology and skill transfer from UK to India. The acquisition has resulted in an active pipeline of 100 MW of trigeneration projects in India worth INR 1000cr which will support the country's need for more sustainable cooling solutions.

The Covid-19 driven economic disruption has brought the energy transition into sharp focus. The government is working towards increasing the share of gas to 15% in the energy mix, and gas-based CHP solutions will remain pivotal to this expansion. The overall unconstrained market size for co-gen and tri-gen solutions in India is currently pegged at 15 GW. The benefits of tapping this potential are manifold, including optimization of India's burgeoning cooling needs. Further, by wide-scale deployment of gas-based solutions, EESL looks to pave the way for grid flexibility and integration of intermittent power. This bodes well with India's renewed target of integrating 450 GW of renewable capacity by 2030.