Issue **15** - March 2024

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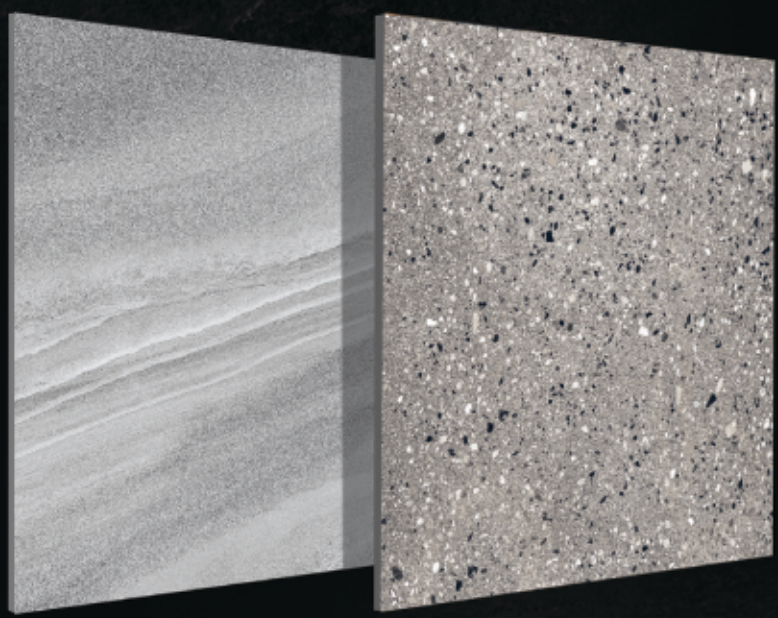

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Editor's Note

The March issue brings forth a profound dialogue on the forthcoming Budget 2024, addressing the economic challenges that persist and the aspirations we collectively hold.

In the wake of an unprecedented economic crisis, the government's active role in negotiating with creditors and seeking support from the IMF has been instrumental. As we navigate the Budget 2024, our focus remains on consolidating the gains made, particularly in the restructuring of loans and addressing the country's fiscal challenges.

The Ceylon Institute of Builders (CIOB) takes a proactive stance, presenting budget proposals aimed at revitalizing the construction industry. From restarting halted projects to attracting foreign direct investment (FDI) and addressing cost concerns, these proposals underscore the industry's commitment to progress.

With a vision for a self-sustaining construction sector, the CIOB proposes initiatives like supporting local manufacturing, fast-tracking project approvals, and providing relief to fallen contractors. The establishment of a construction sector development bank/fund emerges as a strategic move to alleviate financial burdens and encourage private participation in infrastructure projects.

A key highlight is the call for a separate ministry dedicated to the construction industry, recognizing its vast impact on employment and its potential to contribute significantly to the country's GDP.

As we advocate for positive change, this issue serves as a platform to discuss crucial matters such as tax structures and support for property developers. The aim is to foster an environment where the construction industry thrives, becoming a beacon of economic growth and sustainability.

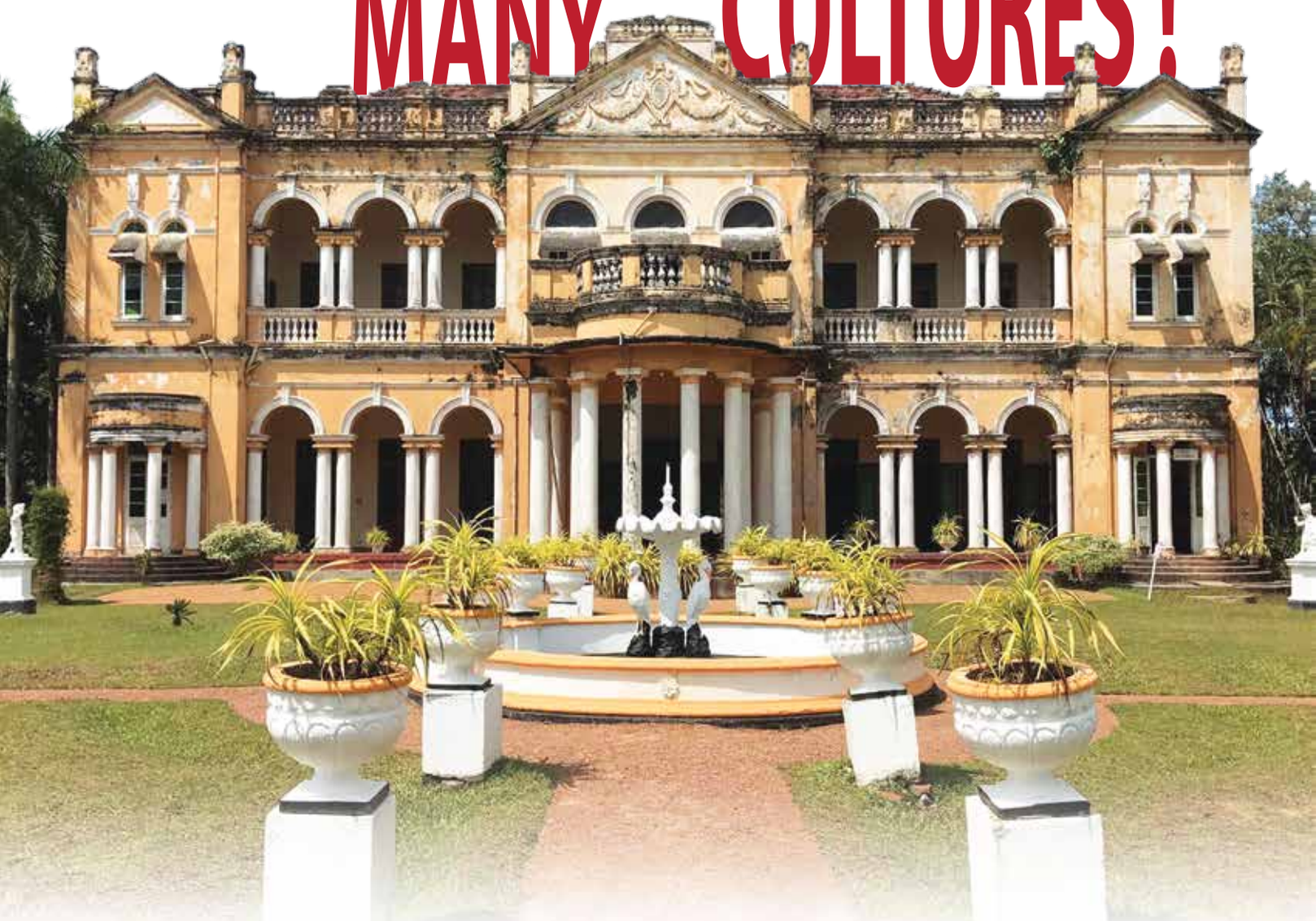
We are excited to announce the upcoming "Construction Expo 2024 by CIOB", scheduled for the 15th, 16th, and 17th of March 2024, at the BMICH, Colombo. Themed "Build Green for Smart Living," this expo marks a significant milestone as we come together to enhance the construction industry.

We are organizing this CIOB's annual exhibition after a short lapse of time this year to enhance the construction industry. After a brief hiatus, we are thrilled to showcase the latest innovations, technologies, and trends driving our industry forward. With your valued partnership, we aim to make Construction Expo 2024 a resounding success, fostering collaborations and driving growth in our sector.

Let this magazine be a source of inspiration and a catalyst for collaborative efforts that shape a brighter future for Sri Lanka's construction industry. Together, let us pave the way for a vibrant and sustainable future for Sri Lanka's construction industry.

RICHMOND CASTLE, KALUTARA

THE ART & CRAFT OF MANY CULTURES !



Richmond Castle is one of the main tourist attractions in Kalutara. It was built by Don Arthur De Silva the Mudaliyar has a tale of its own. The Mudaliyar was inspired by the architecture of the Palace of Maharaja of Ramnad of India, one of his old school mates from London. The mansion was completed around early 1900s by local builders.

Richmond Castle, built at the turn of the century in Kalutara, is considered one of the most spectacular architectural works of the period. The castle is located in located in a rural area called Thekkawatta which lies some 3 km east of Kalutara town.

The Richmond Castle, which is situated in 42 acres of land with stunning views, is a blend of structural design on a trail from the East to the West.

Richmond Castle is a two-storeyed building with 99 doors and 34 windows, decorated with glass panes of exquisite design depicting grape vines. Records indicate that two shiploads of teak were imported from Burma (Myanmar) for its construction.

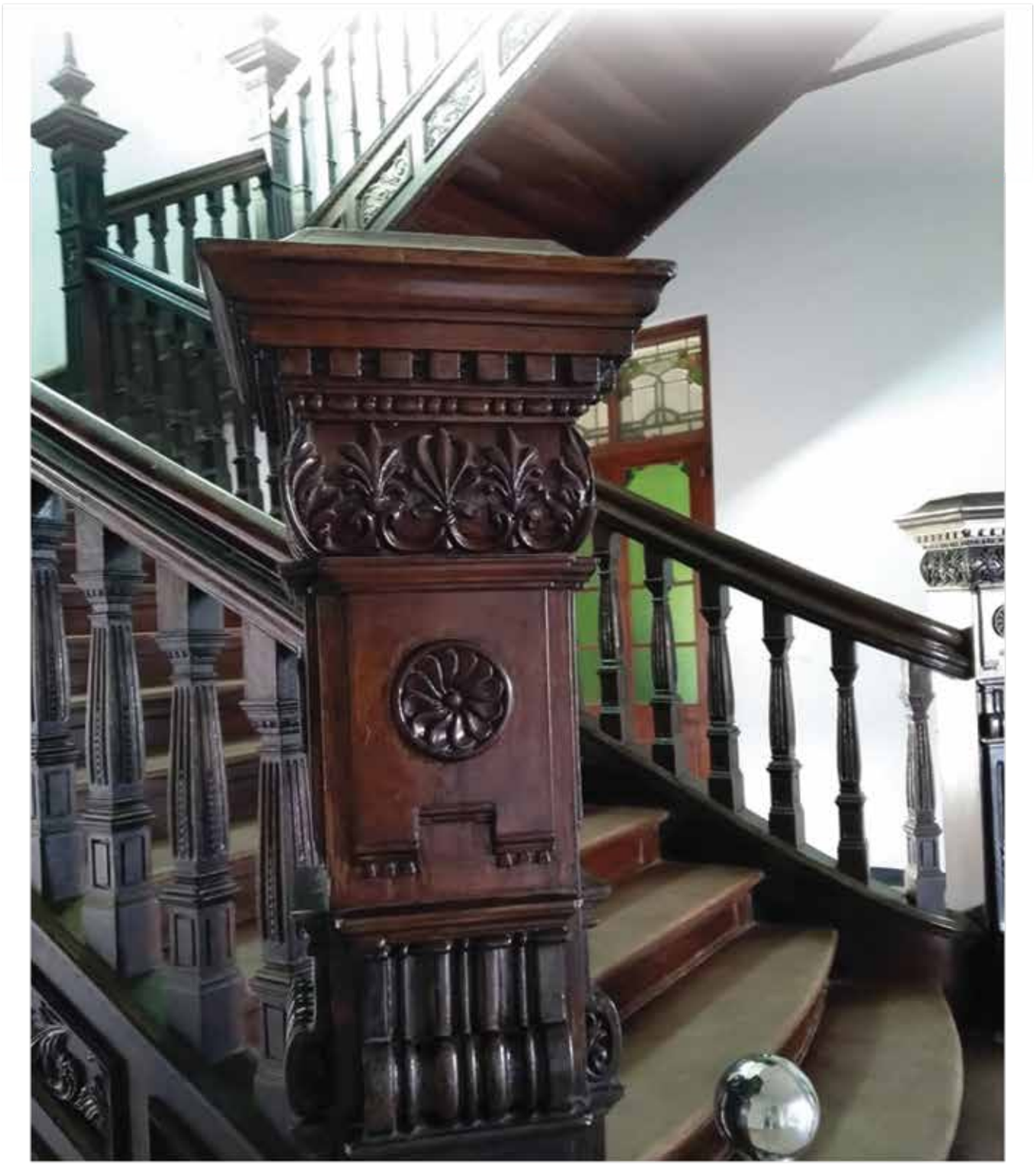
The Richmond Castle, which is situated in 42 acres of land with stunning views, is a blend of structural design on a trail from the East to the West.

Richmond Castle is a two-storeyed building with 99 doors and 34 windows, decorated with glass panes of exquisite design depicting grape vines. Records indicate that two shiploads of teak were imported from Burma (Myanmar) for its construction.

As the Mudaliyar, wanted to maintain the true luxury and exquisiteness of the mansion; every accessory of the mansion, including the tiles, fixtures wood and even the marble-lai
outdoors through the entryway.

The banquet hall, which is said to have housed many, both local and foreign dignitaries, has an underground ventilation system, which would direct the cool winds blowing from the Kalu Ganga (Kalu River) into the room, maintaining a natural air cooling system.

The bedrooms of the mansion were designed to be soundproof and to maintain the cool within the rooms, with the aging of the mansion and poor maintenance of it, the putty and other materials used for interiors could be seen through the decayed walls. The Richmond Castle is a living testament to the intricate fusion of the art and crafts of many cultures and works of art architectural structures.



It is said that 'Governor George Anderson was requested by the royal family of England to appoint a battalion of 40 soldiers to guard the castle and its occupants. Padikara Mudali, as he was known, had a 12-strong staff known as mudaliyars.

This Mansion was also used to the filming of the world-renowned film 'water' due to its architectural significance. The mansion which homes to the Mudaliyar and housed many dignitaries is now a house to the less fortunate children.

Courtesy : Internet

WHAT DOES NET-ZERO EMISSIONS MEAN & HOW TO ACHIEVE IT?

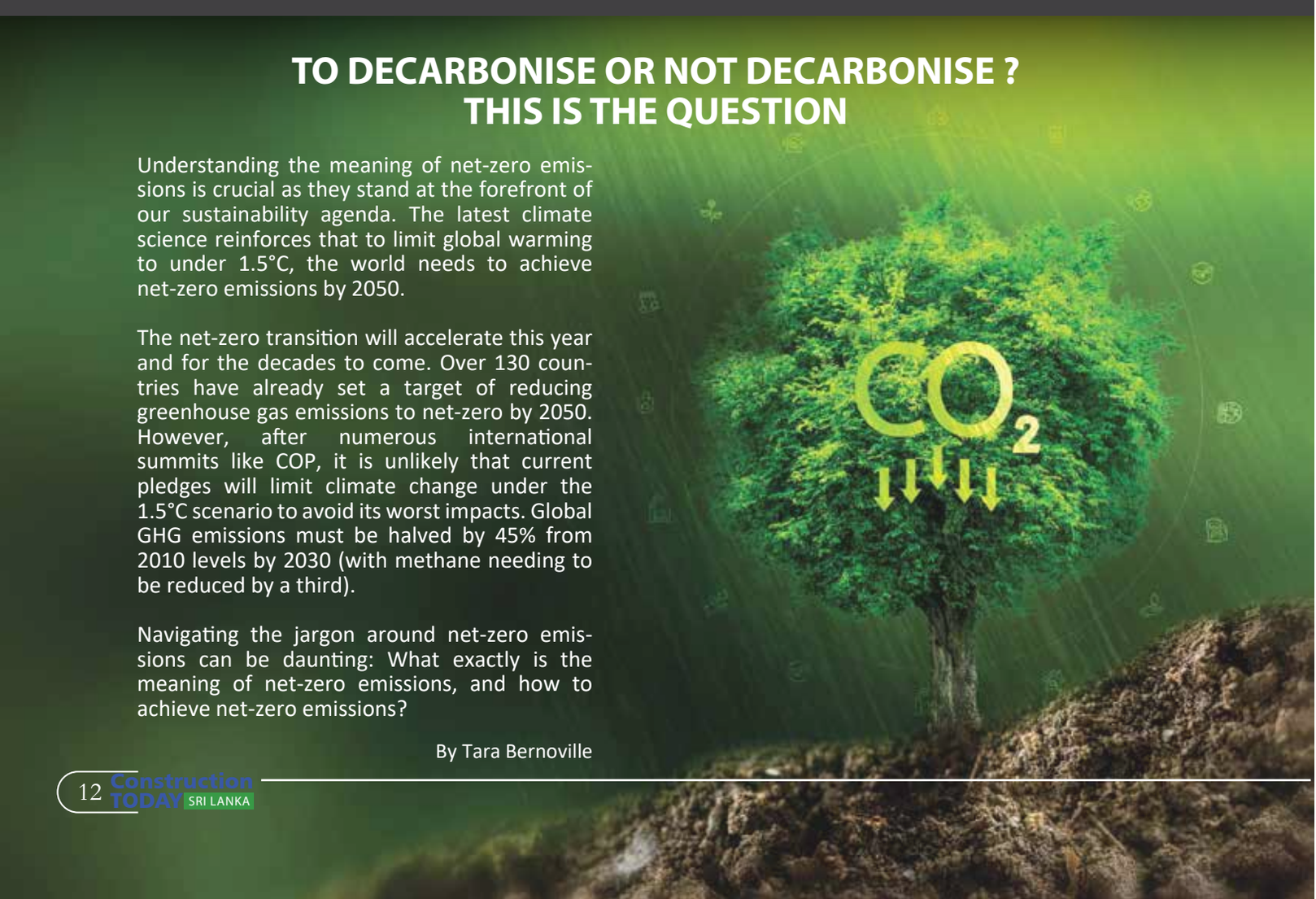
TO DECARBONISE OR NOT DECARBONISE ? THIS IS THE QUESTION

Understanding the meaning of net-zero emissions is crucial as they stand at the forefront of our sustainability agenda. The latest climate science reinforces that to limit global warming to under 1.5°C, the world needs to achieve net-zero emissions by 2050.

The net-zero transition will accelerate this year and for the decades to come. Over 130 countries have already set a target of reducing greenhouse gas emissions to net-zero by 2050. However, after numerous international summits like COP, it is unlikely that current pledges will limit climate change under the 1.5°C scenario to avoid its worst impacts. Global GHG emissions must be halved by 45% from 2010 levels by 2030 (with methane needing to be reduced by a third).

Navigating the jargon around net-zero emissions can be daunting: What exactly is the meaning of net-zero emissions, and how to achieve net-zero emissions?

By Tara Bernoville



WHAT ARE NET-ZERO EMISSIONS?

By definition, net-zero emissions means cutting greenhouse gas emissions to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere by oceans and forests, for instance. Net-zero is reached when a business has eliminated all the carbon emissions it could and then compensated the remaining emissions with beyond value chain mitigation.

The net-zero process starts with calculating emissions across scope 1, 2, and 3, setting science-based targets, developing decarbonisation pathways until 2030, and gradually moving towards long-term carbon capture, storage, and sequestration for those emissions which cannot be reduced.

For further scientific clarity, according to the IPCC, net-zero emissions are achieved when anthropogenic removals balance anthropogenic emissions of greenhouse gases to the atmosphere over a specified period. Where multiple greenhouse gases are involved, the quantification of net-zero emissions depends on the climate metric

chosen to compare emissions of different gases (such as global warming potential, global temperature change potential, and others) and the time horizon selected.

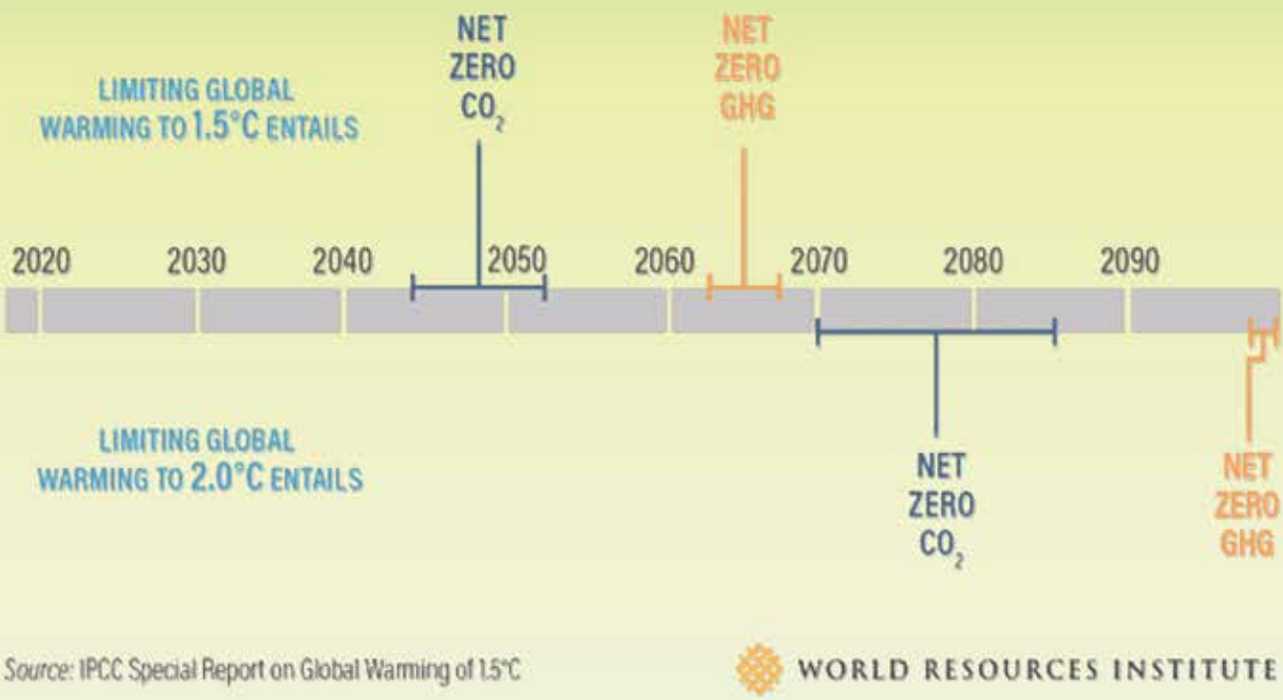
Achieving net-zero emissions by 2050: The path ahead

To achieve net-zero emissions by 2050, we need immediate and impactful climate action. As we near the critical threshold of 1.5°C increase in global temperature, the focus is now on governments and businesses to lead the charge in realising how to achieve net-zero emissions.

A variety of strategies exist for companies to adopt science-based targets to reduce emissions and progress towards net-zero. However, it's crucial that these pledges be put into action effectively, and not merely serve as greenwashing.

Did you know? Stabilisation of global temperatures will only occur once we've successfully achieved net-zero CO2 emissions. To put this in perspective, limiting global warming to 1.5°C (2.7°F) necessitates reaching global net-zero carbon emissions by the early 2050s. Conversely, if we aim to limit the temperature increase to 2°C (3.6°F), the timeline extends to the early 2070s for reaching global net-zero carbon emissions.

GLOBAL TIMELINE TO REACH NET-ZERO EMISSONS



HOW TO BECOME NET-ZERO?

The United Nations launched the "race to net-zero" campaign with a worldwide coalition of companies and actors to answer this pressing challenge. Collectively these 3,000 actors cover nearly 25% of global CO2 emissions and over 50% of the worldwide GDP.

On the one hand, a McKinsey report estimated that the annual cost of getting to net-zero - when CO2 emissions are entirely reduced or captured - will be €8.2tn ($9.2tn). On the other hand, the number of companies using science-based targets (SBTs) has significantly increased. More than 1,045 companies representing €20.5 trillion in market capitalisation (more than the GDP of the United States) are committed to science-based targets for emissions reduction. Companies that translate climate commitments into concrete actions will achieve a sustainable leading status.

You don't need to climb Everest, but rather pick a hill and go. Companies often mistake the sustainability journey for an utterly complex one. It is a lot simpler. You must take the first step and start implementing actions leading to a significant shift in positioning as a market leader.
Lubomila Jordanova, CEO & Co-Founder at Plan A

WHAT ABOUT NET-ZERO PLEDGES ?

The net-zero pledges model presents limitations. It is criticised that most companies setting science-based targets to reach net-zero emissions look good on paper but less in practice. This practice enables a particular "net-zero greenwashing", misleading well-intentioned investors, stakeholders and consumers.

The reason is that many businesses are still making decisions based on outdated data and often do not know which framework to refer to. Also, it is primordial for companies to include all scope of carbon emissions in data disclosure. A recent report analysed the net-zero pledges of 55 of the biggest US companies and found no single large corporation with a net-zero goal covering Scopes 1, 2, and 3 emissions while limiting carbon offsets. The vast majority of major corporations are falling short regarding all three metrics: disclosures, targets, and actual performance.

For example, Walmart, the world's largest retailer, has an official strategy to reach zero emissions by 2040. Yet, according to the company, its reduction plan excludes Scope 3 emissions—although they make up 95% of its emissions. Take Chevron (which received an overall F grade): scope 3 emissions account for 91% of the company's greenhouse gas emissions, so while Chevron has focused on reducing Scope 1 and 2 emissions in line with 1.5 degrees, the report notes, those reductions represent only about 9% of the company's total emissions.

EXAMPLE OF A NET-ZERO COMPANY

Among the many companies aiming to be net-zero, Microsoft stands as a paragon. The tech giant pledged to be carbon negative by 2030, meaning it plans to remove more carbon from the atmosphere than it emits. Further, by 2050, Microsoft aims to have removed all the carbon it has emitted since its inception in 1975. Its ambitious commitment is an excellent example of a comprehensive approach to achieving net-zero emissions.

Microsoft's strategy revolves around the principles of reduction, electrification, and carbon capture. It uses a combination of measures like increasing the energy efficiency of their operations, transitioning to renewable energy, and leveraging carbon capture and storage technologies. Moreover, Microsoft is investing $1 billion in a new Climate Innovation Fund for technology development and carbon removal solutions. This exemplifies the transformative corporate action required to achieve the global net-zero target. How can companies achieve net-zero aligned carbon compensation?

As part of their net-zero strategies, companies are relying on voluntary carbon offsetting, but it is unlikely to deliver on net-zero promises. According to the Science-based Target Initiative (SBTi), SMEs and PMEs need to reduce their carbon emissions by 80% before compensating anything - carbon compensation would be too easy otherwise. The SBTi requires deep decarbonisation of 90-95% by 2050 for companies to reach science-based net-zero, emphasising that any residual emissions, which should not exceed 5-10% of a company's total emissions, must be neutralised through carbon removal methods. For certain sectors, such as the forestry, land-use, and agricultural sector, up to 20% carbon removal is permitted after an 80% decarbonisation by 2050.
The Oxford principles for net-zero aligned carbon offsetting

While striving for net-zero emissions, it's important to scrutinise the breadth of corporate pledges and to ensure carbon offsetting aligns with net-zero goals. Also, there is a clear need for the development of net-zero aligned carbon compensation principles.

On this regard, the prestigious Oxford University came up with principles, better known as "the Oxford Principles for net-zero aligned carbon offsetting". Our decarbonisation team has recommended reading their report as it is a natural source of truth regarding carbon compensation, in line with net-zero targets.

PRINCIPLE #1: CUT YOUR EMISSIONS FIRST, USE HIGH-QUALITY OFFSETS & REGULARLY REVIEW YOUR COMPENSATION STARTEGY

Numerous effective carbon offsetting methods have been established in recent years. Those who abide by these principles must first take into account these effective practices, which include:

- *Making your own emissions reduction a priority - The primary goal should be to limit the necessity for offsets.*
- *Upholding environmental integrity - Opt for offsets that can be verified, accurately accounted for, and carry minimal risk of non-additionality, reversal, or causing unintentional adverse effects on people and the environment.*
- *Sustaining transparency - Report current emissions, accounting methodologies, net-zero objectives, and the kinds of offsets being used.*

PRINCIPLE #2: SHIFT TO CARBON REMOVAL COMPENSATION

Most offsets available today are emission reductions necessary but not sufficient to achieve net-zero emissions in the long run. Carbon removals scrub carbon directly from the atmosphere. Users of offsets should increase the portion of their compensation that comes

from carbon removals, rather than from emission reductions, ultimately reaching 100% carbon removals by midcentury to ensure compatibility with the Paris Agreement goals. Creating demand for carbon removal offsets today will send the necessary market signal to increase the supply.

PRINCIPLE #3: SHIFT TO LONG-LIVE CARBON STORAGE

The transition from emissions reduction to carbon removal has been outlined but does not resolve how long the carbon is stored. Long-lived storage refers to storing carbon that has a low risk of reversal over centuries to millennia, such as storing CO2 in geological reservoirs or mineralising carbon into stable forms. On the other hand, short-lived storage involves methods with a higher risk of being reversed over decades.

PRINCIPLE #4: SUPPORT THE DEVELOPMENT OF NET-ZERO ALIGNED CARBON COMPENSATION

Forming sector-specific alliances - work collaboratively with peers to develop a net-zero aligned offsets market. Adopting and publicising these principles and incorporating them into regulation and standard setting for carbon compensation and net-zero emissions approaches. Supporting the restoration and protection of a wide range of natural and semi-natural ecosystems in their own right.

Did you know that Coldplay uses the Oxford principle to compensate for their emissions from world touring?

In conclusion, the path to achieving net-zero emissions demands not only understanding the meaning of net-zero emissions but also concerted action from all sectors of society.

Plan A stands ready to assist you on your journey towards decarbonisation and science-based target setting.

Courtesy : plana.earth/academy

YEAR 2024 & CONSTRUCTION INDUSTRY

FOR THE ATTENTION OF EXISTING & FUTURE GOVERNMENTS

Dr. Rohan Karunaratne.

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Hatton National Bank PLC-Director
Sino Lanka Hotels & Spa-Director
Helanko Hotels & spa (Pvt) Ltd-Director
Pinthaliya Resorts & Spa -Chairman

Sri Lanka is about to lose one of its largest industries. This is an industry which contributed around 9.6 % to the GDP and involves directly and indirectly nearly 2.6 million stake holders. This is none other than the Sri Lankan Construction industry.

By now, the Industry has shrunk by 60%. Over 500,000 employees have been retrenched and over 10, 000 professionals have left the county. Government has kindly appointed a task force to counteract this issue. All stakeholder s contributed to this cause and produced a 51-point report. From this, the government chosen 11 points of concern and showed their support to fulfill these points. Yet nothing happened.

Therefore, immediate attention should be given to put the construction industry back on track by the existing government or any future governments which shall acquire power.

PRIORITIES AS SUCH ARE:

1/ Providing aid to bring back ruined contractors who have lost due to sudden stoppage of their projects & non-settlement of their bills in a reasonable manner. Many government officers have ignored the commitments of contractors (noted below) and this harassment is what had devastated contractors.

- Bonds &guarantees issued by banks
- cost overruns
- settlement of suppliers, sub-contractors labor salaries and dues
- harassment from banks to settle bank dues and encashing their bonds & pressing for settlements
- consultants too are ignoring this situation
- not approving their EOTs, variations, claims etc.
- These contract disputes are further tortur ing contractors especially the SME sector.

Imagine a small/medium contractor who acquires a job and puts all their life efforts into that one projects. They sometimes keep their own home as collateral for bonds & guarantees, high-interest loan for bridging finance, gaining credit from material suppliers and even equipment in hope of future projects. All the while, material prices increases 3-4times and these are not remunerated to contractors. Bearing all this they still survive, however when their projects are stopped, it is the final blow to their livelihood.

To make matters worse, these projects are acquired via highly competitive bids with 3-4% margin or even to the cost simply for the survival of their company. In such projects cashflows are damaged, financial stability is damaged and in short it damages their whole business cycle. Due to a fault of the economy or government this person has no relief from banks, creditors, and thus marks the end of yet another of Sri Lanka's few remaining contractors.

FOR THIS PROBLEM, OUR RECOMMENDATION IS THAT:

A high-powered committee (consisting of government administrative officers, industry representatives and experts in construction policies & contracts) should be appointed to deal with contractor issues, enhance contractual obligations, facilitate amicable dispute resolution, and evaluate the adequacy of the current terms of contract in the current context of crisis & to make appropriate amendments for adequate compensation mechanisms, in a way that is favorable to the contractor because he is not at fault.

2/ Restarting of halted projects- dangerous half-done structures should be recommenced. Help contractors of the relevant projects to receive payment for the cost overruns and complete the projects without incurring losses and complete the outstanding projects. Funds can be drawn from the 55B allocated for construction industry and the 1.26T given for new developments for this.

3/ Government to negotiate and encourage the restarting of donor funded projects

4/ Roads are deteriorating very fast. Therefore, the government should commence road maintenance & overlays. If this is not financially feasible, imposing a minor road tax would be beneficial, rather than waiting for both people and vehicles to be destroyed due to dangerous roads.

5/ Construction cost & VAT increase:

Given that construction cost skyrocketed in the year 2022, Currently Sri Lankan construction cost has reduced to levels in par with its neighboring countries namely, Indonesia, Malaysia, Vietnam etc. Therefore, even with VAT increases for material and fuel we can manage to be at the range of $800/m2, which is still a favorable price to restart private sector projects & attract FDIs. This is good news.

6/ Fair Distribution of work:

We ask you to remember that there is no work in the country. Therefore we strongly & very seriously advise that government & regulating authorities, control the distribution of work in a way that is just and fair for all, so that a few large companies do not grab all the work that others severely need to survive. This is what the industry requires to survive the year 2024.

WHAT ROLE COULD BIODEGRADABLE MATERIALS PLAY IN BUILDING & CONSTRUCTION?

Industries around the globe are reevaluating their practices to incorporate environmentally friendly materials for a sustainable future. Traditionally, construction has been associated with resource-intensive processes and materials that contribute to environmental degradation, but biodegradable materials are revolutionizing building and construction in this regard.

This article discusses the role of biodegradable materials in building and construction and how building design can be made more circular using these materials.

By Taha Khan

WHY DO WE NEED BIODEGRADABLE MATERIALS IN CONSTRUCTION?

Biodegradables are organic materials that can be decomposed via microbial activity and abiotic elements like oxygen, UV, temperature, etc. The main advantage of using biodegradable materials is due to their environmentally friendly nature since they can be decomposed into simpler organic materials that fade into the soil.

The idea of using biodegradable materials in construction may seem counterintuitive since conventional materials like steel and concrete have been used for a very long time, and they provide durability and longevity as well.

The problem with conventional materials is the environmental toll of extracting, processing, and disposing of them, which has prompted researchers to explore alternatives that align with the principles of sustainability.

Hence, for some time now, researchers have turned towards biodegradable materials derived from renewable sources like plant fibers, biopolymers, and agricultural waste and have the unique ability to break down naturally over time, minimizing the ecological impact associated with traditional building materials.

HOW BIODEGRADABLE MATERIALS ARE USED

Biodegradable materials are designed to break down naturally over time, reducing the environmental impact associated with traditional construction materials. For instance, normal plastic is dangerous for the environment since it does not decompose for a very long time; however, biodegradable polymers derived from natural sources, such as cornstarch or sugarcane, can be used to create biodegradable plastics, which, over time, break down into harmless byproducts, reducing the amount of waste produced.

These plastics can be employed in various construction applications, including packaging, insulation, and temporary structures. Similarly, researchers are exploring biodegradable concrete alternatives to reduce the environmental impact of traditional concrete production, which is a significant source of carbon dioxide emissions.

RECENT STUDIES CIRCULAR DESIGN FOR SUSTAINABLE BUILDING

In a recent study, researchers explored the transition to a Circular Economy (CE), focusing on making building designs more circular using biodegradable materials. In the study context, "circular design" does not refer to literal circular shapes but rather to a circular economy concept that involves designing, producing, and using goods with the intention of minimizing resource input, waste, emissions, and energy leakage by keeping materials and products in use for as long as possible through strategies such as recycling, and regeneration.

The study emphasizes the need to replace conventional linear building components with circular building components during maintenance and renovation to achieve sustainability goals. The Circular Kitchen (CIK) serves as an exemplary case, with four design variants including a 'Bio kitchen' utilizing biodegradable materials, a 'Reclaim! Kitchen' incorporating recycled content, a 'Life+ kitchen' optimizing the current design, and a 'Plug-and-Play (P&P) kitchen' featuring modular components for extended use.

Environmental design guidelines were developed based on Life Cycle Assessment (LCA) and Material Flow Analysis (MFA), revealing that the modular P&P kitchen exhibits the least environmental impact and material consumption. The study underscores the importance of co-creation, integral redesign, and multifunctionality in achieving truly circular building components.

STRAW-BASED BIODEGRADABLE INSULATION FOR BUILDINGS

In another 2017 study, researchers focused on the role of biodegradable materials in building and construction, particularly in developing insulating materials. The study addresses replacing widely used polystyrene insulation with more sustainable alternatives. The research emphasizes the environmental advantages of utilizing biodegradable materials, specifically straw-based insulating panels bonded with casein glue. The study explores the complexity of creating these panels and conducts physico-mechanical tests, including bulk density, thermal conductivity, stress at deformation, and flexural strength. Results indicate that using casein adhesive, a natural and biodegradable material, shows promise in creating stable and environmentally friendly straw-based insulation.

CHALLENGES

The durability of biodegradable materials in diverse climatic conditions and their cost-effectiveness compared to traditional counterparts are big challenges. The cost of biodegradable materials, at present, can be a deterrent against widespread adoption. Government incentives and policies promoting sustainable construction practices could play a crucial role in making biodegradable materials more economically viable.

CONCLUSION

As the construction industry faces increasing scrutiny for its environmental impact, integrating biodegradable materials allows for creating more sustainable and circular building practices. The innovative use of these materials in construction can revolutionize the industry, aligning it with the principles of circular design and reducing its ecological footprint.

Courtesy : AZOBUILD

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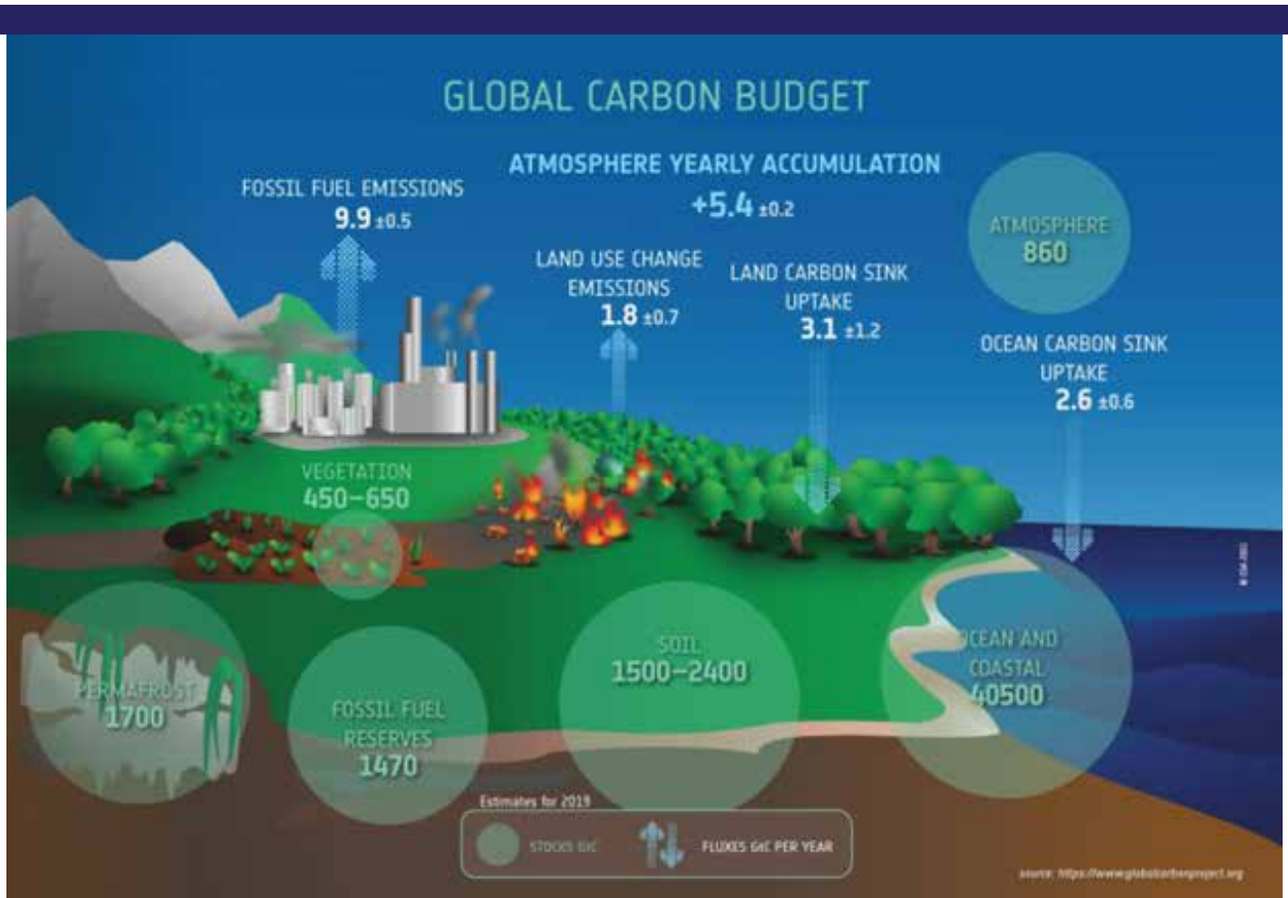
EARTH'S CARBON BUDGET



EARTH'S CARBON BUDGET FOR 1.5°C WILL BE EXHAUSTED BY 2029, SAYS IPCC

Humanity is burning through its available carbon budget quicker than originally thought, scientists say.

Without urgent and concerted global efforts to reduce atmospheric CO2 emissions that cause climate change, we could breach the 1.5°C limit by 2029 instead of the mid-2030s, The Guardian reports.

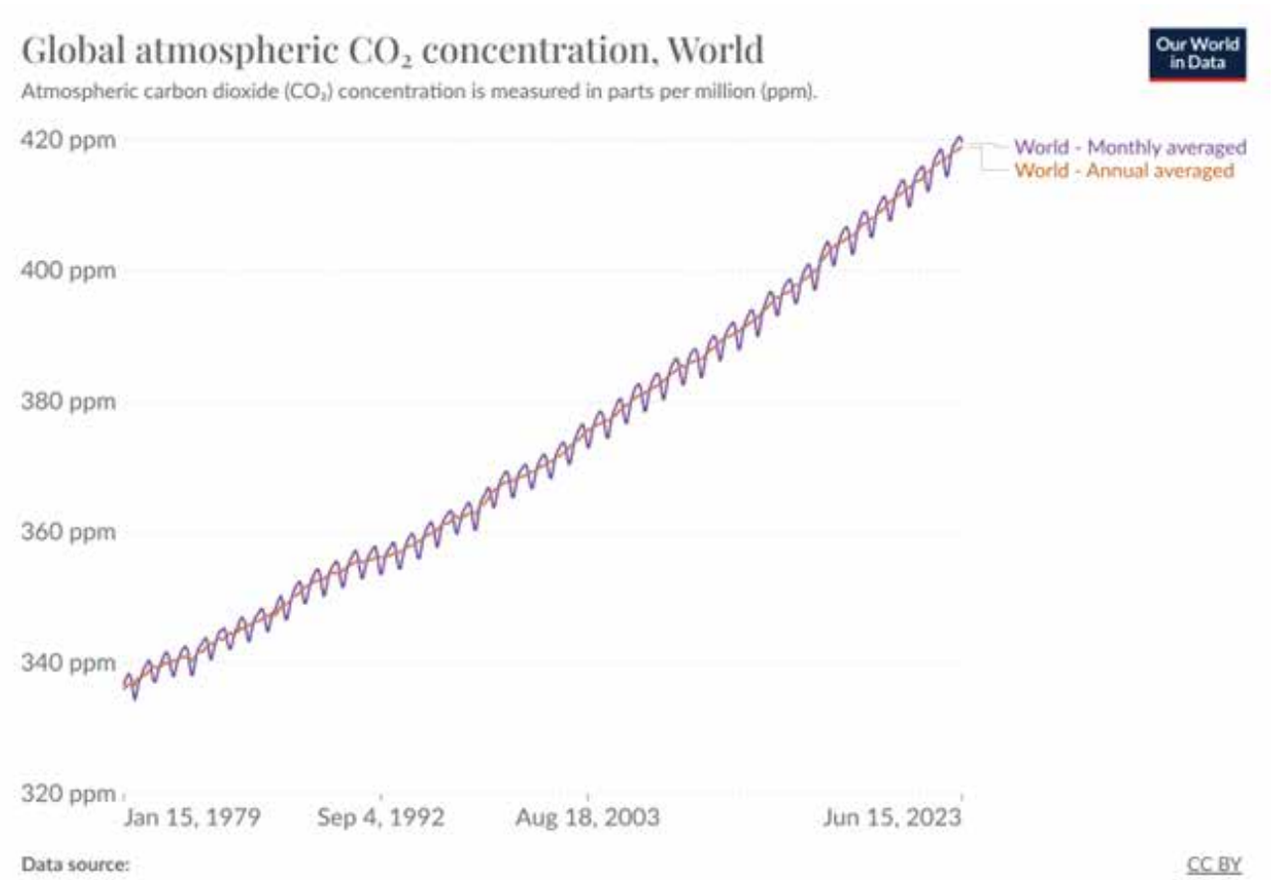
Globally, 2023 saw extreme heat and unprecedented temperatures, including the world's hottest-ever month recorded in July. Mean-average annual temperatures for the year are expected to be close to 1.5°C above pre-industrial levels.

While this could be a one-off extreme year, scientists are concerned that soon the volume of CO2 in the atmosphere will keep temperatures at dangerous levels for longer.

UN advisory body the Intergovernmental Panel on Climate Change, had forecast that the world could afford to emit another 500 billion tonnes of CO2 and have a 50% chance of keeping below the 1.5°C target. This budget assumed annual carbon dioxide emissions of around 40 tonnes.

However, new research into the impact of a global ban on aerosols, which worked to cool the atmosphere by reflecting sunlight back into space, has led scientists to recalculate the remaining carbon budget.

The latest estimate leaves 250 billion tonnes, which brings forward the 1.5°C deadline to 2029 - just six years from now, *The Guardian says.*



Courtesy: The World Economic Forum

TYPES OF METALS & THEIR USES

GENERAL INTRODUCTION OF METALS

Types of Metals and Their Uses [with Pictures] :- The significance of metals and advancement in the manufacturing processes has resulted into the much needed industrial revolution. This revolution has contributed to an escalated growth of human civilization bringing us where we are today. Today, we find numerous types of metals in our surroundings. From the nib of your pen to the big steel bridges, everything big or small is made up of metals. To our surprise there are more than eighty different types of metals found in the world today.

DEFINITION OF METALS

Metals are defined as minerals or substances that are found naturally below the surface of the earth. Most metals are found to be lustrous or shiny. Metals are inorganic substances, which imply they're product of substances that were never known to exist. Metal is incredibly sturdy and so is employed to form several things. These are used for manufacturing vehicles, computer items. Satellites, preparation utensils, etc. Most metals are found to be exhausting however some aren't. Sodium and potassium are those metals that may be cut by knife whereas mercury could be a liquid metal at temperature. On the other hand metals such as iron, copper, steel etc. are found in solid state

CLASSIFICATION OF METALS

A) CLASSIFICATION BY IRON CONTENT

The most prevalent method of classifying metals is by iron content they have. A metal containing iron is called ferrous metal. The iron is responsible for magnetic properties of the metal and also makes them susceptible to corrosion. Metals not containing iron content are called non-ferrous metals. These metals do not exhibit any magnetic properties. Examples aluminum, lead, brass, copper and zinc.

B) CLASSIFICATION BY ATOMIC STRUCTURE

The metals can also be classified depending upon their atomic structure according to the periodic table. Going by the periodic table a metal may be categorized as alkaline, alkaline earth, or a transition metal. Metals coming in the same group behave alike when reacting with other elements. Hence these metals exhibit analogous chemical properties.

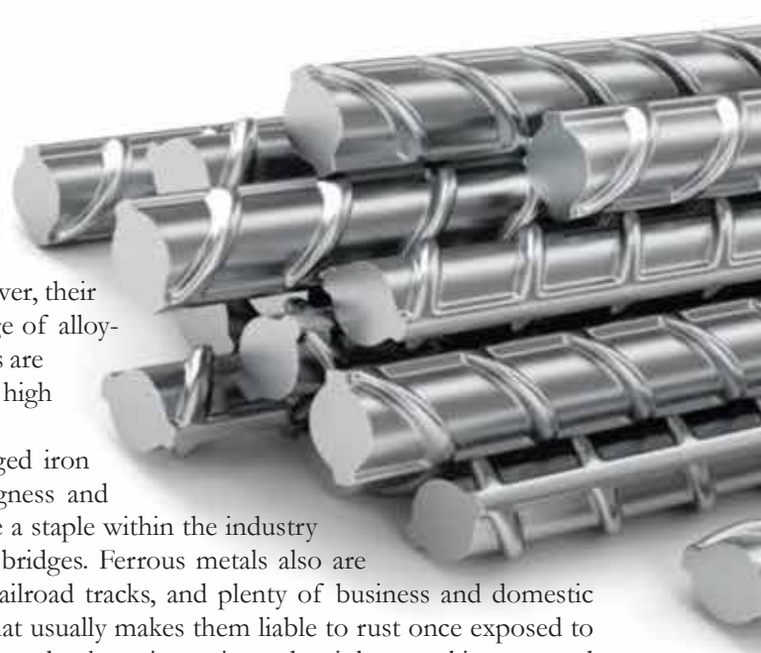
C) CLASSIFICATION BY MAGNETIC & NON-MAGNETIC METALS

Another means to distinguish metals is studying their behaviour or interaction with magnets. Analysing their behaviours towards magnets helps to classify them as magnetic or non magnetic.
The ferromagnetic metals are strongly attracted towards magnets; the paramagnetic metals display weak interactions. Diamagnetic metals on the other hand shows loose repulsion towards magnets.

TYPES OF METALS

Metals are found to exist into 2 main types: ferrous metals are those that contain iron and non-ferrous metals that are those that contain no iron.

A) FERROUS METALS



The word ferrous itself comes from Latin in which the word is ferrum and means an iron containing compound of metal. Metals with considerably scarce amounts of iron in their composition aren't classed as ferrous metal. The iron in ferrous metals tends to induce some properties in them namely magnetic, of high strength and hardness. However, their characteristics will disagree greatly looking on the wide range of alloying parts of that they're created from. Metallic element metals are liable to rust once exposed to wet conditions as they need a high carbon content.
Some common metallic element metals embody steel, forged iron and iron. These metals are prized for his or her enduringness and sturdiness. Steel – additionally called structure steel could be a staple within the industry and is employed within the tallest skyscrapers and longest bridges. Ferrous metals also are utilized in shipping containers, industrial piping, vehicles, railroad tracks, and plenty of business and domestic tools. Metallic element metals have a high carbon content that usually makes them liable to rust once exposed to wet. There are 2 exceptions to the current rule: Iron resists rust thanks to its purity and stainless-steel is protected against rust by the presence of metallic element.
Most of the metals which are ferrous in nature are hugely magnetic thus making them a very helpful material for making motors and electrical applications, etc. The utilization of ferrous metals in your icebox door permits you to pin your searching list on that with a magnet.

1| STEEL

Steel is created by adding iron to carbon that hardens the iron. Steel becomes even more durable as different parts like metallic element and nickel are introduced. Steel is created by heating and melting ore in furnaces. The steel will be broached from the furnaces and poured into moulds to create steel bars. Steel is wide utilized in the development and producing industries.

A) STAINLESS STEEL

Stainless steel consists of elevated chromium content. This makes it 200 times more resistant to corrosion than low carbon steel. It is used in abundance for the manufacturing of kitchen utensils, piping, surgical and dental equipment.

B) TOOL STEEL

Tool steel is a special variety of steel used for forging cutting and drilling tools. The most important property is their high hardness making them an ideal choice for tool making. Tool steel comprises of molybdenum, vanadium, cobalt, and tungsten as its chief materials.

2| CARBON STEEL

Carbon steel incorporates a higher carbon content as compared to different sorts of steel eventually making it extremely hard. It's usually utilized in the producing of machine tools, drills, blades, taps. It is capable of having a very sharp edge cutting.

A) Low Carbon Steel

The percentage of carbon is up to 0.25% in low carbon steel. The low carbon steel is also called mild steel. This steel variant is mostly used for tubing in moderate pressure applications. Rein forcing bars and in I-beams in construction are generally made up of mild steel only. Applications involving a hefty amount of steel without much forming or bending use mild steel. For example- Ship's hull.

B) Medium Carbon Steel

The percentage of carbon is 0.25…0.6%. Medium carbon steel is used at places requiring high tensile strength and ductility. It is typically used in gearing and shafts, railway wheels and rails, steel beams in buildings and bridges, pressure vessels (Cold gases must not be stored because it cracks at low temperatures).

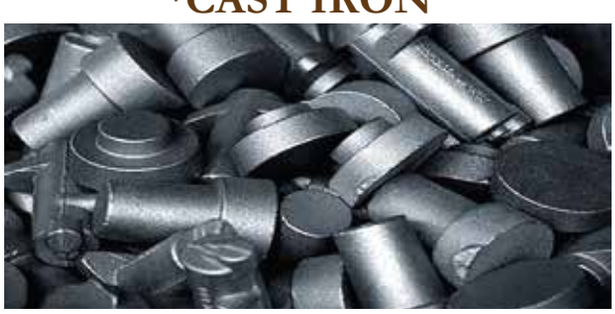
C) High Carbon Steel

If there is 0.6% of carbon, it is called high carbon steel. This steel is harder and more brittle of all. It is used in making chisels and cutting tools. It has ample of hardness and good resistance to material wear. Its other applications include uses in presses and for manufacturing drill bits.

3| ALLOY STEEL

Alloy steels incorporate parts like metallic element- nickel and Ti to impart bigger strength and sturdiness while not increasing weight. Stainless-steel is a very important steel created with the help of chromium. Alloy steels are utilized in construction, machine tools, and electrical elements.

4| CAST IRON



Cast iron is associate alloy made of iron, carbon, etc. Forged iron is brittle and exhausting and immune to wear. It's utilized in water pipes, machine tools, automobile engines and stoves.

5| WROUGHT IRON

Wrought iron is associate alloy with very little carbon content that it can be said that it's virtually pure iron. Throughout the method of production, some addition of slag takes place which provides iron wonderful resistance to corrosion and reaction, however, it's low in hardness and fatigue strength. Iron is employed for fencing and railings, agricultural implements, nails, wire, chains, and numerous ornaments.

B) NON-FERROUS METALS

Non-ferrous metals don't contain a major quantity of iron and are a lot more fascinating as they need semi conductive, non-magnetic, and low weight properties. The ever-increasing demand for non-ferrous metals means that they're usually dearer than metallic element metals (ferrous metals). Non-ferrous metals may also be distinguished by their plasticity. This implies they will be reshaped and reused, typically while not losing their valuable properties. This makes them ideal for an in depth vary of economic industries.

Some of the most common examples of Non-ferrous metals are zinc, tin, lead and copper and even highly valuable metals like gold and silver. Their main advantage over metallic element materials is their plasticity. They even have no iron content, giving them a better resistance to rust and corrosion, and eventually making them ideal for gutters, liquid pipes, roofing and out of doors signs. Lastly, they're non-magnetic, that is very important for several electronic and wiring applications.

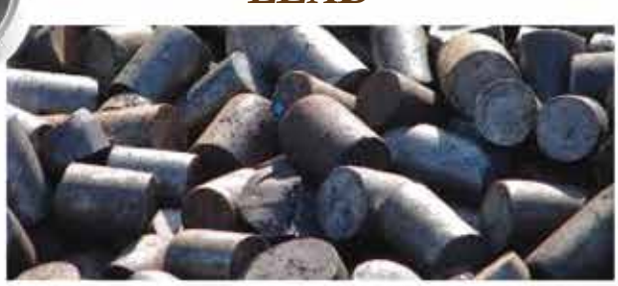
1| ALUMINUM

Aluminum is light-weight, soft and low strength. Metal is well solid, forged, machined and welded. It's not appropriate for high-temperature environments. As a result of metal is light-weight, it's a decent alternative for carrying out the production of craft and food cans. Metal is additionally utilized in castings, pistons, railways, cars, and room utensils.

2| COPPER

Copper is red in color, extremely ductile, malleable and has high physical characteristics for electric conductivity and thermal conductivity. Copper has its main utilization in the electrical business within the sort of wire and different conductors. It finds its use even in cartridge cases, sheet roofing, bearings and statuses. Copper is additionally accustomed to create brass, associate alloy of zinc and copper.

3| LEAD



Lead could be a soft, heavy, malleable metal with a comparatively lower melting point and low enduringness. It will face up to corrosion from wet and plenty of acids. Lead is wide utilized in power cables, batteries, building construction and fastening.

4| ZINC

Zinc could be a medium to low strength metal with an awfully low melting temperature. It will be machined simply, however sometimes heating is also done to avoid cleavage of crystals. Zinc is most generally utilized in electric purposes like galvanizing, the method of applying a protecting zinc coating to iron or steel to forestall rust.

5| TIN

Tin is incredibly soft and malleable, ductile with low enduringness. It's typically accustomed to coat steel to forestall corrosion. Tinplate steel is employed to form tin cans to carry food. Within the late nineteenth century, tin foil was usually accustomed wrap food merchandise, however has since mostly been replaced by aluminum foil. Tin may also be alloyed with copper to provide tin brass and bronze.

6| BRASS

Brass is basically an alloy made of copper and zinc. The amount of each of the metals may differ based upon the electrical and mechanical attributes sought of the metal. Brass also comprises of slight amounts of other metallic elements such as aluminum, lead, and manganese. Brass is generally used for low friction uses like locks, bearings, plumbing, tools and fittings. It is a crucial metal in inherently safe applications to stop sparks and grant usage in flammable environments.

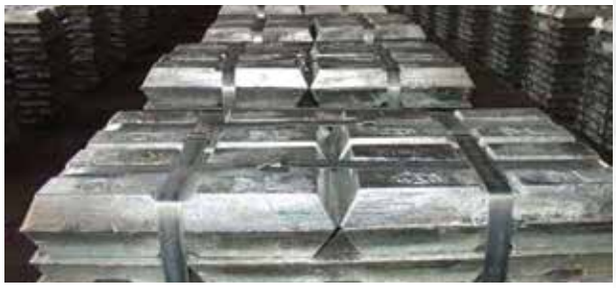
7| BRONZE

Bronze is another popular alloy of copper. The only difference is that bronze contains tin and not zinc. When other elements such as phosphorus, manganese, silicon, and aluminum are added to bronze, it may improve its attributes and appropriateness for a particular application. Bronze has following characteristics- it is brittle, hard, and resists fatigue skillfully. It also exhibit adequate electrical and thermal conductivity and corrosion resistance. Bronze is mostly used manufacturing of mirrors, reflectors, electrical connectors etc. Owing to its remarkable corrosion resistance, it is used in submerged parts and ship fittings.

8| TITANIUM

Titanium is a principal engineering metal because it is strong and at the same time significantly lightweight. It also has requisite thermal stability even at elevated temperatures going up to 480 degrees Celsius. Owing to such important attributes, it finds application in the aerospace industry, manufacturing of military equipment is one use-case, medical applications (due to low corrosion resistance). Titanium also finds wide applications in the chemical and sporting goods industry.

9 | COBALT



Cobalt finds its applications in making blue pigment in paints and dyes from the ancient times. In modern times, this metal is chiefly used in making wear-resistant, high-strength steel alloys. Cobalt is generally a byproduct of mining of copper and nickel and its own mining is rarely undertaken.

10 | NICKEL

Nickel is one of the most customary metals used in a variety of places. Nickel is mostly used for making stainless steels, in order to elevate the metal's strength and corrosion resistance. Almost 70% of the nickel manufactured in the world finds its application for making stainless steel.

11 | TUNGSTEN

Tungsten metal is known for its topmost melting point and the highest tensile strength among all the pure metals. These two properties make tungsten an extremely useful metal.

Around 50%of all the tungsten manufactured is used to make tungsten carbide. This is a very hard material used for making cutting tools (for mining and metalworking), abrasives, and heavy equipment.

Courtesy : engineeringlearn

INVESTMENT OUTLOOK

ANALYZING THE POTENTIAL FOR FOREIGN INVESTORS IN SRI LANKA'S CURRENT ECONOMIC CLIMATE

By - Shanika Gamage

"Well-designed tax reforms can boost economic growth and resilience to climate shocks and help contribute to a fairer society and to a just transition" – European Commission (December 11, 2019), The European Green Deal.

Sri Lanka, with its rich cultural heritage and strategic geographic location, continues to be an attractive prospect for foreign investors seeking opportunities in South Asia. In this article, we explore the investment outlook in Sri Lanka, evaluating the potential for foreign investors against the backdrop of the current economic climate.

ECONOMIC LANDSCAPE & OPPORTUNITIES

1. Strategic Location and Connectivity: Sri Lanka's strategic location as a gateway to South Asia presents a compelling case for foreign investors. Improved connectivity, including modernized ports and infrastructure, enhances the country's appeal as a hub for regional trade and investment.

2. Robust Infrastructure Development: Ongoing infrastructure projects, such as the Colombo Port City and highway expansions, signal a commitment to bolstering the nation's infrastructure. Foreign investors can capitalize on opportunities arising from these projects, contributing to the country's economic growth.

3. Tourism Potential: Sri Lanka's tourism sector, renowned for its scenic landscapes and cultural attractions, offers promising investment potential. Strategic investments in hospitality, eco-tourism, and related services align with the country's efforts to enhance its tourism offerings.

CHALLENGES & MITIGATION STRATEGIES

1. Policy Stability: Maintaining policy stability is crucial to attracting foreign investment. Sri Lanka must provide clarity and consistency in regulations and policies to instill confidence in potential investors, assuring them of a conducive and reliable business environment.

2. Skilled Workforce Development: Bridging the skills gap is imperative for sustained economic growth. Investments in education and vocational training programs ensure a skilled workforce, addressing a key concern for foreign investors seeking long-term commitments.

3. Foreign Exchange Management: Managing currency fluctuations and ensuring a stable foreign exchange environment is pivotal for attracting foreign investment. Transparent policies and mechanisms to hedge against currency risks will enhance investor confidence.

OPPORTUNITIES IN EMERGING SECTORS

1. Renewable Energy: Sri Lanka's commitment to sustainable development creates opportunities in renewable energy projects. Foreign investors can explore partnerships in solar, wind, and hydropower initiatives, contributing to the nation's green energy goals.

2. Technology and Innovation: The burgeoning tech sector in Sri Lanka, with a focus on IT services and innovation, offers avenues for foreign investment. Collaboration with local tech firms and startups can foster technological advancements and drive economic diversification.

3. Manufacturing and Export: Sri Lanka's emphasis on export-led growth opens avenues for foreign investors in manufacturing. Investments in export-oriented industries can contribute to the country's economic resilience and global competitiveness.

Sri Lanka stands at the crossroads of economic development, presenting an array of opportunities for discerning foreign investors. The government's commitment to infrastructure development, coupled with the nation's strategic advantages, makes it an attractive destination. While challenges exist, proactive measures to address policy stability, workforce development, and foreign exchange management will further enhance the investment climate. As the nation welcomes foreign investors, a collaborative effort between policymakers and the business community will undoubtedly pave the way for sustainable economic growth and prosperity.

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HOLDS CONSTRUCTION EXPO 2024 ON 15, 16 & 17 MARCH @ BMICH

Ceylon Institute of Builders (CIOB) is organizing the exhibition "Construction Expo 2024 by CIOB" the most inclusive exhibition for the Construction Industry in Sri Lanka. The exhibition will be held during the period 15, 16 & 17 March 2024 at the Sirimawo Bandarnaike Memorial Exhibition Centre in the BMICH.

As a proven platform for the promotion of the Construction Industry in Sri Lanka, 'Construction Expo 2024 by CIOB' will showcase the latest technology and development added to the building and construction sector with renowned industry experts, stakeholders and decision makers in attendance.

This will be the ideal event to source new products, networking with new contacts and business opportunities. Trade visitors from Sri Lanka and the neighbouring countries are expected to utilize in the event to exhibit their inventive products with new features and visitors will also be looking for the latest, inventive products to improve their building industry projects.

CIOB https://ciob.lk/ is the premier professional body of building and construction professionals in Sri Lanka. The Membership of CIOB comprises construction companies, Architects, Engineers and allied building professionals. CIOB is an affiliated member of the Council of Research and Innovation in Building and Construction in the Netherlands. In addition to disseminating modern building practices among builders

and promoting competencies for the builders to reach professional standards, the institute plays a key role in providing feedback to the Government on the policies affecting the industry.

The above activities are carried forward through a number of annual programmes such as World Construction Symposium with the University of Moratuwa https://ciobwcs.com, CIOB Exhibition, Annual Awards Ceremony and Green Mark Accreditation Programme for the sustainable construction, Construction Training with Horizon Campus – TRACS Programme, Seminars, Sri Lanka 'Construction Today' magazine, submission to National Budget on construction industry, and providing assistance on dispute resolution issues among the industry stakeholders between private and statutory organizations through CIOB Mediation programme.

CIOB expects to upgrade knowledge and awareness in innovative and environmentally friendly concepts and social responsibility in raising the issues in the construction Industry in Sri Lanka. One such activity is the compilation of the 'Roadmap for 2024 for the construction industry', which was handed over to the President of Sri Lanka to consider implementation. With the consultative status of the Government of Sri Lanka, CIOB makes every endeavor to enhance the Sri Lankan Construction Industry to its glory once again. One of the major initiatives to continue to support is by organizing the Construction Expo 2024 by CIOB.

This Exhibition will help the enhancement of the entire construction industry in Sri Lanka.

With the support already received from almost all the industry Giants with sponsorships and stall bookings, CIOB will no doubt be able to organize the highly successful major industry exhibition of the year. CIOB appreciates the enormous support received from Rhino Roofing Products Ltd and St. Anthony's Ventures Ltd. as the Main sponsor of the Construction Expo 2024. The invaluable support extended by Tokyo Cement PLC as the Platinum sponsor of the exhibition this year is also appreciated and recorded. Alumex PLC, Confab Steel Private Ltd., Lexduco (Pvt) Ltd., Nippon Paint Lanka (Pvt) Ltd and Creative Granite & Marble (Pvt) Ltd are the other great enthusiasts who have join hands with CIOB as Gold sponsors to make this event a reality.

It is encouraging to note the increased interest of the construction companies to be stallholders "Construction Expo 2024 by CIOB" exhibition.

CIOB invites all the academics, consultants, professionals, construction industry stakeholders and the general public to visit the exhibition and reap the benefits together to 'Build Green for Smart Living" by utilizing this invaluable opportunity.

BUILDING A FUTURE

PROSPECTS & CHALLENGES FOR CONSTRUCTION COMPANIES IN SRI LANKA'S TAX REGIME

"You can dream, create, design, and build the most wonderful place in the world. But it requires people to make the dream a reality." - Walt Disney

In the ever-evolving landscape of Sri Lanka's construction sector, navigating the intricacies of the tax regime is a crucial aspect of building a sustainable future. This article explores the prospects and challenges faced by construction companies as they endeavor to shape the nation's skyline while aligning with the demands of the tax landscape.

Prospects for Growth

1. Infrastructure Boom: Sri Lanka's ambitious infrastructure projects, including highways, ports, and urban developments, present significant growth prospects for construction companies. Participation in these projects can not only contribute to national development but also catalyze sustained industry expansion.

2. Sustainable Construction Practices: The global shift towards sustainability has created opportunities for construction firms to embrace eco-friendly practices. Tax incentives for adopting sustainable building materials and green construction methods incentivize companies to contribute to environmental conservation while enjoying financial benefits.

3. Technology Integration: The integration of technology in construction processes, from project management to Building Information Modeling (BIM), opens avenues for efficiency gains. Embracing digital tools not only enhances productivity but can also lead to tax advantages through incentives for technological innovation.

Challenges to Overcome

1. VAT Adjustments: Changes in Value Added Tax (VAT) rates can impact construction costs, influencing project budgets and profit

margins. Staying abreast of VAT adjustments and strategizing to absorb or mitigate these changes is essential for financial viability.

2. Customs Regulations and Import Duties: The reliance on imported materials and equipment exposes construction companies to fluctuations in customs regulations and import duties. Navigating these challenges requires meticulous planning and adaptability to maintain project timelines and budgets.

3. Income Tax Variability: Variations in income tax policies can impact the financial performance of construction companies. A proactive approach to understanding and managing these variations ensures effective financial planning and compliance.

Strategies for Success

1. Diversification of Services: To mitigate the impact of tax-related challenges, construction companies can explore diversification of services. Venturing into related areas such as facility management, consultancy, or sustainable construction solutions can provide additional revenue streams.

2. Investment in Skills Development: A skilled workforce is pivotal for the success of construction projects. Investment in ongoing skills development not only enhances project execution but also positions companies favorably in the eyes of policymakers, potentially leading to tailored incentives.

3. Collaboration with Authorities: Constructive engagement with tax authorities can foster a better understanding of the unique challenges faced by the construction sector. Advocating for policies that promote industry growth and sustainability can contribute to a more favorable tax environment.

As construction companies in Sri Lanka embark on building a future that aligns with the nation's development goals, addressing tax-related prospects and challenges is paramount. Strategic planning, technological adoption, and collaboration with policymakers can create a conducive environment for sustainable growth. By navigating the complexities of the tax regime with foresight and adaptability, construction firms can play a pivotal role in shaping a resilient and thriving future for the industry and the nation.

By - Shanika Gamage

BUILDING SRI LANKA'S FUTURE

A Conversation with Mr. Dinesh Weerakkody on Taxation, Investment and Growth in the Construction Industry

Mr. Dinesh Weerakkody
Chairman
Board of Investment of Sri Lanka

Port City Colombo catalyst to attracting foreign investors to Sri Lanka's construction industry-BOI & Port City EC Chief

Predicts 5.6% average sector growth in 2024

Port City Colombo will play an integral role in attracting foreign investors to Sri Lanka's construction industry, BOI & Port City Economic Commission Chairman Mr. Dinesh Weerakkody opined participating in an exclusive interview with Sri Lanka Construction Today Magazine.

He said despite short-term hurdles, the medium to long-term growth outlook for the Sri Lankan construction sector remained positive, contingent upon improvements in economic stability, resumption of investments in transport, housing and renewable energy projects, and government initiatives promoting manufacturing and exports. Thus, it is estimated that the Construction Industry will reach an average annual growth of 5.6% from 2024 to 2027, rebounding from the low base in 2022 and 2023.

EXCERPTS OF THE INTERVIEW

1| Mr Weerakkody, considering the current tax situation in Sri Lanka, how do you perceive its impact on the construction industry, and what steps can be taken to facilitate growth within this sector?

The Sri Lankan construction industry, contributing approximately 9.6% to the GDP and engaging nearly 2.6 million stakeholders directly and indirectly, faced several challenges impacting its growth and profitability during the last 2-3 years. The industry experienced a contraction of 14.9% last year, surpassing the earlier projection of a 7.9% decline, attributable to the persistent economic crisis, significant currency devaluation, and escalating inflation.

Despite short-term hurdles, the medium to long-term growth outlook for the Sri Lankan construction sector remains positive, contingent upon improvements in economic stability, resumption of investments in transport, housing, renewable energy projects, and government initiatives promoting manufacturing and exports. Thus, it is estimated that the Construction Industry will reach an average annual growth of 5.6% from 2024 to 2027, rebounding from the low base in 2022 and 2023.Against this backdrop, the impact of the VAT hike from 15% to 18% effective from January 1, 2024, must be considered. This adjustment is expected to escalate construction costs, potentially discouraging the industry from investing in residential condominiums. Despite construction costs in Sri Lanka aligning with neighboring countries like Indonesia, Malaysia, and Vietnam (currently around $1,000 per m2), the VAT increase, combined with taxes on previously exempted items, could further elevate costs, potentially diminishing the country's competitiveness. However, there is optimism that the resulting prices will still be favorable compared to regional peers. Some of the challenges will be to establish financial improvements in the country.

2| As the Chairman of the Colombo Port City Economic Commission, what role do you see the Port City playing in attracting foreign investors to Sri Lanka's construction industry?

Port City Colombo will undoubtedly play an integral role in attracting foreign investors to Sri Lanka's construction industry in several ways.

Firstly, its strategic location and connectivity are unparalleled. Situated in the heart of Colombo, adjacent to the top-ranked Colombo Port, it grants investors access to regional trade routes and global markets, connecting them to over 2 billion people in South Asia and beyond. This positions Port City Colombo as a gateway to a growing and dynamic market. The Special Economic Zone (SEZ) makes it easier and more attractive for foreign investors to do business due to competitive tax incentives, streamlined regulations, and a single-window investment facilitation process to simplify the process. Additionally, as a greenfield development platform, it allows investors to participate in building a brand-new city with modern infrastructure, including the first Multi-Currency and Multi-Service Regional Hub in the region.

Further, its diversified development encompasses key vertical developments like the Colombo International Financial Centre (CIFC), a marina, international educational institutions, an international convention centre, an international hospital, and luxury leisure facilities, which creates a vibrant live-work-play environment that attracts diverse businesses and residents, stimulating demand for construction activities.

And also, its focus on sustainability appeals to environmentally conscious investors seeking sustainable projects. By incorporating green building practices, renewable energy sources, and smart city technologies, Port City Colombo showcases Sri Lanka's commitment to environmental

responsibility, aligning with the global need for decarbonization towards net-zero emissions by 2050.

Finally, knowledge transfer and innovation are fostered by attracting leading international construction companies and engineering firms. Their expertise and technology transfer will enhance the overall competitiveness of Sri Lanka's construction sector through the adoption of best practices.

3| Given your extensive experience in banking, how do you think financial institutions can collaborate with the construction industry to foster investment and development?

Based on my experience, financial institutions play a pivotal role in fostering investment and development in Sri Lanka's construction industry through strategic collaboration. With their expertise in financing and risk management, banks and other financial entities can offer tailored solutions to construction companies. By providing access to capital, expert guidance, and risk mitigation strategies, financial institutions empower construction projects to thrive. They can support sustainable development initiatives by offering green financing options and promoting environmentally friendly practices.

Moreover, financial institutions can facilitate partnerships between construction firms, government agencies, and other stakeholders to drive innovation and infrastructure growth. By building strong relationships based on trust and understanding, financial institutions can effectively address the unique challenges of the construction sector in Sri Lanka. Through collaborative efforts, they can contribute significantly to the advancement of the construction industry, stimulating economic growth and improving infrastructure across the country.

4| Could you elaborate on the BOI's strategies for sector-based investor targeting in the construction industry and how it contributes to sustainable growth?

In 2023, a new BOI regulation was gazetted (Gazette No 2334/39 dated 1st June 2023), providing an opportunity for existing non-BOI companies or existing companies under Section 16 of the BOI Law, to enter into agreements with BOl under Section 17 of BOl Law. Accordingly, Existing companies engage in export-oriented manufacturing or services sectors can to enter into agreement under Section 17 of the BOI Law, provided they meet an additional investment requirement of USD 250,000. In addition, existing companies governed under the general law of the country in the tourism and mixed development sector, could enter into agreements with BOI with an additional investment of USD 5 million.

These companies are entitled to incentives and concessions provided under the BOl regime. At the same time, non-BOI enterprises with local shareholding which transfer its shares to a foreign shareholder are also eligible for the above scheme, subject to provisions of the Land (Restrictions on Alienation) Act No 38 of 2014.

5| with your roles in various organizations, including the Employers ' Federation of Ceylon, how do you envision addressing labor challenges within the construction sector and ensuring a skilled workforce?

Due to the economic and financial crisis, the Construction Industry experienced a contraction, compelling companies to implement cost-cutting measures such as downsizing and reduced investments in human capital. This presents a significant challenge for Sri Lanka's construction sector, as skilled workers may explore alternative employment opportunities abroad, leading to a brain drain.

The construction sector contributes around 7% of the total estimated workforce in the country, approximately 650,000 individuals. According to the Skills Gaps Analysis conducted by TVEC in the Construction Industry Sector, there is a projected need for around 1 million workers within the next couple of years, presenting a challenging scenario unless proactive measures are taken to address this issue.

Addressing this concern requires prioritizing workforce retention and skill development. Policies should be implemented to ensure fair employment practices, competitive compensation packages, and opportunities for career advancement within the construction sector. Additionally, investing in vocational training programs and fostering collaborations with educational institutions can play a crucial role in bridging the skill gap and cultivating a skilled workforce for the industry's long-term sustainability.

6| As an Advisor on Treasury Affairs to the President, how does the government plan to support and incentivize investments in the construction sector for both local and foreign investors?

Unfortunately, at present, there are no tax holidays or concessionary tax rates provided for the construction sector investment. However, there are various other incentives available to investors in lieu. Any new investment project or an expansion of an existing project is entitled to an enhanced capital allowance of 100% to 200%, depending on the total investment made on classes of depreciable assets and location of the investment, and the unrelieved loss could be deducted over 10 - 25 years. For an example, an investment made on railroad cars, locomotives, and equipment, vessels, barges, tugs, and similar water transportation equipment, aircraft, specialised public utility plant, equipment, and machinery, office furniture, fixtures and equipment, any depreciable asset not included in another class (classified under class 3) and buildings, structures and similar works of a permanent nature (classified under class 4), as provided for in Schedule V of the Inland Revenue Act No 24 of 2017; Types and Classification of depreciable assets, will be eligible for this concession.

In addition, these companies are entitled to Customs duty, PAL, CESS and VAT exemptions or deferments as well. For instance, Construction sector enterprises would be entitled to a Customs duty exemption and VAT deferment for importation of capital goods (plant, machinery and equipment) during the project implementation period and also importation of construction items during the project implementation period are exempted from PAL and CESS for investments over USD 50 million

7| Considering your past roles in the Ministry of National Policies and Economic Affairs, what policy changes or reforms do you believe are necessary to enhance the attractiveness of Sri Lanka for construction-related investments?

The global economic crisis has prompted governments to reassess their infrastructure development plans, and Sri Lanka is no exception to this situation. With limited financial resources, we have experienced delays or cancellations of some of the construction projects which again would impede economic growth and disrupt progress. To address this challenge, Sri Lanka must proactively diversify its funding sources for infrastructure projects. Exploring Public-Private Partnerships, attracting Foreign Direct Investment, and engaging international development institutions can help mobilize the necessary resources. Moreover, enhancing project implementation efficiency and attracting potential investors requires streamlining approval processes and improving governance practices.

Simultaneously, close collaboration with industry stakeholders is essential to implement measures promoting financial stability. These measures may involve providing access to credit and capital, streamlining payment processes, and ensuring fair and transparent contract agreements. By securing the financial well-being of construction companies, Sri Lanka can effectively mitigate the risk of insolvencies and safeguard employment opportunities.

Another significant challenge faced by Sri Lanka's construction industry is the migration of skilled workers seeking alternative employment opportunities. To tackle this issue, prioritizing workforce retention and skill development is crucial. Vocational training programs and collaborating with educational institutions can bridge the skill gap, nurturing a skilled workforce for the industry's long-term sustainability.

8| How can the Ceylon Institute of Builders (CIOB) strategically engage with the Board of Investment (BO1) to amplify support for their initiatives in Green and Sustainable Construction, leveraging the platform of the World Construction Symposium (WCS) with the University of Moratuwa, the 12th edition of WCS scheduled for August?

The collaboration between the ClOB and the University of Moratuwa underscores their shared commitment to advancing sustainable construction practices and enhancing Sri Lanka's Construction industry as a whole. The 12th World Construction Symposium (WCS) would be an ideal platform for gaining insights into green

buildings and determining future initiatives to promote the construction industry in Sri Lanka. It will provide an opportunity to disseminate knowledge and expertise on sustainable construction practices to all stakeholders, contributing to the nation's progress and the well-being of its people.

To further amplify this mission, the Board of Investment (BOI) could play a supportive role by facilitating forums that bring together industry stakeholders, including government officials, investors, and construction professional and encouraging BOI representatives' active participation in these discussions which would enable them to gather valuable insights and extend support towards the promotion of green construction practices in the country.

9| As Vice Chairman of the Sri Lanka Institute of Directors, what governance measures do you think are crucial to ensure transparent and accountable practices in the construction sector?

To ensure transparent and accountable practices within the construction sector in Sri Lanka, particularly concerning PPP projects, a comprehensive set of governance measures is imperative. This is crucial for fostering public trust, attracting responsible investment, and promoting sustainable development.

Key governance measures essential for achieving transparency and accountability include: streamlining and enhancing the transparency of the project approval process, ensuring stakeholders have access to insights into decision-making processes, thereby fostering accountability, elevating transparency in public procurement through the promotion of competitive bidding processes, clearly defining procurement criteria, establishing vendor selection mechanisms, and conducting regular audits to ensure fair practices and prevent corruption, mandating construction companies to maintain transparent financial records and disclose pertinent financial information. Regular financial audits by independent firms should be conducted to identify irregularities and ensure compliance with financial regulations and establish robust systems to monitor and evaluate the performance of construction projects. Regular assessments against predefined benchmarks should be conducted to identify areas for improvement, ensuring accountability for project delivery.

10| Given your involvement in international chambers and advisory roles, what insights can you share on how Sri Lanka's construction industry can remain competitive and appealing to global investors in the long run?

In 2022, the global construction market reached USD 14.4 trillion, while the local construction industry in Sri Lanka amounted to USD 12.8 billion. Projections indicate a Compound Annual Growth Rate (CAGR) exceeding 5.6% from 2024 to 2027. Sri Lanka's strategic geographical location along the One Belt One Road (OBOR) initiative, valued between USD 4-8 trillion, presents significant economic opportunities for the construction industry in Sri Lanka. Despite previous setbacks due to economic and financial pressures, the Sri Lankan construction industry is gradually recovering. Factors such as alleviation of foreign exchange liquidity pressures, resumed remittances, improved tourism earnings, and increased private investment are contributing to this resurgence. Noteworthy growth drivers also include investments in transport, housing, mining, industrial, and tourism projects.

To become competitive and appealing to global investors, emphasizing skill development within the sector is crucial, necessitating structural changes in education and vocational training to align with globally required skills. Facilitating local contractor involvement in large-scale infrastructure projects is essential for gaining the necessary exposure and experience in the modern construction environment. This can be achieved by providing opportunities for local contractors to participate in major infrastructure projects which will enhance competitiveness locally, paving the way for global competitiveness through value creation, and exposure to construction of large-scale projects.

Simultaneously, steps must be implemented to position ourselves as a cost-competitive hub for the construction industry, ensuring that construction costs remain equal to or lower than those of our regional counterparts.

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ASSESSING THE PROSPECTS OF THE CONSTRUCTION SECTOR AMIDST SRI LANKA'S TAX LANDSCAPE

"Solar power is the last energy resource that isn't owned yet--nobody taxes the sun yet" - Bonnie Raitt.

By - Shanika Gamage

In the dynamic tapestry of Sri Lanka's economic landscape, the construction sector stands as a crucial pillar, contributing significantly to the nation's development and progress. However, the sector is not immune to the influences of the ever-evolving tax landscape. In this article, we delve into the prospects of the construction industry against the backdrop of Sri Lanka's tax environment, examining the challenges and opportunities that shape its future.

TAX REFORMS & CONSTRUCTION SECTOR DYNAMICS

Sri Lanka has witnessed notable changes in its tax policies in recent years, with implications for various industries, including construction. The adaptation to a new tax regime brings both challenges and opportunities for the construction sector. Understanding the intricacies of these reforms is crucial for stakeholders to navigate the evolving landscape successfully.

CHALLENGES FACED BY THE CONSTRUCTION INDUSTRY

1. VAT Changes: Changes in Value Added Tax (VAT) rates can impact construction projects, influencing costs and project timelines. Stakeholders must carefully assess and adapt to these adjustments to maintain financial viability.

2. Import Duties and Customs Regulations: The construction sector heavily relies on

imported materials and equipment. Fluctuations in import duties and changes in customs regulations can affect project budgets and logistics. Industry players need to stay vigilant and strategize to mitigate potential disruptions.

3. Income Tax Variations: Shifts in income tax policies may impact the financial performance of construction companies. A comprehensive analysis of these variations is essential for effective financial planning and risk management.

OPPORTUNITIES FOR GROWTH

1. Incentives for Sustainable Practices: Sri Lanka's commitment to sustainable development opens avenues for construction companies to embrace eco-friendly practices. Tax incentives for environmentally conscious projects can drive innovation and foster sustainable growth.

2. Investment in Infrastructure: Government initiatives investing in infrastructure development present opportunities for construction firms. Participating in these projects can lead to long-term partnerships and contribute to sectoral expansion.

3. Digital Transformation and Tax Compliance: Embracing digital tools for project management and financial reporting not only enhances efficiency but also aids in meeting tax compliance requirements. Technology adoption can position construction companies favorably in the evolving tax landscape.

STRATEGIES FOR SUCCESS

1. Collaboration and Advocacy: Construction industry stakeholders should foster collaboration and engage in constructive dialogue with policymakers. Advocacy for policies that support sustainable growth and address industry-specific challenges is essential.

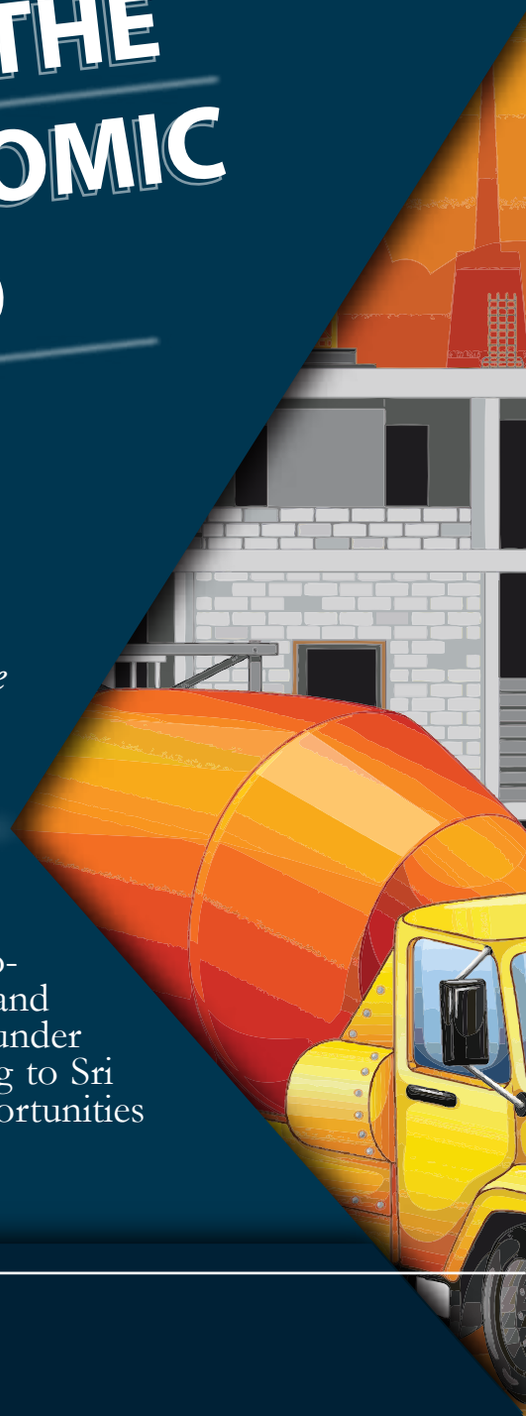
2. Diversification of Revenue Streams: To mitigate risks associated with tax changes, construction companies can explore diversifying their revenue streams. Venturing into related sectors or offering complementary services can enhance resilience.

3. Investment in Skills Development: The construction sector's adaptability to tax reforms is closely linked to the skill set of its workforce. Continuous investment in skills development ensures that the industry remains agile and responsive to changing tax dynamics.

As the construction sector in Sri Lanka navigates the complex terrain of tax reforms, a proactive and strategic approach becomes paramount. Embracing opportunities presented by sustainable practices and infrastructure investments, coupled with effective risk management strategies, will position the industry for robust growth. The building blocks for success lie in a collaborative effort to shape policies that foster a conducive environment for the construction sector's sustainable development.

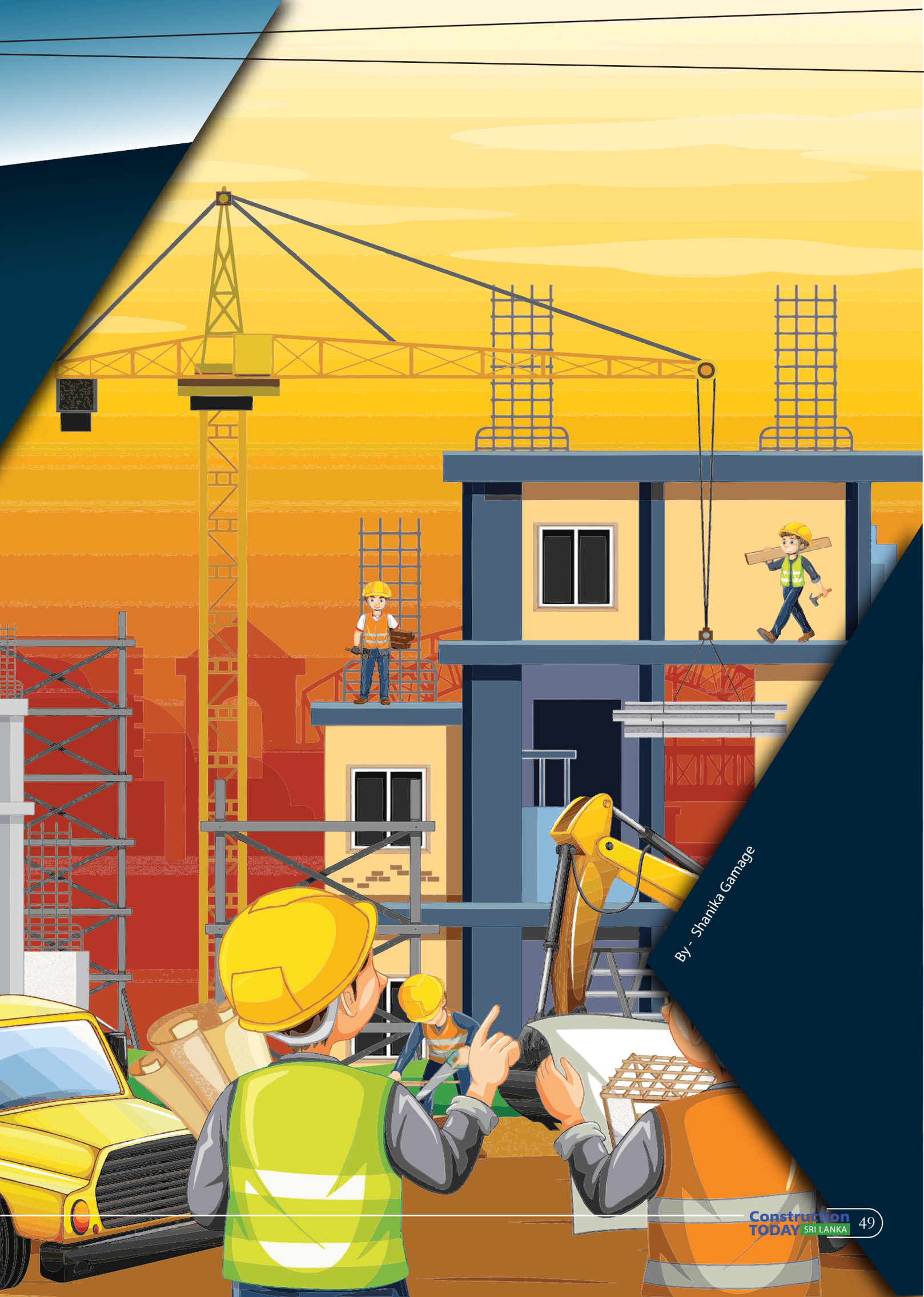
ATTRACTING INVESTMENTS

EVALUATING SRI LANKA'S ALLURE FOR INVESTORS IN THE PRESENT ECONOMIC SCENARIO



"There is nothing more poetic and terrible than the skyscrapers' battle with the heavens that cover them."
- Federico Garcia Lorca

Sri Lanka, with its unique blend of cultural richness and strategic location, has long been recognized as an attractive destination for investors. In the current economic landscape, characterized by both opportunities and challenges, the allure of Sri Lanka for investors comes under scrutiny. This article examines the factors contributing to Sri Lanka's appeal and explores the investment opportunities amidst the prevailing economic scenario.



By - Shanika Gamage

Strategic Location and Connectivity

Sri Lanka's geographical positioning as a gateway to South Asia, coupled with improved connectivity through modernized ports and transportation networks, enhances its appeal to investors. The nation's strategic location facilitates seamless regional trade, positioning Sri Lanka as a pivotal player in the global economic landscape.

Investment in Infrastructure

Ongoing and planned infrastructure projects, such as the Colombo Port City and highway expansions, signify a commitment to bolstering the nation's infrastructure. Investors are drawn to opportunities in these projects, as they not only contribute to national development but also provide avenues for long-term returns.

Tourism Potential

Sri Lanka's tourism sector, celebrated for its diverse landscapes and cultural attractions, remains a significant draw for investors. Strategic investments in hospitality, eco-tourism, and related services align with the nation's efforts to enhance its tourism offerings, presenting lucrative opportunities in an industry poised for growth.

Trade Agreements and Economic Reforms

Sri Lanka's engagement in trade agreements and ongoing economic reforms augur well for prospective investors. The nation's commitment to liberalizing its economy and fostering a business-friendly environment signals a proactive approach toward attracting foreign investments and fostering economic growth.

Challenges to Navigate

1. Policy Stability

Investor confidence is closely tied to policy stability. Sri Lanka's challenge lies in ensuring consistent and transparent policies that provide a reliable framework for investors. Addressing concerns related to policy unpredictability is crucial to maintaining and enhancing the nation's allure for potential investments.

2. Skilled Workforce Development

A skilled workforce is instrumental in realizing the full potential of investments. Sri Lanka's efforts to bridge the skills gap through education and training initiatives are critical. A well-trained workforce not only attracts foreign investors but also contributes to the sustainability and growth of invested ventures.

3. Foreign Exchange Management

Managing currency fluctuations and ensuring a stable foreign exchange environment is pivotal. Transparent policies and effective mechanisms to hedge against currency risks are imperative for maintaining investor confidence and facilitating a conducive investment climate.

Opportunities for Diversification

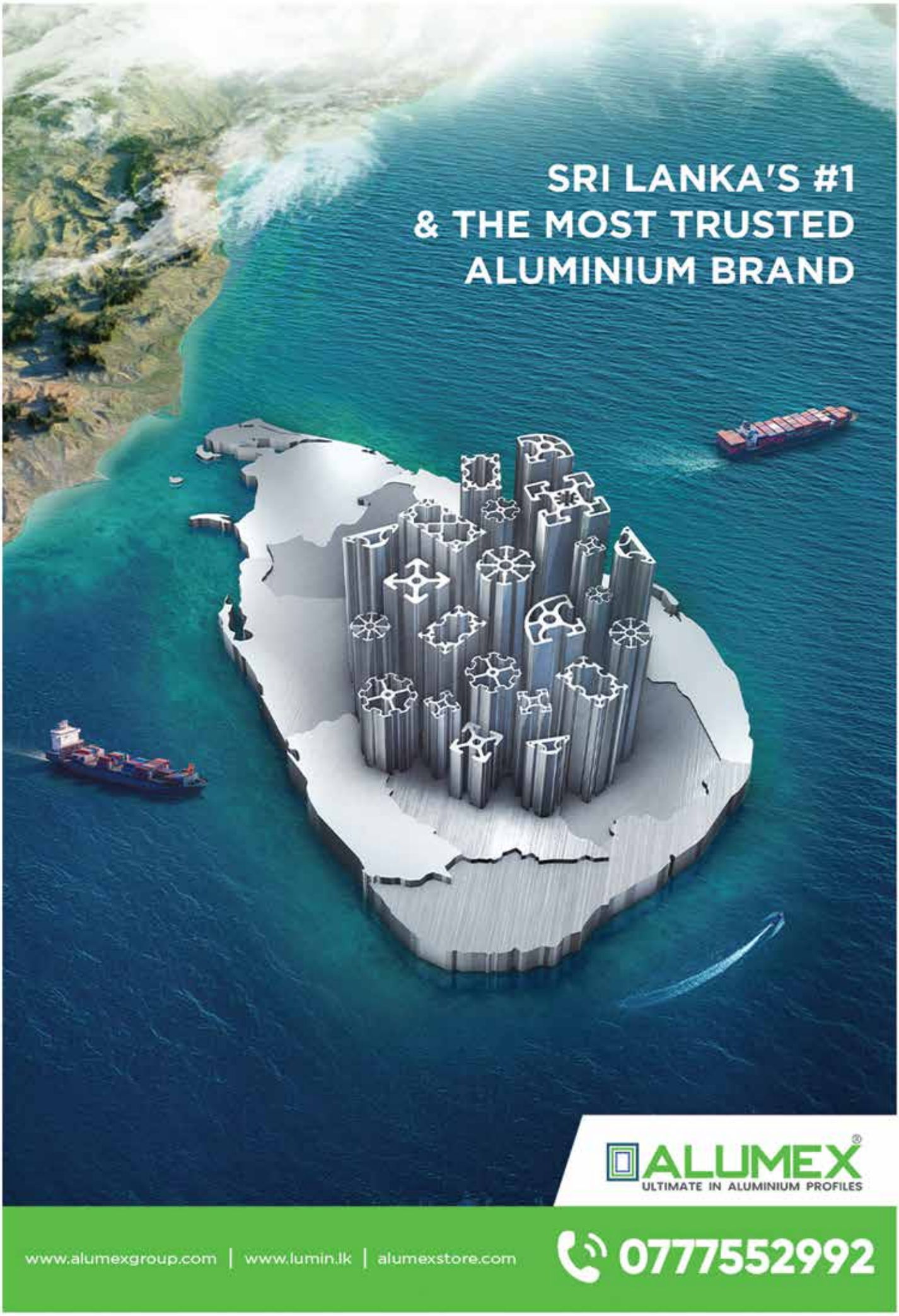
Renewable Energy Initiatives

Sri Lanka's commitment to sustainable development creates opportunities for investors in renewable energy projects. Collaborative ventures in solar, wind, and hydropower initiatives align with global trends and contribute to the nation's green energy goals.

Technology and Innovation

The burgeoning tech sector in Sri Lanka offers avenues for investors. Collaborating with local tech firms and startups can foster technological advancements and position investors at the forefront of innovation in a rapidly evolving digital landscape.

As Sri Lanka navigates the complex terrain of the present economic scenario, the allure for investors remains rooted in its strategic advantages and growth potential. Addressing challenges related to policy stability, workforce development, and foreign exchange management is essential. By capitalizing on opportunities in infrastructure, tourism, and emerging sectors, Sri Lanka can strengthen its appeal and foster an environment where investors thrive, contributing to sustained economic development and prosperity.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WHAT IS BIOPHILIA

(& WHAT DOES IT MEAN FOR THE BUILDING ENVIRONMENT)

When coupled with sustainable development, biophilic design can offer significant benefits for the built environment.

As an industry currently responsible for 39% of global energy-related carbon emissions, the built environment has an important role to play in fulfilling the United Nations' Sustainable Development Goals (SDGs). Through embracing new technologies, adopting new construction methods, improving education on sustainability and championing processes like retrofitting, work is being done to address the industry's impact by the UN's 2050 deadline.

Learn more: 'Breathing new life into old walls'

One concept that has often been cited in the drive to improve the industry's approach to sustainability is biophilia. But what exactly is biophilia? How does it translate to architecture and design? And what does it mean for the built environment?

WHAT IS BIOPHILIA ?

Biophilia, as coined by psychologist Erich Fromm and popularised by biologist E. O. Wilson in the 1980s, is defined as 'the urge to affiliate with other forms of life'. Originating from Greek, it translates literally as 'love of life'.

In a design context, biophilia refers to architecture and urban planning that integrates nature to enhance and improve well-being. While this concept has been around for a long time, its popularity has grown in recent years, particularly since the COVID-19 pandemic and the increased emphasis on mental health and workplace ergonomics.

How does biophilic design impact health and well-being?

There's been plenty of research into the impact of biophilia on physical and mental health. According to research by Human Spaces, offices with 'natural' elements such as sunlight and vegetation are 6% more productive, 15% more creative, and have a 15% higher level of well-being than their counterparts.

Similarly, another survey, which asked respondents to name the top three most wanted elements in the workplace, produced three results relating to biophilia – natural light (44%), indoor plants (20%), and a view of the sea (17%).

With mental health challenges costing the UK economy at least £117.9 billion annually, more and more businesses are adopting biophilic design principles into their offices in an attempt to improve the well-being of their staff.

Outside of businesses, awareness and demand for biophilic environments is rising – in the hotel industry, guests are willing to pay 23% more for rooms with views of biophilic elements. Most interestingly, the healthcare industry look set to particularly benefit from biophilic design, with research finding it can reduce post-operative recovery times by 8.5% and the need for pain medication by 22%

What does biophilia mean for sustainability? To create biophilic environments

To create biophilic environments, you need to incorporate natural elements and materials, meaning there's a crossover between biophilic design and sustainability.

When embraced from the beginning of construction projects, biophilia can support sustainability. The benefits of biophilic design, such as greater air quality, optimised thermal comfort, improved water management, and increased building lifespans, to name a few, align with the SDGs set by the UN in 2015.

Furthermore, without actively incorporating sustainability into your biophilic architecture, you'll likely be found guilty of greenwashing – attempting to camouflage and remarket your operations as being more environmentally-friendly than they actually are.

Learn more: What is greenwashing (and how does it impact the built environment)?

As Dr. Graeme Larsen, Associate Dean (Sustainability) at UCEM said:

"Biophilia is a powerful concept for helping us understand and enact sustainability and sustainability development. Biophilia is embedded in, and resonates strongly with, the emerging ecocentric perspective of sustainability. Concepts like biophilia help us move the beyond the traditional egocentric perspectives that have shaped the world of today and contributed to many of the challenges we now face."

Sustainability isn't a passing trend – it's here to stay and is constantly evolving. If you want to inspire and action change in your career, UCEM's MSc Innovation in Sustainable Built Environments will give you the skills you need, both now and in the future.

BIOPHILIC ARCHITECTURE & DESIGN

Biophilia is changing the way architects approach sustainable design. Here are some famous and innovative examples from around the world.

Have you ever stepped into a room full of plants and immediately felt energetic and refreshed? According to a study in 2019 performed by Aarhus University, Denmark, children that are exposed to more nature have 55% fewer mental health problems later in life than those who aren't. Furthermore, in an office context, incorporating nature can improve well-being by 13% and productivity 8%.

This phenomenon, known as biophilia or biophilic design, has picked up popularity as of late, with increased awareness of mental health issues and more businesses looking to improve the well-being of their employees.

However, biophilic design is more than just keeping house plants in your office. Today, architects have incorporated biophilic principles into sustainable construction projects, and are making nature a part of new buildings, complexes, and homes from inception.

Here are some famous and ground-breaking examples of biophilic architecture from around the world.

1 BARBICAN CENTRE – LONDON, UK

The Barbican Centre is one of the earliest and most famous examples of biophilic architecture. Opened in the 1980s as an estate in London, it's renowned for its striking, brutalist design.

The bleak style of the Barbican is juxtaposed with the use of natural and artificial lakes and extensive wildlife. It even has its own conservatory, housing over 1,500 species of plants and trees.

2 ATRI – LAKE VANERN, SWEDEN

The Atri is a sustainable greenhouse villa in Sweden built by Naturvillan – a company that specialises in self-sustaining houses built from ecological materials.

What makes the Atri biophilic is its incorporation of nature, through the use of natural materials and its reliance on natural lighting.

3 APPLE PARK, CALIFORNIA, USA

One of the most widely recognised examples of biophilic architecture, tech giant Apple's headquarters in California has been praised for its design and incorporation of nature.

Apple Park embraces the shape of the land – it's surrounded by a forest of around 9,000 trees and, with a hollowed-out centre full of wildlife, provides employees with a space for well-being and a connection with nature.

Source: Unsplash

4 BOSCO VERTICALE – MILAN, ITALY

Another famous landmark of both biophilia and sustainability, the Bosco Verticale was designed to combat urban sprawl and reduce expansion.

Covered by 20,000 plants (which all help to convert carbon, absorb CO2 and dust, and improve air quality), it's one of the most recognisable and widely-cited images of sustainable construction.

Source: Unsplash

5 THE JEWEL – SINGAPORE, SINGAPORE

The first of two entries from Singapore, The Jewel is an entertainment and retail complex that forms part of Singapore Changi airport. It's home to the world's largest indoor waterfall (the 40-metre tall Rain Vortex) and 100,000 plants, and is part of Singapore's goal to become 'a city in a garden' and a model

Source: Unsplash

6 THE VIBES OFFICE – HO CHI MINH, VIETNAM

As with Apple Park, the Vibes Office is an attempt to bring the benefits biophilic design into the work environment. Opened in 2021, this building is a multi-zonal construction based around several gardens, and incorporates biophilic features such as green walls and water features.

One of the most interesting aspects of the Vibe Office is the use of bamboo sunshade skin, which reduces thermal radiation and consequently minimises energy consumption.

Courtesy : ucem.ac.uk

7 REASONS WHY NUCLEAR ENERGY IS NOT THE ANSWER TO SOLVE CLIMATE CHANGE

MARK Z. JACOBSON

Professor of Civil and Environmental Engineering & Director of the Atmosphere/Energy Program, Stanford University

There is a small group of scientists that have proposed replacing 100% of the world's fossil fuel power plants with nuclear reactors as a way to solve climate change. Many others propose nuclear grow to satisfy up to 20 percent of all our energy (not just electricity) needs. They advocate that nuclear is a "clean" carbon-free source of power, but they don't look at the human impacts of these scenarios. Let's do the math.....

One nuclear power plant takes on average about 14-1/2 years to build, from the planning phase all the way to operation. According to the World Health Organization, about 7.1 million people die from air pollution each year, with more than 90 percent of these deaths from energy-related combustion.

Cofrentes Nuclear Power Plant located about 2 kilometers southeast of Cofrentes, Spain

So switching out our energy system to nuclear would result in about 93 million people dying, as we wait for all the new nuclear plants to be built in the all-nuclear scenario.

Utility-scale wind and solar farms, on the other hand, take on average only 2 to 5 years, from the planning phase to operation. Rooftop solar PV projects are down to only a 6-month timeline. So transitioning to 100% renewables as soon as possible would result in tens of millions fewer deaths.

This illustrates a major problem with nuclear power and why renewable energy -- in particular Wind, Water, and Solar (WWS)-- avoids this problem. Nuclear, though, doesn't just have one problem. It has seven. Here are the seven major problems with nuclear energy:

1. LONG TIME LAG BETWEEN PLANNING & OPERATION

The time lag between planning and operation of a nuclear reactor includes the times to identify a site, obtain a site permit, purchase or lease the land, obtain a construction permit, obtain financing and insurance for construction, install transmission, negotiate a power purchase agreement, obtain permits, build the plant, connect it to transmission, and obtain a final operating license.

The planning-to-operation (PTO) times of all nuclear plants ever built have been 10-19 years or more. For example, the Olkiluoto 3 reactor in Finland was proposed to the Finnish cabinet in December 2000 to be added to an existing nuclear power plant. Its latest estimated completion date is 2020, giving it a PTO time of 20 years.

The Hinkley Point nuclear plant was planned to start in 2008. It has an estimated the completion year of 2025 to 2027, giving it a PTO time of 17 to 19 years. The Vogtle 3 and 4 reactors in Georgia were first proposed in August 2006 to be added to an existing site. The anticipated completion dates are November 2021 and November 2022, respectively, given them PTO times of 15 and 16 years, respectively.

The Haiyang 1 and 2 reactors in China were planned to start in 2005. Haiyang 1 began commercial operation on October 22, 2018. Haiyang 2 began operation on January 9, 2019, giving them PTO times of 13 and 14 years, respectively. The Taishan 1 and 2 reactors in China were bid in 2006. Taishan 1 began commercial operation on December 13, 2018. Taishan 2 is not expected to be connected until 2019, giving them PTO times of 12 and 13 years, respectively. Planning and procurement for four reactors in Ringhals, Sweden started in 1965. One took 10 years, the second took 11 years, the third took 16 years, and the fourth took 18 years to complete.

Many claim that France's 1974 Messmer plan resulted in the building of its 58 reactors in 15 years. This is not true. The planning for several of these nuclear reactors began long before. For example, the Fessenheim reactor obtained its construction permit in 1967 and was planned starting years before. In addition, 10 of the reactors were completed between 1991-2000. As such, the whole planning-to-operation time for these reactors was at least 32 years, not 15. That of any individual reactor was 10 to 19 years.

2. COST

The levelized cost of energy (LCOE) for a new nuclear plant in 2018, based on Lazard, is $151 (112 to 189)/MWh. This compares with $43 (29 to 56)/MWh for onshore wind and $41 (36 to 46)/MWh for utility-scale solar PV from the same source.

This nuclear LCOE is an underestimate for several reasons. First, Lazard assumes a construction time for nuclear of 5.75 years. However, the Vogtle 3 and 4 reactors, though will

take at least 8.5 to 9 years to finish construction. This additional delay alone results in an estimated LCOE for nuclear of about $172 (128 to 215)/MWh, or a cost 2.3 to 7.4 times that of an onshore wind farm (or utility PV farm).

Next, the LCOE does not include the cost of the major nuclear meltdowns in history. For example, the estimated cost to clean up the damage from three Fukushima Dai-ichi nuclear reactor core meltdowns was $460 to $640 billion. This is $1.2 billion, or 10 to 18.5 percent of the capital cost, of every nuclear reactor worldwide.

In addition, the LCOE does not include the cost of storing nuclear waste for hundreds of thousands of years. In the U.S. alone, about $500 million is spent yearly to safeguard nuclear waste from about 100 civilian nuclear energy plants. This amount will only increase as waste continues to accumulate. After the plants retire, the spending must continue for hundreds of thousands of years with no revenue stream from electricity sales to pay for the storage.

3. WEAPONS PROLIFERATION RISK

The growth of nuclear energy has historically increased the ability of nations to obtain or harvest plutonium or enrich uranium to manufacture nuclear weapons. The Intergovernmental Panel on Climate Change (IPCC) recognizes this fact. They concluded in the

4. MELTDOWN RISK

To date, 1.5 percent of all nuclear power plants ever built have melted down to some degree. Meltdowns have been either catastrophic (Chernobyl, Russia in 1986; three reactors at Fukushima Dai-ichi, Japan in 2011) or damaging (Three-Mile Island, Pennsylvania in 1979; Saint-Laurent France in 1980). The nuclear industry has proposed new reactor designed, built, and operated correctly or that a natural disaster or act of terrorism, such as an airplane flown into a reactor, will not cause the reactor to fail, resulting in a major disaster.

5. MINING LUNG CANCER RISK

Uranium mining causes lung cancer in large numbers of miners because uranium mines contain natural radon gas, some of whose decay products are carcinogenic. A study of 4,000 uranium miners between 1950 and 2000 found that 405 (10 percent) died of lung cancer, a rate six times that expected based on smoking rates alone. 61 others died of mining-related lung diseases. Clean, renewable energy does not have this risk because (a) it does not require the continuous mining of any material, only one-time mining to produce the energy generators; and (b) the mining does not carry the same lung cancer risk that uranium mining does.

6. CARBON-EQUIVALENT EMISSIONS & AIR POLLUTION

There is no such thing as a zero- or close-to-zero emission nuclear power plant. Even existing plants emit due to the continuous mining and refining of uranium needed for the plant. Emissions from new nuclear are 78 to 178 g-CO2/kWh, not close to 0. Of this, 64 to 102 g-CO2/kWh over 100 years are emissions from the background grid while consumers wait 10 to 19 years for nuclear to come online or be refurbished, relative to 2 to 5 years for wind or solar. In addition, all nuclear plants emit 4.4 g-CO2e/kWh from the water vapor and heat they release. This contrasts with solar panels and wind turbines, which reduce heat or water vapor fluxes to the air by about 2.2 g-CO2e/kWh for a net difference from this factor alone of 6.6 g-CO2e/kWh.In fact, China's investment in nuclear plants that take so long between planning and

operation instead of wind or solar resulted in China's CO2 emissions increasing 1.3 percent from 2016 to 2017 rather than declining by an estimated average of 3 percent. The resulting difference in air pollution emissions may have caused 69,000 additional air pollution deaths in China in 2016 alone, with additional deaths in years prior and since.

Barrels of radioactive waste. Image credit: Creative Commons, ShinRyu Forgers

In fact, China's investment in nuclear plants that take so long between planning and operation instead of wind or solar resulted in China's CO2 emissions increasing 1.3 percent from 2016 to 2017 rather than declining by an estimated average of 3 percent. The resulting difference in air pollution emissions may have caused 69,000 additional air pollution deaths in China in 2016 alone, with additional deaths in years prior and since.

7. WASTE RISK

Last but not least, consumed fuel rods from nuclear plants are radioactive waste. Most fuel rods are stored at the same site as the reactor that consumed them. This has given rise to hundreds of radioactive waste sites in many countries that must be maintained and funded for at least 200,000 years, far beyond the lifetimes of any nuclear power plant. The more nuclear waste that accumulates, the greater the risk of radioactive leaks, which can damage water supply, crops, animals, and humans.

SUMMARY

To recap, new nuclear power costs about 5 times more than onshore wind power per kWh (between 2.3 to 7.4 times depending upon location and integration issues). Nuclear takes 5 to 17 years longer between planning and operation and produces on average 23 times the emissions per unit electricity generated (between 9 to 37 times depending upon plant size and construction schedule). In addition, it creates risk and cost associated with weapons proliferation, meltdown, mining lung cancer, and waste risks. Clean, renewables avoid all such risks.

Nuclear advocates claim nuclear is still needed because renewables are intermittent and need natural gas for backup. However, nuclear itself never matches power demand so it needs backup. Even in France with one of the most advanced nuclear energy programs, the maximum ramp rate is 1 to 5 % per minute, which means they need natural gas, hydropower, or batteries, which ramp up 5 to 100 times faster, to meet peaks in demand. Today, in fact, batteries are beating natural gas for wind and

solar backup needs throughout the world. A dozen independent scientific groups have further found that it is possible to match intermittent power demand with clean, renewable energy supply and storage, without nuclear, at low cost.

Finally, many existing nuclear plants are so costly that their owners are demanding subsidies to stay open. For example, in 2016, three existing upstate New York nuclear plants requested and received subsidies to stay open using the argument that the plants were needed to keep emissions low. However, subsidizing such plants may increase carbon emissions and costs relative to replacing the plants with wind or solar as soon as possible. Thus, subsidizing nuclear would result in higher emissions and costs over the long term than replacing nuclear with renewables.

Derivations and sources of the numbers provided herein can be found https://web.stanford.edu/group/efmh/jacobson/Articles/I/NuclearVsWWS.pdf

THE SOLUTION

A breakthrough climate model shows that we have a window to stay below the dangerous threshold of 1.5 degrees Celsius, achieving net-zero emissions before 2040. The two-year collaboration with 17 leading scientists, entitled Achieving the Paris Climate Agreement Goals(APCAG), shows that we can prevent the worst impacts of climate change while unlocking trillions in economic benefits through rapid decarbonization of our energy systems, a transition to 100% renewable energy, and large-scale land restoration.

Download the APCAG Executive Briefing to read more about the solutions to the climate crisis.

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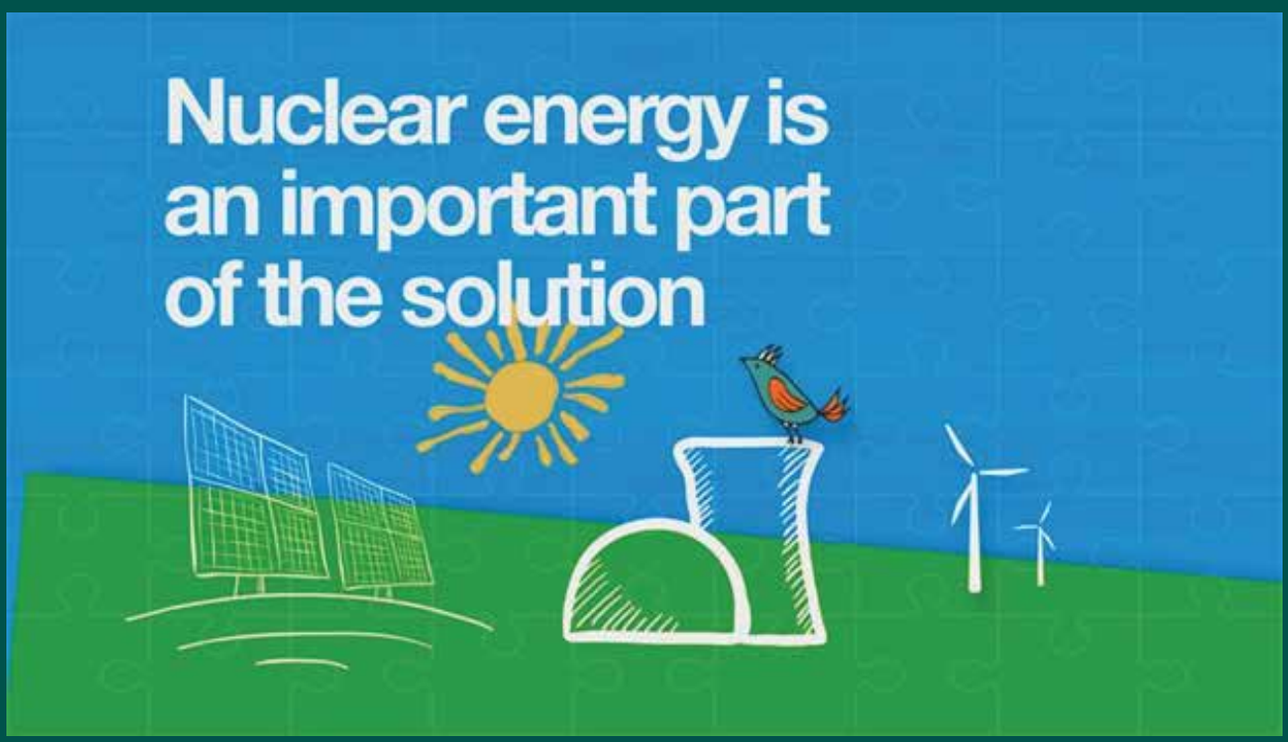
HOW CAN NUCLEAR COMBAT CLIMATE CHANGE?

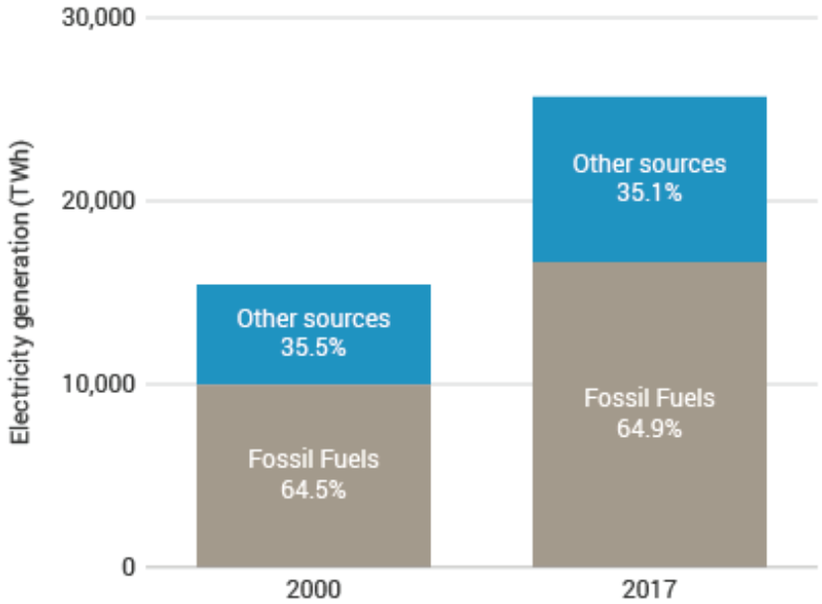
To limit the impacts of climate change, the world must rapidly reduce its dependency on fossil fuels to reduce greenhouse gas emissions. Nuclear energy is low-carbon and can be deployed on a large scale at the timescale required, supplying the world with clean, reliable and affordable electricity.



CLIMATE CHANGE – AN ACCELERATING GLOBAL PROBLEM

The United Nations has identified climate change as "the defining issue of our time", with the central aim of the 2015 Paris Agreement is to keep the rise in global temperatures to well below 2 °C compared to pre-industrial levels, and with the aim to limit the rise to 1.5 °C. This is driven by the scientific consensus that limiting the rise to 1.5 °C would significantly reduce the risks posed by climate change. Despite this, carbon dioxide emissions related to energy continue to rise – reaching 33.1 billion tonnes in 2018, a record high, and have increased by more than 40% since 2000.

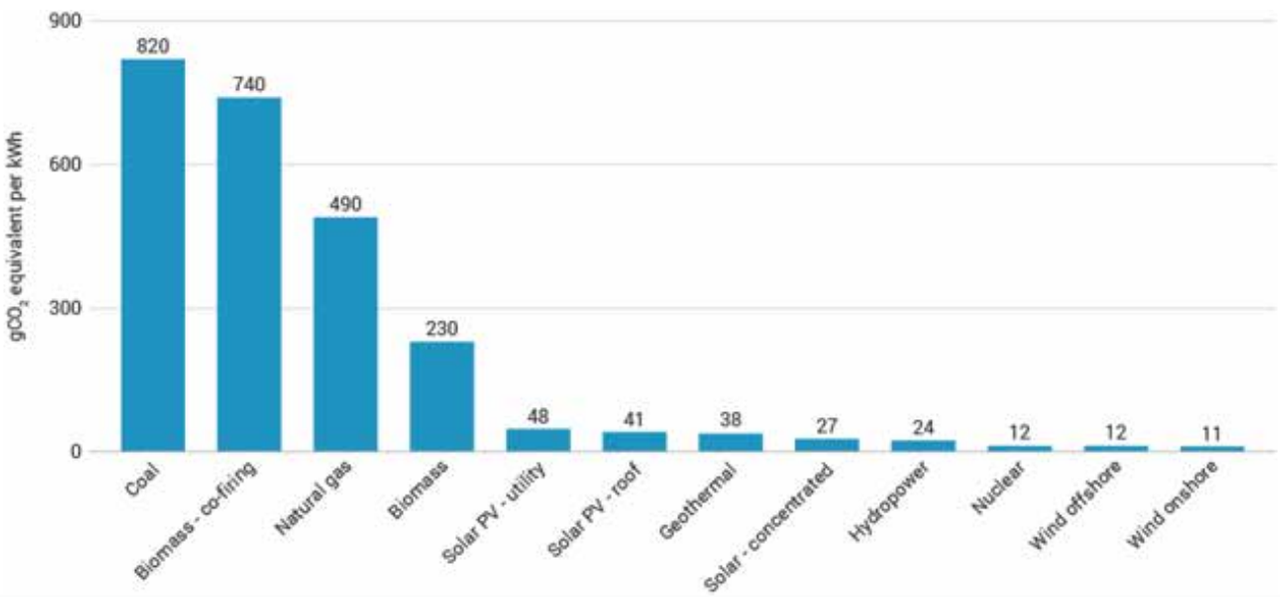
Concerted international efforts over the past 20 years have increased the amount of electricity generated by wind, solar and other renewable sources, but have failed to displace fossil fuels from the mix. As a matter of fact, in 2017, fossil fuels produced more electricity – in relative and absolute terms – than ever before. In its 2018 report, Global Warming of 1.5 °C, the Intergovernmental Panel on Climate Change (IPCC) warned that we are likely to breach the 1.5 °C threshold by as early as 2030.



Fossil versus non-fossil fuel electricity generation in 2000 and 2017 (Source: IEA World Energy Outlook)

NUCLEAR IS LOW-CARBON

Nuclear power plants produce no greenhouse gas emissions during operation, and over the course of its life-cycle, nuclear produces about the same amount of carbon dioxide-equivalent emissions per unit of electricity as wind, and one-third of the emissions per unit of electricity when compared with solar.



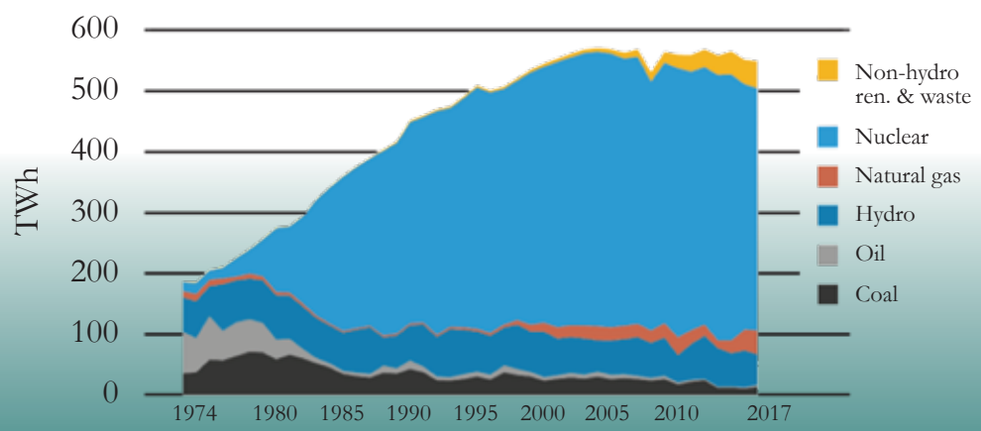
Average life-cycle carbon dioxide-equivalent emissions for different electricity generators (Source: IPCC)

Experts have concluded that in order to achieve the deep decarbonisation required to keep the average rise in global temperatures to below 1.5°C, combating climate change would be much harder, without an increased role for nuclear. Because nuclear power is reliable and can be deployed on a large scale, it can directly replace fossil fuel plant, avoiding the combustion of fossil fuels for electricity generation. The use of nuclear energy today avoids emissions roughly equivalent to removing one-third of all cars from the world's roads.

Nuclear power plants, such as the Diablo Canyon power station in California, provide our societies with reliable and affordable electricity, day in and day out (Photo: Mike Baird)

Modern society is becoming more and more dependent on electricity, with demand steadily increasing as transport, domestic heating and industrial processes are increasingly electrified. Whilst electricity is clean at the point of use, its generation currently produces over 40% of all energy-related carbon emissions. Decarbonising the electricity supply, whilst providing affordable and reliable electricity to a growing global population, must be central to any climate change strategy.

Nuclear energy has shown that it has the potential to be the catalyst for delivering sustainable energy transitions, long before climate change was on the agenda. France generates over 70% of its electricity from nuclear power – the largest nuclear share of any country globally – and its electricity sector emissions are one-sixth of the European average. In around 15 years, nuclear power went from playing a minor role in the French electricity system to producing the majority of its electricity, showing that nuclear energy can be expanded at the speed required to effectively combat climate change.



The French electricity mix 1974-2017 (Source: IEA)

ACHIEVING HARMONY

All technologies that can contribute towards solving one of the greatest challenges faced by humankind should be deployed. We cannot afford to wait, as the impacts of climate change will hit the poorest and most vulnerable first and failing to act will have significant humanitarian consequences.

The nuclear industry recognises the scale and immediacy of the challenge, and the important role that all low-carbon energy sources must play. Harmony – the industry's vision for the future of electricity supply – sets a target to build an additional 1000 GWe of nuclear reactors across the world so that nuclear power would provide 25% of electricity by 2050. By achieving Harmony, we can build a new, cleaner and truly sustainable world – enabling us to pass on a cleaner planet to our children.

Courtesy : world-nuclear.org

5 PROVEN WAYS TECHNOLOGY CAN HELP INCREASE CONSTRUCTION EFFICIENCY

As more and more new technologies emerge in the construction industry, it can be difficult to keep up with them all, not to mention that the adoption process often takes a considerable amount of time and money. Construction professionals need to first learn about these technologies and then test them thoroughly prior to adoption.

Though adopting new technologies may require a significant investment upfront, many of these technologies can actually save time and money in the long run while also increasing new opportunities for business. It is important for construction professionals to stay up-to-date with the latest data on technologies that improve construction efficiency in order to best determine which ones are most beneficial and worth the investment.

Those who want to remain competitive in the construction industry need to discover and adopt the beneficial technologies that are available, or they may get left behind. Here, we will examine a proven method for ensuring that technology adoption is successful and effective. Then, we will discuss five important ways that technology can increase construction efficiency and positively affect a company's bottom line.

HOW TO EFFECTIVELY ADOPT NEW TECHNOLOGIES QUICKLY

Historically, the construction industry has been slow to adopt new technologies. However, that is starting to change as more and more companies begin to realize just how much of an impact these technologies can have on their bottom line. Before deciding which technologies to adopt, companies should research the variety of solutions available and then watch demonstrations or test the solutions in order to determine which options would best help solve their company's biggest challenges.

After research and testing, companies must follow a three-step process in order to effectively incorporate the new technologies they have chosen: adopt, embrace, and invest. Once a construction company has decided to adopt a new technology, they need to make sure that staff at all levels is embracing it. The best way to do this is through thorough education and training. Education not only ensures that staff members are using the new technology appropriately, but it also helps them better understand the

The best way to do this is through thorough education and training. Education not only ensures that staff members are using the new technology appropriately, but it also helps them better understand the benefits. Finally, technology adoption requires an investment of time and money—for licensing fees, equipment, implementation, education and training, and maintenance and updates. Company budgets and schedules need to be built with these investments in mind.

WHAT NEW TECHNOLOGIES MEAN FOR THE BOTTOM LINE

Now that you know "how" construction companies should approach adopting new technologies, let's talk about the "why." Technology is changing the way that construction teams work by increasing efficiency and reducing overall costs. Here are five proven ways that technology can help increase construction efficiency:

1 TECHNOLOGY MAKES IT EASIER FOR EVERYONE INVOLVED IN THE PROJECT TO COLLABORATE MORE QUICKLY AND EFFECTIVELY.

Using technology on the job site makes it easier for contractors to communicate and collaborate with architects, owners, and their teams. They can collect information on the job site and share it with others while also asking questions and getting input in real-time. Useful technologies include online and mobile apps for everything from reporting, to document sharing, construction management, auto-archiving and data collection. Other common examples are building information modeling (BIM), bid management software with integrated response trackers, mobile devices with automated alerts and notifications, online plan rooms and virtual meeting platforms, and GPS tracking. These advances can help increase real-time communication and collaboration among stakeholders, decreasing downtime and errors.

2 TECHNOLOGY ALLOWS CONTRACTORS AND PROJECT MANAGERS TO MAKE MORE TIMELY AND INFORMED DECISIONS BASED ON COST AND LABOR DATA.

With intelligent modeling, users can make adjustments to the building model in real time in order to see how changes will impact cost and labor. This enables designers and contractors to better visualize how different design scenarios change the look of the building while also allowing them to consider the costs and time constraints. In the end, this technology helps project teams make more informed decisions more quickly. It also increases the chances that the project will stay within the set budget and timeline.

3 TECHNOLOGY SIMPLIFIES AND AUTOMATES THE INFORMATION CAPTURING PROCESS WHILE INTEGRATING DATA BACK INTO COMPANY SYSTEMS IN REAL TIME.

Supervisors can use a mobile device to record employee hours and wirelessly send this information to the field office. This technology eliminates the need to complete paperwork and streamlines the timesheet-approval

Sprocess. This information is then seamlessly integrated into the company's main system, which decreases the errors and inefficiencies involved in paper-based record keeping. Using a mobile software solution to track employee-time data can help companies significantly improve accuracy and reduce processing costs.

4 TEAMS CAN USE TECHNOLOGY TO ENSURE THAT THEY ARE QUICKLY AND ACCURATELY MEETING DOCUMENTATION AND COMPLIANCE REGULATIONS.

Using technology on the job site allows construction teams to better meet documentation and compliance regulations by allowing them to complete required documentation more accurately and in a timely manner. For example, digital photo, video and webcam documentation can be stored in electronic document management solutions. These systems can then be accessed via a secure online document portal from any mobile device. This saves a significant amount of time while also reducing the potential for penalties, which can be costly.

5 TEAMS CAN ACCESS REAL-TIME PROJECT DATA BY UTILIZING MOBILE AND CLOUD-BASED TECHNOLOGIES.

Mobile technology, like tablets and smart phones, paired with cloud-based data storage and management systems help improve the efficiency of workflows on the job site. Contractors can access blueprints, documents, contracts, and other important information in real-time from the job site, which decreases wait time that can cause serious delays and allows contractors to avoid costly mistakes.

Though many construction professionals may be hesitant to test and adopt new technologies, such advances improve efficiency in the long run. By carrying out preliminary research and thorough testing to understand which technologies may be most beneficial, and then using the three-step method of adopt, embrace, and invest. We at South Bay Construction have been able to stay ahead of the curve, and adopt only the most meaningful technology to help increase our efficiency.

As we enter into the new year, we are excited to see which technologies will impact our ever-changing world. You need to have a better understanding of which technologies are emerging as frontrunners to innovation and which technologies you should keep an eye on.

Courtesy : South Bay Construction

INSIGHTS FROM GLOBAL CONSTRUCTION INDUSTRIES

"To tax and to please, no more than to love and to be wise, is not given to men."
- Edmund Burke

The construction industry, a key driver of economic growth, faces unique challenges in the context of high taxes. Across the globe, various countries, both developed and developing, have implemented strategies to address the impact of high taxes on construction businesses. In this article, we explore best practices from high-tax-paying countries, shedding light on innovative approaches that can inspire positive change in the construction industry.

BEST PRACTICES IN DEVELOPED COUNTRIES

1 / Tax Credits for Innovation: Developed nations often offer tax credits to construction companies investing in innovation and sustainable practices. Countries like Germany and Japan incentivize firms to adopt advanced construction technologies, contributing to increased efficiency and environmental responsibility.

2 / Public-Private Partnerships (PPPs): Collaborative approaches, such as PPPs, are common in high-tax environments. Canada and the United Kingdom, for example, have successfully leveraged PPPs to share the financial burden of large-scale infrastructure projects between the public and private sectors.

3 / R&D Tax Incentives: Some developed countries, including the United States, provide Research and Development (R&D) tax incentives for construction companies engaged in projects that push the boundaries of technological advancements and industry best practices.

BEST PRACTICES IN DEVELOPING COUNTRIES

1 / Tax Stability Agreements: Developing nations facing fluctuating tax environments often establish Tax Stability Agreements. These agreements assure investors, including construction companies, of stable tax rates over a predetermined period, fostering a conducive investment climate.

2 / Streamlined Permitting Processes: Countries like Brazil and India have focused on simplifying and expediting permitting processes. Efficient regulatory frameworks reduce construction delays, mitigating financial strains on companies and encouraging investment.

3 / Training and Capacity Building: Developing nations prioritize investing in the skills development of their workforce. By enhancing the

capabilities of construction professionals, these countries aim to boost project efficiency and attract foreign investments. This is evident in the efforts of countries like Vietnam and South Africa.

COMMON GLOBAL PRACTICES

1 / Collaboration with Tax Authorities: Many countries encourage open communication between construction businesses and tax authorities. Regular dialogues and consultations help authorities understand the industry's unique challenges, paving the way for tailored tax policies that promote growth without unduly burdening companies.

2 / Incentives for Sustainable Practices: A global trend involves providing tax incentives for adopting sustainable construction practices. Whether it's energy-efficient designs, the use of eco-friendly materials, or adherence to green building standards, tax breaks encourage responsible construction in countries like Sweden and Singapore.

3 / Investment in Digitalization: Both developed and developing countries recognize the benefits of digitalization in the construction sector. Incentivizing companies to adopt Building Information Modeling (BIM) and other digital tools not only enhances productivity but also aligns with broader economic goals.

High taxes in the construction industry are a global challenge, but countries around the world are adopting innovative approaches to address this issue. From tax credits for innovation to streamlined permitting processes and sustainable practices, the construction industry can draw inspiration from a diverse range of best practices. By fostering collaboration, embracing technology, and advocating for industry-specific incentives, countries can create a tax environment that promotes growth and ensures the resilience of their construction sectors.

$5-Billion Moon-Shaped Hotel in Dubai Will Let You Experience Outer Space on Earth

By Jessica Stewart

Dubai is known for its extravagant architecture and, if Moon World Resorts has its way, a new hotel is set to reshape the most populous city in the UAE. The Canada-based company plans to build four MOON resorts, with the first designated for Dubai. The 735-foot-tall replica of the Moon will include all the amenities one would expect from a luxury resort, as well as special experiences meant to replicate a visit to Earth's satellite.

The $5 billion project would feature both a “lunar colony” and “lunar surface” experience intended to bring space tourism down to Earth. According to the company's founders, Sandra Matthews and Michael

Henderson, the resort could accommodate up to 10 million visitors a year once completed. The lunar colony alone has capacity for 2.5 million guests a year, and it's even projected to include a training platform for space agencies and astronauts.

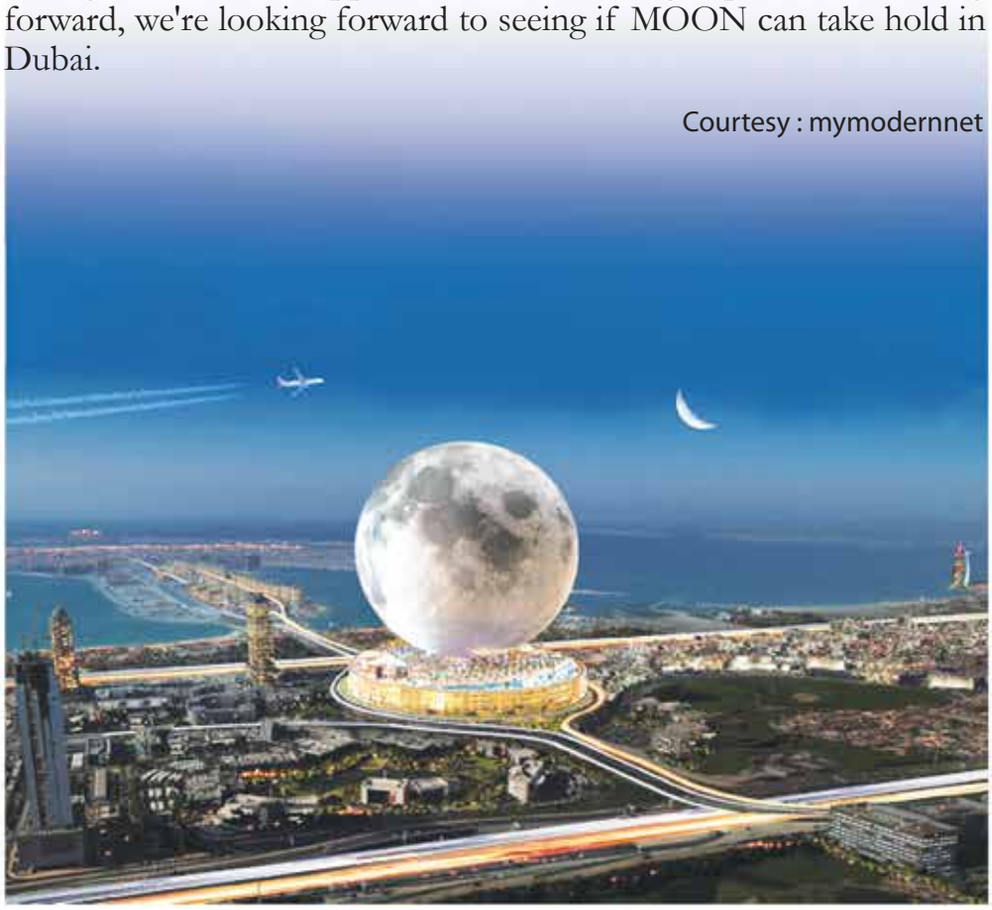
Of course, MOON is still a resort and, as such, there will be plenty for guests to experience and enjoy. The resort will include a nightclub, an event center that will hold up to 5,000 guests, a spa-wellness center, a jazz piano lounge, and a multi-level lounge based on an alien spacecraft. A large convention center is intended to attract exhibitors in the technology and space fields.

MOON will also include 144 luxury units for purchase as part of a private residence program. Each 2,000-square-foot villa comes with a lifetime membership to MOON that comes with exclusive privileges.

While official plans in Dubai are being finalized, the company estimates that it would take two years to construct this unique resort. "From an architectural, engineering, and design perspective, MOON can be built," Henderson shares.

This is not the first time that Moon World Resorts has made a splash. In 2021, the company announced that they were planning on bringing MOON to Las Vegas. At the time, Henderson shared that he and Matthews first came up with the concept in 2000 and that "the objective was to develop an authentic, mega-scale reproduction of planet Earth's Moon, incorporating the world's largest sphere."

Though it does not appear that the Las Vegas project is moving forward, we're looking forward to seeing if MOON can take hold in Dubai.



Courtesy : mymodernnet

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One of the distinctive features of Tilara Polyplast is its involvement in significant infrastructure projects, including collaborations with metro and railway stations. Tilara Polyplast's extensive range of offerings includes polycarbonate solid sheets, multiwall sheets, and profiled sheets, catering to various requirements in construction and design, making it a preferred choice for industrial, infra structural, and residential roofing solutions and wide-ranging applications, particularly in roofing, skylights, sound barriers, and walkways.

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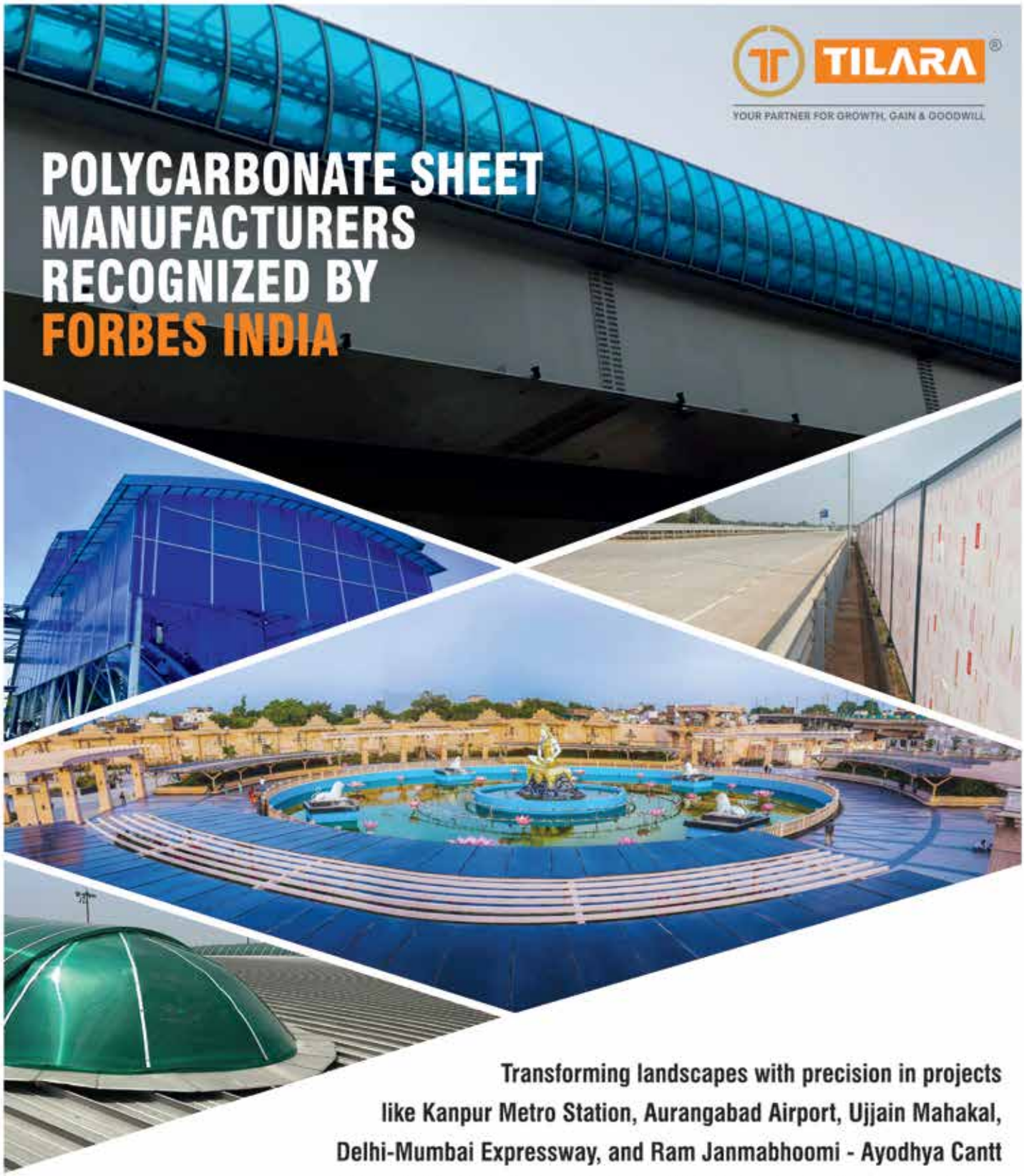

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