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RESPONSIBLE INNOVATION DO NO HARM

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RESPONSIBLE INNOVATION: DO NO HARM!



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The combination of innovation and responsible leadership presents a very powerful mandate that touches every part of the 17 United Nation's Strategic Development Goals (SDGs), as it activates the critical behaviours of citizens, public and private business leaders, and policy makers.

Adoption of innovation, either in the form of new technologies or new approaches, is often driven by the expectation of increased future profits and the development of differentiated capability. Such an undertaking is predicated on the availability of the necessary capital, a willingness to take risk and having a capable workforce. These elements often form an organisation's 'Adaptive Capacity'.

Investment in new technologies, processes and products have multiple benefits. Generally, such benefits can be manifested in the following:

- Productivity Gains, which contribute to meeting the targets of *SDG 8 'Decent Work and Economic Growth'*;
- Efficiency Gains, which contribute to meeting the targets of *SDG 9 'Industry, Innovation and Infrastructure'*;
- Carbon Intensity Reductions, which contribute to meeting the targets of *SDG 12 'Responsible Consumption and Production'*, and the targets of *SDG 13 'Climate Action'*;
- Reduction of Polluting Emissions, which contribute to meeting the targets of *SDG 3 'Good Health and Well-Being'*.

However, decarbonisation of electricity supply is ostensibly a critical part of meeting the targets of many of the UN SDGs. This involves the replacement of fossil-fuelled generating capacity by renewable supply. It also requires providing comprehensive electricity supply to many countries, particularly in Africa, where this is likely to involve renewable microgrids for cost, and, speed of diffusion reasons.

GREEN INNOVATIONS

At our partner Institution, the South West College (SWC) in Northern Ireland, where the IKE Institute NI branch is located, two great interlocking projects come together to accelerate green innovations. The first project is an Erasmus+ trans-European project that started three years ago known as Creative Engine (CE). It's purpose is to respond to the creativity and innovation skills gap identified in an earlier study that the IKE Institute conducted across 240 engineering and technology businesses in partnership with SWC, Dublin City University in Ireland, Thomas More in Belgium, and Tknika in Spain. An online programme that covers ideas management, innovation culture, innovation process and planning, innovation strategy and evaluation, customer analysis and market analysis was developed by CE,

and is now available freely online for all educational providers and engineering and technology businesses to benefit from. Innovation as a taught discipline provides the fundamental underpinning to help organisations come up with coherent, workable solutions to the toughest problems. And Climate Change is one of the toughest ever!

Dovetailing into that innovation focus on Climate Change, has been SWC's second project entitled - Renewable Engine (RE), which was funded under the EU's Interreg VA programme. RE supports research work at PhD level and above in Renewables and Eco-Engineering alongside ten other organisations from the micro-sized to the multinational, working in harmony to find answers in the critical areas of energy generation and energy storage. RE's industrial partners include B9 Energy Storage, Booth Welsh, Caley Ocean Systems (in collaboration with Industrial Systems & Control), Doosan Babcock, Kastus Technologies, Kingspan Water and Energy, Organic Power, Platinum Tanks, RotoSim, and Soltropy. Alongside SWC are leading research organisations - Queens University Belfast, Advanced Forming Research Centre University of Strathclyde, and Institute of Technology Sligo.

This cross-border collaboration and co-creation has focused on advanced engineering and manufacture of innovative smart materials and processes to support the renewables industry. Within RE, there are projects aimed at wind energy, such as the development of a new rotomoulding simulation and modelling software specifically for the renewables energy sector; the creation of large, low cost and lightweight multi-layered rotomoulded structures for off-shore windfarms that offer an alternative to steel, but are resilient enough to overcome challenging marine environments; research into advanced control methods to enable high performance lifting from floating vessels for installation and maintenance of off-shore wind platforms, and an industry 4.0 project incorporating augmented reality to provide digital twinning of windfarms, aiding remote maintenance and control of such rigs.

RE has also given attention to the rural community, supporting farmers with off-grid energy generation through such innovations as combining new thermoplastic composite materials with new rotational moulding techniques to develop new solar frames, and development of robust, modular, and small-scale anaerobic digestion systems enabling 24/7 power supply for farms.

The aspect of energy storage, often a bugbear in renewable tech, has also been targeted by RE. With projects such as the development of a novel isothermal compressed air energy system using liquid piston technology, and the use of smart or phase-change materials to enable thermal energy storage inside solar collectors providing pre-heating

before entry into a combi-boiler, are some of the innovations that are emerging.

Through this project, new energy efficient products and processes are being founded by leaps in physiochemistry. Conversion of materials into their greener component parts using nanocatalysts converting CO2 into renewable fuels like hydrogen; first-gen PV modules being recycled through pyrolysis – a thermochemical conversion process – into sustainable materials, and photocatalysts being used to create energy efficient LEDs thus, supporting the journey to a greener, circular economy. Even transitioning to green power is being supported by a development within RE using AI algorithms to find and visualize the best economics, energy performance and social benefit optimisation metrics for an organisation anticipating a move toward sustainable energy systems.

RESPONSIBLE INNOVATION

As the combination of CE and RE projects demonstrated, Responsible Innovation (RI) can be defined as *“the careful consideration of, and action to address, the potential impacts of introducing a new product, service, process or business model. It considers the benefits that are derived from innovation and seeks to eliminate, minimise or mitigate any potential downsides from the perspectives of the company, its employees, suppliers and customers, and stakeholders...”* (Innovate UK - British Standards Institution, PAS 440, 2020, p8).

As a relational concept, RI is the result of the intersection of three main contexts: the Governance Context, which includes the rules, regulations

and policies within which RI occurs; the Innovation Context, which includes the technical possibilities and the social responsibility priorities set by governments including the UN SDGs; and the Stakeholder Engagement Context, which includes the whole company as part of the governance context, and, also transparency about the direction of innovation, and its likely outcomes.

However, to activate the SDGs drive in business, to compel senior business leaders, particularly those of large industrial businesses, and their global supply chains and ecosystems, requires policy makers to consider a means to offset the inevitable cost and complexity implications to businesses, by creating incentives to galvanise collective action. Spreading the success stories of use-cases across the UN member states will also increase the adoption of RI.

THE INNOVATIVE RESPONSIBLE LEADER

The global pandemic crisis and its resulting business dislocations have unlocked change, at a pace and magnitude, that has made even the boldest and most progressive of leaders to question their assumptions.

Responsible Innovation Leadership mandates formally to establishing multi-faceted reviews that act as a brake on purely money-making schemes or just a nationalistic focus, operated at all costs. Clearly, establishing a Code of Practice recognition for UN-inspired RI Leaders would be an effective step forward. RI Leadership is a collective mission, that includes amongst others, the following actors and influencers:

- Policy makers in governments, who are

willing to support the mission of addressing Climate Change and addressing the SDGs;

- Scientists, whose research addresses the critical issues of providing a sustainable infrastructure;
- Entrepreneurs, who ensure that technologies are adopted and delivered at scale to produce sustainable infrastructure;
- Financiers, who provide the needed innovative financial structures that deliver this sustainable infrastructure; and
- Individuals, who choose more sustainable lifestyles.

Orchestrating partnerships amongst all these actors and influencers to achieve the global goals, in less than ten years, requires better knowledge. Promulgating and assimilating the UN's 17 SDGs and their targets will provide the foundational knowledge-base needed to rebalance profit vs. purpose responsibly.

The power to reimagine the possible to recalibrate what can be achieved, is now profoundly critical. Questioning, where should we be, aspiring 10 times higher or 10 times faster, and therefore, what do we say no to, or stop doing to create the additional space to “do no harm” should be a key attribute of the RI Leader of the future.

And, we hope the forthcoming 26th UN's Climate Change conference in Glasgow will embrace vivaciously the underlining essence of **Do No Harm!** □