

# **CONNECTING TECHNOLOGICAL INNOVATION TO DECISION MAKING FOR SUSTAINABILITY**

## **G-STIC 2018 Co-host Statement**

In 2015, the international community adopted the 2030 Agenda for Sustainable Development (thereby setting clear aspirations and goals to shift the world onto a sustainable development path) and launched the Technological Facilitation Mechanism (TFM) with its motto “Harnessing the Contribution of Science, Technology, and Innovation for Achieving the 2030 Agenda and the 17 Sustainable Development Goals”.

To reach these global objectives, a deep transition is needed to more resilient, sustainable and equitable socio-economic development models. Such a transition is possible despite the magnitude of the challenges ahead, but the limited time that remains necessitates the near-term deployment of market-ready transformative technological solutions at scale.

To help shape the transformative technological transitions that are urgently needed, five independent and not-for-profit technological research institutes – the co-hosts of G-STIC – have teamed up to organise the Global Sustainable Technology & Innovation Conference series (G-STIC).

G-STIC aims to (1) identify context-specific, integrated, market-ready and scalable technology solutions that can have a major impact on achieving the SDGs by 2030, and (2) raise awareness of such technological solutions within government, civil society, research, the private sector, non-for-profit and multilateral organisations. Working across national and sectoral boundaries, G-STIC focuses on integrated technological solutions that are socially acceptable, economically feasible and affordable, environmentally sound, and that have proven to work in specific countries or regions of the world.

By communicating G-STIC key findings and messages to decision makers at local, national and international level and to industry and business leaders, it is our ambition to enrich the knowledge base to help set up the institutional, regulatory, policy, social awareness, and business frameworks that are favourable for realising a new sustainable development paradigm and achieving the SDGs. At the same time, we also hope that G-STIC can contribute to deepening citizen’s engagement, especially from the youth, and help harness the power of a myriad of organisations and individuals across the world to shape our future through directed and mindful technological innovation.

The first edition of G-STIC took place in Brussels, Belgium, October 2017. Annexe 1 to this co-host statement summarizes the G-STIC 2017 key findings.

**G-STIC 2018 reconfirmed that the deployment of transformative technological solutions and innovations at scale is critical and needs to be accelerated to make major progress toward the achievement of the SDGs.**

The challenge to achieve the SDGs by 2030 has certainly not diminished since G-STIC 2017 took place. Recent geopolitical developments even seem to move us back towards a narrower and more inward-looking focus, away from global cooperation and in effect hampering the quest for a better future for all.

On the other hand, the resolve and ingenuity of those in the academic, research, NGO, and the private and public sector communities to move jointly to a more sustainable world continues unabated. G-STIC 2018 echoed this resolve and contributed in concrete terms to finding practical and feasible technological solutions to the many challenges that civil society and the private and public sectors face in realising the SDGs.

G-STIC 2018 brought several of these solutions to the foreground (relating to water, energy, circular economy, food, health, and education) and gathered them in one forum, enabling cooperation and innovation across sectors, and established industrial and governance groups. G-STIC 2018 provided context-specific and real-life examples of technological transformations that address several sustainable development challenges simultaneously, discussed what needs to happen to bring them to the market under different socio-economic conditions and in different regions of the world, and identified the requirements to make these transformations sustainable in the long run. G-STIC 2018 further encouraged participants to evaluate integrated technology solutions from a gender and youth perspective, with the aim of ensuring both gender and intergenerational equity.

**Five key findings have materialised during the G-STIC 2018 Conference:**

- 1. Innovative, market-ready integrated technological solutions that can substantially contribute to the achievement of the SDGs already exist. These technologies are however often not sufficiently deployed on a global scale because policy and decision makers are sometimes not aware of their existence, do not fully recognise their potential to contribute to achieving the SDGs or lack the political will to implement them. Policy action is therefore urgently needed to bring them to the market at scale.**

Market-ready technological innovations should be considered by those constructing STI roadmaps for the SDGs because they offer a possibility to make major progress in the achievement of the SDGs. The deployment of cutting-edge integrated technological solutions at scale can help jumpstart the transition to more sustainable and equitable societies.

- 2. The deployment of integrated technological solutions and innovations at scale requires the identification of (1) suitable technologies that can have a systemic transformative impact, (2) the gaps, hurdles, barriers and opportunities to bring these innovative technologies to the market at scale and (3) the broader conditions and requirements that can facilitate such transformations, while leaving no one behind in the transition to more sustainable and equitable societies and economies.**

G-STIC 2018 identified a set of such integrated technological solutions, deepening the understanding and insight in the solutions identified at G-STIC 2017 in the fields of agro-ecology, water, energy and circular economy and complementing them with solutions pertaining to education, health, and geospatial techniques. The Chairperson Summary details these solutions.

**3. Identifying transformative technological solutions alone will not bring the paradigm shift that is needed to move the world to more sustainable and inclusive socio-economic development models that are in line with the SDGs. Therefore, G-STIC 2018 identified critical levers of change and the necessary enabling environments to deploy these new transformative technologies at scale.**

G-STIC 2018 explored societal, policy, legislative, regulatory and institutional changes, and changes in the financial and business environments, that are required to bring integrated technological solutions to the market. Furthermore, tools and practices, checks and balances (including universally accepted standards), intellectual property right and ethical issues, as well as the convergence of technologies were discussed as they need to be considered by those dealing with technological transformation in support of the SDGs. Many of the issues identified require further research, system analysis, discussion, and consensus building to identify the critical levers of change to accelerate the transition to more sustainable and inclusive socio-economic development models, along with the necessary enabling environments to deploy transformative technological solutions at scale.

G-STIC 2018 reconfirmed the urgency of the systemic and disruptive changes needed to achieve the SDGs by 2030 - break down institutional barriers, revisit established concepts, change laws, regulations and habits, promote new business models and value chains, rethink local, national and global patterns of development, develop new visions of the future we want, and how we will get there.

While major technological innovations and integrated approaches are at the heart of these systemic and disruptive changes, it is crucial however to acknowledge that different clusters of technological innovations have different impact and repercussions on society and have different policy-setting requirements. Hence, there is an urgent need to define technological innovation clusters and to classify technologies of relevance (including digital technologies, societal technologies, biotechnology, soft and hard technologies, nanotechnology, at different stages of readiness), into such clusters.

**4. Real-world solutions are based on combining policy, behavioural, financing, capacity building, social empowerment, institutional changes, and innovative business models with the introduction of innovative technological solutions while keeping an eye on local circumstances. These “human” changes, social acceptance, uptake, marketing, are often the hardest to achieve and require a lot of time and energy (and some financing).**

Therefore, G-STIC 2018 drew attention to

- Intelligent decision platforms,
- Innovative forms of cooperation across national borders and among a variety of actors,
- Fostering open science and open innovation,

- The governance of the technological transition processes, particularly with the view of the speed and magnitude at which they need to happen,
- The need to consider soft technologies besides hard technologies,
- The cross-sectoral, whole-of-government changes that need to occur to arrive at integrated, transformative, technological solutions, often demanding the close cooperation between line ministries,
- The changing world of South-South and Triangular cooperation.

**5. The many challenges that civil society and the private and public sectors face in helping to realise the SDGs are complex and multifaceted, and therefore need a particularly thoughtful approach.**

G-STIC 2018 recognised that the deep technological transitions that are needed to achieve the SDGs cannot be realised easily and quickly and cannot be dealt with in one single forum such as G-STIC, as comprehensive as it might aspire to be. Perhaps the most critical condition for successful transitions to more resilient, sustainable and equitable socio-economic development models, is a change in the mindset of policy and decision-makers as well as citizens. Policy and decision-makers must recognise that deep transitions are needed and that sustained and consistent policy attention and governance actions are required to make them happen. In addition, inroads into technological transformations made for one or more SDGs will positively reflect on the other SDGs, and thus have a catalytic effect on transitioning socio-economic development paths to more sustainable futures.

G-STIC 2018 also identified several dimensions of technological innovation that need to be addressed in future G-STIC sessions as a matter of priority. These include:

- Governance of STI for SDGs and technological transition processes,
- Impact of the integrated technological solutions on the macro-economy,
- Global financial mechanisms in support of the technological transformations,
- Promoting intellectual property rights and capacity building as enablers for innovation, technology transfer and diffusion,
- Convergence of technologies,
- Assessment of the ethical and long-term societal, economic, and environmental implications of the technological transitions,
- Nature-based solutions,
- Social technologies,
- Verifiable sustainable technological transition targets for the industry and governments to monitor progress,
- Education on how to use technologies for “the world we want”, especially to ensure decent jobs and sustainable livelihoods,
- Developing local manufacturing capabilities.

## **G-STIC 2018 confirmed a concrete engagement toward international processes that forward Science, Technology and Innovation for the SDGs**

In striving to catalyse a process of better harnessing sustainable technologies and innovation to achieve the SDGs by 2030, and improve human well-being and prosperity broadly, G-STIC pledges its support to the international processes that aim at providing STI support to the SDGs.

In particular, G-STIC promises to support the IATT Expert Group Meeting on STI Roadmaps for the SDGs process under the Technology Facilitation Mechanism and its Annual Multi-Stakeholder STI Forum, by providing for specific targets of a selected number of SDGs:

- Concrete, context-specific, scalable examples of integrated technological solutions that cut across sectors and disciplines and that promise to have a significant impact on the achievement of the SDGs in specific regions and under certain circumstances;
- Easy-to-use checklists for public and private decision makers to assess the applicability and usefulness of emerging and alternative (not BAU) market-ready innovative technological solutions in a selected number of industrial/economic areas.
- A non-exhaustive listing of the fundamental conceptual shifts that are needed,
- Identification of major gaps and barriers to – and levers and policy changes required for – scaling up market-ready innovative technological solutions
- A list of critical areas that need further research, discussion and consensus building.
- The creation of thematic clusters on STI Roadmaps for the SDGs.

**We, the 5 G-STIC 2018 co-hosts, thank the numerous experts and all conference participants that contributed their knowledge, expertise, and insights to G-STIC 2018. We hope to welcome them again at G-STIC 2019, November 27-29, Brussels, Belgium.**

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## **Annex 1: G-STIC 2017 Key findings**

### **KEY FINDINGS OF G-STIC 2017 CONFERENCE**

1. Many technologies needed to achieve many SDG-related targets are readily available. Following the demonstration to show effectiveness under real-life conditions, we need to develop strategies for deployment at scale to a level necessary to achieve the SDGs. For this, suitable policy and institutional environments, models, targeted incentives and partnerships are needed, which themselves are underpinned and strengthened by deep and sustained business, political and citizen engagement.
2. Widely distributed and bottom-up technological solutions that are appropriate for communities' needs and circumstances are to drive the realisation of the energy and food SDGs, two key SDGs for achieving the 2030 Agenda.
3. Circular economy is an essential element of the new narrative, with Industry 4.0 a key enabler to achieve it and resource recovery and use from waste streams, such as wastewater and CO<sub>2</sub>, the new normal.
4. ICTs are an indispensable tool to enable the achievement of the SDGs.

### **KEY FINDINGS OF G-STIC 2017 THEMATIC CLUSTERS**

#### **AGROECOLOGY FOR SUSTAINABLE FOOD SYSTEMS**

A paradigm shift is needed from input-intensive crop monoculture and industrial-scale animal feedlots towards more resilient and diversified agroecological practices. G-STIC 2017 provided evidence that such diversified agroecological systems can work in delivering nutrition and secure livelihoods, in the places where needed most and to people who need these most.

#### **CIRCULAR ECONOMY AND THE ROLE OF INDUSTRY 4.0**

Industry 4.0 provides the technological driver for circular innovation, while circular economy is considered a driver for envisioning the industrial framework in 2030. We can't have a circular economy without the 4th industrial revolution, nor can we have socially useful and doable transitions to more sustainable economic development models without advancing the circular economy.

#### **ENERGY POSITIVE COMMUNITIES**

G-STIC calls for an energy access agenda that is driven by decentralized systems that are affordable, appropriate, and allow for bottom-up distribution. Ownership of customers in the energy positive communities transition is essential in the energy access debate.

#### **SMART WATER**

The digital revolution is providing a huge potential to manage our water resources more efficiently. The Smart Water session illustrated how Instrumentation, Control and Automation (ICA) technologies, combined with information derived from remote sensing, are already revolutionizing how water resources are managed. Three components are required to move from digital technology to smart solutions: (1) the creation of data platforms, (2) the availability of open data, and (3) citizen participation.

## **URBAN DESIGN AND SUSTAINABLE BUILDING**

A systemic and integrated approach is needed, in which design, construction, operation and use come together, with ICTs and the Internet of Things as major enablers. Much of the needed technology already exists, but moving forward will require new voluntary and mandatory measures and more demonstration projects that will create the required public and political awareness.

## **ELECTRIC MOBILITY**

A mere technological shift without changes in mobility behaviour is insufficient, and the importance of urban planning, fuel efficiency, and prioritising system electrification was underscored. Meanwhile, managing the growth of the global vehicle fleet along with efforts to reduce the carbon intensity of the fleet are vital interventions.

## **WASTEWATER AS A RESOURCE**

There is a need to not think of wastewater as a burden, but rather as a provider of energy, nutrients and clean water for irrigation and human use. Again, much of the needed technology exists, and there is an immediate need for more demonstration efforts and new business models to ensure economic viability.

## **BAMBOO**

Bamboo fibre and poles are successfully used in an increasing number of applications, from textiles and furniture, wood panels, laminates, biofuels, pulp & paper, up to prosthetics and water pipes. G-STIC 2017 illustrated how bamboo can also be an alternative resource in many commercial applications, supporting the creation of new jobs and extra income for local people, and acting as a significant carbon sink.

## **CO2 AS A RESOURCE**

Feasible solutions to harness CO<sub>2</sub> as a resource by transforming CO<sub>2</sub> into chemicals, fuels and materials were highlighted at G-STIC 2017. Although further research and innovation efforts are needed in several applications, some of the technologies are ready for the market.

## **INNOVATIVE BUILDING MATERIALS**

Innovations in the production and use of building materials play a key role in the development of a more sustainable built environment around the world. At the same time, there is a growing focus on whether and how building materials may affect the environment and the health of building occupants. G-STIC 2017 showcased feasible innovations in the production and use of building materials.