

## 1 Introduction

The Industrial Revolution brought great progress to humanity. The global population increased sevenfold, life expectancy doubled, economic output increased a hundredfold and there are as many telephone connections as people in the world. However, many have been left behind. Some three billion people still do not have access to modern cooking and sanitation. A billion people go home hungry and do not have access to electricity, yet many of them have to charge their phones. Those left behind are the most vulnerable to the negative consequences of the Industrial Revolution, ranging from climate change to biodiversity loss.

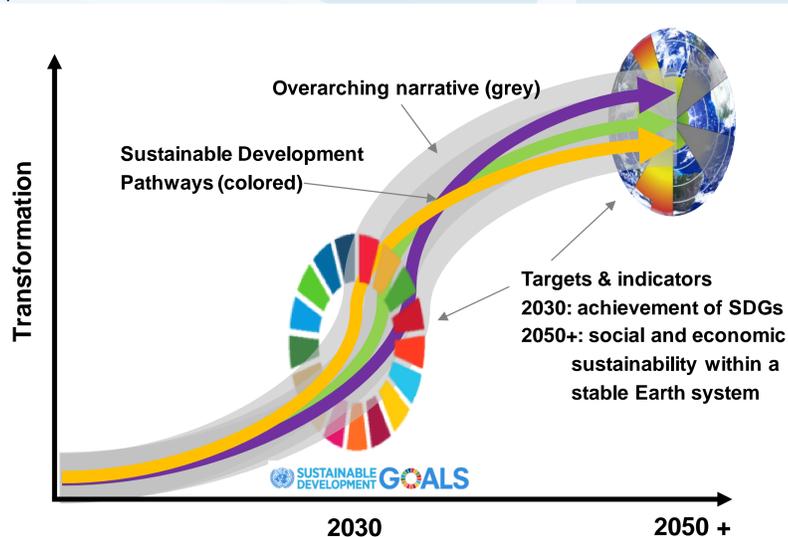
Humanity is at a crossroads. Unbounded growth is endangering planetary support systems and increasing inequalities, the rich are getting richer and the poor even poorer. The transformation towards sustainable futures is an alternative possibility for people and the planet – a just and equitable world for all. This is exactly what the United Nations 2030 Agenda (adopted on 27 September 2015) offers and is thus a great gift to humanity. It presents a new social contract with its 17 Sustainable Development Goals (SDGs). It is an aspirational and ambitious vision for the future betterment of humanity and it gives strong reasoning for fact-based understanding of the interrelationships and synergies among the SDGs.

The World in 2050 (TWI2050) was established by the International Institute for Applied Systems Analysis (IIASA) to provide scientific foundations for the 2030 Agenda. It is based on the voluntary and collaborative effort of more than 60 authors from about 20 institutions, and some 100 independent experts from academia, business, government, intergovernmental and non-governmental organizations from all the regions of the world, who met three times at IIASA to develop pathways toward achieving the SDGs.

## 2 Sustainable Development Pathways

Ensuring future sustainable development will require socio-economic development within sustainability limits and budgets for improving human well-being, while preserving natural resources and environmental processes that regulate ecosystem and ensure planetary resilience.

The approach taken by TWI2050 differs from other scenario analyses and integrated modeling because it is goal-based oriented and thus normative (Figure 1). First the targets for 2050 and beyond is to be defined through a set of indicators and those are used to “backcast” development from the base-year and include the achievement of SDGs by 2030 on the way to social and economic sustainability within planetary boundaries. A sustainable development pathway must also take account of the critical drivers of human capacity, demographic changes, opportunities for technological innovation and diffusion, sound institutions and transformative governance capabilities, sustainable diets, and other critical socio-economic developments.



**Figure 1.** An illustration of TWI2050 conceptual framework. Two sets of science-based, normative targets provide bounds for the transformation toward sustainable future. The first are symbolized by the SDGs for 2030 and the second for 2050 and beyond symbolizes the achievement just and equitable future for all on a resilient planet. The gray band illustrates the overarching narrative that indicates how the future is connected to the present. It is about what needs to change to achieve the transformation toward sustainability by ‘backcasting’ from the normative targets. Also shown are alternative SDPs that provide model-based quantifications of the transformational changes. They can be interpreted as alternative realizations of the overarching narrative. Source: TWI2050.

This new generation of back-casting scenarios would therefore need to explore pathways towards achieving the goals, and exploring possible interactions between SDGs (synergies and trade-offs) and the different steps that need to be taken (including barriers and opportunities). Moreover, the scenarios also need to address some of the key uncertainties involved in our understanding of the future. By taking a long-term perspective TWI2050 allows for an assessment of the interactions across SDGs beyond 2030, ensuring that the long-term trajectories of development pathways indeed respect planetary boundaries and are hence sustainable.

## TWI2050 Network

TWI2050 brings together a network of leading policymakers, businesses, analysts, modeling and analytical teams from around the world to collaborate in developing pathways toward sustainable futures and policy frameworks needed for implementing the SDGs, and more importantly, for achieving the needed transformational change. For an up-to-date list of members and partners, how to join and general information please visit: [www.twi2050.org](http://www.twi2050.org)

## Reference

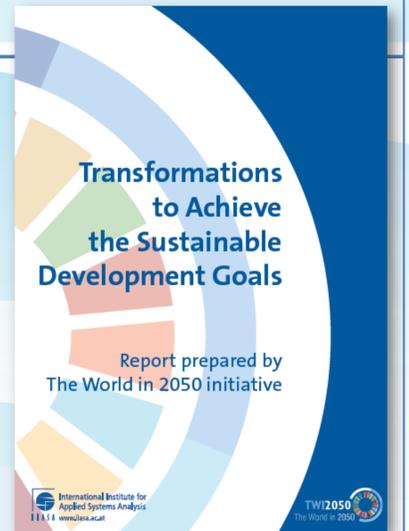
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## 2 TWI2050 Report 2018

The first TWI2050 report ‘Transformations to Achieve the Sustainable Development Goals’ (Figure 2) will be launched at several events during the 2018 UN High-level Political Forum (HLPF).

The report is based on the voluntary and collaborative effort of more than 60 authors from about 20 institutions, and some 100 independent experts from academia, business, government, intergovernmental and non-governmental organizations from all the regions of the world, who met three times at IIASA to develop pathways toward achieving the SDGs.

The report examines the current trends and dynamics that promote and jeopardize the achievement of the SDGs. It presents the TWI2050 framework (Figure 1), the integrated pathways which harness the synergies and multiple benefits across SDGs, and approaches to governing this sustainability transformation.



**Figure 2.** TWI2050 Report

TWI2050 identifies six exemplary transformations (Figure 3) which will allow achieving the SDGs and long-term sustainability to 2050 and beyond. The six transformations provide a ‘silver tread’ throughout the report and translate the SDGs into actionable way forward for a plethora of stakeholders and major groups.



**Figure 3.** TWI2020 focuses on six transformations that capture much of the global, regional, and local dynamics and encompass major drivers of future changes. Together they give peoples-centered perspective: building local, national and global societies and economies which secure wealth creation, poverty reduction, fair distribution and inclusiveness necessary for human prosperity. They are necessary and potentially sufficient to achieve the SDGs if addressed holistically in unison. Source: TWI2050.

The report calls for both transformative change and policy coherence. It demonstrates how systems analysis supports decisions makers toward holistic policymaking, considering all dimensions of sustainability – society, economy and the environment and how they are interrelated. The report provides policy recommendations to guidance to target audiences, such as policymakers, mayors, businesses, investors, civil society, on how to achieve integrated pathways that implement these transformations.

## Key Messages

- Transformation towards a sustainable future is possible but ambitious action is needed now!
- Six transformations that are necessary to achieve the SDGs!
- Attaining the SDGs in a resilient and lasting way, requires vigorous action now, and a people and planet focus beyond 2030!
- As everything is integrated in the connected world, the grand transformation requires a holistic perspective!
- Transformational change is needed but to succeed we must take along winners and losers!
- The world is at crossroads as we are currently experiencing signs of a counter-transformation!
- A central element of the sustainability transformation is effective and inclusive governance!
- Think globally, act locally! Think long-term, act now! It is all a matter of scale