The World in 2050 (TWI2050) is a partnership between science and policy that aims to develop pathways toward sustainable development within planetary boundaries. TWI2050 aims to address with an integrated and systemic approach the full spectrum of transformational challenges related to achieving the 17 Sustainable Development Goals (SDGs) and reach the desired just and safe target space for people and planet by 2050 and beyond. Today, no science-based pathways exist for successfully achieving all SDGs. This approach is the first goal-based, multi-model quantitative and qualitative integrated analysis that encompasses the full set of SDGs. The first sustainable target space for 2030 is based on the 17 SDGs and the second for 2050 and beyond is defined through a set of indicators and those are used to backcast development from the base year and achievement of SDGs by 2030 as illustrated in Figure 1.

Figure 1: TWI2050 Framework: The illustrative graphic shows alternative sustainable development pathways (SDPs) that reach the two defined target spaces: all 17 SDGs and the transformation toward sustainability within planetary boundaries beyond 2050. An overarching narrative (grey) on sustainability transformation motivates the TWI2050 framework. Source: based on (WBGU 2011).

TWI2050 initiative brings together a network of leading policymakers, analysts, modeling and analytical teams, and organizations 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.
The first step was to describe this approach and methodology in a science paper drafted by TWI2050 community that will be presented and discussed during the Annual Meeting. The second is to further refine the indicators of the target space and the plan is to do this in parallel sessions based on the clustering of SDGs shown in the Figure 2 below. There are many possible clusterings and none of them should be seen as a way to divide the SDGs as they need to be achieved holistically. In fact, the major objective of TWI2050 is to understand possible trade-offs and synergies among the SDGs as well as the dynamics that could emerge toward 2050 and beyond.

In addition to the plenary sessions six parallel sessions are planned, one per SDG cluster, to further refine the target space indicators, their ranges and characteristics by 2050 and beyond, and how they are related to other SDGs and each other. The parallel sessions should also assess the dynamics of backcasting from target space as defined by the indicators to the achievement of SDGs in 2030.

The plenary sessions will serve to integrate the results of the parallel sessions and develop a holistic approach that can be used to refine the transformational pathways to 2050 and beyond and their underlying narrative. Finally, future activities and products will be also planned during the Annual Meeting.

Figure 2. The World in 2050 [TWI2050] framework for Sustainable Development Pathways (SDP) of attaining the SDGs within Planetary Boundaries by 2050. The SDGs are universal, holistic and inter-dependent, thereby indivisible. The indicative clustering of the SDGs proposed here, has the sole purpose of emphasizing the inter-dependence between human wellbeing, world development and Earth system stability.
**Monday, 3 April**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00</td>
<td>Transportation from Hotel (Albertinaplatz) to <strong>Laxenburg Conference Center</strong></td>
</tr>
<tr>
<td>09:30-10:00</td>
<td>Arrival and Registration</td>
</tr>
<tr>
<td>10:00-10:20</td>
<td><strong>Welcome, Pavel Kabat, IIASA (10 min)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>SDSN and Agenda 2030, Jeffrey Sachs, SDSN (10 min)</strong></td>
</tr>
<tr>
<td>10:30-11:00</td>
<td><strong>Introduction and TWI2050 Updates</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Moderators: Nebojsa Nakicenovic, IIASA and Johan Rockström, SRC</strong></td>
</tr>
<tr>
<td></td>
<td>● Update of activities and discussion on future initiatives</td>
</tr>
<tr>
<td>11:00-12:30</td>
<td><strong>Plenary Session I: Discussion on TWI2050 framework and science policy interface</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Chair: Elmar Kriegler, PIK</strong></td>
</tr>
<tr>
<td></td>
<td>The TWI2050 community has jointly developed a draft science paper describing the concept for developing pathways to 2050 and beyond by “back-casting” from a “target space” (sustainability for people and the planet) to achievement of all SDGs by 2030 with some exemplary cases of how this could be achieved with quantitative and qualitative methods. First part of the session will present the draft paper and the second how to define the target space indicators that would be used for backcasting in the pathways.</td>
</tr>
<tr>
<td></td>
<td><strong>TWI2050 draft science paper and objectives for the meeting</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Nebojsa Nakicenovic, IIASA and Johan Rockström, SRC (20 min)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Discussion (60 min)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Group Photo</strong></td>
</tr>
<tr>
<td>12:30-13:30</td>
<td><strong>Lunch in the Conference Center – Oval Room</strong></td>
</tr>
<tr>
<td>13:30-16:00</td>
<td><strong>Plenary Session II: Stocktaking of TWI2050 related activities with brief presentations</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Moderator: Nebojsa Nakicenovic, IIASA and Johan Rockström, SRC</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Activities related to TWI2050</strong></td>
</tr>
<tr>
<td></td>
<td>● Update on the G20 and T20, <strong>Dirk Messner, DIE (5 min)</strong></td>
</tr>
<tr>
<td></td>
<td>● Global Sustainable Development Report 2019, <strong>Wolfgang Lutz, IIASA (5 min)</strong></td>
</tr>
<tr>
<td></td>
<td>● ICSU SDGs, <strong>Anne Sophie Stevance, ICSU (5 min)</strong></td>
</tr>
<tr>
<td></td>
<td>● Future Earth, <strong>Wendy Broadgate, FE (5 min)</strong></td>
</tr>
<tr>
<td></td>
<td>● <strong>Belmont Forum, Maria Uhle, NSF and Erica Key, Belmont Forum (5 min)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Contributions from participants and presentation of related activities (30 min)</strong></td>
</tr>
<tr>
<td></td>
<td>● <strong>UNDESA SDG Activities, Alex Roehrl, UNDESA (10 min)</strong></td>
</tr>
<tr>
<td></td>
<td>● <strong>CD-LINKS, Keywan Riahi, IIASA (10 min)</strong></td>
</tr>
<tr>
<td></td>
<td>● Update on the SSP work, <strong>Dietlef van Vuuren, PBL (10 min)</strong></td>
</tr>
<tr>
<td></td>
<td>● TWI2050 Stocktaking, <strong>Matthias Berger, IIASA (5 min)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Setting the stage for Parallel Working Sessions</strong></td>
</tr>
<tr>
<td></td>
<td>● Overall Objectives and Guidance, <strong>Elmar Kriegler, PIK (15 min)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Discussion (45 min)</strong></td>
</tr>
<tr>
<td>16:00-16:30</td>
<td><strong>Coffee break</strong></td>
</tr>
</tbody>
</table>
Parallel Working Sessions “A” (Cluster Target Spaces):
Each parallel group will start work with exemplary indicators of the target spaces and refine them by other indicators while keeping in mind possible interdependencies and relationship to other SDGs.
Discussions should include the following topics:
- Key indicators for target spaces for all SDGs in 2030 and 2050+
- Possible key linkages and knowledge gaps within the SDG cluster
- Methods to develop pathways (models, narratives, other tools)

Venue: Theater
Session A1: Social and Economic Development - SDGs 8, 9 and 11
Chair: Valentina Bosetti, FEEM
Rapporteurs: Lorenza Campagnolo, FEEM (Lead) and Sebastian Busch, IIAAS

Venue: Marschall Room I
Session A2: Basic Human Needs - SDGs 1, 2 & 3
Chair: Sander van der Leeuw, ASU
Rapporteurs: Heleen van Soest, PBL (Lead) and Raya Muttarak, IIAAS

Venue: Marschall Room II
Session A3: Earth Preconditions - SDGs 13, 14 & 15
Chair: Carlos Nobre, CEMADEN
Rapporteurs: Jörn Schmidt, CAU (Lead) and Frank Sperling, IIAAS

Venue: Franz Josef Room
Session A4: Sustainable Resource Use - SDGs 6, 7 & 12
Chair: Jae Edmonds, JGRCI
Rapporteurs: Alexander Popp, PIK (Lead) and Apollonia Miola, JRC

Venue: Kaminzimmer
Session A5: Universal Values - SDGs 4, 5 & 10
Chair: Guido Schmidt-Traub, SDSN
Rapporteurs: Eric Zusman, IGES (Lead) and Kathryn Smith, CSIRO

Venue: Kronprinz Rudolf Room
Session A6: Governance and Partnerships - SDGs 16 & 17
Chair: Dirk Messner, DIE
Rapporteurs: Caroline Zimm, IIAAS (Lead) and Julia Leininger, DIE

18:30-21:00 Social Event at the Laxenburg Conference Center
21:00-21:30 Transportation to Hotel (Albertinaplatz) in Vienna

Tuesday, 4 April
08:00 Transportation from Hotel (Albertinaplatz) to Laxenburg Conference Center
09:00-12:00 Plenary Session III: Brief Reports of Parallel Sessions “A”
Moderator: Detlef van Vuuren, PBL

Parallel Session Chairs and Rapporteurs
- **Session A1: Social and Economic Development - SDGs 8, 9 & 11** (10 min)
  Valentina Bosetti, FEEM, Lorenza Campagnolo, FEEM (Lead) and Sebastian Busch, IIAAS
- **Session A2: Basic Human Needs - SDGs 1, 2 & 3** (10 min)
  Sander van der Leeuw, ASU, Heleen van Soest, PBL and Raya Muttarak, IIAAS
- **Session A3: Earth Preconditions - SDGs 13, 14 & 15** (10 min)
  Carlos Nobre, CEMADEN, Jörn Schmidt, CAU and Frank Sperling, IIAAS
- **Session A4: Sustainable Resource Use - SDGs 6, 7 & 12** (10 min)
  Jae Edmonds, JGRCI, Alexander Popp, PIK and Apollonia Miola, JRC
- **Session A5: Universal Values - SDGs 4, 5 & 10** (10 min)
  Guido Schmidt-Traub, SDSN, Eric Zusman, IGES and Kathryn Smith, CSIRO
- **Session A6: Governance and Partnerships - SDGs 16 & 17** (10 min)
  Dirk Messner, DIE, Caroline Zimm, IIAAS and Julia Leininger, DIE
Feedback: Jeffrey Sachs, SDSN (5 min)

Discussion

Setting the stage for Parallel Working Sessions
- Overall Objectives and Guidance, Detlef van Vuuren, PBL (10 min)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00-13:00</td>
<td>Lunch in the Conference Center – Oval Room</td>
</tr>
<tr>
<td>13:00-15:00</td>
<td>Parallel Working Sessions “B” (Systems Perspectives)</td>
</tr>
<tr>
<td></td>
<td>Parallel sessions to discuss from a systems analysis perspective backcasting approaches for sustainable development pathways; the analysis should be informed by the target space for the SDGs. The following areas should be covered:</td>
</tr>
<tr>
<td></td>
<td>• Key systems, their characteristics and relationships to the SDGs (e.g., energy system: related to climate, human health, and water and land-use);</td>
</tr>
<tr>
<td></td>
<td>• Possible trade-offs and synergies among main system indicators with other SDGs;</td>
</tr>
<tr>
<td></td>
<td>• Branching points in alternative sustainable development pathways.</td>
</tr>
</tbody>
</table>

Venue: Kaminzimmer

Session B1: Water and Aquatic Systems, SDGs 6 & 14
Chair: Belay Begashaw, SDGC/A
Rapporteurs: Peter Burek, IIASA (Lead) and Jörn Schmidt, CAU

Venue: Marschall Room I

Session B2: Agriculture, Food and Terrestrial Systems, SDGs 2 & 15
Chair: Michael Obersteiner, IIASA
Rapporteurs: Frank Sperling, IIASA (Lead) and Heleen van Soest, PBL

Venue: Marschall Room II

Session B3: Human Capacity, Health and Institutional Systems, SDGs 3, 4, 16 & 17
Chair: Thomas Hale, Oxford
Rapporteurs: Kathryn Smith, CSIRO (Lead) and Julia Leininger, DIE

Venue: Theater

Session B4: Energy and Climate Systems, SDGs 7 & 13
Chair: Roberto Schaeffer, COPPE
Rapporteurs: Apollonia Miola, JRC (Lead) and Caroline Zimm, IIASA

Venue: Franz Josef Room

Session B5: Cities, Infrastructure and Consumption Systems, SDGs 9, 11 & 12
Chair: Jerry Miller, NAS
Rapporteurs: Tomoko Hasegawa, NIES (Lead) and Owen Gaffney, SRC

Venue: Kronprinz Rudolph Room

Session B6: Economic Development and Equity, SDGs 1, 5, 8 & 10
Chair: Jean-Pascal van Ypersele, UCLouvain
Rapporteurs: Sebastian Busch, IIASA (Lead) and Lorenzo Campagnolo, FEEM

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:00-15:30</td>
<td>Coffee break</td>
</tr>
<tr>
<td>15:30-18:30</td>
<td>Plenary Session IV: Brief Reports of Parallel Sessions “B”</td>
</tr>
<tr>
<td></td>
<td>Moderator: Keywan Riahi, IIASA</td>
</tr>
</tbody>
</table>

Parallel Session Chairs and Rapporteurs
- Session B1: Water and Aquatic Systems, SDGs 6 & 14 (10 min)  
  Belay Begashaw, SDGC/A, Peter Burek, IIASA and Jörn Schmidt
- Session B2: Agriculture, Food and Terrestrial Systems, SDGs 2 & 15 (10 min)  
  Michael Obersteiner, Frank Sperling, IIASA and Heleen van Soest, PBL
- Session B3: Human Capacity, Health and Institutional Systems, SDGs 3, 4, 16 & 17 (10 min)  
  Thomas Hale, Oxford, Kathryn Smith, CSIRO and Julia Leininger, DIE
- Session B4: Energy and Climate Systems, SDGs 7 & 13 (10 min)  
  Roberto Schaeffer, COPPE, Apollonia Miola, JRC and Caroline Zimm, IIASA
- Session B5: Cities, Infrastructure and Consumption Systems, SDGs 9, 11 & 12 (10 min)  
  Jerry Miller, NAS, Tomoko Hasegawa, NIES and Owen Gaffney, SRC
- **Session B6: Economic Development and Equity, SDGs 1, 5, 8 & 10** (10 min)  
  *Jean-Pascal van Ypersele, UCLouvain, Sebastian Busch, IIASA and Lorenza Campagnolo, FEEM*

  **Feedback:** Veerle Vandeweerd, G-STIC (5 min)

  **Discussion**

---

**18:30**  
*Adjourn and transportation to Hotel (Albertinaplatz) in Vienna*

---

**Wednesday, 5 April**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00</td>
<td><strong>Transportation from Hotel (Albertinaplatz) to Laxenburg Conference Center</strong></td>
</tr>
</tbody>
</table>
| 09:00-12:00 | **Plenary Session V: Way forward**  
  *Venue: Theater*  
  *Chairs: Elmar Kriegler, PIK, Keywan Riahi, IIASA, Detlef van Vuuren, PBL*  
  *Feedback and Contributions from participants*  
  *Global Environment Facility, Noako Ishii, GEF (5 min)* |
  | **Summary of the conceptual framework**  
  | **Integration and how to improve the target space**  
  | **Dynamics of backcasting from target space to SDGs**  
  | **Quantifications and storylines to be used for pathways**  
  | **Alternative pathways, trade-offs and synergies**  
  | **Development of protocols for tools to be used in TWI2050**  
  | **Formation of Working Groups**  
  | **Community building, Dissemination and Outreach**  
  | **Work plan and process**  
  | **Conclusion** |
| 12:00-13:00 | **Adjourn and Sandwich lunch** |
| 13:00    | **Transportation to Hotel (Albertinaplatz) in Vienna**  
  **Transportation to Airport (upon request)** |