Document 1

Moonshot Research and Development Program

- Future Visions & Ambitious Goals -

July 31, 2019

Drafted by the Visionary Council

Elements of Moonshot (MS) Goals

Inspiring

- ✓ Clarity of MS objectives and its necessity
- ✓ Strong impact on our future society and the industries
- ✓ Collaboration with other countries
- ✓ Intellects brought together from all over the world

Imaginative

- ✓ Innovative and radical change of our future societal system
- ✓ Clear image of our future direction

Credible

- ✓ Not only ambitious but also scientifically feasible
- ✓ Validity of progress towards MS goals
- ✓ Consistency with relevant strategies and policies

Note: Human centric is the basic concept of MS goals.

Background of setting MS goals

- ✓ Discuss MS future vision and examples of MS goals with the aims of
  - 1)enhancing national welfare and industrial competence,
  - 2)collaborating with other countries, and
  - 3)revealing our future potential,
- ✓ Determine the followings 3 areas :

< Directions >

- Seek innovative solutions for resolving societal problems,
- Create new values

- Pioneer our future in 30 years
- Trigger diversified R&D,
  - (1) in corporate with creative scientists
  - (2) beyond conventional research

< 3 areas >

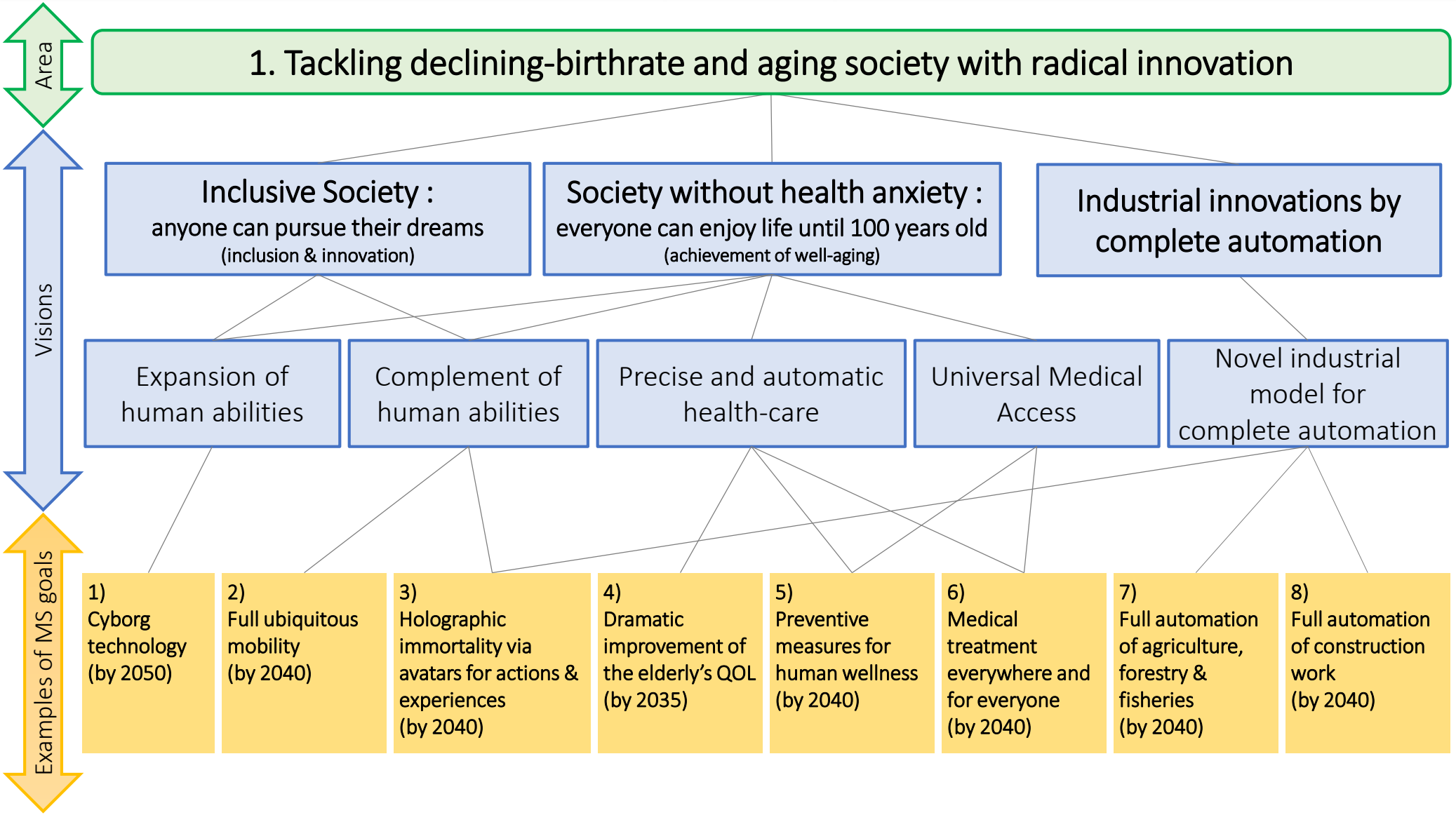
1. Tackling declining-birthrate and aging society with radical innovation
2. Recovering our civilization and healthy global environment
3. Pioneering new frontiers with science and technology

< Outcomes >

- Economic growth in a sustainable manner
- Development of earth-regeneration industries
- Entrepreneurship and innovators of the next generation

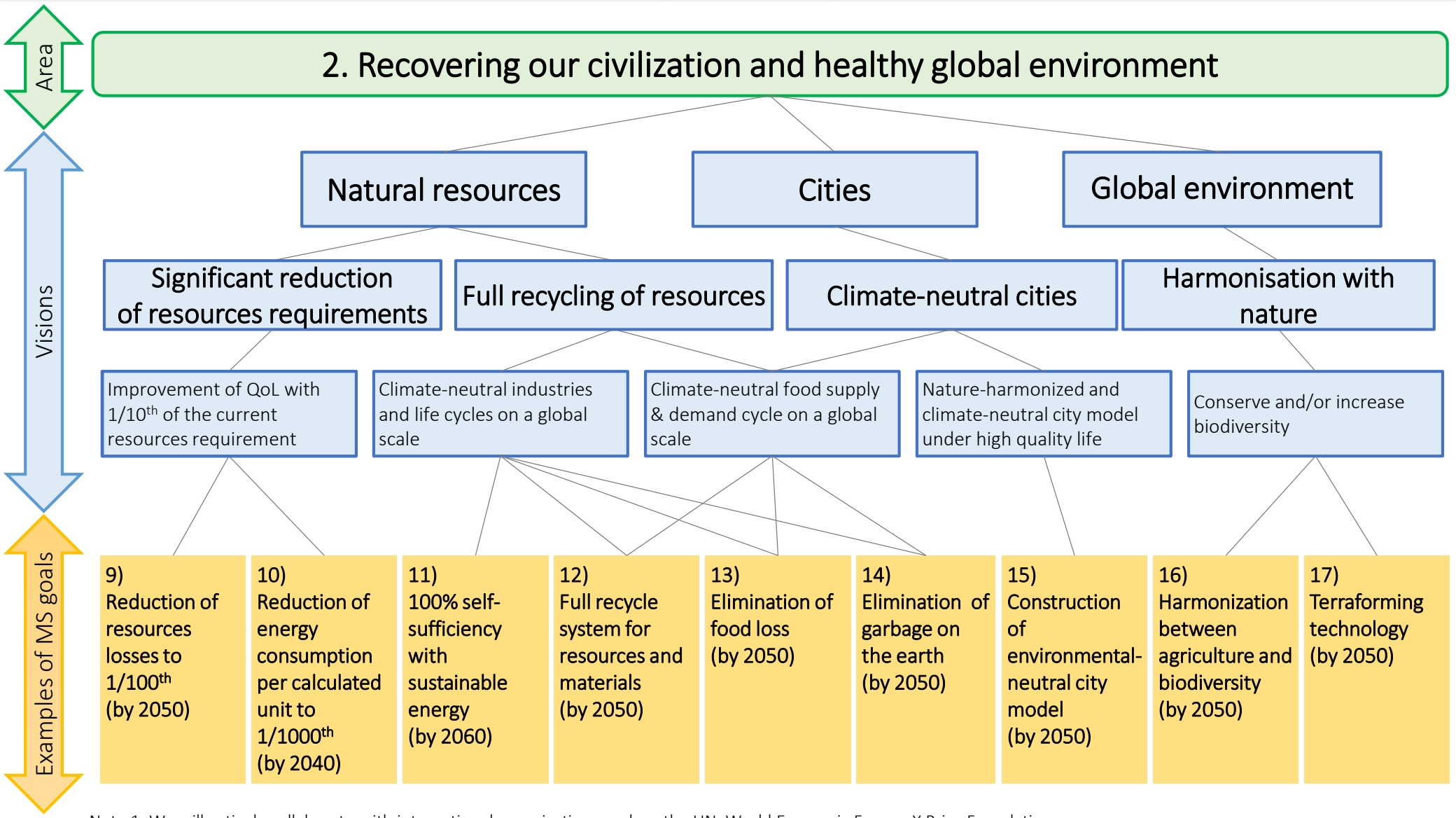
Revitalize our society based on human centric S&T

MS Area, Visions, Goals



Note 1: We will further carefully examine the examples of MS goals based on interviews with experts and discussions in the international symposiums, and review it as necessary.
2: The R&D intended to realize MS goals will not only advance technological development, but also actively promote empirical R&D based on societal implementation, including researchers in the social sciences and humanities fields.

MS Area, Visions, Goals



Note 1: We will actively collaborate with international organizations such as the UN, World Economic Forum, X Prize Foundation.
2: Climate neutrality means that there is no environmental load without trading carbon emissions.
3: We will further carefully examine the examples of MS goals based on interviews with experts and discussions in the international symposiums, and review it as necessary.
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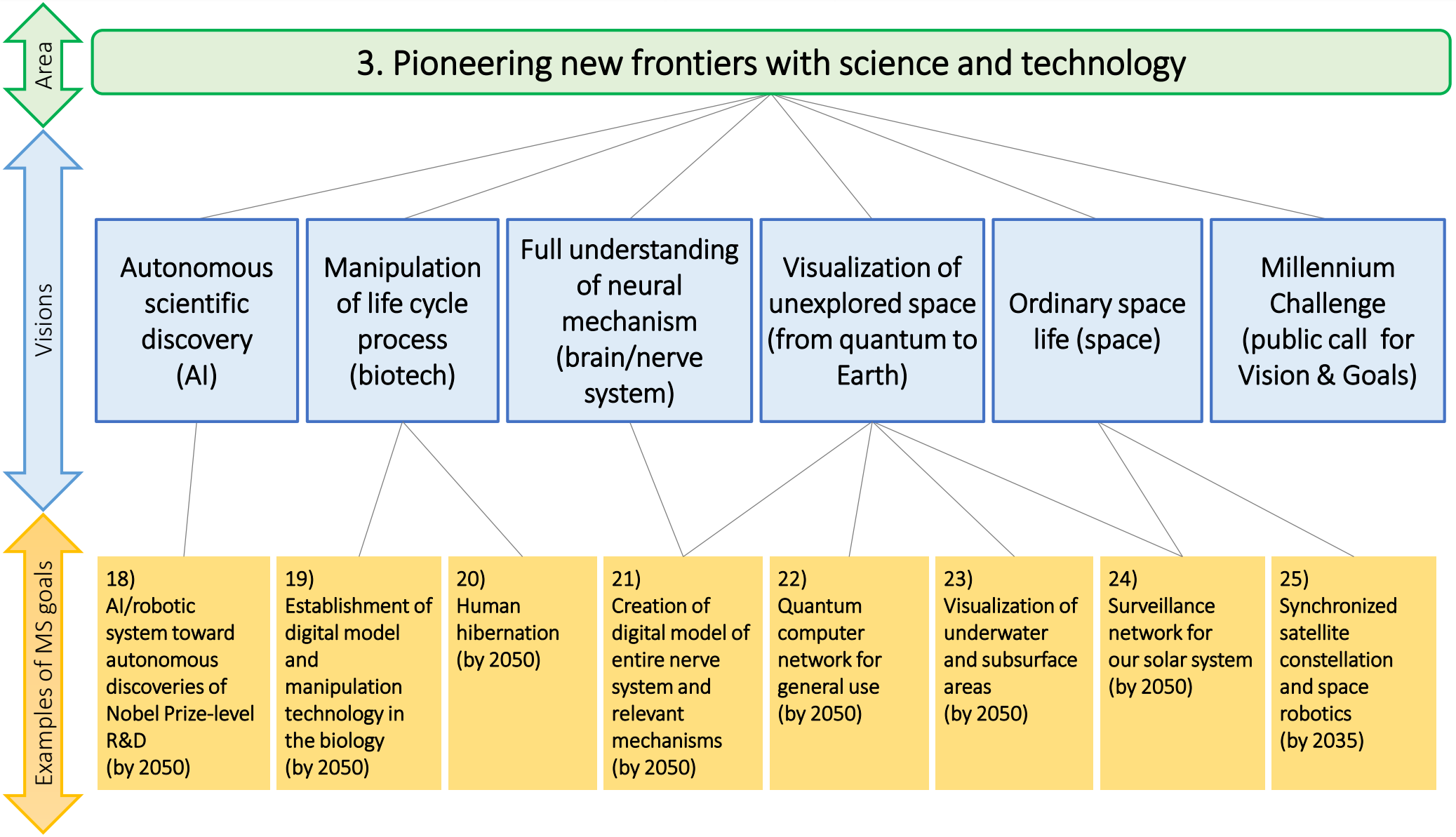

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Next steps

- ✓ CSTI (Council of Science, Technology and Innovation) **will check the feasibility of MS goals** with funding agencies (JST,NEDO) .
- ✓ CSTI will **arrange an international symposium** in December 2019.
- ✓ CSTI will **decide on the MS Goals.**(CSTI general meeting)
- ✓ JST and NEDO will **call for research program proposals**.

31 July, 2019

Proposal of future visions and Mission goals, drafted by Visionary Council

Expert interviews

- ✓ Preparation for international symposium
- ✓ Identify feasible MS Goals

17-18 Dec, 2019

International symposium

Decision on MS Goals (CSTI general meeting)

Public application for research programs (JST and NEDO)

Tentative translation

References

Status of Visionary Council's Review

- ✓ CSTI established the Moonshot Research and Development Program to challenge resolving hard societal problems. CSTI will also plan to decide the ambitious MS goals.
- ✓ To decide MS goals, the Visionary Meeting has gathered opinions from industry as well as received proposals from the general public (about 1,800) and relevant ministries and discussed the future visions and specific goals.

Visionary Council Members

Hiroaki Kitano	President and CEO, Sony Computer Science Laboratory
Yoichi Ochiai	Media Artist, Assoc. Professor, University of Tsukuba
Marissa Ozaki	Artist ("Sputniko!"), Project Associate Professor, The University of Tokyo
Yoshimitsu Kobayashi (Chair of the council)	Mitsubishi Chemical Holdings Corporation
Naohiro Nishiguchi	Executive Officer, Japan Innovation Network
Taiyo Fujii	SF Writer
Makiko Eda	Chief Representative Officer, The World Economic Forum Japan

Review Status & Future Plans

March 29: 1st Meeting
- Consultation on the important points for determining MS goals

April 22: 2nd Meeting
- Requests from the academia and industry
- Consultation on the elements of MS goals

May 23: 3rd Meeting
- Discussion on the direction for determining MS goals

June 14: Round Table Conference (private)
- Discussion on the examples of the MS goals

July : 4th Meeting

Challenge, Mission, Program

- ✓ Category of National R&D :
  - ✓ Challenges(societal problems etc.)
  - ✓ Mission(MS goals)
  - ✓ Program

	Fields (Areas of Focus)	**Challenge (Societal problems etc.)**	**Mission (MS goals)**	**Program**
EU example	● Resources, environment	● Zero household waste	● Fully recyclable packaging technology	Horizon Europe
US example	● Military	● Maintain US technological superiority	● Boost soldiers' resilience	● Technology to freely operate prosthetic hand by using the human neural network DARPA US Defense Advanced Research Projects Agency
Japan example (Moonshot)	• Backcast from global and future challenges • The <u>strength</u> of Japan's industries and technologies		Inspiring, Imaginative, Credible	Challenging R&D that takes advantage of the <u>strength</u> of Japan's basic research

<u>Visionary Council</u>

decided by CSTI (planned)

JST & NEDO

Outline of the MS International symposium

- ✓ Gather prominent program directors and scientists from all over the world
- ✓ Have discussions and collaborations about future visions and technologies.

Overview

- ■ Date: mid-December 2019 (tentative)
- ■ Location: Tokyo
- ■ Participants: Approx. 300 scientists etc. within/outside of Japan

Day 1: Keynote, General presentation

- ➢ Presentations by prominent PD and researchers

(Pictures: *ImPACT Newsletter, Vol.12*)

Day 2: Workshops in thematic areas

- ➢ Proposal and discussion about radical ideas for achieving MS goals

Status of mission-oriented research program in EU

- ✓ Horizon Europe is EU's new RD framework program with three "pillars." The European Commission has proposed **94.1 billion EUR budget over seven years**
- ✓ 10% of fund given to Pillar 2: Global Challenges and Industrial Competitiveness will be allocated to **mission-oriented research programs**
- ✓ Missions address **five Mission Areas** straddling six societal challenge Clusters
- ✓ Each **Mission Area** has a **Mission Board** with up to 15 experts. **At least one Mission will be chosen for each Area by the end of 2019** based on Board recommendations.

Horizon Europe overview (2021 - 27)

(Billion EUR)

Pillar 1 (frontier research support): **Open Science**	**25.8**	**Pillar 2** (solutions to societal challenges): **Global Challenges and Industrial Competitiveness**	**52.7**	**Pillar 3** (market creation support): **Open Innovation**	**13.5**
European Research Council	16.6	Six societal challenges (Cluster) ✓ Health ✓ Culture, Creativity, Inclusive Society ✓ Citizens' Security for Society ✓ Digital, Industry, Space ✓ Climate, Energy, Mobility ✓ Food, Natural Resources, Bio-Economy, Agrochemicals, Environment	50.5	European Innovation Council	10.0
Marie Skłodowska-Curie Actions	6.8			European innovation ecosystems	0.5
Research infrastructures	2.4	Joint Research Centre	2.2	European Institute of Innovation and Technology	3.0
Sharing excellence and strengthening the European Research Area (ERA)					**21**
Total					**94.1**

Mission Oriented Research: 5.0

Mission Areas and Mission Board Chairs

*Each mission area engages more than one Cluster

	Mission Area	Mission Board Chair
1	Adapting to Climate Change, including Societal Transformation	Ms. Connie Hedegaard Former EU Commissioner for Climate Action (Ministerial level)
2	Cancer	Prof. Harald zur Hausen Nobel Medicine Prize winner
3	Healthy Oceans, Seas, Coastal and Inland Waters	Mr. Pascal Lamy Former EU Commissioner for Trade (Ministerial level)
4	Climate-Neutral and Smart Cities	Prof. Hanna Gronkiewicz-Waltz Former Mayor of Warsaw
5	Soil Health and Food	Mr. Cees Veerman Former Dutch Minister of Agriculture

Mission Planning Milestones

Year	Month/Date	Milestone
2019	May 13 – June 11	Mission Board Membership application (2,100 applications received)
	July 4	Mission Board Chairs announced at EU Competitiveness Council (Helsinki)
	July end	All Mission Board membership finalized
	Early September	1st Mission Board Meeting
	September 24-26	**R&I Days** (major Horizon Europe promotional event) – stakeholders' discussion on their Missions
	December	**Missions finalized**

Source: CRDS