

G7 Climate, Energy and Environment WORKSHOP: Sustainable and Circular Bioeconomy for reducing emissions and restoring ecosystems: success stories and indicators and best practices for monitoring their sustainability

October 31, 2024 (12.00-16.30)

Web meeting, Presidency of Council of Ministers, Rome

Italian Presidency G7 Climate, Energy and Environment and the National Bioeconomy Coordination Board (CNBBSV), Italian Presidency of Council of Ministers, and OECD

**Round table on monitoring tools and indicators:
good practices at national and territorial level**

The Bioeconomy Strategy of Japan

Takeo MIYAKE

**Senior Science and Technology Policy Fellow for Bio, Secretariat of the
Science, Technology and Innovation Policy, Cabinet Office, JAPAN**

Contacts: takeo.miyake.a6n@cao.go.jp

The Bioeconomy Strategy

Bio-manufacturing

Target market size 53.3 trillion JPY (ca. 355 billion USD) in 2030

- Engineering biology-based biofoundry and biorefinery
- R&D support for bio-plastics



Plant-biomass based plastic



Biofoundry

Primary Production

Target market size Up to 15.9 trillion JPY (ca. 106 billion USD) in 2030

- Automated agriculture, genome editing technology-based breeding
- Large wooden architecture design and construction



Asparagus harvesting robot

Healthcare

Target market size up to 97.7 trillion JPY (ca. 650 billion USD) in 2030

- Bio-drug (incl. vaccines) development and production systems
- Large-scale genome database



Alzheimer's disease Remedy "Lecanemab"

Promotion Initiatives Aimed for the Global Bioeconomy Market Expansion estimating it to be 100 trillion JPY (667 billion USD) by 2030

Related Target/Indicators of the Bioeconomy Strategy

<Bio-manufacturing>

- Increasing government and private investments in biomanufacturing to 3 trillion yen (20 billion USD) per year by 2030.
- Introducing approximately 2 million tons of bioplastics by 2030.

<Primary Production>

- Proportion of which smart agriculture technology is used
- KPIs for the MIDORI Strategy (ag environment improvement), reduce the chemical pesticides usage (as converted to risk value) by 10% and 50% by 2030 and 2050, respectively. Reduce chemical fertilizer usage by 20% and 30% by 2030 and 2050, respectively. Organic agriculture, to increase the area to 63,000 ha by 2030 and to 1 million ha (by 25%) by 2050)
- Using the new construction floor area of large-scale buildings utilizing wood (in Japan) as the benchmark, the target is to exceed about double the level of 2018 in 2030.

<Healthcare>

- Number of regenerative medical products approved/ launched: 2 or more (as of the end of fiscal 2024) - Targets for fiscal 2025 onward will be considered during discussions on the 3rd Health and Medicine Strategy.)
- Increase the number of Certified KIH outstanding Organizations to 33,000 corporations by the end of fiscal 2027.
- Match at least 120 healthcare ventures with supporting organizations via Innohub by the end of fiscal 2027.
- Increase the number of businesses linked to Myna Portal API to 50 companies by the end of fiscal 2027.

1. Taking into account the national context, which economic indicators are used in your country or would be most appropriate to monitor the progress of the bioeconomy towards the objectives?

What indicators would be most effective to describe the sustainability of the implementation of bioeconomy in your country?



1. In Japan (Bioeconomy Strategy), **each of the ministries and agencies in charge determine and defined market areas and the future market size based on surveys and set respective targets.**
2. The target market areas are very wide, spreading to manufacturing industry, agriculture and healthcare. It is difficult to set common economic indicators for all of them. Therefore, as much as possible, we divide the supply chain into separate market areas and treat as units.
3. **Related indicators other than market size are also set.** Specifically, it is an indicator of the amount of bioplastics introduced and the amount of chemical fertilizers and pesticides used. **There is a common philosophy of aiming for economic growth that takes sustainability into account in each market area, and aiming for market growth monitoring sustainability in terms of related indicators.**

2. Which national institutions or organizations have the mandate to select indicators and monitoring methods?

What national, regional or international statistics and databases are used to assess the progress and sustainability of your national bioeconomy?



1. In Japan, the ministries and agencies in charge are defined for each market area. Then, **the ministry in charge will manage the progress of the market area in charge.** The Ministry of Economy, Trade and Industry (METI) is in charge of biomanufacturing, the Ministry of Agriculture, Forestry and Fisheries is in charge of primary production, and the Cabinet Office is in charge of healthcare.
2. The ministries and agencies in charge manage progress **by setting management indicators according to the characteristics of each market area by combining official statistics, survey results by national think tanks, and market research results by private companies.**

3. What kind of cooperation and international dialogue initiatives could foster the tailoring of robust and transparent criteria and methodologies for monitoring and evaluating the sustainability of bioeconomy policy and implementation?

How could multilateral institutions support these processes while providing a neutral platform where all countries and stakeholders have a central role in shaping the future bioeconomy?



1. The bioeconomy can contribute to both the economy and sustainability, and it is desirable that monitoring and evaluation be approached from both aspects.
2. The market for the bioeconomy is vast, but if it is divided into a certain range, there is a great deal of knowledge and experience accumulated in monitoring and evaluation methods for the economy. On the other hand, knowledge and experience on sustainability are relatively scarce, and technical difficulties are great. Therefore, **a mechanism for international cooperation and dialogue with a particular focus on sustainability is desired.**
3. **Sustainability, especially the reduction of environmental impact, has the potential to bring new added value to bioproducts and use them as a driving force for the bioeconomy.** By establishing this possibility at the center, there is potentials to involve many countries and stakeholders.

Bio-manufacturing

Aim

Promote bioprocess conversion in industries, reduce environmental burden by utilizing unused resources, and increase the strength of supply chains.

What to do

● Technology Development

- **Cultivate microorganism/cell design platformers** and **develop infrastructure for biofoundries** by fusing together biotechnology and digital technologies such as AI.
- Focus on **hydrogen-oxidizing bacteria, cultivation and fermentation processes, etc.** that may become our advantages.
- **Direct use of unused biomass and CO₂**, reduction of production and collection costs, pretreatment technologies, etc. to resolve restrictions on raw materials

● Market Environment

- Focus first on commercialization of **high value-added products**, toward commercialization of **bio-derived products**. Discuss appropriate regulations and markets toward cost reduction, mass production, etc. Commercialize general-purpose products in a staged manner. **Increase the size of public-private investment to 3 trillion yen/year.**
- Make rules for **LCA (life cycle assessment) and other assessments, product labeling, international standardization**, etc. and discuss **demand stimulation measures** by using examples from the Act on Promoting Green Purchasing, etc.

● Business Environment

- Develop **hubs for biofoundries**
- **Develop and secure human resources** needed in value chains and build **supply chains involving surrounding industries**.
- Coordinate regulations and rules by cooperation between government agencies, deal with international discussions, and promote utilization of biomass based on the Basic Plan for Promoting Biomass Utilization.