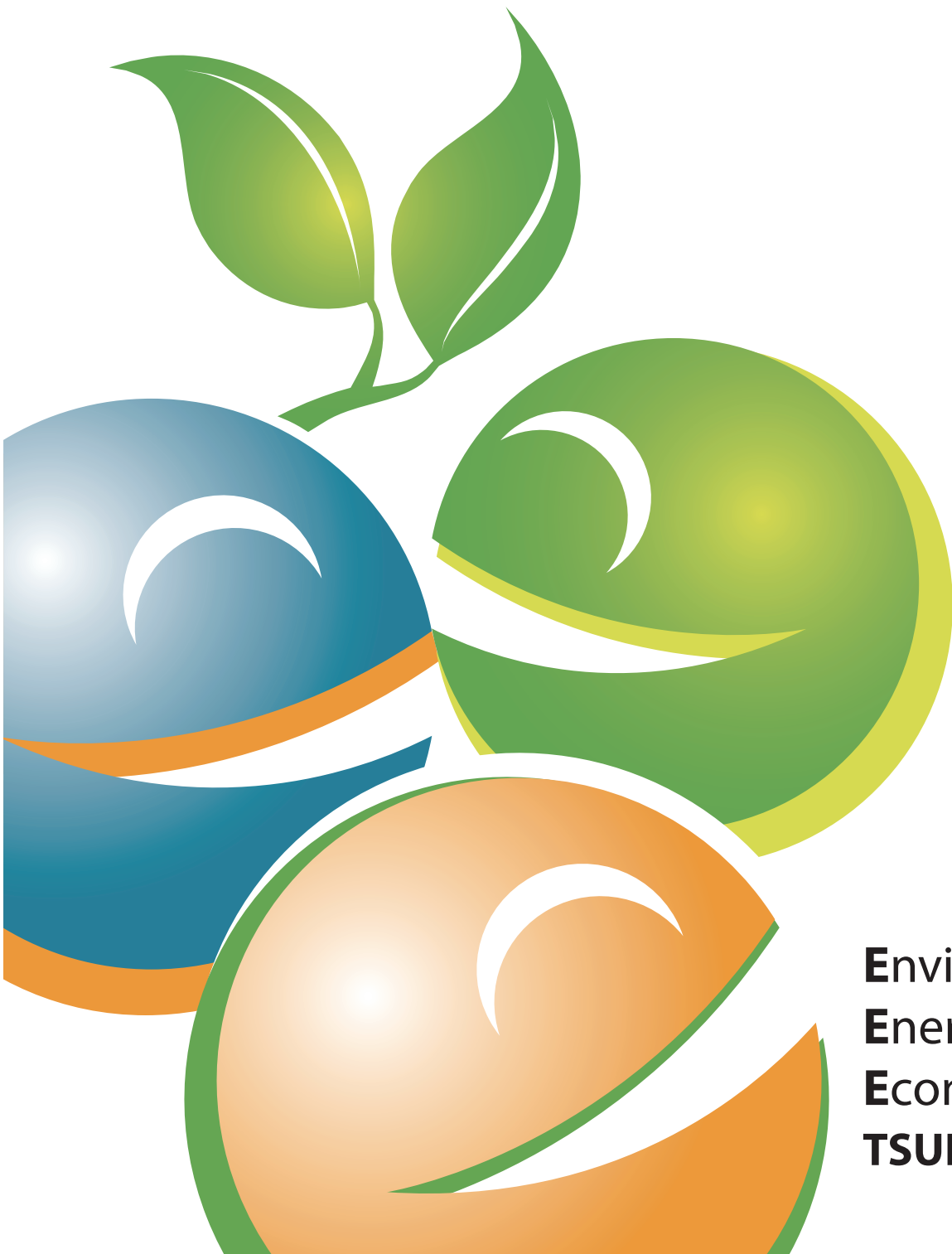


Tsukuba 3E Forum

Tsukuba Environment-Energy-Economy Forum

Reduce CO₂ emissions by 50% in Tsukuba by 2030



**Environment
Energy
Economy
TSUKUBA**

What is the Tsukuba 3E Forum?

It was collaboratively organized by universities, research institutes, and municipalities in 2007 with the aim of tackling researches that establish Tsukuba as an energy-saving, low-carbon city of science, based on the **Tsukuba Eco City Concept**. It operates on a forum of open discussion.

The goal is to “reduce CO₂ emissions by 50% in Tsukuba by 2030 (Tsukuba 3E Declaration 2007)” while balancing the “3Es” of **environment**, **energy**, and **economy**. Task forces organized within the forum propose technologies and systems to the city to achieve an eco city through demonstration.

A committee has been created within the Tsukuba Science City Network (TSCN) that discusses objectives for the entire forum and draws up proposals for the city. This network also contributes to build an ideal, cosmopolitan and mature city. The occurrence of the Great East Japan Earthquake in 2011 led to a call for the need to reassess energy policies, and investigations are being conducted that include the ideal vision for a new environmental city of the future that focuses on restoration.

What is the Tsukuba Eco City Concept?

The University of Tsukuba proposed the “**Tsukuba Eco City Initiative**” as a collaborative, joint R&D project for Tsukuba Science City. It is the foundation for the establishment of the “Tsukuba 3E Forum.”

The basic concept of the Tsukuba Eco City Initiative (as of 2007)

1. Themes that involve Tsukuba Science City as a whole
2. The ability of numerous institutes to be involved through their areas of expertise
3. A school-wide initiative for the University of Tsukuba
4. Agreement with the demands and intents of the 3rd Science and Technology Basic Plan
5. Agreement with the directionality of “Innovation 25”
6. Conformity to the aims of Tsukuba City 3rd Stage

Tsukuba Eco City Initiative

■ Tsukuba 3E (Environment, Energy, Economy) Program

Developing energy conservation, green energy technologies, and systems that are integral to energy-saving urban design

■ Model Program for Environmental Preservation

Developing environmental technologies and systems that become the foundation of community formation that underpins recycling and symbiosis

■ Model Program for Education, Culture, and Health

Developing model neighborhoods that people want to live in that value health, education, culture, and cultural assets

■ Model Program for Fundamental Urban Rejuvenation

Creating secure, comfortable urban design that includes safe, low-pollution, energy-saving transportation systems and disaster prevention information systems

Tsukuba Eco City is a ...

- Environmental Model City
- Science City
- International City of Technology and Education

The goal of this concept is to **rebuild** Tsukuba Science city as an **environmental model city**, and **city of technology and science education** through the implementation of these programs. Out of the 4 programs, the **Tsukuba 3E Program** was given priority and launched first to tackle the urgent issue of global warming. As the 3E Programs is being explored, the remaining 3 Eco City Initiative programs will be launched in turn and developed while sharing research outcomes from each program with an eye toward building a “**Tsukuba Eco City**” that is a **safe, secure, healthy, and cultured community that people want to live in**”.





Task forces for the Tsukuba Eco City Construction

The Tsukuba 3E Forum organizes four task forces to reduce the CO₂ emission form Tsukuba city, which are composed from specialists for each fields. They are from the university, research institutes, private companies and administrative officers of Tsukuba city and Ibaraki prefecture.

Solar Energy Task Force

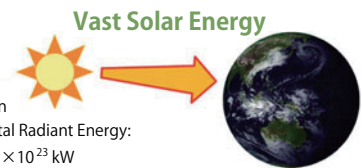


A variety of endeavors, both tangible and intangible, are necessary to reach the 3E Forum aim of halving CO₂ emissions by 2030 and achieving a low-carbon society. It goes without saying that the large-scale introduction of carbon-free, renewable energy is especially essential in terms of having a direct effect on the reduction of carbon emissions. The direct utilization of solar energy is the one type of eco energy that is the most anticipated because it possesses the greatest potential for aggregate amounts.

To assist in achieving the goal of reducing CO₂, this task force utilizes solar energy with this type of potential as an energy source for Tsukuba and examines the possibility of introducing such energy. It also creates and discovers new places and ways to introduce the energy. In particular, the task force creates various ideas not only from the perspective of energy suppliers, but also from the perspective of uses with the goal of submitting the ideas to the 3E Forum Committee.

Issues being addressed

- Solar power
- Solar thermal application
- Creation of frameworks for large-scale introduction



Sun
Total Radiant Energy:
 3.8×10^{23} kW

(Photo: Japan Meteorological Agency)

- Solar Energy Humans Can Harvest on Earth:
Approx. 1×10^{12} kW
(several times more than the world's energy demand)
(B.Sorensen,Energy Policy(1991)386-391.)
- Energy Consumed by All Humans: Approx. 1.3×10^{10} kW
(the year 2000)
(Hamakawa, Kuwano. "Solar Energy Engineering,"
Baifukan)

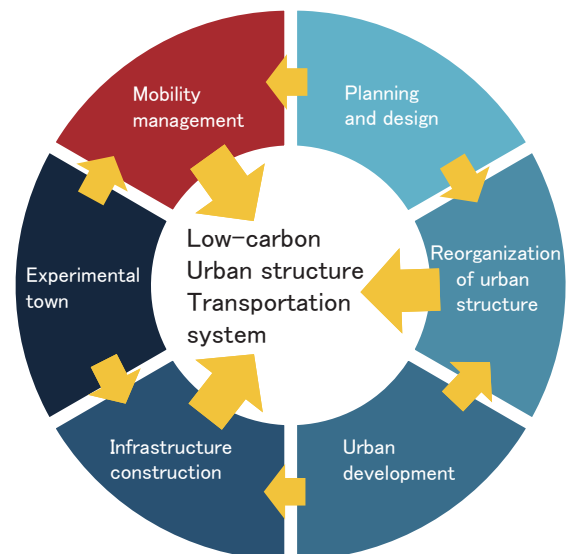
Urban Structure and Transportation System Task Force

The Tsukuba region is typical in that it relies on cars. The possibilities of global warming mitigation measures in Japan must be explored to determine the extent to which CO₂ emissions can be reduced in the future through the reorganization of urban structure and the transportation system. A leading role could be undertaken through the accumulation of technologies, ideas, and knowhow that exist in research institutes in the Tsukuba region.

This task force examines the potential and outcomes of short-term and mid-to-long-term measures that can be implemented in the transportation and urban planning sectors, draws a roadmap for research, and clarifies the issues that should be tackled by the target year.

Issues being addressed

- A transportation system beneficial to humans and the environment
- Construction of an energy-saving urban infrastructure through IT technologies, etc.
- Realization of a way to live "Tsukuba Environmental Style"



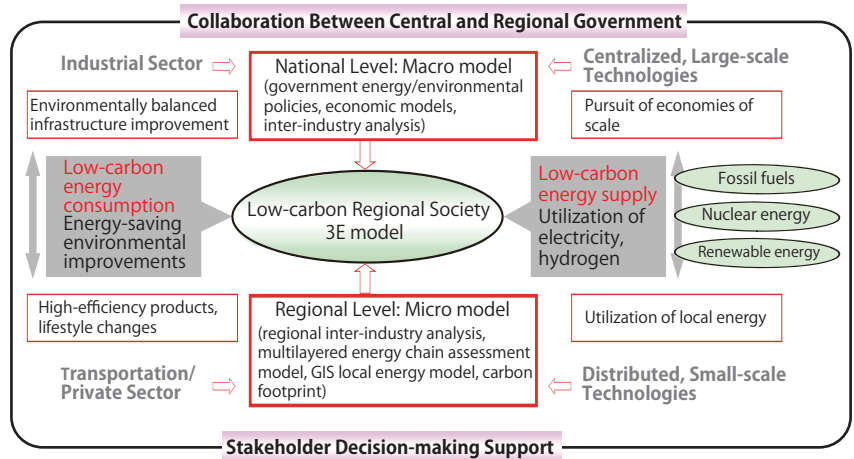
Energy Systems and Assessment Task Force

Until now, the promotion of energy conservation and popularization of new energies centered on the government, which set forth various policies and implemented them accordingly. Separate goals were put forth by sector for cutting greenhouse gases and assistance policies were executed for each. However, they were not always effective in terms of achieving goals. One reason is because the policies touted by the government were not implemented based on regional circumstances.

This task force develops a support system necessary to build a low-carbon society that takes into account the circumstances that local municipalities face, with the objective of leveraging it in the construction of a low-carbon society in Tsukuba. The support system is based on individual activities carried out by companies and residents, and clarifies the manner in which relevant organizations such as regional municipalities, universities, research institutes, NPOs, and consumer groups should collaborate to enable significant reduction of greenhouse gases.

Issues being addressed

- The prospect of a low-carbon regional society through regional 3E models
- Assessment of the possible utilization of solar power and biomass
- Assessment of technologies and regional energy systems that expand the use of hydrogen
- Assessment of the environmental life cycle of products



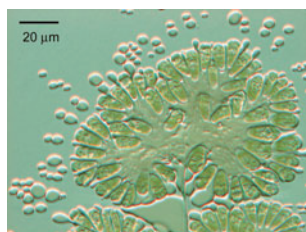
Biomass Task Force

Members participating in the task force promote the utilization of biomass in Tsukuba by contributing experiences and technologies of their own or that belong to their organization in order to aid environmental preservation that includes the formation of a recycling-oriented society, vitalization of rural regions, creation of human networks, and the prevention of global warming. Of the initiatives in the Tsukuba Environmental Style Action Plan, the task force principally supports those related to biomass research.

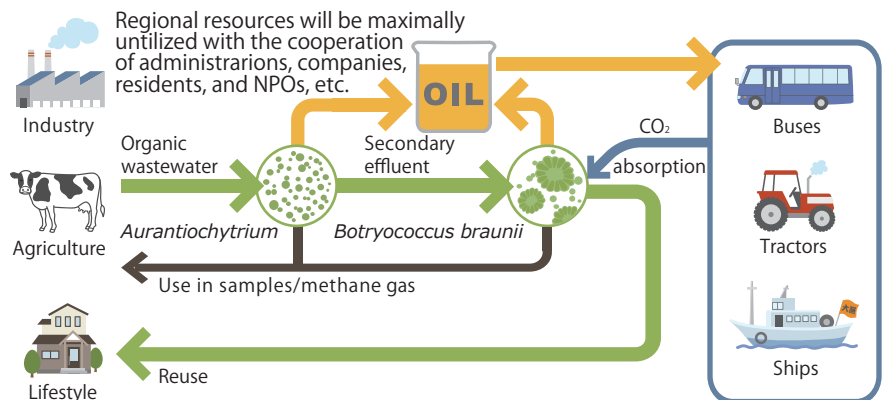
Issues being addressed

- Support for the creation of a plan promoting the utilization of a biomass town in Tsukuba
- Preservation policies for forests and undeveloped woodland near populated areas
- An energy utilization system for algae
- Cultivation of resources in fallow fields and deserted, cultivated land

A recycling system will be built that absorbs CO₂ and treats wastewater with a hybrid of *Botryococcus braunii* and *Aurantiochytrium*, and uses the generated carbohydrate as a fuel.



Botryococcus braunii



“Tsukuba 3E Forum” Conference



Once a year the Tsukuba 3E Forum holds a conference to introduce 3E Forum activities, shares information on reducing greenhouse gases, and calls on members to interact and cooperate with Tsukuba residents and industrial circles.

For details, see the reports and website for this forum [Japanese]
<http://eeeforum.sec.tsukuba.ac.jp/>

3E Café Project Team

Students are achieving the “Tsukuba Eco City” concept

Students from the University of Tsukuba voluntarily created the “3E Café Project Team” in accordance with actions taken by the Tsukuba 3E Forum. They are utilizing their status as students and challenging themselves to execute community development that brings local residents together.

The Underlying Principle

Contribute to the formation of an eco city by leveraging our status as students and residents.



Our Vision of “Tsukuba Eco City”

“Tsukuba Eco City” is not simply a community of environmental sustainability. We believe that it should also possess the following characteristics.

- Approach: Be a community that focuses on the next generation as well as the near future, and continuously makes improvements.
- Style & System: Be a community that naturally achieves the reduction of greenhouse gas emissions and suitable 3R within normal daily activities.
- People: Be a community where all people and organizations involved in Tsukuba earnestly consider Tsukuba and environmental issues, and take unified action.
- Tsukuba Identity: Be a community that maximizes utilization of the various organizations and human resources in the city, and is a leading example of collaboration among industry, academia, government, and residents.



3E Café

3E Café is an interactive project based on the concept of providing a place to which guests active in 3E-related fields can be invited so that a variety of participants, including students, ordinary residents, and researchers, can easily talk about the ideal world of the future and share information. 3E Café Project Team hopes to contribute to community and university development in Tsukuba by providing a venue for free exchange of ideas, with the aim of creating a low-carbon society in the future.

Presentation & Event Participation

Based on ideas that grow from exchanges at the 3E Café and member reports on overseas tours, the café offers support for proposals and execution of ideas for the purpose of creating an eco city in Tsukuba city and the University of Tsukuba. Presentations of activities are also given at events on the regional and national level.



Inquiries about the 3E Café Project Team

Website: <http://www.stb.tsukuba.ac.jp/~t3ecafe/>

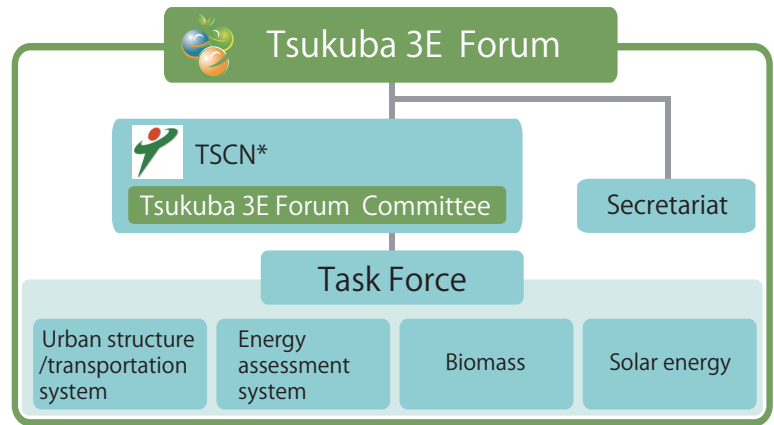
Email: 3ecafe@gmail.com



Organization

Tsukuba 3E Forum is an open discussion forum.

A committee has been formed for the purpose of running the forum, holding discussions regarding overall policy, and drawing up proposals. There are 8 organizations currently participating in the committee, and many research institutes have joined the task force.



Cooperation

*Tsukuba Science City Network

Tsukuba Environmental City Promotion Committee

Organizations participating in the "Tsukuba 3E Forum Committee" and/or Task forces (as of July 2012)

Ibaraki Prefecture/Institute for Applied Optics/
City of Tsukuba/University of Tsukuba/
National Institute for Environmental Studies/
National Institute of Advanced Industrial Science and Technology/
National Agriculture and Food Research Organization/National Institute for Materials Science

Ibaraki University/Kumagai Gumi/Building Research Institute/National Institute for Land and Infrastructure Management/
Forestry and Forest Products Research Institute/Tsukuba Gakuen Gas/Tokyo Electric Power Company/
Urban Renaissance Agency/Public Works Research Institute/Toda Corporation



Reduce CO₂ emissions by 50% in Tsukuba by 2030

(Tsukuba 3E Declaration 2007)



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