

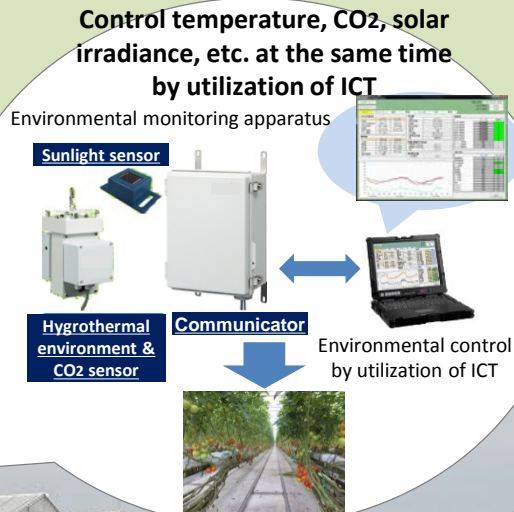
3. Tackling the challenges of greenhouse horticulture (approach for the next-generation greenhouse horticulture)

To pursue the establishment of a top-runner model (next-generation greenhouse horticulture) capable of overcoming the challenges facing Japan's greenhouse horticulture all together in the form of matching the nation's natural conditions by (1) installing advanced environmental control, (2) expanding the scale of operation through the utilization of employment, and (3) making use of regional energy, taking clues from greenhouse horticulture in the Netherlands.

1. Productivity improvement by install of advanced environmental control technology

Realize the **year-round production** based on the sales plan with the grater yield by the horticulture in the weather-resistant Greenhouse **with an environmental control system which is able to control different environments at the same time** by utilizing ICT.

(Example) Success in yielding **30-40t/10a** of large tomatoes(National average of 10t/10a)



3. Reduction of dependence on fossil fuels by utilization of local energy resources

Realize the **stable management of farms** by the **reduction of dependence on fossil fuels where price rise has a potent influence on farm management** due to the fuel expenses account for big portion in the farming costs.

Utilization of local energy resources



Waste heat



Woody biomass



Heat from hot spring

2. Large-scale management utilizing employed labor

Realization of **efficient production and expansion of management scale by utilizing employed labor** through preparation and review of appropriate work plans, due assignment of employees, standardization of work processes, etc.

Employment-oriented production management needed for expansion of operation scale



Preparation of production plan and work plan and assignment of employees



Nurturing of employees to streamline operations

Reference: Differences in natural conditions between Japan and the Netherlands

	Japan	The Netherlands
Temperature	Hot and humid in summer	Cool in summer
Accumulation of snow	Present	Almost non-existent
Big wind	Occasional brunt of typhoons	Absence of hurricane brunt
Main fuel	Fuel oil reliant on imports	Natural gas from North Sea oil field

3. Tackling the challenges of greenhouse horticulture (development of base of next-generation greenhouse horticulture)

- **Formation of ten model bases across Japan** to create next-generation greenhouse horticulture matching natural conditions, etc. of the country extended north and south
- **To rotate the PDCA cycle by collecting the environment, growth, work and other data at the model bases and assess yield per 10a, the rates of reduction in the use of fossil fuel and productivity per worker** in order to study integrant technologies for next-generation greenhouse horticulture.
- **To accumulate evidence** that can help overcome the challenges facing Japan's greenhouse horticulture and improve profitability

Data to be collected at model bases

Daily program

- Environment, growth of plants, amount of fuel used and other factors inside greenhouses
- Work plans and results

Grasping challenges and improvement (PDCA cycle)

Benchmarks

- Yield per 10a
- Rate of reduction in use of fossil fuel
- Yield per worker

Improvement in balance of management (PDCA cycle)

5. Toyama Prefecture (Toyama City) [Completed in June 2015]

Tomato (2.9 ha)
Ornamental plants including Eustoma (1.2 ha)
Waste heat



7. Hyogo Prefecture (Kasai City) [Completed in August 2015]

Tomato (1.8 ha)
Cherry tomato (1.8 ha)
Woody biomass



10. Miyazaki prefecture (Kunitomi Town) [Completed in July 2015]

Sweet pepper (2.3 ha)
Cucumber (1.8 ha)
Woody biomass



1. Hokkaido (Tomakomai City)

Strawberry (4 ha)
Woody biomass



2. Miyagi pref. (Ishinomaki City)

Tomato (1.1 ha)
Red pepper (1.3 ha)
Woody biomass
Ground thermal



3. Saitama prefecture (Kuki City)

Tomato (3.3 ha)
Woody biomass



4. Shizuoka prefecture (Oyama Town) [Completed in January 2016]

Tomato (3.2 ha)
Cherry tomato (0.8 ha)
Woody biomass



6. Aichi prefecture (Toyohashi City)

Cherry tomato (3.6 ha)
Water discharged from a
Sewage effluent heat



8. Kochi prefecture (Shimanto Town) [Completed in March 2016]

Tomato (4.3 ha)
Woody biomass



9. Oita prefecture (Kokonoe Town) [Completed in March 2016]

Red pepper (2.4 ha)
Heat from hot spring



Hokkaido (Tomakomai City)



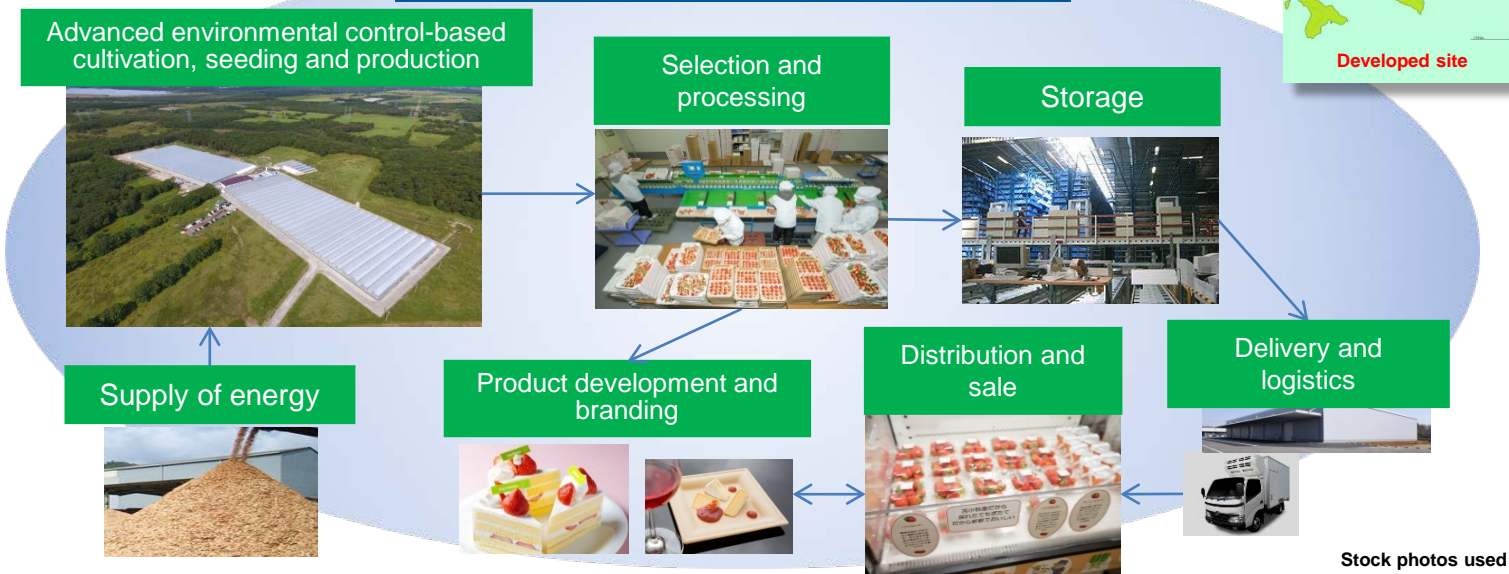
Strawberries



Wooden biomass

- To realize year-round production of strawberry with cool weather of summer in the north area of Japan.
- To introduce the advanced environmental control technology and make toward high quality and low cost production of strawberry.

To realize a cluster of plant factories!



Names of consortium and its members

Name	Consortium of the Next-Generation type of Greenhouse Horticulture in Hokkaido
Members	Tomatch Farm Co.,Ltd. / morimoto Co.,Ltd. / The Hokkaido Confectionery Association /Tomatch Inc. / TANJI FORESTRY Co.,Ltd. / Tomakomai-Kouiki Japan Agricultural Cooperatives /Hokkaido Food Industry Promotion Organization / Hokkaido Government / Tomakomai City

Crops	Area	Yield (goal)
Strawberries	4ha	314t (7.5t/10a)

Category	Overview of project
Facilities at base	(1) greenhouses, (2) woody biomass, (3) facilities for production of seedling, and (4) facilities for collection and shipment
Technological demonstration	Demonstration of devices for warming inside and around a bench ,mist cooling, application of CO2, etc. adopting advanced environmental control technology
Other programs	(1) Establishment of regional brands for new products (2) expansion of overseas sales, etc.