

Plant Factories Market in Japan: Key Research Findings 2013

◆ Research Outline

Yano Research Institute has conducted a study on the market of plant factories business (using sunlight, artificial lights, and both) with the following conditions:

1. Research period: July to December, 2013
2. Research target: Enterprises and organizations operating those plant factories using sunlight, artificial lights or both lights
3. Research methodologies: Face-to-face interviews by the specialized researchers, surveys via telephone/email, and literature research

<What are Plant Factories and Plant Factories Business Market?>

The plant factories are the facilities to grow plants throughout the year or according to planned schedule by way of controlling the facility environment such as light, concentration of CO₂, and culture fluid. There are three types in the plant factories: Those that use only artificial lights within completely sealed facilities, those that use sunlight within the facility adding some artificial lights accordingly, and those that do not use any artificial lights. The size of the plant factories business market in this research is the market size of those plants produced at and sold from the domestic plant factories, calculated based on the shipment value of distribution.

◆ Key Findings

■ Domestic Plant Factories Business Market in 2013 Projected to be 3.396 Billion Yen for Factories Using Only Artificial Lights and 19.919 Billion Yen for Both Factories Using Sunlight Only and Those Using Combination of Lights

Size of the domestic plant factories business that use only artificial lights is anticipated to reach 3.396 billion yen in 2013, whereas total size of those that use only sunlight and those that use both sunlight and artificial lights is expected to attain 19.919 billion yen.

■ Domestic Plant Factories Business Market in 2025 Anticipated to Reach 44.338 Billion Yen for Factories Using Only Artificial Lights and 105.690 Billion Yen for Total Size of Factories Using Sunlight Only and Combination of Lights

Size of the domestic plant factories business that use only artificial lights is estimated to reach 44.338 billion yen by 2025, whereas total size of those that use only sunlight and those that use both lights is likely to achieve 105.690 billion yen. After widespread of LED-using factories and progress in functional vegetables market, the artificial-light only factories are likely to enter developing period as those factories cultivate super-value-added products such as crude drugs and pharmaceutical materials in 2020 and later. Also, those factories using sunlight only and those using combination of sunlight and artificial lights are expected to expand, the former of which due to the plans by private companies to construct large factories, and the latter due to increasing cases of artificial lights introduced into those sunlight-only factories.

■ System Development, Lower Costs, and Higher Added Value Required for Further Market Expansion

In order for the plant factories to develop further, it is important to solve the issues of rising energy costs. With anticipation of increasing numbers of private companies entering the market, development of the systems for plant factories to save and create energies, more advancement in key technologies such as air conditioning, lights, and the environment control systems that matches the Japanese environments, as well as approaches for lower costs, higher added values of products expected to be achieved by controlling the growth of plants, is required for further market expansion.

◆ Report format:

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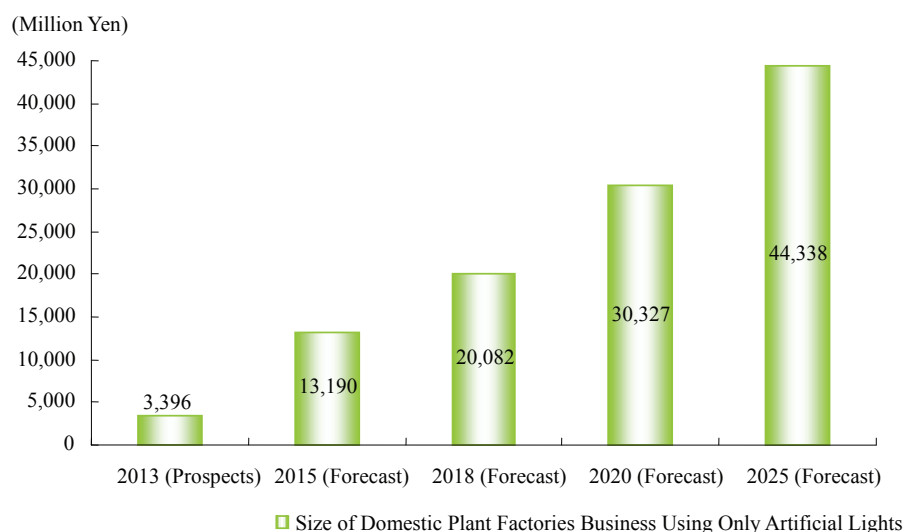
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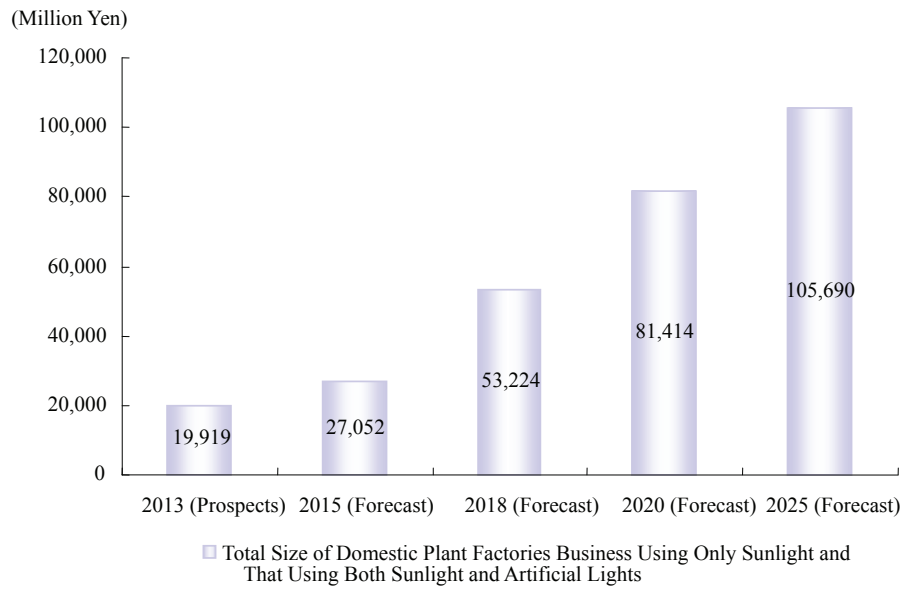
■ Figure 1: Transition of Size of Domestic Plant Factories Business Using Only Artificial Lights



Notes:

1. The market size is calculated based on the shipment values of domestic distribution of: 1) lettuce, 2) functional vegetables (fresh low-potassium lettuce), 3) crude-drug plants (licorice), and 4) transgenic plants that have been produced within domestic plant factories.
2. The forecast of major 4-item market size is calculated under the condition as follows:
 - 1) The size of lettuce plant factory market is calculated based on the assumption that all domestic plant factories producing fresh vegetables produce only lettuce.
 - 2) The market size of functional vegetables only targets fresh low-potassium lettuces.
 - 3) The market size of crude-drug plants only targets licorice.
 - 4) The market size of transgenic plants targets the current projects on the production of transgenic plants containing useful materials only.

■ **Figure 2: Transition of Size of Domestic Plant Factories Business Using Only Sunlight and Combination of Lights**



Notes:

3. The market targets approximately 90 domestic factories. The market size is calculated based on the shipment values of domestic distribution of the plants produced within such domestic plant factories.