Aiming for a Thriving Low-Carbon Society; Toyota City

Overview of Toyota City

- Population: 421,465 (as of January 1, 2015)
- Area: 918.47 km² (18% of Aichi Prefecture)
- Industrialized urban areas and hilly & mountainous depopulated areas coexist.

Specialties of Toyota City

- Pear
- Peach

Prius

UNCRD/BMA Training Programme in Japan for 15th Intermediate Executive Bangkok Metropolitan Management Programme
16-17 and 19 March 2015
Aichi, Toyota, Kyoto, and Osaka
Recent status of designation, etc. by government

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
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<tbody>
<tr>
<td>2008 (H20)</td>
<td>Environmental model city (Fiscal 2009 - 2013)</td>
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<td>2009 (H21)</td>
<td>Next-generation energy and social system verification area (Fiscal 2010 - 2014)</td>
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<td>2010 (H22)</td>
<td>General special area for regional vitalization &lt;Special district for next-generation energy/mobility creation&gt; (Fiscal 2011 - 2015)</td>
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Environment
Challenge to reduce greenhouse effect gas (balancing the environment with vitalization of the industry & region)

Traffic (ITS)
Realization of environmentally friendly traffic society utilizing ITS

Energy

Efforts for “Environmental model city”

Traffic
- Realization of eco-friendly car life through smart use of car and road
- Construction of human- and environmentally-friendly public transportation system

Industry
- Prevalence of environmental management by building the Toyota City Environmental Management Network
- Promotion of transition to sustainable plants

Forest
- Maximization of CO₂ absorption amount by strengthened thinning
- Promotion of use of regional lumber
- Educational activities to citizens and forest environmental education

Residential
- Promoting widespread use of photovoltaic generation systems
- Energy saving of lighting/home electric appliances/architectural structures
- Improving environment-related knowledge and raising environmental awareness through visualization
- Cooperation structure with residents, etc. in each region

Urban center
- Upgrading low-carbon society model districts
- Building urban center where “human” and “green” coexist
Efforts in traffic field (existing efforts)

**Constructing whole-city bus network**

Bus ridership in fiscal 2013:
- Core bus: 2.12 million
- Regional bus: 0.26 million

*approx. 2.38 million*

**Solar light charging equipment**

- General charging facilities: 21 units in 11 places (installed in fiscal 2009)
- General charging facilities: 22 units in 24 places
- 10-km mesh
- Urban area
- Mountainous area
- Parking lots for park and ride (installed in fiscal 2011)

**Subsidies for next-generation vehicle purchase**
- Up to 150,000 yen for EV and PHV

**Subsidies for charging equipment installation**
- Up to 50,000 yen

**Charging network connecting public facilities**
- 50 units
- Private fast/normal charging units: more than 82 units

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**Charging at a parking lot while away from home**
- Using the charging network of public facilities and supermarkets
- Since the vehicle has another power source, a driver feels safe even if a vehicle is running out of electricity.

**Charging at home**
- Storing power through photovoltaic panels during the day and charging a vehicle during nighttime
- Moving a vehicle through solar energy within a short distance

**Efforts in traffic field (existing efforts)**

**Expansion of use of mechanism for driving vehicles by natural energy**

**Charging station**
- Total generated output
- CO₂ reduction amount
- k W
- k g

**Solar cells**
- Generated power
- k W

**Power for selling**
- k W

**Power for charging**
- k W

**Electric vehicle**
- Secondary cell

**Power for storage**

**System connection**

**Generated power**
- k W

**Charging at a parking lot while away from home**
- Using the charging network of public facilities and supermarkets
- Since the vehicle has another power source, a driver feels safe even if a vehicle is running out of electricity.
Financial Support for Eco Families

- Up to 200,000 yen for Next Generation Vehicles (PHV, EV), including 50,000 yen for Charging Devices
- Up to 90,000 yen for Fuel Cells “Ene Farm”
- Up to 110,000 yen for Household Storage Batteries
- Up to 50,000 yen for HEMS
- Up to 84,000 yen for Solar Panels at Home

Environmental Tax Incentives

- Smart House Tax Incentive (First City in Japan)
  Reduced property tax by 1/2 for existing/newly-constructed smart houses which are equipped with
  - solar panels for generating
  - storage battery for storing
  - HEMS for saving energy

- Tax Incentive for Renewable Energy Generating Facilities
  Reduced property tax by 1/2 for generating facilities which are certified by the national gov’t with capacity of 10kw - 2000kw (First City in Japan)

- Tax Incentive for Electric Vehicle (EV)
  Reduced light motor vehicle tax by 10/10 for EVs and compact EVs (First City in Aichi)
Next-generation Energy and Social System Verification area
Joint efforts by citizens, universities, companies and the city government

Chair
Toyota City

Vice-chair
Toyota Motor Corporation

Coordination entities
Toyota City, Toyota Motor Corporation, Chubu Electric Power Co., Inc., Denso Corporation and Dream Incubator Inc.

Establishment: August 5, 2010
Description of activities
1. Planning, promoting and coordinating communication of the Low-Carbon Social System Verification Project
2. Coordinating communication of related agencies and organizations
3. Publicizing information to the public and PR activities
4. Other activities needed to achieve objectives of this council

Project participants (as of the end of January 2015): 50 organizations

At home
Mobility
Destination
Whole living sphere

Construct the promotion structure by establishing the "Toyota City Low-Carbon Society Verification Promotion Council"
[1] Optimizing energy use in home

Target: reduction of CO2 emissions by 70% or more in a single house (from the 2005 level)

Housing complexes for verification (Higashiyama Area)

Japan’s first verification in citizens’ actual lives
September 2011
Higashiyama Area: 28 households,
Takahashi Area: 39 households
[2] Construction of a low-carbon transportation system

Achieving lower-carbon human movement through a variety of means of transportation

Our new efforts

Ha: mo RIDO

Cooperation

Ha: mo NAVI

**Objectives**
Promote use of public transportation systems while securing the convenience of movement. Contribute to regional energy management by charging time control, etc.

**Objectives**
Connect individual traffic services with each other to promote their use according to traffic conditions. Provide support to realize a low-carbon and seamless transportation system.

Multi-modal route guide through smartphone
[3] Optimizing energy usage at commercial and public facilities

- Improving infrastructure for charge with renewable energy
- Introducing secondary cell systems into commercial complexes, etc.
- Constructing hydrogen stations in urban central areas
- Using energy derived from woody biomass, etc.
- Supplying electricity at the time of blackout/disaster through portable stationary secondary cells
- Optimizing the use of electricity generated through photovoltaic systems, thermal energy and unused energy by using them in places where residents go, etc. at the whole city level

FCV serves as a moving generator at the time of disaster or peak demand
[4] Support for green consumer behavior and optimizing the energy usage of society as a whole

- Weather information
- Season and day of the week
- Hourly traffic volume, etc.
- Consumption of various energies
- Behavior

Various data

EDMS (Energy Data Management System)

Data collection
Data storage
Data mining (Statistics, analysis and estimation)
Support for actions/equipment control

Achieving optimum usage of energy as the whole society system

Conserving energy by making energy consumption visible

Support for green consumer behavior and optimizing the energy usage of society
Achieving eco-friendly lifestyles with high QOL (quality of life) and no laborious effort

CO₂ reduction effect of the verification project so far

Plan for reducing amount of power consumption (CO₂) & Toyota City Verification results

Target: 70% reduction
Reduction rate: 55%
Reduction rate: 75%

Furthermore, a reduction of approximately 75% was achieved in households with high eco-awareness, thus achieving the verification goal.
Ecoful Town: An Area to Visualize and Better Understand Our Eco Efforts in Toyota City

- Total planning area = approx. 1.55 ha (opened in April 2014)

- Food Production in the Urban Area
- Smart House
- Smart Mobility Park
- Hydrogen Station
- FC Bus

Ecoful Town is an area designed to visualize and better understand eco efforts in Toyota City. The total planning area is approximately 1.55 hectares, and it was opened in April 2014. The area features various facilities including a hydrogen station, FC bus, smart house, and smart mobility park, among others. It aims to promote eco-efforts and sustainability in Toyota City.