

# Production

TME's Production Engineering Division has been tracking Key Environmental Performance Indicators since 2001. In six key areas, ambitious targets for the last 5-Year Plan have been met or, even better, exceeded by a significant margin. Our goal remains: to achieve the absolute best environmental manufacturing performance, both in the short and longer term.



Tetsuo Agata  
President  
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Company

## European Production Capacity Increase Towards Sustainable Production

In FY2005, Toyota continued its expansion in Europe. It was the 1st full year of operation for Toyota Peugeot Citroen Automobile (TPCA), Toyota's joint venture manufacturing plant in the Czech Republic, and it was also the year production started for Toyota Motor Industries Poland (TMIP).

FY2005 saw the completion of the Production 5-Year Action Plan (FY2001-2005). All plants continued to rise to the challenge of improving their environmental performance by implementing step-by-step improvements and by sharing best practice throughout the Toyota global family. It was also done by benchmarking Toyota's performance. Through these measures, all of the production targets set out in that plan were achieved and in several areas the results were significantly better.

Energy consumption and CO<sub>2</sub> levels are now of critical public concern. This year was the first period of Phase 1 of the EU Emissions Trading Scheme (ETS), which has set up a system whereby Member States limit CO<sub>2</sub> emissions from the energy and industrial sectors through the allocation of allowances.

Toyota's only facility to be included in the first phase of this new European regulatory scheme is TMUK Burnaston. Under the eligibility rules, TMUK's allowance allocated a "business as usual" target emission level equivalent to a 15% reduction over the previous year. In an exemplary demonstration of the Toyota Way values of challenge and Kaizen, the TMUK Burnaston plant managed to achieve this exceptionally high target, despite an already existing class-leading energy performance.

Waste to landfill is also a mounting concern within Europe. With TMUK, TMMF and TPCA already at zero, Toyota Motor Manufacturing Poland (TMMP) achieved this milestone during FY2005. In addition, TMMP was publicly recognised for this achievement when they received a National Level award (see TMC Sustainability Report 2006).

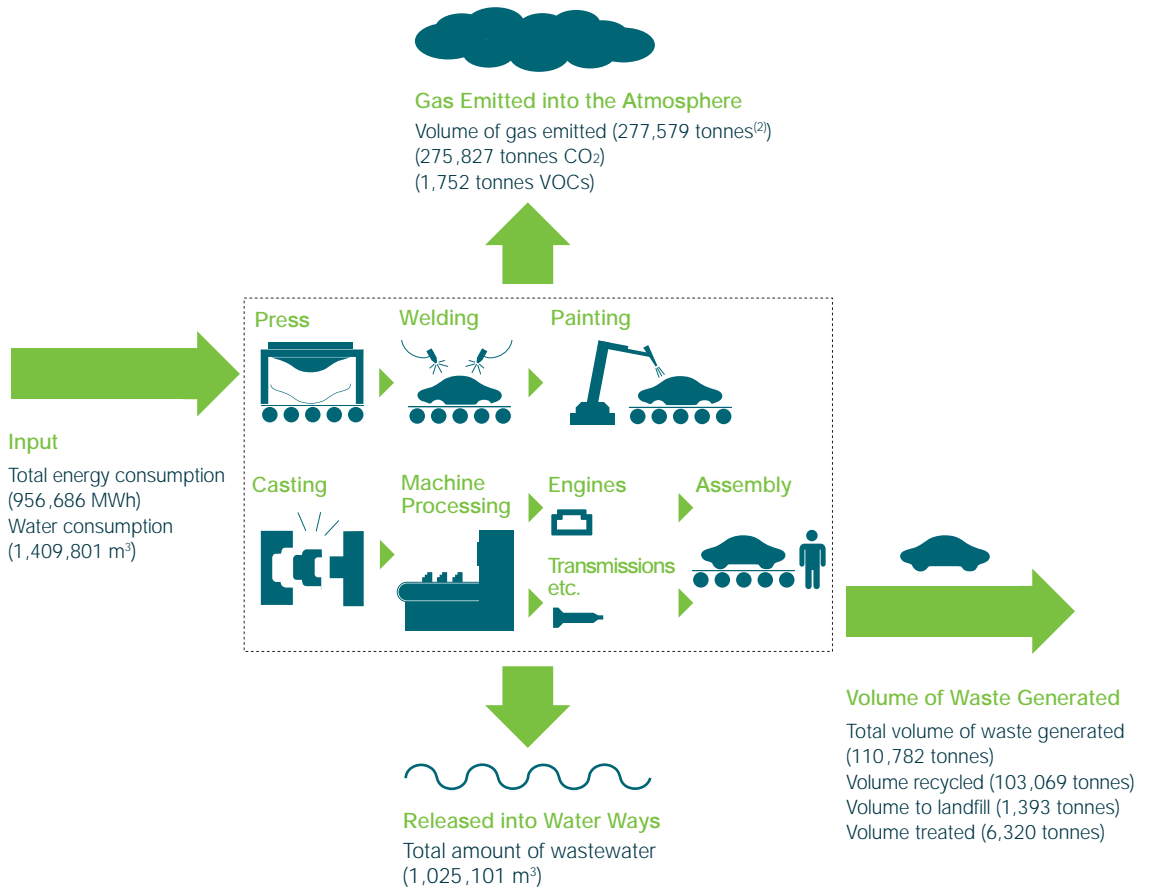
A new 5-Year Environmental Action Plan was established this year covering the period of FY2006-2010. The new targets pose a challenge for each EMC (European Manufacturing Company) in all areas of their operations. All of TME's new action-plan targets will include the performances of TMIP and TPCA (based on Toyota's share of the output).



Production line at TMMF

## Environmental Impact from Production

Volume of Resources Input and Volume of Substances Released into the Environment in FY2005<sup>(1)</sup>



(1) Data for FY2005 includes TMUK-(B)(D), TMMF, TMMP, TMMT, excludes TMIP & TPCA

(2) To calculate CO<sub>2</sub> emissions National Emission factors were used (International Energy Agency).

Toyota has established a set of six environmental key performance indicators (KPIs) for each of the most significant aspects of production:

1. Energy usage
2. Water usage
3. VOCs (Volatile Organic Compounds) released from painting operations

#### 4. Waste reduction

5. Degree of compliance with environmental regulations
6. Number of complaints from external (neighbourhood) parties

Annual targets are set by each plant in Europe for each KPI, and data are reported on a monthly basis to Toyota's European Head Office via an intranet-based system.

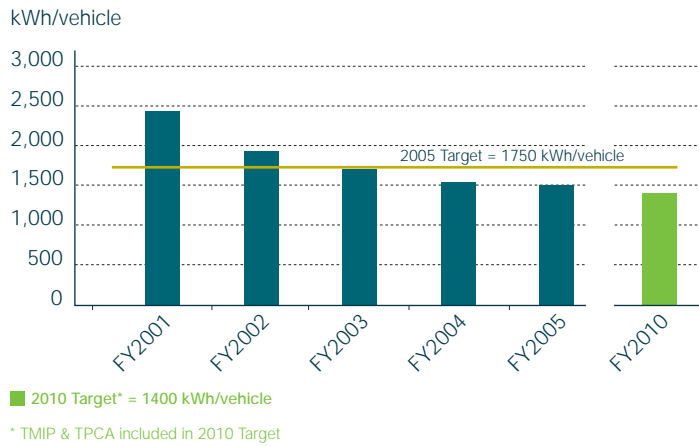
### Energy Usage

Despite unusually cold weather in the last quarter of FY2005 and its consequent impact on energy consumption and CO<sub>2</sub> emissions, the energy conservation actions of Toyota's EMCs resulted in a continued downward trend. At the close of the last 5-Year Plan, the result was 10.8% below the original target of 1750 kWh/vehicle. Accordingly, Toyota has set

a further challenging target of 1400 kWh per vehicle – an additional 20% reduction over the 2005 target – to be achieved across all European operations by 2010.

In addition, TME will establish a plant-based CO<sub>2</sub> KPI, which will support the company's focus on overall efficiency in energy production.

## Energy Usage



### Consolidated Data

FISCAL YEAR	2001	2002	2003	2004	2005
Number of Plants Included	4	5	5	5	5
Data (kWh/Vehicle)	2,424	1,949	1,697	1,560	1,536

### Energy Usage – Best Practice: TMUK Burnaston

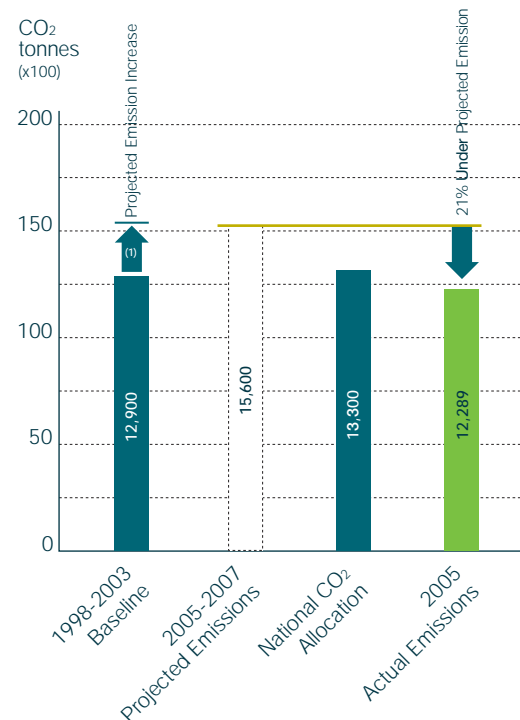
While the automotive sector already had an overall target of a 4% CO<sub>2</sub> emission reduction in the UK, TMUK was presented with a “business as usual” reduction target of 15%, as production increases at the Burnaston plant did not entitle the company to any further allocations under the UK National Allocation Plan.

TMUK identified and implemented a wide variety of conservation measures in order to meet the target and avoid the necessity of purchasing additional CO<sub>2</sub> allowances on the open market. Two examples of such measures are:

- Streamlined start-up operations of the boiler equipment for each shift systematically reduced the boiler operation requirement, ultimately requiring only one boiler to sustain start-up.
- Steam pressure to user equipment was reduced, producing significant energy savings.

Implementation of the Kaizen principle led to a fundamental re-examination of existing practice and incremental improvements until the target was achieved. The result is that for 2005, the reduction in CO<sub>2</sub> emissions for TMUK Burnaston amounts to a 21% savings over the “business as usual” case.

### 2005-2007 Allocation (Phase 1)



(1) Production volume increase of 100,000 vehicles per year

Emissions came in at 12,289 tonnes CO<sub>2</sub> instead of the projected 15,600 tonnes CO<sub>2</sub> due to efficiency of:

- equipment start up
- steam supply pressure

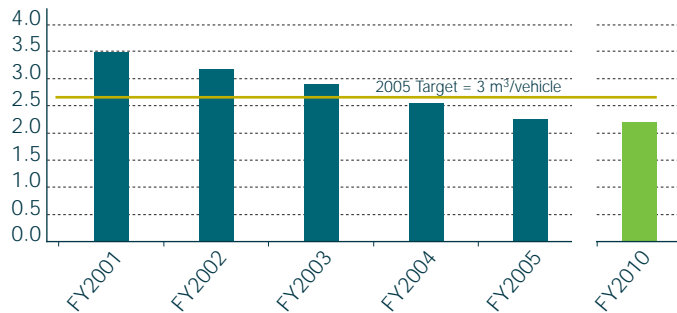
## Water Usage

In 2005, the company's manufacturing activities attained yet another record level of only 2.3 m<sup>3</sup> of water usage per vehicle, which represents a 23% savings over the original

five-year target. In preparation for the next 5-Year Plan, Toyota has incorporated a further 5% reduction challenge for the 2010 target: 2.2 m<sup>3</sup> / vehicle.

### Water Usage

m<sup>3</sup>/vehicle



■ 2010 Target\* = 2.2 m<sup>3</sup>/vehicle

\* TMIP & TPCA included in 2010 Target

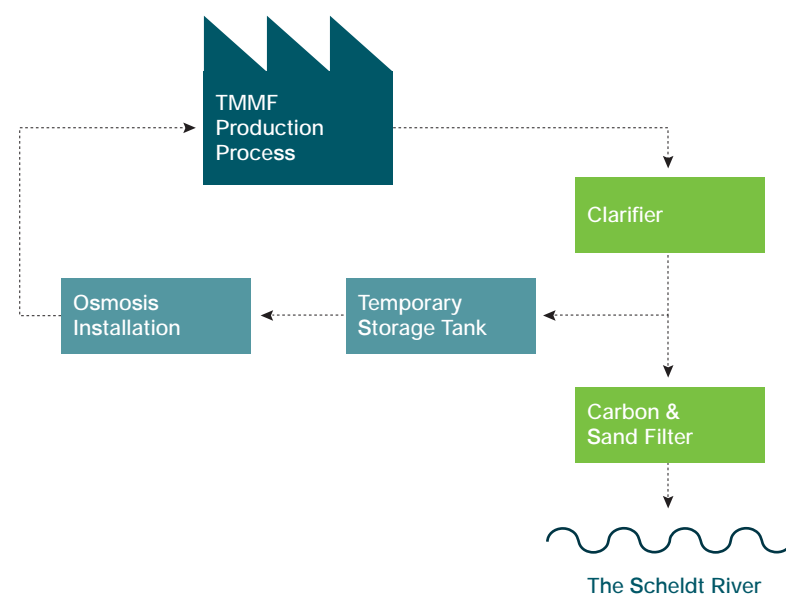
### Consolidated Data

FISCAL YEAR	2001	2002	2003	2004	2005
Number of Plants Included	4	5	5	5	5
Data (m <sup>3</sup> /vehicle)	3.5	3.2	2.9	2.6	2.3

### Water Usage – Best Practice: TMMF

By operating the recycling system at the Waste Water Treatment plant, TMMF was able to generate annual savings of 13,000 m<sup>3</sup> of raw water. The system recycles water that would otherwise be discharged into the Scheldt River. The recovered water is

temporarily stored in a tank and sent to the osmosis installation. After the osmosis treatment, the water is re-introduced into the sludge pool, cooling systems and shower tester.

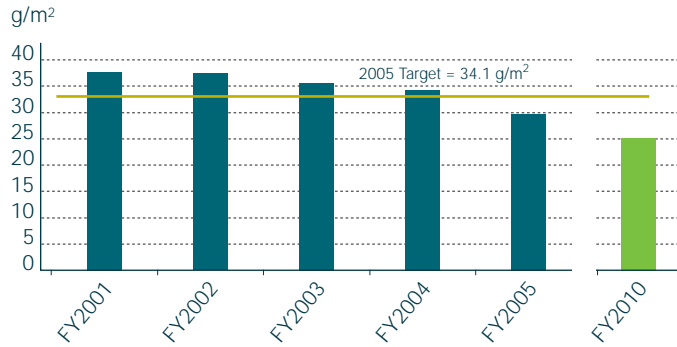


## Volatile Organic Compounds (VOCs)

The emission of VOCs into the atmosphere affects the local air quality experienced by our employees as well as the immediate community surrounding Toyota's plants. In the past year, Toyota's continued efforts to reduce

VOCs yielded a further incremental yearly reduction of 4.6 g/m<sup>2</sup> of painted surface (13.4%), allowing the company to beat the original FY2001-2005 Action Plan target by 13%.

### VOC Emissions



■ 2010 Target\* = 25 g/m<sup>2</sup>  
\* TPCA included in 2010 Target

### Consolidated Data

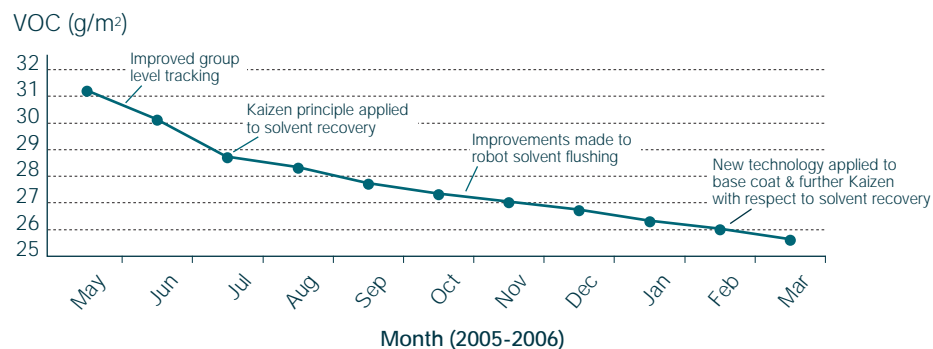
FISCAL YEAR	2001	2002	2003	2004	2005
Number of Plants Included	3	3	3	3	3
Data (g/m <sup>2</sup> )	37.7	37.5	35.6	34.3	29.7

### VOCs - Best Practice: TMUK Burnaston

With no model change and stable production conditions during FY2005, TMUK Burnaston benefited from focussing on Toyota's global benchmarking efforts and was able to implement changes that had been tested and proven in other plants

to reduce VOCs. Using the Toyota-developed PDCA method (Plan, Do, Check and Act), Burnaston personnel verified results and standardised the actions taken to ensure consistent results over time.

### VOC Reduction at TMUK due to Yokoten



TMUK is currently expanding and is also benefiting from Yokoten (best practice sharing). These efforts are improving the plant's paint shop

capacity as well as VOC emission levels through investment in new paint material and application technologies.

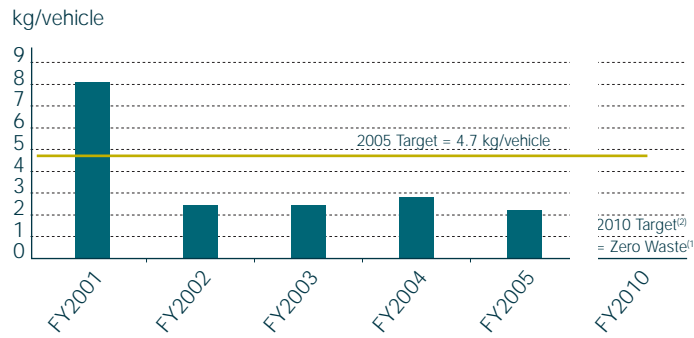
## Waste Reduction

During FY2005, TMMP achieved the milestone of “Zero Waste to Landfill”<sup>(1)</sup>, joining TMUK (Burnaston and Deeside), TMMF and TPCA in this achievement. In fulfilment of this goal for Europe, TMMT and TMIP are expected to achieve the target during FY2006.

Toyota plans to set a maintenance target of Zero Waste

to Landfill on an ongoing basis. However, the company also plans to turn its attention to reducing wastes at other levels within the waste hierarchy. In line with its commitment to recycling, the company has set a further challenging target for FY2010 of achieving a 10% reduction over FY2003 levels for wastes being thermally treated or recycled at cost.

## Waste to Landfill



(1) Zero Waste to Landfill is defined as <3% of waste in the baseline year  
 (2) TMIP & TPCA included in 2010 Target

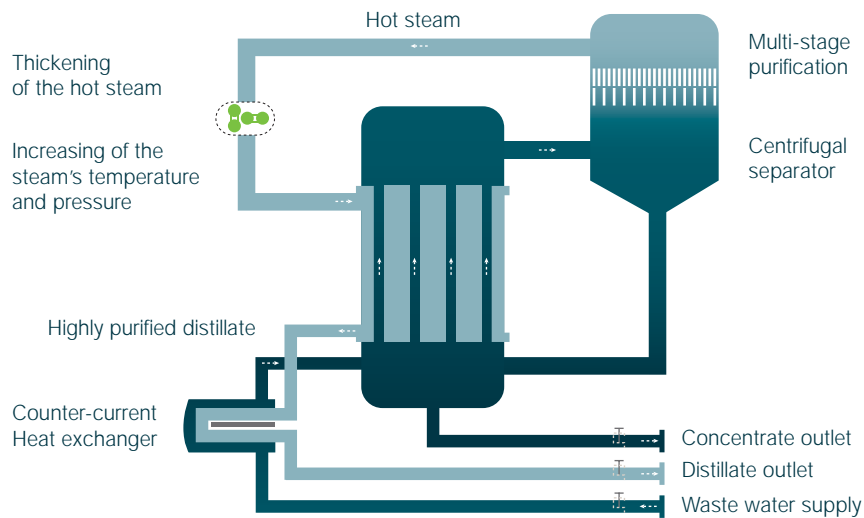
## Consolidated Data

FISCAL YEAR	2001	2002	2003	2004	2005
Number of Plants Included	4	5	5	5	5
Data (kg/vehicle)	8.1	2.5	2.4	2.8	2.2

## Waste Reduction - Best Practice: TMMP

TMMP had a number of liquid waste streams from machining processes that necessitated transport and offsite treatment. In order to reduce the volume of these waste streams, a process was introduced making it possible to concentrate the solid portion and

extract only the liquid waste. After a test period, the change should result in an annual reduction of 1,485 tonnes of liquid waste. A further goal for this process is to find a way to recycle the resulting recovered water back into the machining processes.



## Initiatives to Reduce Environmental Risk

In FY2004, TME introduced an auditing methodology focussed on the reduction of environmental risk, such as spills and legal non-compliance. A central audit team audited five plants and trained local staff to perform their own future audits.

This included strengthening the management system as well as staff competence in order to proactively recognise and manage potential risks, setting control parameters and developing robust and effective control mechanisms and checks.

During FY2005, each of Toyota's manufacturing plants has continued its risk reduction and improvement activity, and all of them have demonstrated an improvement over the initial audit. Each of the five plants now scores within

the low-risk zone (see chart, below).

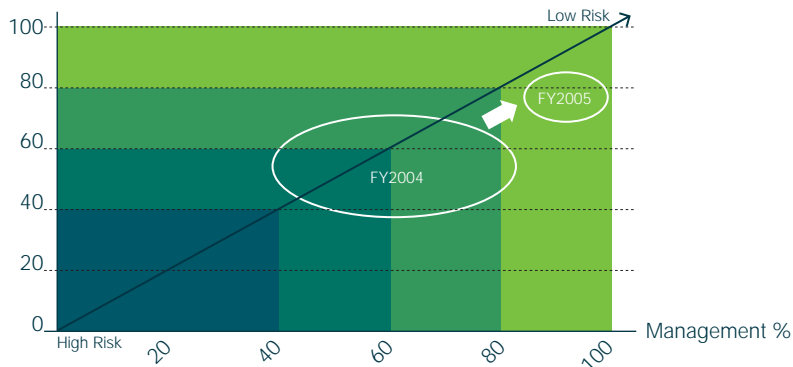
The next steps are to expand the audit in breadth to cover the two remaining plants (TPCA and TMIP), and in depth by including additional, lower risk equipment in the next category of risk evaluation.



Risk reduction audit at TMMF.

## Improvement in EMC Environmental Risk Management and Performance

Performance %



## KPI – Absolute emissions

The following chart lists the absolute figures for each of the Key Performance Indicators. The absolute figures have, of course, increased with increases in Toyota's

production levels. However, the per vehicle data on the previous pages shows that significant improvements have been made.

Absolute Emissions	FY 2002 <sup>(1)</sup>	FY 2003	FY 2004	FY 2005
<b>Total Energy Usage (MWh)</b>	817,943	873,611 <sup>(2)</sup>	930,496	956,686
Total CO <sub>2</sub> (1,000 tonnes) <sup>(6)</sup>	203	234	257	276
<b>Total Water Usage (1,000m<sup>3</sup>)</b>	1,337	1,496	1,522	1,410
<b>Total VOC Emissions (tonnes)</b>	1,368	1,672 <sup>(2)</sup>	1,905	1,752
<b>Total KPI Waste (tonnes)<sup>(3)</sup></b>	11,272	13,464 <sup>(2)</sup>	14,789	16,329
Total Waste to Landfill (tonnes)	1,179	1,252	1,680	1,393
<b>Legal Compliance</b>				
Total Number of Fines	0	0	0	0
Total Number of Prosecutions	0	0	0	0
<b>Total Number of Complaints</b>	0	2 <sup>(4)</sup>	1 <sup>(5)</sup>	0
<b>Total European Production Volume (Vehicles)<sup>(7)</sup></b>	<b>419,674</b>	<b>514,975</b>	<b>596,544</b>	<b>622,907</b>

(1) FY2002 is 12 months at all plants except France, where performance data has been calculated using data from January 2002 to March 2003.

(2) Data has been corrected since publishing the 2004 Update.

(3) Excludes scrap steel at all plants and recycled wastes for which revenue was gained.

(4) One noise complaint and one odour complaint.

(5) One noise complaint was received and fully investigated. This was attributed to a temporary contractor activity. Immediate corrective measures were implemented and confirmed with the complainant. No subsequent complaints have been received.

(6) This includes direct emissions from fuels and indirect emissions from purchased electricity.

(7) Includes TMMF, TMUK-(B) & TMMT.



OVERVIEW OF MANUFACTURING PLANTS

	<p><b>Toyota Motor Manufacturing France (TMMF)</b></p>	<p>Plant Location: Valenciennes, France                  2005 Production: 180,548 Yaris                  Start of Production: 2001                  Number of Employees: approx. 4,000                  ISO 14001 Certification: 2002</p>
	<p><b>Toyota Motor Manufacturing Turkey (TMMT)</b></p>	<p>Plant Location: Nehir Kent/Adapazari, Turkey                  2005 Production: 163,537 Corolla Verso MPVs, Corolla sedans and station wagons                  Start of Production: 1994                  Number of Employees: 3,550                  ISO 14001 Certification: 1999</p>
	<p><b>Toyota Motor Manufacturing Poland (TMMP)</b></p>	<p>Plant Location: Walbrzych, Poland                  2005 Production: 604,647 gasoline engines and manual transmissions                  Start of Production: 2002                  Number of Employees: 1,694                  ISO 14001 Certification: 2003</p>
	<p><b>Toyota Motor Industries Poland (TMIP)</b></p>	<p>Plant Location: Jelcz-Laskowice, Poland                  2005 Production: 37,299                  Production: diesel engines                  Number of Employees: 932                  ISO 14001 Certification: planned 2006</p>
	<p><b>Toyota Motor Manufacturing UK (TMUK) Engine Plant</b></p>	<p>Plant Location: Deeside, UK                  2005 Production: 369,926 engines                  Start of Production: 1992                  Number of Employees: 571                  ISO 14001 Certification: 1996</p>
	<p><b>Toyota Motor Manufacturing UK (TMUK) Vehicle Plant</b></p>	<p>Plant Location: Burnaston, UK                  2005 Production: 128,016 Corolla Hatchback, 150,806 Avensis                  Start of Production: 1992                  Number of Employees: 4,055                  ISO 14001 Certification: 1996</p>
	<p><b>Toyota Peugeot Citroën Automobile Czech (TPCA)</b></p>	<p>Plant Location: Kolin, Czech Republic                  2005 Production: 184,752 (all three brands)                  Production: Toyota AYGO (Peugeot 107, Citroën C1)                  Number of Employees: approx. 3,000                  ISO 14001 Certification: 2005</p>