

# Products for Reduced Environmental Impact



At the TEL Group, we have endeavored to satisfy our customers by offering services and products such as semiconductor and LCD production equipment and electronic components. Moreover, as stated in our Principles of Environmental Preservation, we will continuously endeavor in unison with customers to reduce TEL Group products' environmental burden. Specifically, every plant will undertake to develop environmentally benign products, setting product-specific targets for energy and resource conservation, reduction of chemical usage, and other such matters.

## ■ Examples of Key Initiatives

Business Unit / Plant	Description of Initiative
Etch systems / Yamanashi plant	<ul style="list-style-type: none"> <li>• Reduction of power consumption</li> </ul>
Single Wafer Deposition / Yamanashi plant	<ul style="list-style-type: none"> <li>• Reduction of power consumption</li> <li>• Reduction of N<sub>2</sub>, exhaust</li> </ul>
LCD systems / Yamanashi plant	<ul style="list-style-type: none"> <li>• Reduction of power consumption</li> </ul>
LCD systems / Ozu plant	<ul style="list-style-type: none"> <li>• Reduction of chemical usage</li> </ul>
Cleaning systems / Saga plant	<ul style="list-style-type: none"> <li>• Reduction of chemical solution usage</li> <li>• Reduction of IPA usage</li> <li>• Reduction of pure water usage</li> <li>• Reduction of power consumption</li> </ul>
Clean track / Kumamoto plant, Koshi plant	<ul style="list-style-type: none"> <li>• Reduction of chemical solution usage</li> <li>• Reduction of power consumption</li> </ul>
Diffusion systems / Sagami plant, Tohoku plant	<ul style="list-style-type: none"> <li>• Reduction of equipment's footprint</li> <li>• Reduction of vinyl chloride resin cable usage</li> <li>• Establishment of procedural guidelines for equipment disposal</li> <li>• Reduction of power consumption</li> </ul>

## ■ Measures for Reduction of Environmental Impact in Physical Distribution [Use of Air-Filled Packaging Materials]

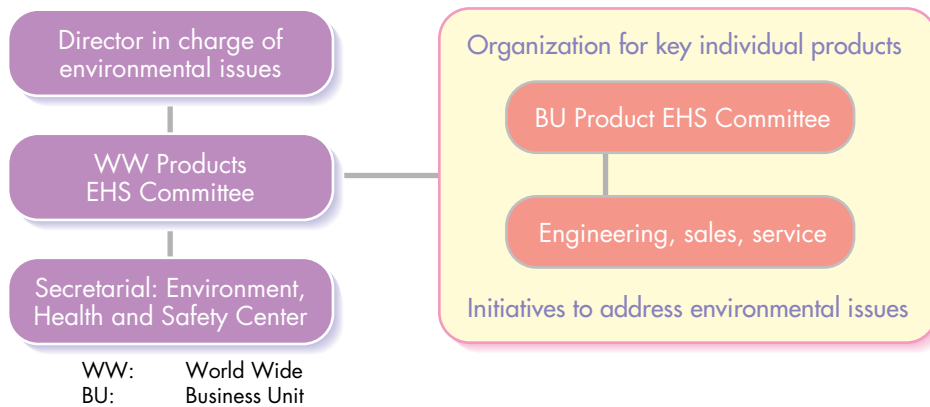
Until recently, we used polyurethane foam and environmentally-friendly, biodegradable loose-fill packaging material to package our parts for shipping around Japan and overseas. However, as of the end of 2000 Tokyo Electron Logistics Limited has been promoting the use of air-filled protective packaging at its offices around the country. This type of packaging cushions the contents in an air-filled bag made of translucent film. From an environmental perspective, this new packaging has a number of advantages over the old packaging: the packages can be reused any number of times simply by refilling with air, for example, and they produce little waste. Other advantages are that they are cleaner, offer easy access to contents when opened, and require little storage space when not in use.



Air-filled packaging material

## ■ Organization for Improvement of Products' Environmental Problems

Common issues related to improvement of environmental problems involving the semiconductor or LCD production equipment manufactured and sold by the TEL Group are reviewed and decided upon by the WW Product EHS Committee chaired by the director in charge of environmental issues. For product-specific environmental problems, the concerned design/production, sales, and/or service department conducts activities to improve the problem under the direction of the applicable BU Product EHS Committee.



## ■ Targets for Reduction of Product-related Emissions and Consumption

In product development, one of our aims is reduce products' environmental impacts such as gas emissions and power consumption. Toward this end, we have set targets for the 2002 models of our semiconductor production equipment for 200 mm and 300 mm wafers based on the 1997 models of our equipment for 200 mm wafers, as shown in the table below.

Product EHS Roadmap

Wafer Size	1997 Standard 200 mm	2002 Target 200 mm	2002 Target 300 mm
HAP emissions	1	0.4	0.5
VOC emissions	1	0.4	0.5
PFC emissions	1	0.4	0.5
Power consumption	1	0.8	1
Water consumption	1	0.8	1
Gas consumption	1	0.8	1

\*Targets for 300 mm diffusion, LP-CVD equipment are set at 1.5 times the standard data.

- HAP: Hazardous Air Pollutants
- VOC: Volatile Organic Compounds
- PFC: Per-Fluoro Compounds



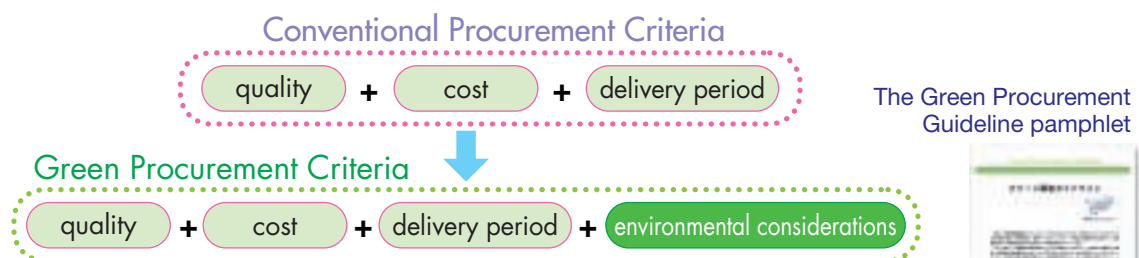
## ■ Fiscal Year 2001 Action Plan for Reducing Products' Environmental Impact

The table below shows the TEL Group's fiscal year 2001 action plan for developing environmentally benign products based on the Product EHS Roadmap.

Issue	FY2001 Action Plan	
Global warming prevention	Reduction of power consumption	Achieve the Product EHS Roadmap's targets for 2002. Adequately reduce power consumption in fiscal year 2001.
	Reduction of PFC emissions	Achieve the Product EHS Roadmap's targets for 2002. Adequately reduce PFC in fiscal year 2001.
Air pollution prevention, Safeguards against acid rain	Reduction of VOC emissions	Achieve the Product EHS Roadmap's targets for 2002. Adequately reduce VOC in fiscal year 2001.
	Reduction of HAP emissions	Achieve the Product EHS Roadmap's targets for 2002. Adequately reduce HAP in fiscal year 2001.
Prevention of ozone layer depletion	Restriction of use of ozone-depleting substances	Promote disuse of HCFC substances
Reduction of consumption of depletable resources	Promotion of recycling/reuse (dismantlement, labeling of materials, disposal)	Set targets for every product and commence action to achieve them. Determine feasibility of incorporating information into work procedures and manuals related to dismantlement and disposal.
	Prolongation of life span of equipment/parts	For every product, set targets for prolonging the life of equipment/parts and commence action to achieve them.
Purchased products	Green procurement	Establish applicable foundations for "green" procurement products.
	Lead-use restrictions	Share information regarding substitutes for lead solder. Ascertain extent of lead usage in purchased products.
Life-Cycle Assessment (LCA)	Introduction of LCA	Implement LCA for each primary product, to prevent global warming.

## ■ Preparation for Implementation of Green Procurement

"Green procurement" means procuring parts based on environmental considerations in addition to the conventional procurement criteria of quality, cost, and delivery period.



The TEL Group's Green Procurement Guideline was established in January 2001 and distributed to our suppliers throughout Japan. In addition, around 200 companies were invited to take part in green-procurement seminars held in Tohoku, Sagami, Yamanashi, and Kyushu, where they were asked to cooperate in the implementation of green-procurement policies. The first step in this process involves conducting vendor assessments on the environmental initiatives implemented by our suppliers. The second step involves an assessment of the environmental considerations for the parts procured by the TEL Group.

## ■ LCA Initiative

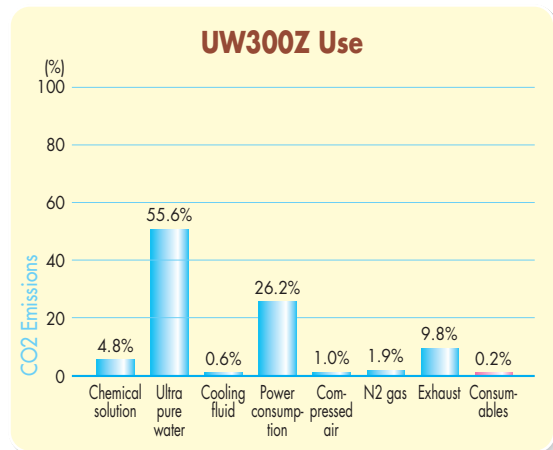
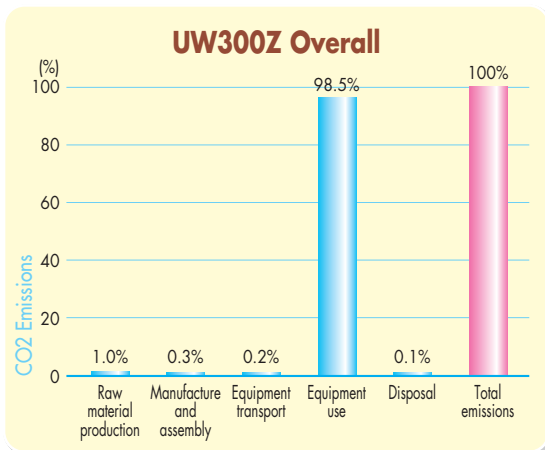
LCA (Life Cycle Assessment) is a technique for quantitatively assessing a product's environmental impact during the course of its life at each stage: from the raw-material stage through manufacture, transport, use, and disposal.

We can significantly reduce a product's overall environmental impact by analyzing, assessing, and giving priority to the rectification of any such major impact.

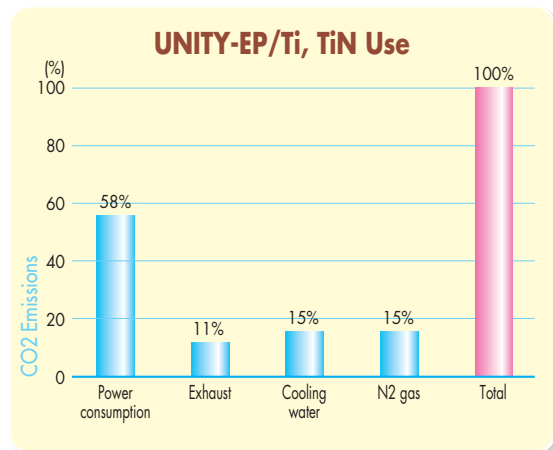
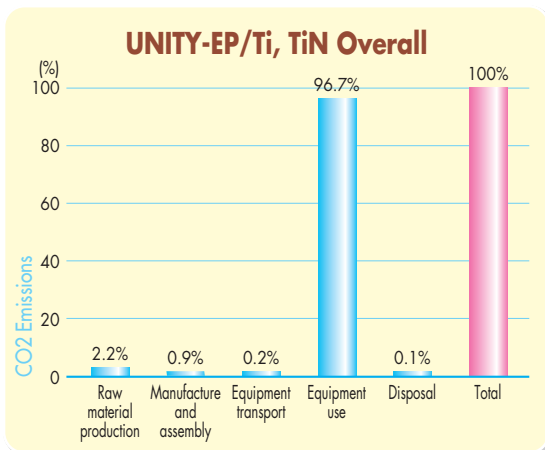
## ■ Examples of LCA Initiatives in Fiscal Year 2000

In fiscal year 2000, each business unit implemented LCA aimed at reducing global warming. One feature common to all of these assessment results was that the environmental impact for all products was the greatest at the use stage. Comparing the environmental impacts at the use stage for each of these products, we found that the impact varied from product to product, with some having the greatest impact through the use of ultra-pure water, and some having the greatest impact through power consumption. In the future, these assessment results will be considered in the course of the development of new products.

### \*1) Example 1 of LCA Result: Cleaning System



### \*2) Example 2 of LCA Result: Metal CVD System



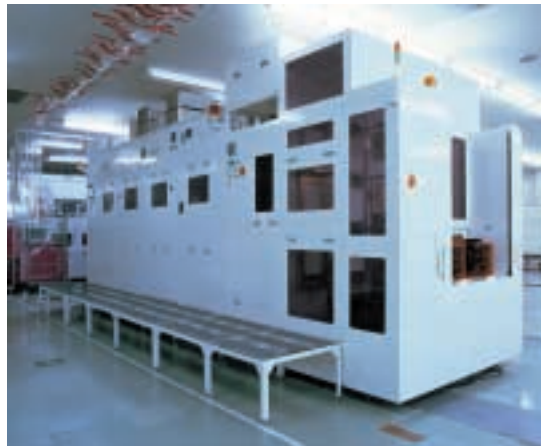


## ■ Examples of Product-Related Energy Conservation Initiatives

At the TEL Group, in order to reduce the overall environmental impact of our products, we are considering ways of reducing the environmental impact both of the existing products and of the product development process. Examples of initiatives introduced for existing and new products are provided below.

### 1) Example of New Product

In the development of the new UW300Z (300 mm  $\phi$ ) cleaning system, considerable improvements were made over the old UW8000 (200 mm  $\phi$ ) model. For per wafer unit area, the amount of ultra-pure water used was reduced by approximately 60%, exhaust emissions were reduced by approximately 50%, and power consumption was reduced by approximately 40%.



UW300Z

### 2) Example of Existing Product

The UNITY Ver.II (200 mm  $\phi$ ) etch system has achieved energy savings of approximately 30% through the use of an energy-saving dry pump and through modification to the sequences and freezer circuits in the chiller unit.



UNITY Ver.II