

Products with Reduced Environmental Impact

TEL actively applies LCA techniques and works to conserve energy in order to efficiently reduce environmental impact.

TEL Stance on Eco Products

TEL offers its customers services and products, such as semiconductor production equipment, FPD production equipment and electronic components produced in-house. TEL has prospered by incorporating customer suggestions into our products and by providing world-leading technologies and products. At a time when concern about environmental issues is growing, we face the need to reduce environmental impact during manufacturing and to eliminate harmful substances from our equipment materials. Notably, customers have asked us about the environmental impacts of products throughout their lifecycles. Taking a sincere approach to customer requests, TEL has compiled environmental impact data for products during manufacture, usage and disposal. TEL plans to continue working with our customers to further reduce environmental impact.

Product Emissions and Consumption Reduction Targets

TEL determines reduction targets for gas emissions and power consumption of its products and works to reduce their environmental impact. Because semiconductor wafer size has increased from 200mm to 300mm, we express these targets in surface area units.

TEL is looking into further aggressive reductions in PFCs* in the event that SEMI*, SEMATECH* or similar organizations promote further measures in the future.

Long-term Targets for Reducing Environmental Impact Occurring During the Use of Semiconductor Production Equipment (Product EHS Roadmap)

	1997 standards ¹		1999 standards ²		2002 intermediate targets		2005 targets	
	200mm	300mm	200mm	300mm	200mm	300mm	200mm	300mm
Wafer size	200mm	300mm	200mm	300mm	200mm	300mm	200mm	300mm
Energy consumption	1	1	0.8	0.8	0.65	0.5		
Water consumption (coolant water, etc.)	1	1	0.8	0.75	0.65	0.4		
Water consumption (ultra pure water)	1	1	0.8	0.85	0.65	0.7		
HAPs* emissions	1	1	0.4	0.7	0.35	0.4		
VOCs* emissions	1	1	0.4	0.7	0.35	0.4		

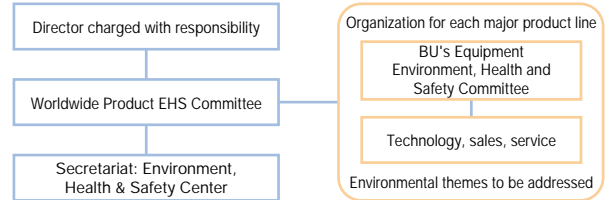
*1 Standards are defined as the amount consumed or emitted per square area unit in 1997 by 200mm semiconductor production equipment.

*2 Standards are defined as the amount consumed or emitted per square area unit in 1999 by 300mm semiconductor production equipment.

Organization for Mitigating Environmental Impacts Associated with Products

Environmental impacts that are common to the areas of semiconductor and FPD production equipment made and sold by TEL are subject to the mitigation efforts of a special organization set up at TEL. See page 20 for details.

Countermeasures Organization for Mitigating Environmental Problems Associated with Products



Example of Major Efforts in Each Business Unit (BU)

BU (Business Unit)/Plant	Efforts made
Etch Systems/Yamanashi	•Reducing power consumption
Single Wafer Deposition/Yamanashi	•Reducing power consumption •Reducing N ₂ and exhaust
FPD Systems/Yamanashi	•Reducing power consumption
FPD Systems/Ozu	•Reducing chemicals
Cleaning Systems/Saga	•Reducing use of chemical liquids •Reducing use of IPA* •Reducing use of pure water •Reducing power consumption
Clean Track/Kumamoto Koshi	•Reducing use of chemical liquids •Reducing power consumption
Thermal Processing Systems/Tohoku	•Reducing equipment footprint •Reducing use of wiring made with vinyl chloride •Establishing guidelines for scrapping equipment •Reducing power consumption

PFCs: Perfluorocompounds, a CFC alternative.

SEMI: Semiconductor Equipment and Materials International, an industry association consisting of semiconductor and FPD production equipment and materials manufacturers.

SEMATECH (SEmiconductor MAnufacturing TEChnology): A consortium of American, European and some Korean and Taiwanese semiconductor device manufacturers.

Fiscal 2002 Action Plan Items

The following table describes TEL's fiscal 2002 action plan for

the manufacturing of environmentally-friendly products, based on the Product EHS Roadmap (see page at left).

■ Fiscal 2002 Action Plan for the Manufacturing of Environmentally - friendly Products

Item	Fiscal 2002 Action Plan Items	
Global warming prevention	Reduce power consumption	Achieve Product EHS Roadmap fiscal 2002 targets Achieve sufficient reductions in power consumption in fiscal 2002
	Reduce emissions of VOCs*	Achieve Product EHS Roadmap fiscal 2002 targets Achieve sufficient reductions in VOCs in fiscal 2002
Air pollution prevention and acid rain countermeasures	Reduce emissions of HAPs*	Achieve Product EHS Roadmap fiscal 2002 targets Achieve sufficient reductions in HAPs in fiscal 2002
Ozone layer depletion prevention	Regulate usage of ozone layer-depleting substances	Promote elimination of HCFC-based substances
Reduced consumption of depleted resources	Promote recycling and reuse (dismantling into separate materials, marking materials, disposal)	For each product type, set targets and begin performing Study the tasks and procedures associated with dismantling and discarding, and how to incorporate these into manuals
	Make equipment and components last longer	For each product type, set targets for extending equipment and component life and begin performing these initiatives
Purchasing measures	Practice green procurement	Establish basis for application to green-procurement products
	Regulate lead usage	Share information regarding lead solder substitutes and learn lead usage status of purchased products
LCA performance	Implement LCA	For major products of each product type, perform LCA with the objective of helping prevent global warming

*We have already achieved a more than 90% reduction in PFCs by improving abatement system performance and using alternative gases.

Efforts to Perform LCA

LCA, or life cycle assessment, is a procedure for quantitatively assessing the environmental effects of a product at every stage of its life, including the manufacture of the product from raw materials, transportation of the product, its usage and disposal. An LCA of semiconductor and other production equipment sold by TEL would concentrate in large part on the environmental impact occurring during the process of making semiconductors.

A unified set of standards is essential to compare the environmental performance of production equipment from different manufacturers. Our group is actively involved in the SEAJ (Semiconductor Equipment Association of Japan) effort to establish an energy-savings calculating standard and, in particular, in seeking to establish a world standard that incorporates the LCA principle.

Beginning in fiscal 2001, the TEL Group has performed LCAs on all newly developed products. These LCAs have taken place within the BUs and it is our intention to take the best examples of improve-

ments made and implement these in other BUs within two years.

Examples of LCA Efforts in Fiscal 2001

Environmental impact for each life stage of a product (material manufacturing, equipment manufacturing and assembly, transportation, usage by the customer and disposal) is calculated in terms of CO₂ emissions. By changing the materials used in the equipment, total CO₂ emissions change as well, so CO₂ emissions are calculated for each material.

In all life stages, equipment usage creates the greatest environmental impacts, and the proportion accounted for by ultra pure water used in cleaning systems is the greatest; with this in mind, cleaning equipment built to water-saving specifications can be the most efficient way to reduce environmental impact. (See page 11.)

HAPs: Hazardous air pollutants

VOCs: Volatile organic compounds

IPA: Isopropyl alcohol