

WINDS OF CHANGE

Oil, gas, coal—they're so 20th century. Slowly but surely, Europe is groping toward the energy technologies of the future. BY HENRY MULLER



WHERE GREEN IS BLACK

Ask anyone at ST Microelectronics about the environment, and before long you'll hear the phrase "green is black." In other words, what's good for the environment is good for the bottom line. The tone is set by Pasquale Pistorio, the ebullient Italian who runs the world's seventh-largest manufacturer of integrated circuits. "Planet Earth cannot sustain the destruction we are making with a material-intensive, energy-intensive approach," he recently told an industry conference in Munich. But in the same breath Pistorio added, "Sustainability is not in contradiction with good financial return."

Six years ago Pistorio spelled out his philosophy in the company's Ten Environmental Commandments. They begin with a pledge to meet the most stringent environmental regulations of any of the nine countries in which the Geneva-based company operates at all of its 18 plants worldwide. The company also promises to comply with all international rules at least one year ahead of official deadlines. Beyond that, the Ten Commandments are a list of specific targets. On energy, for example, ST pledges to cut consumption 5% a year, adjusted for production increases. (It has exceeded that target every year since 1994.) ST also pledges to continue to cut its use of water and hazardous chemicals 5% a year. By 2005 it wants to recycle at least 95% of its packing waste, while reducing the use of office paper (95% of which is recycled) by 10% a year.

Most ambitious is ST's commitment to the reduction of greenhouse gases. Although the company generally buys electricity from local utilities and thus has little to say about how that electricity is generated, it will gradually shift its sourcing to avoid power generated by the burning of coal, gas, and oil. In

France, ST will continue to buy power from hydroelectric and nuclear plants. In other countries it will move to renewables such as wind; it will also invest in gas-fired co-generation (the simultaneous production of power and heat), which is almost twice as efficient as conventional gas-powered generation and produces half as much CO₂ per watt. The goal for 2010 is to reduce ST's carbon dioxide emissions to a tenth of what they were in 1990. To compensate for whatever greenhouse gases ST is still responsible for in 2010, the company will plant trees at the rate of one acre per 100 tons of carbon released. The aim is to become carbon neutral—that is, to emit no net new carbon into the atmosphere.

"All this makes economic sense," says Georges Auguste, the corporate vice president in charge of quality and environmental management at ST. With an annual power bill of around \$100 million, saving energy can mean saving money. "The payback period for environment-related investments," Auguste says, "has averaged two years and in no case been greater than three." Nor is the payback strictly economic. Executives believe that ST's environmental record helps the company attract and retain younger employees. Managers have strong incentives to meet their goals: All salary reviews take account of environmental performance.

One place to see the Ten Commandments at work is ST's plant outside the village of Crolles, set in a bucolic landscape at the foot of the French Alps near the university town of Grenoble. Cleanliness is so central to the plant's culture that visitors have to wear paper booties (recycled, of course), even in conference areas. In the clean rooms the air must be so pure—ten million times purer than on the Alpine peaks nearby—that it is renewed every seven seconds. Water may contain only 100 parts per trillion in impurities. All this requires a huge infrastructure for air conditioning, heating, and water purification. ST has chosen to view those needs as an opportunity for innovative engineering.

In most buildings around the world, air-conditioning ducts turn corners at a sharp angle. Here the ducts not only are oversized but curve gently; this is more efficient and causes less turbulence. A common problem with air-conditioning chillers is the buildup of calcium, which slows the flow of air. ST engineers came up with a process that shoots sponge balls through pipes, scraping away the calcium and keeping the air moving. In Singapore alone the sponge balls save \$120,000 a year in energy costs.

Executives at ST like to joke about their proclivity to measure everything. Pistorio's favorite numbers, however, are on the bottom line. ST's stock was hit by the technology blues, and its price is down about 50% since its high in March 2000. But revenues increased 55% last year to a record \$7.8 billion, and earnings were \$1.5 billion, up 165% from 1999. Such numbers lend support to Pistorio's conviction that green is indeed black.

