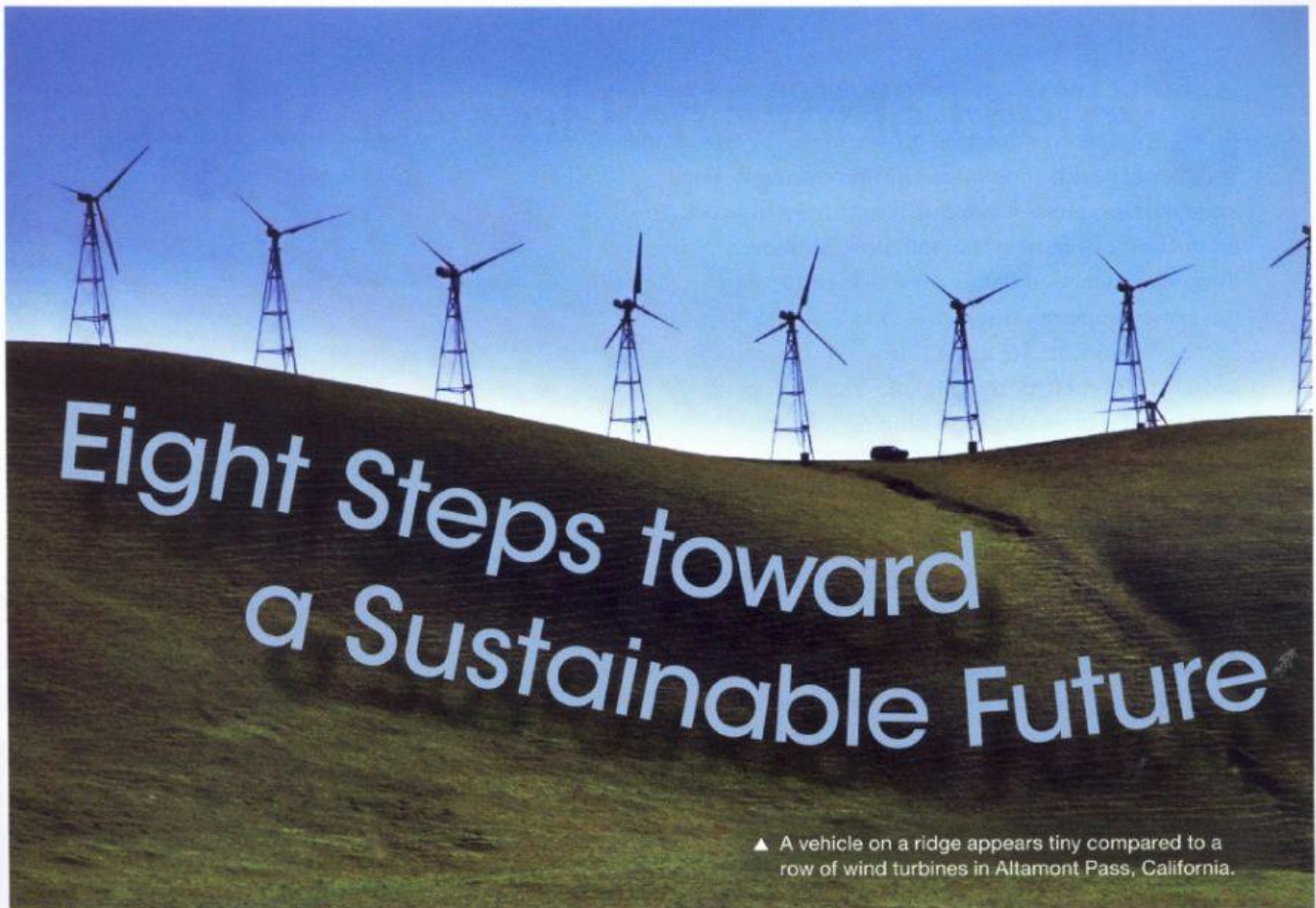




Eight Steps toward a Sustainable Future

▲ A vehicle on a ridge appears tiny compared to a row of wind turbines in Altamont Pass, California.



track 2-04

A WE HUMANS HAVE UNLIMITED APPETITES,¹ but we live on a planet with limited resources. We already use more of Earth's renewable resources—such as forests, clean air, and fresh water—than nature can restore each year. And when the rate of consumption of a resource is greater than the rate at which it is replaced, the resource may become exhausted.²

B Today, Earth's population stands at around seven billion, and it is still growing fast. By 2050, we face the possibility of nine billion people living on the planet. As a result, the imbalance between what nature replenishes³ and humans consume will probably continue to grow. So how will so many more people live on Earth without exhausting the planet?

C The key is **sustainability**—finding new and efficient ways of conserving more and consuming less—so that we do not ultimately exhaust our most valuable resources. Here are eight steps to sustainability from around the world:

1. Sustainable Communities



D Sustainable communities are cities and towns that encourage residents to protect their local environment in ways that also reduce their impact on the larger global environment. Residents in Mbam, Senegal, for example, use solar ovens to cook food. By using solar energy instead of cutting down trees for fuel, people are saving forests for future generations. Communities in other places are using improved public transportation systems to reduce the need for cars. In Curitiba, Brazil, city buses are frequent, convenient, and efficient—so 70 percent of Curitiba's commuters use them. As a result, the city has little traffic congestion⁴ and cleaner air.

¹ People's **appetites** for things are their strong desires for them.

² If something becomes **exhausted**, it has been used up and is gone.

³ If you **replenish** something, you replace it or make it full again.

⁴ **Traffic congestion** occurs when there are a lot of vehicles on the road, making movement slower.

2. Safer Livestock Production



As meat consumption grows, so do the environmental and health consequences of producing it. For example, the animal waste that results from livestock production can cause water pollution. Moreover, livestock production that is close to urban centers can cause dangerous diseases such as avian flu.⁵

- E** Some governments are using financial incentives to address this problem. In Bangkok, Thailand, poultry⁶ production centers that are within 62 miles (100 kilometers) of the city must pay a special tax. The goal is to encourage livestock producers to move away from the city center.

3. Renewable Energy Resources



The sun's energy provides a nonpolluting and renewable energy source. Harvesting that energy is an increasing trend. One method is via the use of photovoltaic cells (PVs), which **convert** solar energy to electricity. By the end of 2011, PVs produced 69 gigawatts⁷ of power worldwide. Germany is the world's top installer of PVs; other major solar energy producers include Spain and Japan.

- F** Another pollution-free, renewable alternative is wind power. Global wind-power **capacity** grew by about 27 percent in just one year—between 2006 and 2007—and it continues to grow. As of 2011, China led in wind-power production, generating over 62,000 megawatts of wind-produced energy. The United States and Germany are also major wind-power producers.

4. Socially Responsible Investing (SRI)



People who practice socially responsible investing (SRI) buy shares in companies that engage in⁸ activities that are **beneficial** to the planet, such as alternative energy production or environmentally sound waste-management practices. While SRI activity is most common in Europe and the United States, it is also growing quickly in Canada and Australia, and it is beginning to **emerge** in other countries, such as South Korea, Brazil, Malaysia, and South Africa.

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⁵ **Avian flu**, or **bird flu**, is similar to a cold but more serious.

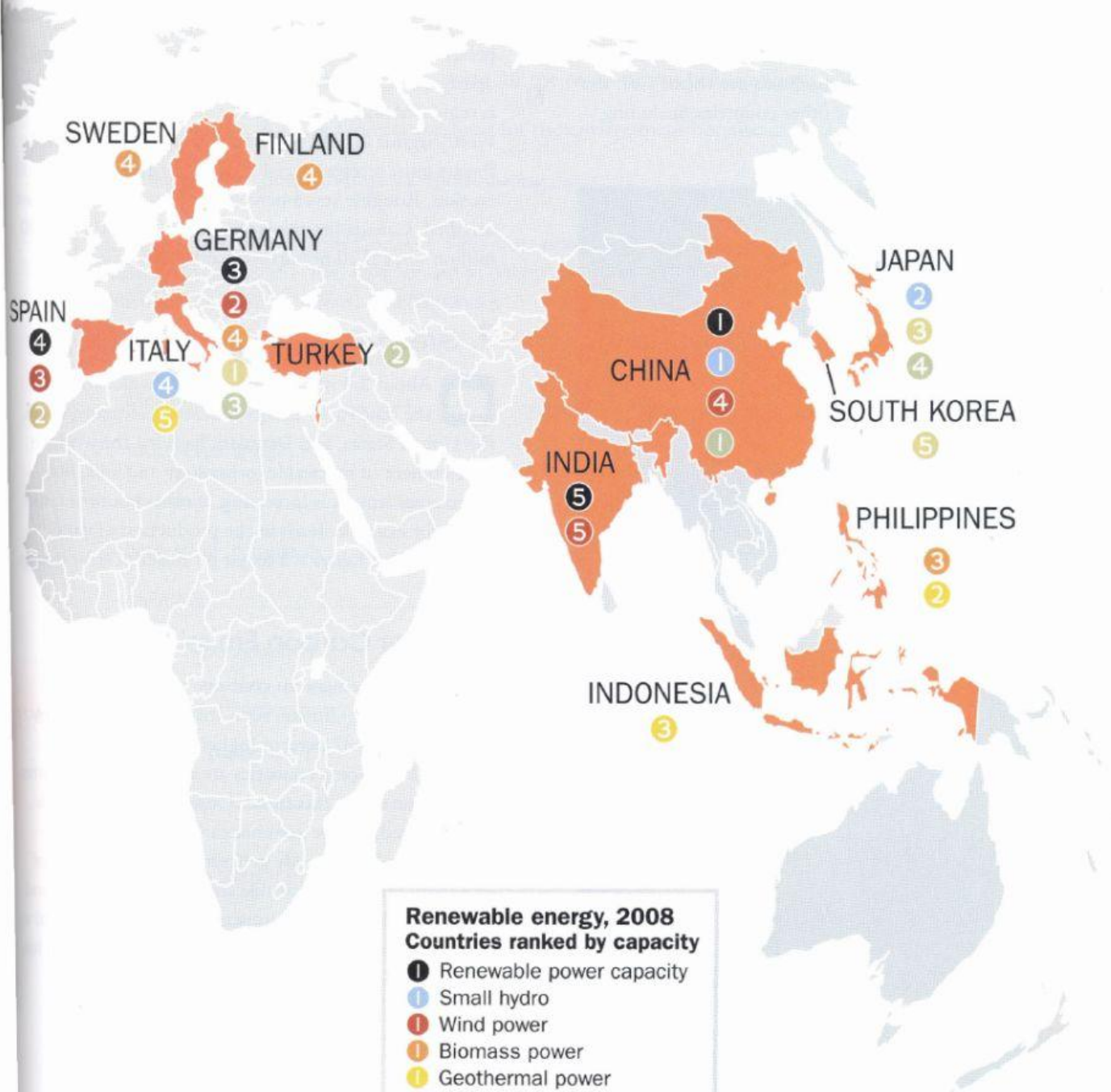
⁶ **Poultry** refers to chickens, ducks, and other birds that are kept for their eggs and meat.

⁷ A **watt** is a unit of measurement of electrical power. A **gigawatt** is one billion watts.

⁸ If you **engage in** an activity, you do it or are actively involved in it.



Global Leaders of Renewable Energy



Renewable energy, 2008 Countries ranked by capacity

- ① Renewable power capacity
- ① Small hydro
- ① Wind power
- ① Biomass power
- ① Geothermal power
- ① Solar PV (grid-connected)
- ① Solar hot water/heat

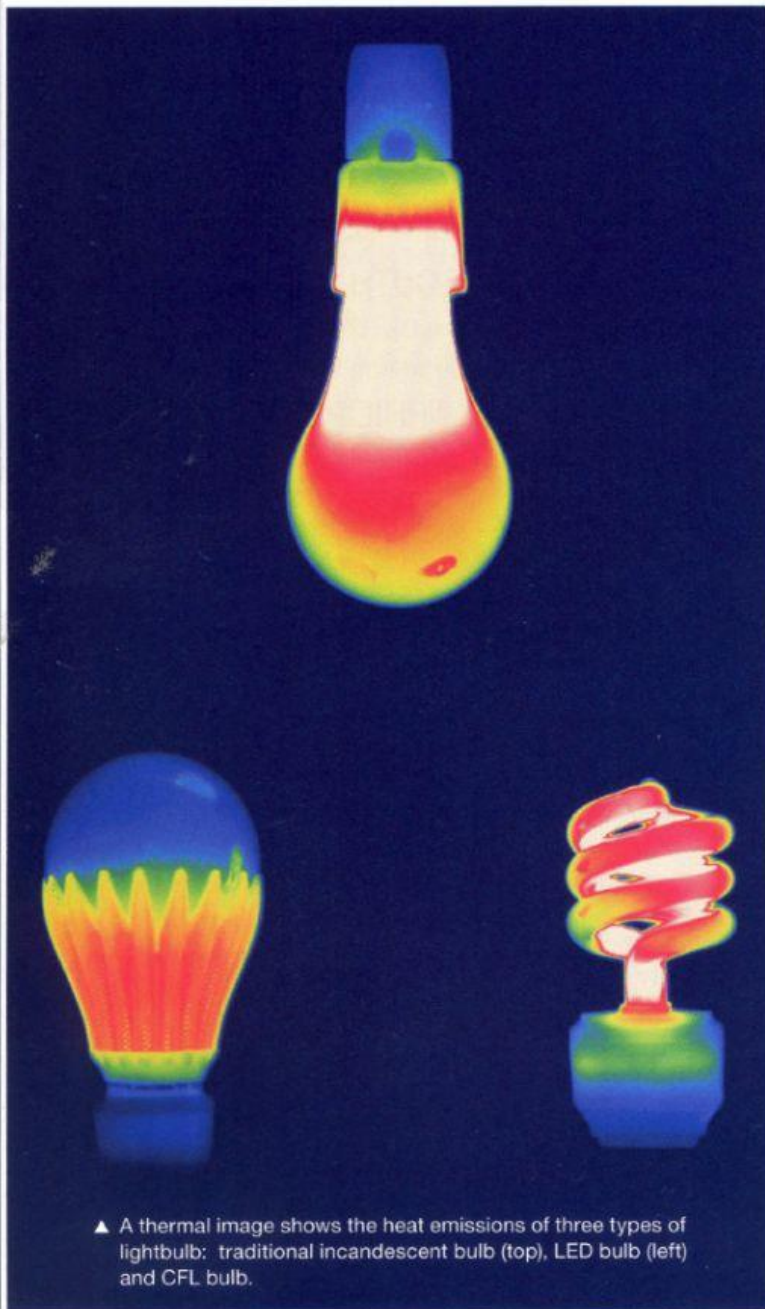
For example, the country labeled ① is the world's top producer of wind power.

5. Greener Lightbulbs



The global use of compact fluorescent lamps (CFLs) tripled between 2001 and 2006. CFLs create light with less heat than traditional lightbulbs. They also use 75 percent less energy and last ten times longer. The global leader in the use of CFLs is Japan, where 80 percent of all households use them. CFL use is also increasing in many other countries, including China and Brazil.

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▲ A thermal image shows the heat emissions of three types of lightbulb: traditional incandescent bulb (top), LED bulb (left) and CFL bulb.

6. Certified Forests



Forestry logging—the cutting down of trees—can contribute to water pollution, lead to the destruction of animal habitats, and have other **negative** effects on the environment. In an effort to preserve forests, several countries have begun creating certified forests. When a forest is certified, the logging is **regulated** and carried out in a sustainable way. In West Virginia (USA), for example, loggers in certified forests must receive special training to avoid causing soil **erosion**. Roughly seven percent of the world's forests are certified. Canada has the largest areas, with almost 300 million acres (120 hectares) of certified forests.

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7. Green Employment



About 2.3 million people worldwide work in the renewable-energy industry. Germany, Spain, the United States, and Denmark have led the world in development of renewable technology and jobs, but green employment is increasing in other countries, too. India, for example, leads in the production of wind turbines,⁹ and Kenya is a major producer of solar energy.

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8. Lower Carbon Emissions



Carbon emissions continue to contribute to a changing climate, with atmospheric CO₂ levels estimated to be 37 percent higher than in the pre-industrial era. Some countries are introducing measures aimed at **reversing** this trend. Costa Rica, for example, has promised to have zero net carbon emissions¹⁰ by 2030. Costa Rica already generates over 80 percent of its energy through renewable sources such as water and wind. In addition, the European Union has promised to cut carbon emissions 20 percent by 2020, and India has planned a 24 percent reduction by 2020.

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⁹ **Wind turbines** are machines that produce electricity, using large wheels that are turned by the wind.

¹⁰ If something has **zero net carbon emissions**, it is not causing any carbon dioxide (CO₂) to be released into the air.