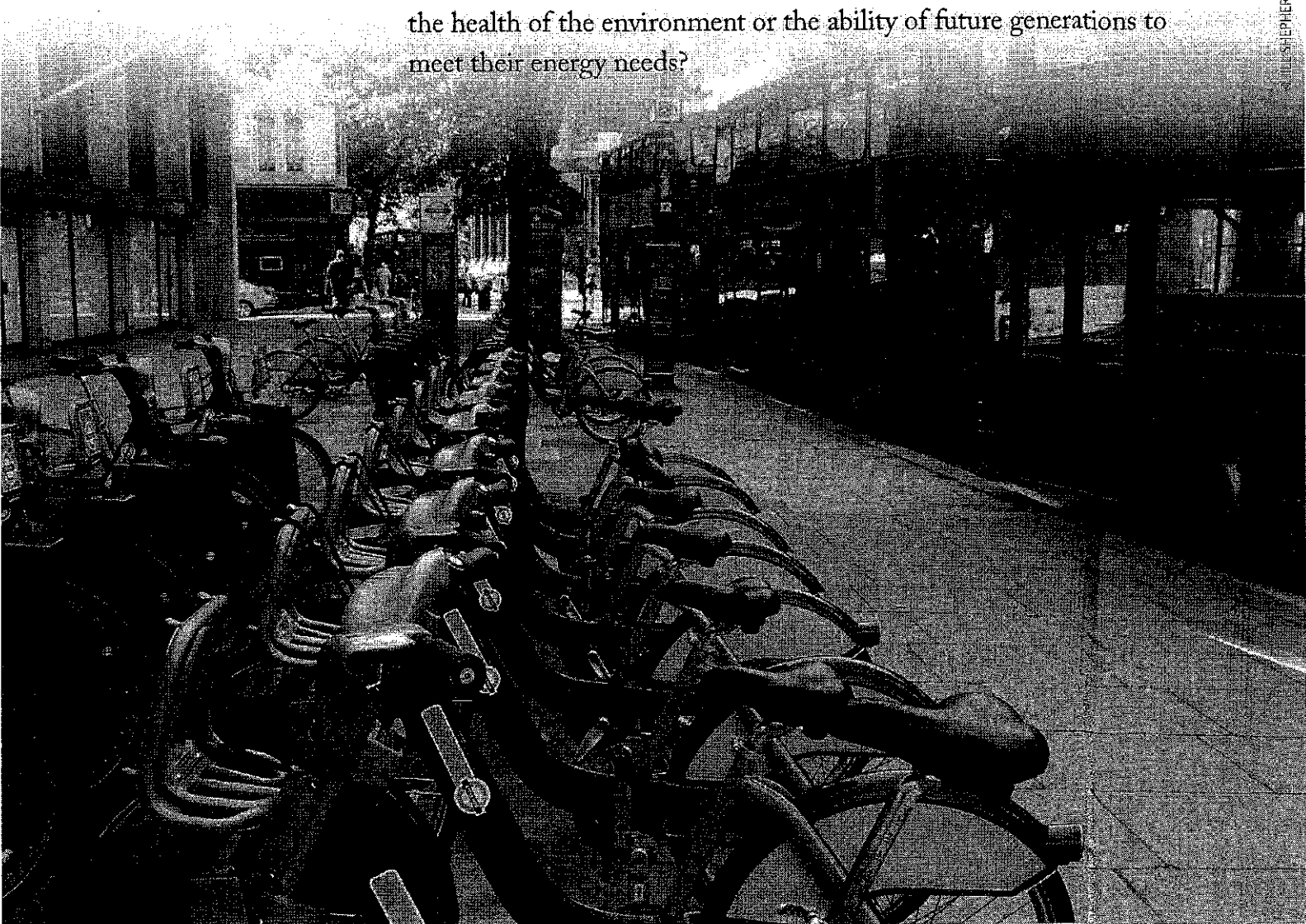


Pathways to Progress: Energy

Now that you have studied several different energy resources, what do you think are the most sustainable ways to supply our world's growing demand for energy? In other words, how do we make sure that all people have access to reliable forms of energy without compromising the health of the environment or the ability of future generations to meet their energy needs?



Energy Conservation

Every choice about energy we make can make a difference in the amount of energy used and the pollution emitted. Perhaps the easiest and most practical way we can contribute to sustainable energy solutions is to simply use less energy. Behaviors and actions that save or use less energy—such as turning off the lights when you leave a room—are often referred to as **energy conservation**.

Individuals, communities, businesses, and governments all have the ability to address energy conservation. For example, the city of Grand Rapids, Michigan has created an inventory of electricity use for all city buildings in order to track usage and reduce energy consumption. The city has also made an effort to purchase 20% of its energy from renewable sources.¹

Energy Efficiency

Another way to reduce our energy consumption is by using energy more efficiently. **Energy efficiency** refers to completing a specific task with less energy input than usual.² For example, an energy-efficient light bulb—such as an LED or CFL light bulb—requires less energy to produce the same amount of light as other light bulbs.

You may have seen technology and appliances such as light bulbs, computer monitors, or refrigerators that are labeled as energy efficient. One

such label, ENERGY STAR®, was created by the U.S. Environmental Protection Agency and Department of Energy as a way for companies to let customers know about energy-efficient products and to encourage the reduction of greenhouse gases.³ According to ENERGY STAR, if each American home replaced one light bulb with an energy-efficient light bulb we could collectively save \$600 million in energy costs and prevent 9 million pounds of greenhouse gases from being released into our atmosphere each year.⁴ Sometimes an energy-efficient product is more expensive to buy up front. However, it is often more cost-effective in the long term because you will save more money over time on your utility bills.

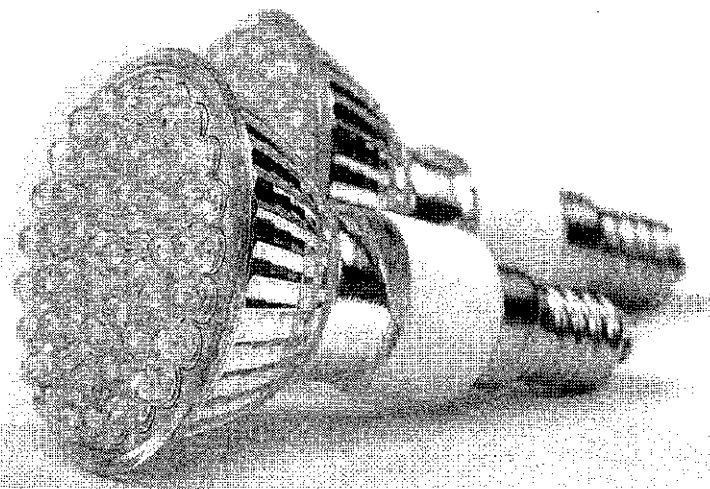
Policies and Subsidies

At the governmental level, policies can be passed that encourage sustainable energy practices. In response to the oil crisis of the 1970s, Corporate Average Fuel Economy (CAFE) standards were enacted in the United States in 1975. These standards required vehicle manufacturers to create passenger cars

energy conservation—Behaviors and actions that save or use less energy, such as turning off the lights when you leave a room.

energy efficiency—Completing a specific task with less energy input than usual, such as using an energy-efficient LED light bulb which uses less energy than other light bulbs to produce the same amount of light.

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Energy-efficient appliances use less energy to perform the same tasks as other appliances.

CAREER PROFILE

NGO Founder

Do you think only governments tackle big social problems? Nongovernmental organizations (NGOs), can also work to address big problems for the benefit of society as a whole or for an underrepresented segment of society.

CEOs and founders of NGOs usually have both a bachelor's degree and business experience. They are savvy in communications, marketing, and management of personnel and finance.

Stacy Noland wants to see major change in the way society powers homes and the work force. After receiving a bachelor's degree in psychology and working as a manager at Microsoft, he founded the Moontown Foundation. The Moontown Foundation is an NGO that creates initiatives with a dual goal: to empower



Stacy Noland founded the nongovernmental organization, Moontown Foundation.

Individuals through experiential education and to make immediate impact on climate change and environmental degradation in the communities that need it most. As Stacy states, "It's my personal mission to get the people in poverty to adopt energy conservation, healthy, sustainable living, and alternative transportation, first. Those are the

hardest people to reach."

The Foundation's YES Program (Young Ecopreneurs in Sustainability) and SWITCH Program are focused on creating careers in home energy efficiency and solar energy. They introduce young adults to the mechanics of energy-saving technologies including solar paneling, weatherizing, and low-flow shower heads. Other projects focus on working with entire communities and considering

how to create sustainable solutions to problems. One of these is the Storm Surge project, a documentary film about bringing sustainability to the southeastern states. In the wake of Hurricane Katrina, the 2010 Gulf Oil Spill, and widespread natural disasters, the film looks at how sustainability can be crucial to the health of all states.



The creation of CAFE standards in the United States have ensured high fuel efficiency for cars sold domestically.

and light trucks with improved fuel efficiency (better gas mileage).⁵ Today CAFE standards are 33.3 miles per gallon for cars (double that of 1974 vehicles) and 25.4 miles per gallon for light trucks.⁶ In 2012, even higher efficiency standards were finalized; the goal is for U.S. vehicles to get an average gas mileage of 54.5 miles per gallon by 2025.⁷

Getting better gas mileage means that drivers will need less gas for each mile they drive. Not only can these regulations help drivers save money at the gas pump, but they can also reduce the amount of greenhouse gases emitted by cars. Japan, Canada, Australia, China, and the Republic of Korea have also created standards to improve car fuel economy and other countries are expected to join them.⁸

Government regulations, like those for fuel economy, are just one way that governments

can influence how we use energy. Governments can also influence the types of energy we use through subsidies. An **energy subsidy** is an economic benefit provided by a government that reduces the cost of producing a particular energy resource, increases the price received for an energy resource, or reduces the cost of a good or service.⁹ In 2010, global fossil fuel subsidies

totaled around \$409 billion and renewable energy subsidies totaled around \$66 billion.¹⁰ For example, the California Solar Initiative

energy subsidy—An economic benefit provided by a government that reduces the cost of producing a particular energy resource, increases the price received for an energy resource, or reduces the cost of a good or service.

CASE STUDY

Students Conduct ECOoffice Audits¹¹

ECOoffice is a community service learning activity for students who work directly with local businesses to conduct a basic carbon footprint analysis. From this analysis, youth prepare a report that includes results and recommendations of affordable, achievable actions the company can take to reduce energy consumption, save office resources and lower operating costs.

ECOoffice is one component of the Jane Goodall Institute-Shanghai Roots & Shoots' Eco Audit Educational Program. The company brings together local businesses, college students, and high school students in a collaborative effort to promote environmentally responsible practices in the business environment.

In April 2009, a trained student group from Shanghai High School International Division conducted an ECOoffice audit of the Unilever Corporation offices in Shanghai. Using a standardized ECOoffice Checklist as their evaluation guide for measuring the office's sustainable practices, the students conducted the audit which consists of three parts:

- walkthrough observations
- administrative interviews



These students conducted an ECOoffice audit of the Unilever Corporation offices in Shanghai.

- employee surveys

With Unilever-Shanghai and Shanghai Roots & Shoots support, the students submitted an audit report which contained positive and negative points about company operations and employee behaviors. The report included practical suggestions for improving the company's environmental impact.

After implementing the students' suggestions throughout the following year, the employees reduced their resource consumption and the company's operating costs. Unilever management realized the sustainable improvements brought by ECOoffice project also would benefit the company financially; therefore, they wished to bring green

concepts to more employees.

A business professional from Seattle learned about the positive impacts ECOoffice had on the Shanghai business community and asked Shanghai Roots & Shoots if the program could be brought to the Seattle area. Since that time, 141 students have conducted 38 ECOoffice audits at various workplaces throughout Washington State impacting 2,698 employees. These

workplaces included architectural and engineering firms, fire stations, restaurants and retail shops, a local YMCA and a few Washington State governmental offices. The auditors consisted of students of various ages and numbers: from small independent groups of one or two students, to curriculum programs at a college, three high schools and even a very small eighth grade class.

The ECOaudit Program was also brought to New Delhi, India; and is run as a program of the Indian Youth Climate Network (IYCN). Since then, 55 college students from New Delhi audited 13 companies impacting 1320 employees. Re-audits will be conducted beginning the fall of 2011.

WHAT YOU CAN DO

Each one of us has the ability to contribute positively to sustainable energy use. The list below suggests a few things that you can do to work toward sustainable energy use. You may even find that, after trying some of these things, there are benefits to these activities beyond a decrease in energy use:

- Commute by foot, bike, public transportation, or carpool.
- If you are shopping for a car, consider its fuel efficiency. By saving on gasoline, you will also save money.
- Perform an energy audit on your home or school.
- Get involved with global campaigns that work to ensure that all people have access to energy.
- Lobby state and national governments for higher energy-efficiency standards and investments in renewable energy.



KATE DAVISON, GREENPEACE SOUTHEAST ASIA

You can contribute in many ways to sustainable energy use.

(CSI) provides rebates for California consumers who purchase various types of solar energy.¹¹

Government institutions can also take part in sustainable energy solutions. The U.S. Department of Defense—the largest consumer of energy in the nation—is promoting renewable and efficient energy use.¹² After several marines were killed while guarding a fleet of fuel trucks, military leaders suggested that reducing the military's reliance on fossil fuels would drastically improve its safety and

capability.¹³ One energy-saving idea put forth was to insulate military tents. Because temperatures are so high in the desert, a great deal of diesel is used for air conditioning in tents. In Iraq and Afghanistan, these simple measures, along with solar panels at interior bases, cut fossil fuel demand in half and saved the military \$95 million in just six months!¹⁴ People have begun to refer to officers who promote and encourage the use of sustainable policies and supplies as Green Hawks.

CHECK FOR UNDERSTANDING

1. What is a personal way to address both energy conservation and energy efficiency?
2. How can a government subsidy support energy conservation?
3. What does Stacy Noland's program introduce young people to?
4. Where do you see opportunities for energy to play a role in environmental, social, and economic development?

Sustainable Energy for All

In 2011, United Nations Secretary-General Ban Ki-moon declared a global initiative to achieve Sustainable Energy for All by the year 2030. The initiative grew out of widespread recognition that access to clean and affordable energy is central to efforts to alleviate poverty, work toward social equity, and grow developing economies. At the same time, the initiative also recognized the importance of making our modern energy systems more sustainable. To achieve these goals, the UN is building a coalition of governments, businesses, and civil society partners to ensure that all people have access to sustainable energy, defined as “energy that is accessible, cleaner, and more efficient.”¹⁶

Around the world, many energy needs are going unmet. About 3 billion people (nearly 40% of the world’s population) use traditional biomass to cook and heat their homes. Traditional biomass refers to fuel such as wood, charcoal, animal dung, or coal. Overuse of wood in some areas has led to deforestation and environmental degradation. Also, burning this type of fuel on inefficient cook stoves can lead to very poor indoor air quality and, therefore, serious health problems. In fact, almost 2 million people each year die prematurely from illnesses related to poor indoor air quality.¹⁷

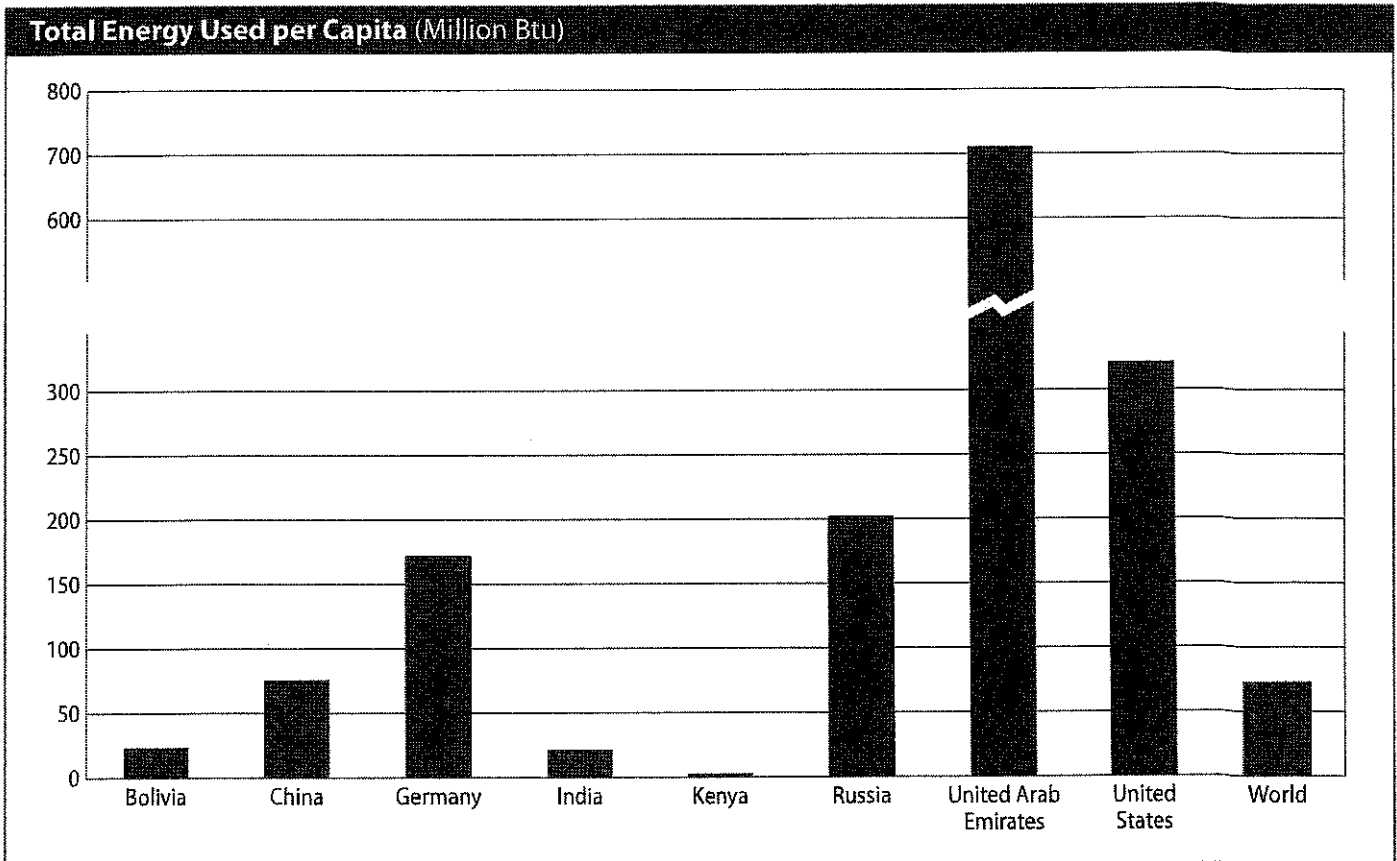
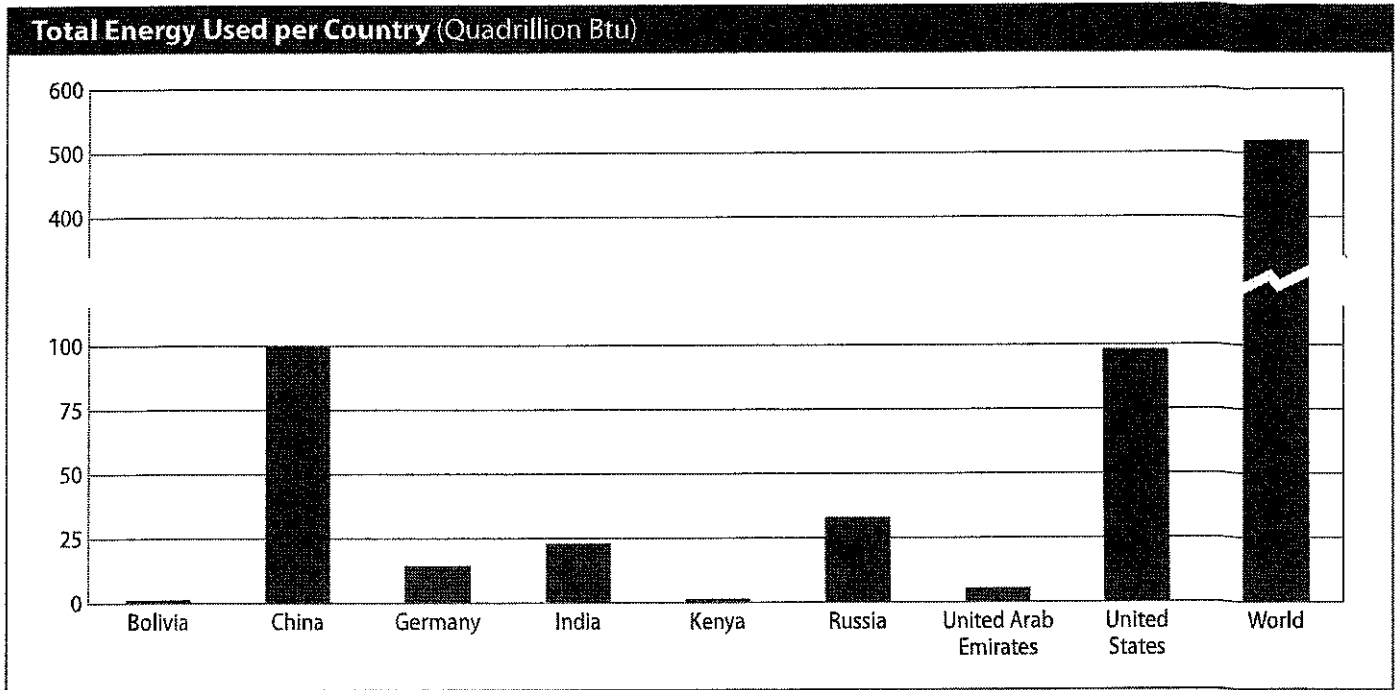
Additionally, there are about 1.4 billion people that have no access to electricity and about 1 billion more whose access to electricity is unreliable.¹⁸ Reliable access to electricity and clean burning fuels and stoves are important for human health, economic stability, and quality of life. For example, electricity is used to power water pumps that help people get clean water and irrigate land. Electricity lights schools and refrigerates vaccines in health clinics. The poor are often most affected by lack of access to electricity or the electric grid. An electric grid refers to the infrastructure (such as power lines and transformers) needed to transmit and distribute electricity to consumers. The electric power grid often does not reach the homes of the rural poor. In urban areas, poor households may not have official connections to the electric grid and the poor often cannot rely on constant access to electricity.¹⁹

Many people around the world do already have access to reliable electricity and clean cooking facilities. While this may contribute positively to the social and economic well-being of these individuals and countries, this energy often comes from nonrenewable, polluting sources. Large amounts of fossil fuels are used to generate electricity and fuel cars. When fossil fuels are burned, it releases greenhouse gas emissions that contribute to climate change. Many countries are also faced with aging energy infrastructure (such as power lines and power plants) that is inefficient and wastes large amounts of energy.

The proponents of the Sustainable Energy for All global initiative believe that if we all work together change can happen. There are things that people can do at local, national, regional, and international levels to use energy more sustainably. There are new, innovative technologies that use renewable sources of energy, such as the sun, to provide people in the most remote regions with power and economic opportunity without needing to connect them to a large electric grid. These leapfrog technologies are advanced technologies transferred to a lesser developed country or region, allowing it to rapidly adopt more suitable or sustainable modern systems without going through intermediate stages. For example, developing countries could build energy infrastructure that can handle renewable sources of energy rather than fossil fuels, or build smaller electric grid systems that are easier to update rather than one large grid. The Sustainable Energy for All initiative invites all sectors of society to help achieve 3 main objectives:

- Make sure all have access to modern energy services.
- Double the efficiency power grids and systems.
- Double the percent of renewable energy in the global energy supply.²⁰

Energy Consumption: Choosing Your Lens



Source: "Total Energy," EIA, under International Energy Statistics, accessed April 18, 2013, <http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=44&pid=44&aid=2>.

