Panelist Left to Right Jean Redfield, John O'Sullivan, Kimberly Hill, Dr. Greg Keoleian, Skiles Boyd, Dave Strenski

REENERGIZING ISSUES

ENERGY EXPERTS ADVISE ON SOLUTIONS FOR AN ENVIRONMENTALLY-FRIENDLY FUTURE

Flip a switch and light appears. Open a faucet and water streams into your palm… (Ouch! Too hot!) Press a button and an automatic starter cranks the engine to warm the heated seats of your climate-controlled SUV. Now you'll only have to endure brief moments of bitter Michigan winter on the commute from your climate-controlled home to your climate-controlled office.

Energy powers the 21st century American way of life. It is quite literally the driving force of our economy, and it permeates every aspect of our society. It is required for everything from the laptop I type on, to the lamp that shines on this page as you read, to the printing presses, the paper, the ink, and the desks in the *Ambassador* offices in between.

This month for our regular roundtable discussion, *Ambassador* assembled a diverse panel of experts at the Ferndale Public Library to illuminate us on a topic that most of us take for granted.

Of course, none of this is magic. A dizzying array of complex natural and man-made systems is at play when your friend's face smiles on the screen of your smart phone.

How often do we stop to think of the coal that is burned to create the electricity that runs those cellular towers and Internet servers? How about the diesel engines that fuel the trucks as they deliver thousands of crates of plastic phones like yours to the brightly lit big box retailer where you bought it?

We think about energy as little as possible, right? The subject was barely broached during the 2012 presidential campaign. Whenever energy policy was discussed it appeared in the form of politically pointed sound bites like "reducing our dependence on foreign oil" or misleading buzzwords like "clean coal."

"Energy is one of the most critical challenges we face in regard to sustainability," says Dr. Gregory Keoleian, Ph.D., director of the University of Michigan's Center for Sustainable Systems, and a professor of civil and environmental engineering.

We hear that word, "sustainability," quite a bit when people talk about America's energy future, but what does "sustainability" really mean? In this context, sustainability is our capacity to support and maintain our way of life as we know it.

Because our energy is delivered to us with the flip of a switch, the thought rarely crosses our minds that this precious fuel might run out. But according to Dr. Keoleian, 92% of the energy generated in the United States comes from non-renewable sources, and most of that is from fossil-based fuels like coal and petroleum. Only 8% of our energy nationally is derived from renewable energy sources like wind, solar, geothermal, and biomass (burning plants or wood). While it may be a long time before we run out of oil and coal, we will never run out of renewable fuels.

Another reason fossil fuels are deemed to be an unsustainable energy source is because particulates and gas are emitted when they burn. The combustion of fossil fuels degrades air quality, and has contributed to

photos: Andrew Potter

a 40% increase in the production of greenhouse gasses, principally carbon dioxide, in the atmosphere since the Industrial Revolution. Scientists tell us that excess greenhouse gas emissions cause the Earth's median temperature to rise, a factor that is blamed for higher sea levels and ocean temperatures, the melting of the polar ice caps, and more frequent super storms like Hurricane Sandy.

Eighty-three percent of U.S. greenhouse gas emissions come from fossil fuel combustion. Electric power generation is responsible for one-third of those gasses, with transportation and industrial emissions running a close second and third respectively. According to Dr. Keoleian's research, global carbon dioxide emissions must be reduced by 50-85% by 2050 if we are to avoid permanent adverse effects of climate change.

The panel's moderator, *Ambassador* Publisher Denise Ilitch, asks, "What's our grade?" If we so desperately need to make the switch to renewable energy, how are we doing as a nation?

"C minus," says Dr. Keoleian.

"That's because we have an A+ and an F," says Jean Redfield, president and CEO of NextEnergy, a Detroit-based non-profit business and technology incubator that aims to accelerate the growth of Michigan's renewable energy industry.

Redfield gives the U.S. an A+ for technological innovation and research, our universities, which are the global model, and access to capital. Unfortunately, we have an F in the pace of deployment. We simply aren't moving fast enough to make our transition away from fossil fuels.

Even Skiles Boyd, vice president of environmental management and resources for DTE Energy, agrees with the need for a transition to more renewable energy sources. However, managing the pace and cost of that transition is of paramount concern to him and his company, which, as of 2011, generates just over 5% of its power from renewable sources.

The United States built a huge infrastructure based primarily on fossil fuels after World War II, Boyd says. "If you have an asset base that's already sitting there, the extra cost is much greater to build new [infrastructure], no matter what [energy] source you use," Boyd explains. "And then it comes down to how much your particular economy will pay for its power."

"As long as we have cheap, ubiquitous electricity and fossil-based energy fuels, it's going to be really hard to make the transition to alternatives, on a purely economic basis," says Redfield.

But just as our post-World War II investments in electrical, communications and transportation infrastructures helped facilitate the nation's economic dominance in the 20th century, our panelists argue that we can't afford not to invest more money and effort in the expansion of our renewable energy infrastructure and industries now. These investments would help create jobs, and could potentially open new export markets for US companies.

"If we're going to be among the higher standards of living for the future global economy, we need to be leading in advanced energy technology sectors," Redfield says.

Dave Strenski of SolarYpsi agrees. "Renewable energy is the way to go from an economic and a techy point of view," Strenski says.

Describing himself as more of a geek than an environmentalist, Strenski works for a super computer company by day, but he and SolarYpsi have received grants to install solar panel systems on buildings throughout Ypsilanti. SolarYpsi also helps its clients negotiate agreements with DTE that allow the customers to export excess power back to the local utility for credit, which can be used when the sun isn't shining.

"Forget the environment," Strenski says. He believes the economic and technological advantages of renewable energy are reason enough to lessen our dependence on coal and oil.

Kimberly Hill, however, is the policy manager for Detroiters Working for Environmental Justice. According to Hill, the field of environmental justice seeks to ensure "that all communities, regardless of

MAKE A **DIFFERENCE**

It's the little things that count. Making small changes in your home and throughout your life can create huge energy savings for the environment and your bills. Check out our tips and start saving the environment one step at a time.

Consider installing renewable energy technologies in your home: photovoltaics, solar thermal, geothermal, wind. Remember that even switching to more energy efficient light bulbs can help.

There are several loan programs available for purchasing energy efficient appliances. Michigan Saves and PACE (Property Assessed Clean Energy) both offer incentives to create a more energy efficient home.

These tips and more can be found on the DTE Energy website (dteenergy.com), U of M's Center for Sustainable Systems (ccs.snre.umich.edu) and solarypsi.org.

The average bathroom sink faucet flows two gallons of water a minute. Turn off the tap when you brush your teeth and you can save EIGHT gallons of water a day!

Idling your car for more than ten seconds wastes more gas than needed for startup. Turn your car off!

Turn off your computer every night. It will save an average of $90/year

Pay your bills online. Not only does it save trees, it also eliminates fossil fuels needed to ship them.

When you need to print something, use both sides of the paper. Americans use 4 million tons of copy paper annually; that's 27 pounds per person.

MAKE A DIFFERENCE AT HOME

- Keep your refrigerator compartment between 36 to 38 degrees Fahrenheit and the freezer compartment between 0 and 5 degrees.
- Don't put freezers or refrigerators in the garage.
- If possible, locate freezers and refrigerators away from direct sunlight and warm air sources.

- When purchasing a new dryer, look for one with a moisture sensor that automatically shuts off when your clothes are dry.
- Clean the dryer lint trap after every load.
- Almost 90 percent of water used for washing clothes in a conventional top load washer is used for heating the water. Use less water and a colder setting.

- Eat less meat, which is more energy and carbon intensive.
- 25 percent of edible food is wasted; try wasting less food by only making what you need and saving leftovers.
- Buy local.

- Avoid using the "rinse hold" setting on your dishwasher if you are cleaning a small load. It uses three to seven gallons of hot water.
- Only run your dishwasher when you have a full load.

- Install a programmable thermostat and turn it down 10 to 15 percent for eight hours to save energy.
- Make sure to purchase the proper size furnace for your home. An undersized one won't properly heat your home and an oversized version will cost more to operate.

- Don't turn your air conditioner off when you leave the house; heat build-up in walls and furniture makes it harder to cool. Instead turn the air up five or ten degrees, but not off.
- Only turn your air conditioner on when the temperature is above 78 degrees Fahrenheit.

- Use public transportation whenever possible.
- When purchasing a new car, consider an energy efficient vehicle.
- Car pool to and from work.

race or class, have access to clean air, clean water and clean land."

Historically, lower income communities and communities of color suffer disproportionately from the effects of environmental pollution. The environmental justice movement fights to create more equity for those groups who often have the least capacity to defend themselves.

One long-time target of environmental action in Detroit is the city's energy from its waste power plant. The Detroit Renewable Power facility on Russell Street processes up to 3,300 tons of municipal solid waste per day, according to the company's website. The garbage that is burned creates 720,000 pounds of steam every hour, a portion of which is used to generate up to 68 megawatts of electricity. The rest of the steam heats and cools 140 buildings in downtown and midtown Detroit.

Environmentalists disparagingly call the facility "the Incinerator," and blame it for increased rates of asthma and mesothelioma, and for the foul-smelling odor that sometimes invades the area surrounding the plant. They claim that instead of burning waste, recycling would be a more sustainable solution.

"It's a very controversial industry," admits John O'Sullivan, president of Detroit Renewable Power. "If we look at the contribution that our Detroit facility makes to the city in general, you'd have to look at it as a positive." O'Sullivan cites the plant's income generation, the power that is provided and the jobs of the 170 employees who operate the facility.

"We eliminate a substance that would normally go to a hole in the ground, with absolutely no value whatsoever," O'Sullivan says. "There's only so much that you can recycle. There is always going to be something left over. You can do something with it that is useless, or something that is useful."

O'Sullivan notes that Denmark generates 50% of its energy from waste systems. Redfield points out that "tipping fees," the cost per ton to store waste in landfills, are much higher in Denmark, which makes burning a more viable option than in the U.S. "It's cheaper to dump it in a hole in the ground than it is to build a steam power plant," she says.

"So burning trash is a good idea," Strenski says, "but it's better to just not make the trash in the first place, or to expend the energy to make the thing you're going to throw out."

All of our panelists agree that the transition to renewable energy is moving slowly because of the contrast between cheap fossil fuels and the high initial cost of investment in renewable sources. Because the deployment of renewable energy technology is regulated at the state and even local levels, manufacturers have different rules for each region.

"Now you have no idea what rules you have to follow," Strenski explains. "What codes, what issues, what pricing…" to install renewable energy at a home or a business.

Therefore companies can't manufacture their products to scale, meaning they can't produce at higher volumes to lower costs. This is compared to places like Europe and Asia where policy is made at much higher levels. In Europe there are national standards, and there are European Union standards.

"If you look at electricity," Dr. Keoleian elaborates, "the transformation from our current system to one that is more renewable energy is being done at the state level through what is called the Renewable Portfolio Standard (RPS), which specifies that a certain percentage of our energy should come from renewable sources.

"In Michigan we have an RPS of 10% by 2015. That is one of the most important policies to transform our system since there is no national standard for renewable energy, and we don't have a national climate

policy," Keoleian says.

During the 2012 election, a ballot proposal that would have amended the state constitution to increase the RPS to 25% by 2025 was defeated. So there is even uncertainty on the state level as certain initiatives pass or fail, and other programs are started but lose funding for a variety of reasons.

This is why our panelists stress that the most effective way to speed the rate of change is by promoting energy efficiency and conservation at the individual and household level. "You can get the total cost of usage down, even with the higher cost of renewable fuels, because you use less [energy]," Redfield says.

"Basically there are two ways to improve energy efficiency," Redfield continues. "Change out the devices, so the devices are more efficient, or change the building envelope so more of your energy actually stays inside."

"There is so much that we can all do as homeowners – more efficient appliances, your envelope, which is insulation, your furnace…" Keoleian says. "These things can be costly, but we've done some research, for instance on refrigerators. You could reduce energy if you change out a refrigerator that's five or six years old, but that's a big investment. But if you have a refrigerator that's older than 1994, you should get rid of it, and you will save money and save energy because those appliances are very inefficient."

Boyd says DTE Energy takes a certain percentage of money from its customers and redistributes it to energy efficiency projects. "We'll not only give you some money for your old refrigerator, but we'll pick it up and take it away for you, so it can be replaced with a more efficient appliance. We [also] supplement the cost of fluorescent lighting, we do energy audits, we do upgrades to housing, especially in low income areas," he says. Customers can call DTE Energy's customer service reps for more information. The company also promotes its efficiency programs with local churches and community groups.

In addition to energy optimization programs run through the utilities, there is a low interest loan program through Michigan Saves, where anyone can qualify to buy down the cost of investment in energy efficiency improvements. A third program called PACE (Property Assessed Clean Energy) provides loans that are repaid through an annual assessment on the property tax bill.

"When you talk about buying new appliances, [low income households] can't always afford it." Hill says. "We believe there have to be more measures taken on the national and state levels that help lower income people make that transition as well."

"It's true," Boyd says. "Lower income people pay a much larger portion of their annual income on energy costs. That's probably where you could impact and help individuals at the greatest level. And unfortunately, with financial constraints in the country and the state, a lot of those [programs] have been cut back. It's important that we all work together to get those put back into place."

Redfield and NextEnergy have been arguing at the state energy office that energy efficiency investments are the cheapest energy investments we can make as a state. "It's the easiest dollar to spend, and when it's spent well, it makes our businesses more competitive, and it also returns that dollar back to the household income. For low income families, it's even more critical."

"But it's even easier than that," Strenski says. "Go to the store and buy a five dollar can of Great Stuff foam [insulation], go down in your basement, and look for cracks. Just put your hand on the wall, and where it feels cold, shoot some foam. You'll get a return on your investment in half a year."

Our panelists also suggest that you clean your filters, make sure your windows seal, and if you can afford it, add additional insulation. If you switch to a programmable thermostat, you can save 5-15% on your energy bills in both the summer and the winter. Each mile driven in you car blows nearly a pound or more carbon dioxide into the atmosphere. Change your driving habits by making fewer trips, and you will save on fuel and reduce greenhouse gasses. Public transportation saves even more.

"Programs exist all over the country that can help homeowners improve their efficiency," O'Sullivan says, "but why is this not a national priority? At some point we have to address that question: Are we doing the right thing for this country not just for the inhabitants and the citizens who live here, but for the future development of the economy?"

— Nadir Omowale

MAKE A SOLAR **DIFFERENCE**

Solar Energy is one of only a few sources of energy that are completely free. Not only is it the primary source of energy for all life forms, it can significantly lower your energy bills and the negative impact on the environment. Check out these solar energy facts.

- Solar panels first appeared on the market in 1956

- Today's home solar energy systems are low maintenance and will last for decades
- The average US taxpayer pays almost 100 times as much in subsidies for fossil fuels as he does for solar energy.

- California currently has the largest solar power plant in the world. Covering 1000 acres are nine solar thermal plants in the Mojave Desert.
- Due to increased competition from manufacturers and DIY solar energy kits, the cost of solar panels are falling.

- Solar energy is measured in kilowatt-hours - 1 kilowatt = 1000 watts
- A single Air Force base in Nevada has saved $83,000 A MONTH since it switched from using traditional energy sources to solar energy produced on site.