

Powering A Bright Future Discussion Activity

Active, personally relevant learning is at the heart of an effective education. This activity takes participants through a process of exploring sustainability through shared discovery and personal reflection designed to help shape the way we think and act.

This activity offers excerpts from *Powering a Bright Future*, a 3 session discussion course used by small groups to explore energy and how to promote energy sustainability.

Question the Norm

By Maggie Koerth-Baker

The staff at Chicago's Shedd Aquarium thought they were conservation conscious. After all, the Shedd, home to more than 25,000 animals, houses its own conservation research institute. If anybody should know how to make

efficient use of resources, it's this place. But, in 2008, the aquarium set itself an ambitious conservation goal — cut the amount of water it consumed in half by 2018 based on 2007 levels. What the aquarium learned is just how easy it is, even for professional conservation experts, to miss the waste right under your nose.

Although the goal seemed lofty, the aquarium found itself within 5 percent in just six years — nearly half the amount of time it had allotted. It didn't do this by reducing capacity; in fact, during the same time period the number of animals and exhibits grew. Instead, says Roger Germann, executive vice president of the Great Lakes and Sustainability department at Shedd, the aquarium went after filter systems that ran too long, inefficient skylights that caused water in exhibits to evaporate too quickly, and water chillers that were outdated and didn't work well. Turns out, that low-hanging fruit was

continued



Read more in
Powering A Bright Future

A FEW POTENTIAL APPLICATIONS

- To get to know one another through small group dialogue.
- As an interactive way to engage in a conversation around energy extraction, production, use and sustainability.
- As a way to enhance systems thinking skills.

HOW TO USE THIS TOOL

1. Gather together a group of your coworkers, classmates, friends, or family — over a healthy potluck lunch, classroom activity, or as the discussion opener for a movie screening.
2. Print off copies of this discussion guide for all members of your group.
3. Individually, take 10-12 minutes to read the excerpts in this discussion guide.
4. In small groups of 3-5, spend approximately 15-20 minutes with the discussion questions. Start with the Circle Question. Have each person briefly answer the Circle Question, with no comments, questions, or interruptions from others. Make sure each person has a chance to answer the Circle Question. Then, move on to the other questions, with participants responding voluntarily. Have group members share their opinions, experiences, feelings and suggestions.
5. During discussion, keep in mind that listening is as important as speaking. Avoid judgment of others. Agreement isn't necessary for effective dialogue.

ADDITIONAL RESOURCES

Purchase the complete *Powering A Bright Future* discussion course book and other NW Earth Institute discussion courses from NWEI's online store: www.nwei.org

Participate in NWEI's Annual EcoChallenge: www.ecochallenge.org

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responsible for the Shedd using 26.4 million gallons of water per year it didn't actually have to use. The problems were easy to fix, but they were hard to see until the staff took a closer look and started asking questions about the basic functions of the aquarium like, "How long should the pumps and filters run, anyway?"

Huge amounts of resources — whether in the form of water or energy or trash — are wasted every day because such waste is built into systems and practices we consider normal. Real-world examples, big and small, show that the best way to reduce your resource consumption is to start questioning those norms. And to ask the right questions, you need the right information.

Think about the lights in your house. While conservation awareness (and/or your parents) may have taught you to flip the lights off when you leave a room, it's likely that you've never considered how much light you need when you're in the room. "Chances are, you really only need 50 percent of the lighting you use most of the time," says Matthew Gudorf, energy manager at the University of California, Irvine.

Curt Volkmann, senior clean energy finance specialist for the Environmental Law and Policy Center, calls that

"actionable insight" — information about the many ways you can conserve and be more efficient that aren't obvious. Americans have done pretty well on basic energy awareness, he says. But there's still a great deal about the way we use energy that remains invisible. Another case in point: "phantom load," a phrase that energy experts use to refer to the electricity consumed by home electronics like televisions, computers and DVRs — even when we think we've turned them off. That silent power draw can add up. A single DVR can suck down as much as 390 kilowatt-hours of electricity every year — as much as some full-sized refrigerators.

Most of the time, we pay attention to the services we get from energy — whether we can watch the shows we like, whether our lights come on when we flip a switch. How much energy it takes to get those services (and whether we could get the same services for less) is a mystery.

Studies have shown that sustained, frequent feedback about personal energy use is the best way to demystify energy while also changing people's behavior. That feedback can be about cost, or it can tie abstract energy use to real-world environmental impacts, or it can show how your energy use compares to that of your neighbors. However it's done, the goal is to make the invisible,

visible — the same way the Shedd Aquarium made invisible waste appear with the help of research.

The point is that these systems change the way we use energy by breaking the inertia of "we've always done it this way." Waste, it turns out, isn't primarily about willful disdain, like tossing an empty beer can out the window of a moving car. Instead, it's about a lack of awareness — the places we don't look, the questions we don't ask and the everyday assumptions we don't challenge. If we're going to seriously reduce the amount of energy we use, it's that awareness we have to go after.

Changing the question changes the game.

A Chance to Change the World

By Richard Heinberg

Worcester Polytechnic Institute in Worcester, MA invited Rex Tillerson, CEO of ExxonMobil, to give the commencement speech at its 2011 graduation ceremonies on May 14. When students heard this, many were surprised and upset. The students then invited Richard Heinberg, Senior Fellow of Post Carbon Institute, to give an alternative commencement speech. This is an abbreviated transcript of what Richard Heinberg had to say.

ExxonMobil is inviting you to take your place in a fossil-fueled twenty-first century. But I would argue that Exxon's vision of the future is actually just a forward projection from our collective rear-view mirror. Despite its high-tech gadgetry, the oil industry is a relic of the days of the Beverly Hillbillies. The fossil-fueled sitcom of a world that we all find ourselves still trapped within may, on the surface, appear to be characterized by smiley-faced happy motoring, but at its core it is monstrous and grotesque. It is a zombie energy economy.

Of course, we all use petroleum and natural gas in countless ways and on a daily basis. These are amazing substances—they are energy-dense and chemically useful, and they yield



enormous economic benefit. America started out with vast reserves of oil and gas, and these fuels helped make our nation the richest and most powerful in the world.

THE END OF THE CHEAP OIL ECONOMY

But oil and gas are finite resources, so it was clear from the start that, as we extracted and burned them, we were in effect stealing from the future. In the early days, the quantities of fuel available seemed so enormous that depletion posed only a theoretical limit to consumption. We knew we would eventually empty the tanks of Earth's hydrocarbon reserves, but that was a problem for our great-great-grandkids to worry about.

ExxonMobil says this is nothing we should worry about, as there are still vast untapped hydrocarbon reserves all over the world. That's true. But we have already harvested the low-hanging fruit of our oil and gas endowment. The resources that remain are of lower quality and are located in places that are harder to access than was the case for oil and gas in decades past. Oil and gas companies are increasingly operating in ultra-deep water, or in arctic regions, and need to use sophisticated technologies like hydrofracturing, horizontal drilling, and water or nitrogen injection. We

have entered the era of extreme hydrocarbons.

This means that production costs will continue to escalate year after year. And we know from recent economic history that soaring energy prices cause the economy to wither: when consumers have to spend much more on gasoline, they have less to spend on everything else.

But if investment costs for oil and gas exploration and extraction are increasing rapidly, the environmental costs of these fuels are ballooning just as quickly. With the industry operating at the limits of its technical know-how, mistakes can and will happen. As we saw in the Gulf of Mexico in the summer of 2010, mistakes that occur under a mile or two of ocean water can have devastating consequences for an entire ecosystem, and for people who depend on ecosystem services.

Of course the biggest environmental cost from burning fossil fuels comes from our chemical alteration of the planetary atmosphere. Carbon dioxide from oil, gas, and coal combustion is changing Earth's climate and causing our oceans to acidify. The likely consequences are truly horrifying: rising seas, extreme weather, falling

agricultural output, and collapsing oceanic food chains. Never mind starving polar bears—we're facing the prospect of starving people.

Renewable energy is viable and necessary, and we should be doing far more to develop it. But solar, wind, geothermal, tidal, and wave power each have limits and drawbacks that will keep them from supplying energy as cheaply and as abundantly as we would like. Our bind is that we have built our existing transport infrastructure and food systems around energy sources that are becoming more problematic with every passing year, and we have no Plan B in place. This means we will probably have less energy in the future, rather than more.

A CHANCE TO CHANGE THE WORLD

This will be the defining reality of your lives. Whatever field you go into—business, finance, engineering, transportation, agriculture, education, or entertainment—your experience will be shaped by the energy transition that is now under way. The better you understand this, the more effectively you will be able to contribute to society and make your way in the world.

We are at one of history's great turning points. During your lifetime you will see

world changes more significant in scope than human beings have ever witnessed before. You will have the opportunity to participate in the redesign of the basic systems that support our society—our energy system, food system, transport system, and financial system.

I say this with some confidence, because our existing energy, food, transport, and financial systems can't be maintained under the circumstances that are developing—circumstances of fossil fuel depletion and an unstable climate. As a result, what you choose to do in life could have far greater implications than you may currently realize.

Over the course of your lifetime society will need to solve some basic problems:

- How to grow food sustainably without fossil fuel inputs and without eroding topsoil or drawing down increasingly scarce supplies of fresh water;
- How to support 7 billion people without depleting natural resources—including forests and fish, as well as finite stocks of minerals and metals; and
- How to reorganize our financial system so that it can continue to perform its essential functions—

reinvesting savings into socially beneficial projects—in the context of an economy that is stable or maybe even shrinking due to declining energy supplies, rather than continually growing.

Each of these core problems will take time, intelligence, and courage to solve. This is a challenge suitable for heroes and heroines, one that's big enough to keep even the greatest generation in history fully occupied. If every crisis is an opportunity, then this is the biggest opportunity humanity has ever seen.

So whether we view these as hard times or as times of great possibility is really a matter of perspective. I would emphasize the latter. This is a time of unprecedented opportunity for service to one's community. It's a time when it will be possible to truly change the world, because the world has to change anyway. It is a time when you can make a difference by helping to shape this needed and inevitable change.

Fossil fuels made it possible to build the world you have inhabited during your childhood and throughout your years in the education system. Now it's up to you to imagine and build the world after fossil fuels.

CIRCLE QUESTION

When you think of having a future with clean energy, what are some of the benefits that come to mind?

DISCUSSION QUESTIONS

1. In "A Chance to Change the World," Richard Heinberg talks about our use of fossil fuels and what will happen if we continue using them as we are today. In order to make change, we need to understand what it is that needs changing. What area of fossil fuels, energy, or climate change do you wish to know more about in order to make positive change?
2. Reading about ways that other people are working for innovative energy solutions can be positive and inspiring. What would you like to see your community/ organization do? What are some of the barriers preventing this from happening?
3. What are your challenges or roadblocks to being more energy efficient in your own life?

Learn more about Northwest Earth Institute's discussion-based resources at www.nwei.org.