



Green energy isn't really green, geologist explains



by **JACK MONEY**

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Scott Tinker, chairman of Switch Energy Alliance, addresses an audience at Oklahoma City University on Monday about global energy needs and the requirement for nonpartisan solutions. Tinker already has co-produced one energy related film, and is working on two others that address global energy poverty and energy transitions. [Jack Money/The Oklahoman]

A growing global population is energy poor.

"Energy poverty doesn't just affect them," said Scott Tinker, a geologist and filmmaker who came to Oklahoma City this week to discuss a need for frank dialogue about energy that isn't rooted in partisan politics. "It affects us all."

Tinker, chairman of Switch Energy Alliance, said the world's population has more than doubled since 1950 to about 7.5 billion people and is projected to grow to more than 11 billion by the end of the current century.

He said about 1 billion people live without electricity, while about 2.7 billion live without access to clean fuels to heat their homes and cook their food.

Tinker, a professor at the University of Texas, is director of the Bureau of Economic Geology and is the state geologist of Texas.

As chairman of the Switch Energy Alliance, he also has produced one film about energy called "Switch" that has been screened in more than 50 countries and viewed by millions of people and is working on another film that will be re

He started his presentation by discussing conditions villagers in Colombia and Nepal face where energy access.

At a Colombian village, the alliance built a small solar farm to provide enough electricity to power outdoor fixture. In Nepal, the alliance worked with villagers to help them switch from using wood liquefied petroleum gas or gas produced from biomass projects.

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He contrasted those examples with another visit the alliance made to Ethiopia where a village was moved to make way for water that will be impounded by a giant dam across the headwaters of the Nile River the country is building on its border with Sudan.

Tinker said the dam will be more than one mile in length and will include 16 turbines, each capable of generating 400 megawatts — the equivalent of six nuclear power plants, or 10 massive coal plants or 10,000 wind turbines that are 2 megawatts each.

Tinker noted that one project will power half of Ethiopia, supplying electricity to more than 50 million people, and predicted it will change the balance of power in North Africa. In the village, power poles were being set for future electrical lines as its residents built the community's first school.

"It is a centralized, good solution" to provide power to a sizable section of that part of the world, he said.

Tinker explained there is a strong correlation between energy poverty, or the lack of access to the energy many in the world take for granted, and economic poverty.

He said energy access improves education rates, which lowers birthrates and helps women who are particularly affected by a lack of energy access.

"Is it tied to economic poverty? There is a correlated relationship," Tinker said. "Energy won't end poverty, but you can't end poverty without energy. That's the paradox.

"One-third of the world living in energy poverty is not sustainable. You can see a trend between access to energy and economy. The biggest thing that stands in the way of fixing it is corruption, at all levels."

Energy forms, use discussed

Tinker said the world tripled the energy it consumes over the past half-century and 85% of today's energy is provided by coal, oil and natural gas.

He said about half the energy consumed globally is generated by coal, especially in Asia and Africa, where demands for power are escalating steeply.

In Europe and the United States, demand for energy has flattened and even is declining slightly. Natural gas power generation has climbed, as has generation from renewable sources such as wind and solar.

Making electricity, Tinker said, creates carbon dioxide emissions, but so do other industrial, transportation, agricultural and land use activities.

While emissions (and electricity prices) have dropped in the U.S., he said data shows emissions are climbing elsewhere, especially in China, where the coal-to-gas ratio used to produce power has increased over time.

He said the U.S. should feel good about lowering its emission rates. However, he also talked about how all that's really happened is that the nation has moved its emissions problems overseas with the manufacturing that left the country.

He also discussed how some so-called environmentally friendly alternatives aren't.

Analysts, for example, predict numbers of electric vehicles will climb significantly. Looking at several estimates, Tinker said there might be 100 million such vehicles on the roads by 2030.

Those cars won't burn gas, but Tinker said enthusiasts need to think beyond that.

One Tesla, he said, contains 7,200 lithium ion batteries, which must be manufactured somewhere materials needed to make them have been mined. Those batteries must then be shipped to get them still must be developed to recycle and reuse or to dispose of old batteries once they reach the end

"A trillion car batteries is a lot different than a couple of billion cellphone batteries," Tinker said. "impacts, you have to think about all of them."



Green energy, Tinker observed, often is referred to as anything that can be consumed without impacting the environment.

"But does it really have no impact? You have to get the metals, glass, copper from somewhere," he said. "The sun and wind are renewable, but the tools we use to capture that energy are not.

"We have got to be honest about good and bad, clean and dirty. All forms of energy have environmental impacts."

Energy education matters

Tinker founded the Switch Energy Alliance, which uses nonpartisan, film-based resources to help students, educators, professional and general users around the world learn more about energy in a nonpartisan way.

Tinker's basic message in the public talk he gave on Oklahoma City on Monday is that it is going to take an educated, concerted effort for people and their elected leaders to choose the types of energy needed to arrest climate change.

First, Tinker said people need to understand that renewable energy sources alone can't grow quickly enough to solve the world's global warming issues.

Second, he said a comprehensive approach is needed that uses centralized natural gas facilities equipped with carbon capture features, carbon-capture fitted coal facilities, both large and modular nuclear generating stations, geothermal and hydro generating stations, wind and solar farms and distributed renewable power sources (mainly solar) in rural parts of the world.

"One size doesn't fit all," Tinker said. "And it's complicated. These are interactive energy systems and very political because they underpin everything we do."



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