

Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Director, Institute of Marine Sciences, UC Santa Cruz.

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Moving to Renewable Energy

We live in an extraordinarily complex and crowded world today, all 7.5 billion of us. We have huge demands for water, food and energy, some of us far more than others, and quite honestly, there isn't enough to go around. According to the United Nations, 21,000 people around the world die of hunger or hunger-related causes every day. This is one person every four seconds, and most of these are children.

One in 10 people lack access to clean water. One in three, or 2.5 billion, do not have access to adequate sanitation. Yet we are adding about 228,000 new people to the planet every 24 hours.

The USA has about 5% of the world's population, but we use 20% of the world's energy, and create 40% of the planet's garbage. On average, one American consumes as much energy as 2 Japanese, 6 Mexicans, 13 Chinese, 31 Indians, 128 Bangladeshis, or 370 Ethiopians.

If the 7.5 billion people on Earth were all to live with the same life style or level of consumption that Americans "enjoy", it would require four planet Earths, which we don't happen to have.

Today the world depends on fossil fuels for 86% of our total energy, and Americans, a bit less, about 81%. Two things have become abundantly clear about fossil fuels: 1] they take millions of years to form so the supplies or reserves are finite and what we have now is all we'll ever have; and 2] there are significant human and global impacts from the extraction, transportation and combustion of these fuels, climate change and all of its myriad effects being the most far reaching.

Sure, we can continue to dig coal out of the ground, drill for oil and gas offshore in deeper and deeper water or in the Arctic with all of the inherent risks, or persist with fracking, using a cocktail of chemicals and huge volumes of water to extract hydrocarbons from shale.

But to be honest, the coal mining industry is quickly winding down. It is no longer cost effective to take down mountains to remove coal. Energy markets have changed and the demand for natural gas has increased. We just aren't going to bring back a bunch of coal mining jobs.

The total number of people employed in coal mining (2014) is about 76,000 and falling. This is about the same number as are employed in the bowling (69,000) and skiing (75,000) industries, and significantly fewer than the number employed in museums, travel agencies and casinos. In fact, it's about half the number employed in used-car dealerships (138,000), theme parks (144,000) and car washes (150,000) across the country.

The point isn't that jobs in coal mining don't matter; they do to the people who have them and to their communities, but if you are trying to significantly increase jobs available to US workers, it isn't going to be in coal mining.

The solar and wind industries are each creating jobs at a rate 12 times faster than that of the rest of the U.S. economy, according to a new report published by the Environmental Defense Fund.

The renewable energy sector has seen rapid growth over recent years, driven largely by significant reductions in manufacturing and installation costs. Building developers and owners have been fueled by state and local building efficiency policies and incentives.

Solar and wind jobs have grown at rates of about 10-20% annually in recent years. There are now 95,000 jobs in wind power industry alone in the US and this is expected to reach 230,000 in less than 15 years. Employment in the solar power industry totaled 260,000 workers in 2016 and is expected to continue to grow as well.

And most importantly, these energy sources are going to last forever, are clean, and almost every state and every country on the planet has at least some opportunity to be part of these industries and begin to develop their own sustainable energy sources. We don't have to ship solar and wind energy around the country or planet in tankers or on trains, and they don't produce greenhouse gases.