

The Myth of Clean Hydropower

Energy and Environment

The Washington Post
Democracy Dies in Darkness

Reservoirs are a major source of global greenhouse gases, scientists say

By **Chris Mooney** September 28, 2016 [✉ Email the author](#)



Switzerland's Grimsel reservoir dam, which provides hydroelectric power; a new study suggests reservoirs contribute more than had been known to greenhouse gases. (EPA/Peter Klaunzer)

Dams and Reservoirs Emit Greenhouse Gases and Make Climate Change Worse

- Gary Wockner, PhD

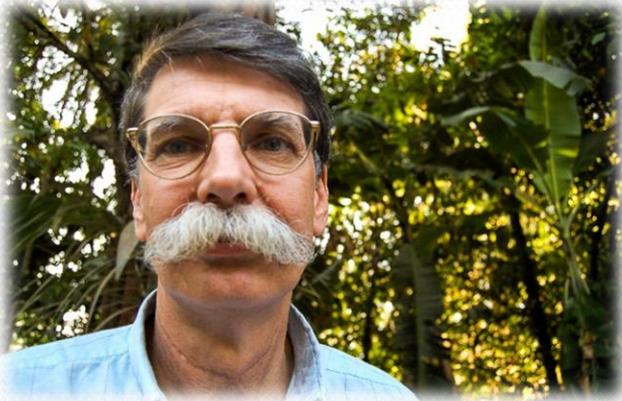
SaveTheColorado.org
SaveTheWorldsRivers.org

Dams Create Many Problems



- Dams Block Rivers – Fish, Sediment, Nutrients, Water.
- Dams Slow Rivers – Changes Ecology, Water Temperature, Sediment, Habitat.
- Dams Almost Always Make Water Quality Worse.
- Dams Can Cause Extinction to Fish and Aquatic Life.
- Dams Displace People, and cause human rights violations.
- Dams are Expensive.
- Dams can make flooding worse.
- Dams exacerbate coastal flooding, beach erosion, and sea level rise.
- Dams increase disease in humans.

DAMS: The Methane/GHG Problem



Dr. Philip Fearnside
Brazilian/IPCC scientist who
“discovered” the methane
problem with dams and
reservoirs 30 years ago

Since that time, studies have been done by:

- U.S. EPA
- U.S. Army Corps
- Dozens of international university research scientists
- IPCC scientists (2006 Kyoto Protocol)
- U.S. National Science Foundation

In 2015 and 2016, global media attention began showing up in the *Washington Post*, *Climate Central*, *EcoWatch*, *Smithsonian*, *Science Magazine*, *The Guardian*, *Mongabay*, etc.

CLIMATE CENTRAL science

Home Research Special Reports Gallery Videos Status of Change

Hydropower May Be Huge Source of Methane Emissions

By Bobby Magill

Published: October 20th, 2014

Imagine nearly 6,000 dairy cows doing what cows do, belching and being flatulent for a full year. That's how much methane was emitted from one Ohio reservoir in 2012.

Reservoirs and hydropower are often thought of as climate friendly because they don't burn fossil fuels to produce electricity. But what if reservoirs that store water and produce electricity were among some of the world's largest contributors of greenhouse gas emissions?

Harsha Lake, a large reservoir near Cincinnati, Ohio, emitted as much methane in 2012 as roughly 5,500 dairy cows would have emitted over an entire year. Credit: Fivestory/istock

EcoWatch

By Gary Wockner
Sep 30, 2016 11:50AM EST

Insights →

Dams Cause Climate Change

It's Official: Hydropower Is Dirty Energy

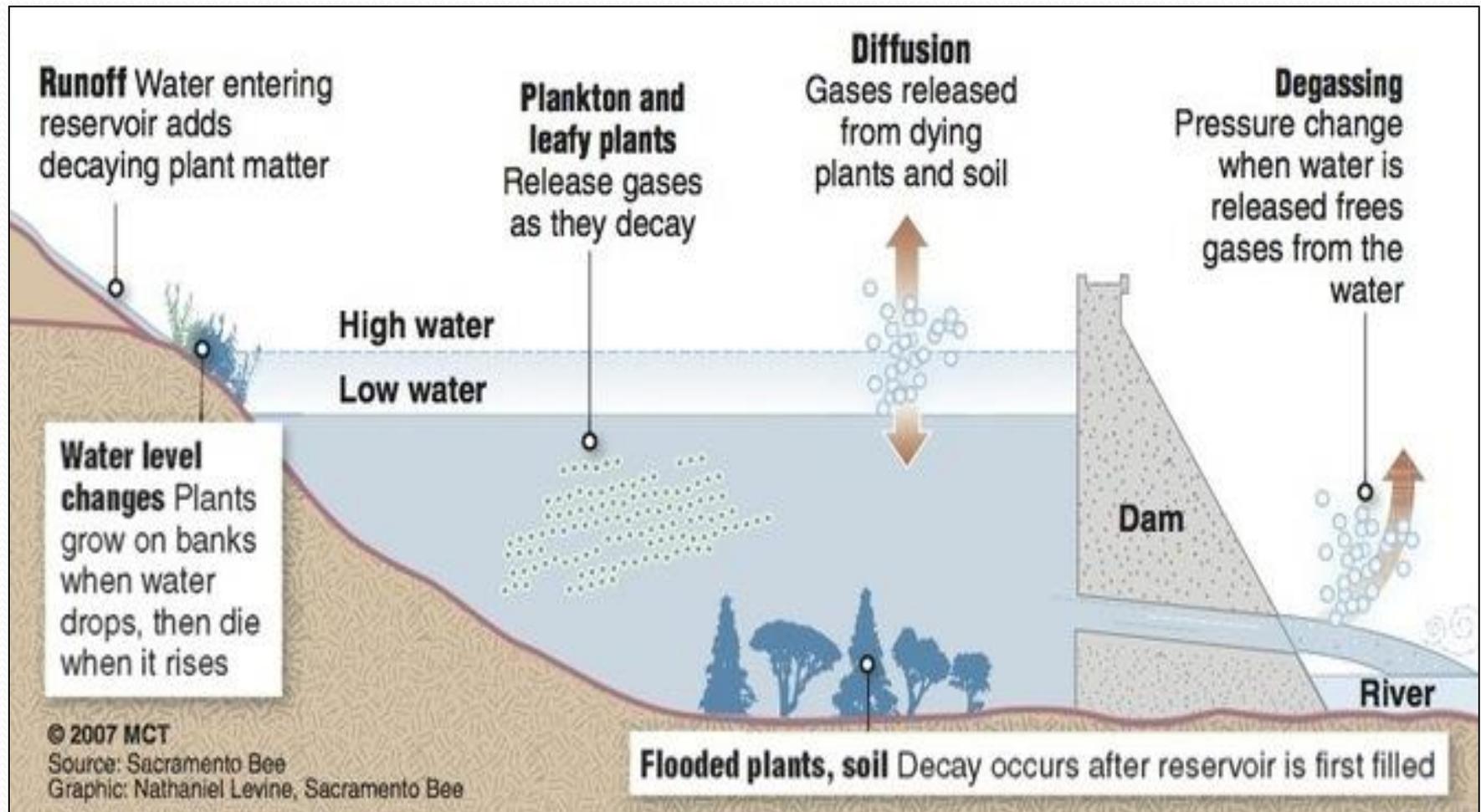
How Dams and Reservoirs Create GHG Emissions: 1. Deforestation



- Forests sequester carbon.
- Estimates: Millions of acres of forests have been cleared worldwide for hydropower. These forests do not regrow and are flooded.
- In just **one study in Brazil**, two hydropower plants caused ~90,000 acres of deforestation.

How Dams and Reservoirs Create GHG Emissions: 2. Methane and CO₂

(anaerobic breakdown of organic matter)



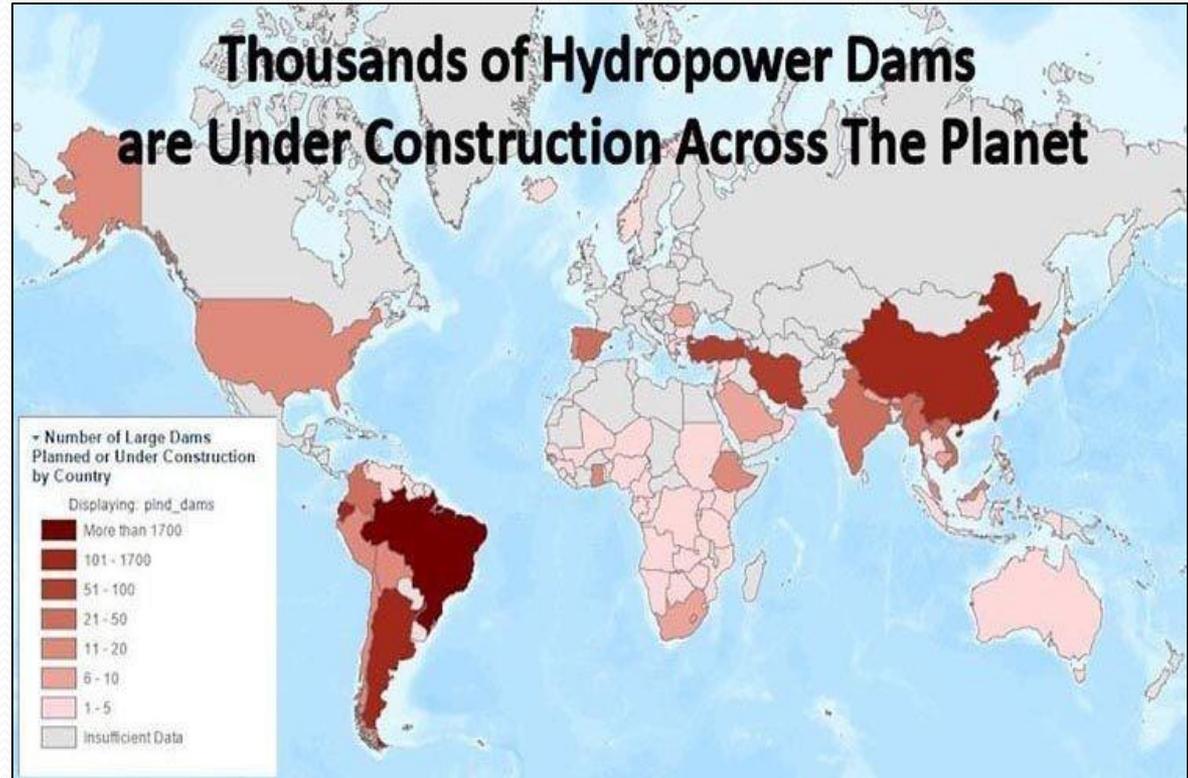
Dam and Reservoir Greenhouse Gas Emissions Are Worse Where:

- the dam is bigger and the reservoir is larger, and especially where the surface area of the reservoir is larger;
- the weather is warmer and wetter, and the water temperature of the reservoir is warmer;
- the initial flooding of the landscape involves large areas of vegetation;
- more vegetation and sediment run off into the reservoir;
- the reservoir's water level goes up and down on a seasonal or hydropower-ramping cycle causing vegetation to grow on the dry banks of the reservoir, and then become submerged when the reservoir level rises causing that vegetation to drown and decompose;
- the reservoir is newer and the landscape more recently flooded;
- the reservoir is near agricultural areas where fertilizer-heavy water and erosion runs off into a reservoir feeding the biological cycle that grows algae and other submerged vegetation;
- and, where any other type of heavy nutrient load is pouring into a reservoir including that from direct human wastes, stormwater runoff, or wastewater treatment plants.

Big, flat, warm reservoirs in tropical countries are the worst.

All Types of Dams/Reservoirs Can Create Greenhouse Gas Emissions

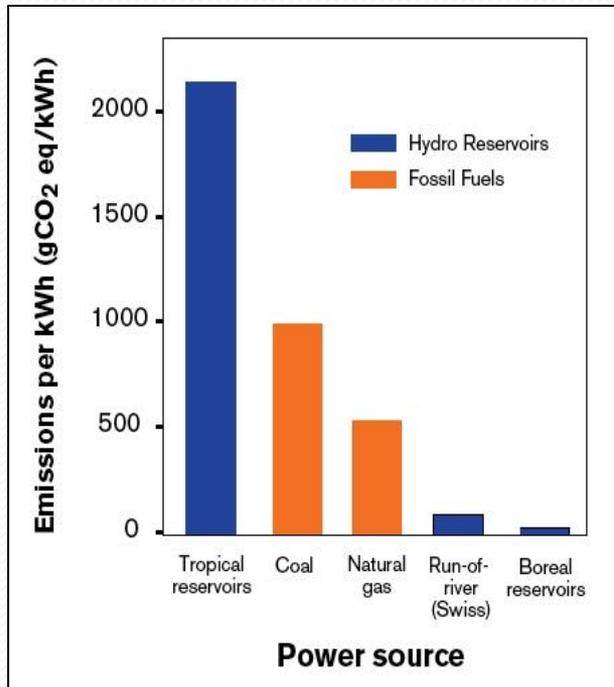
- Hydropower
 - Traditional
 - Run of the River
- Flood Control
- Water Supply
- Recreation



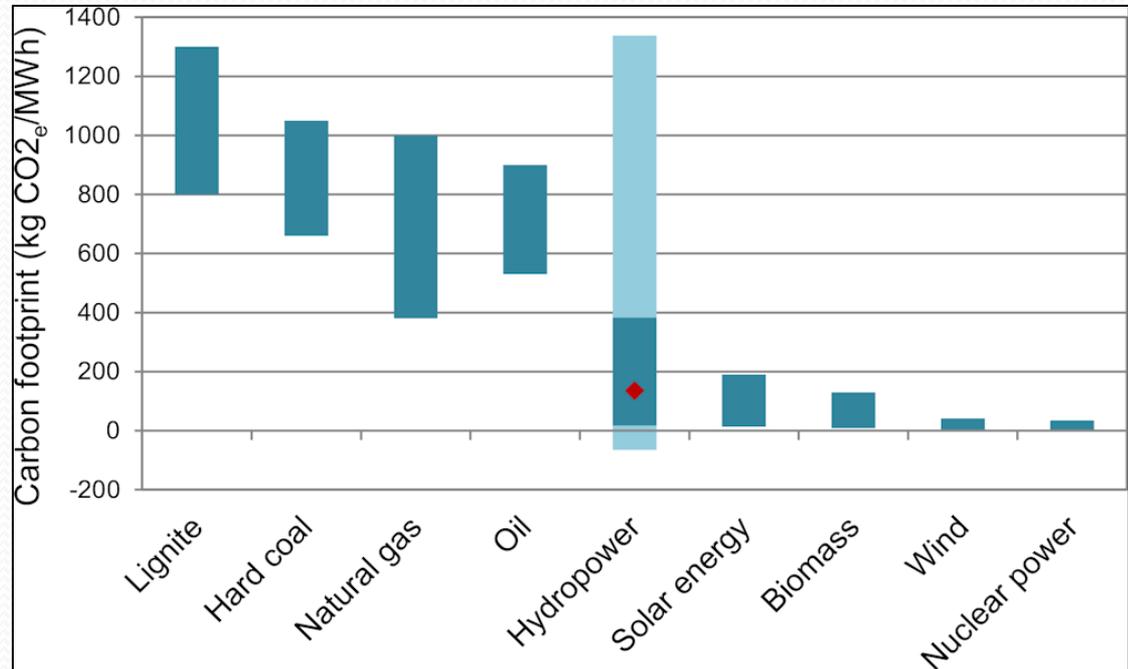
How Bad Is The GHG Pollution?

Carbon Footprint of Various Energy Sources

2008 estimate



2016 estimate



“Those researchers suggest all large reservoirs globally could emit up to 104 teragrams of methane annually. By comparison, NASA estimates that global methane emissions associated with burning fossil fuels totals between 80 and 120 teragrams annually.” -- *Climate Central 2014*

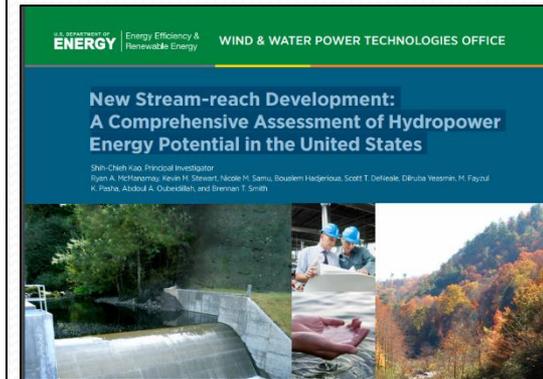
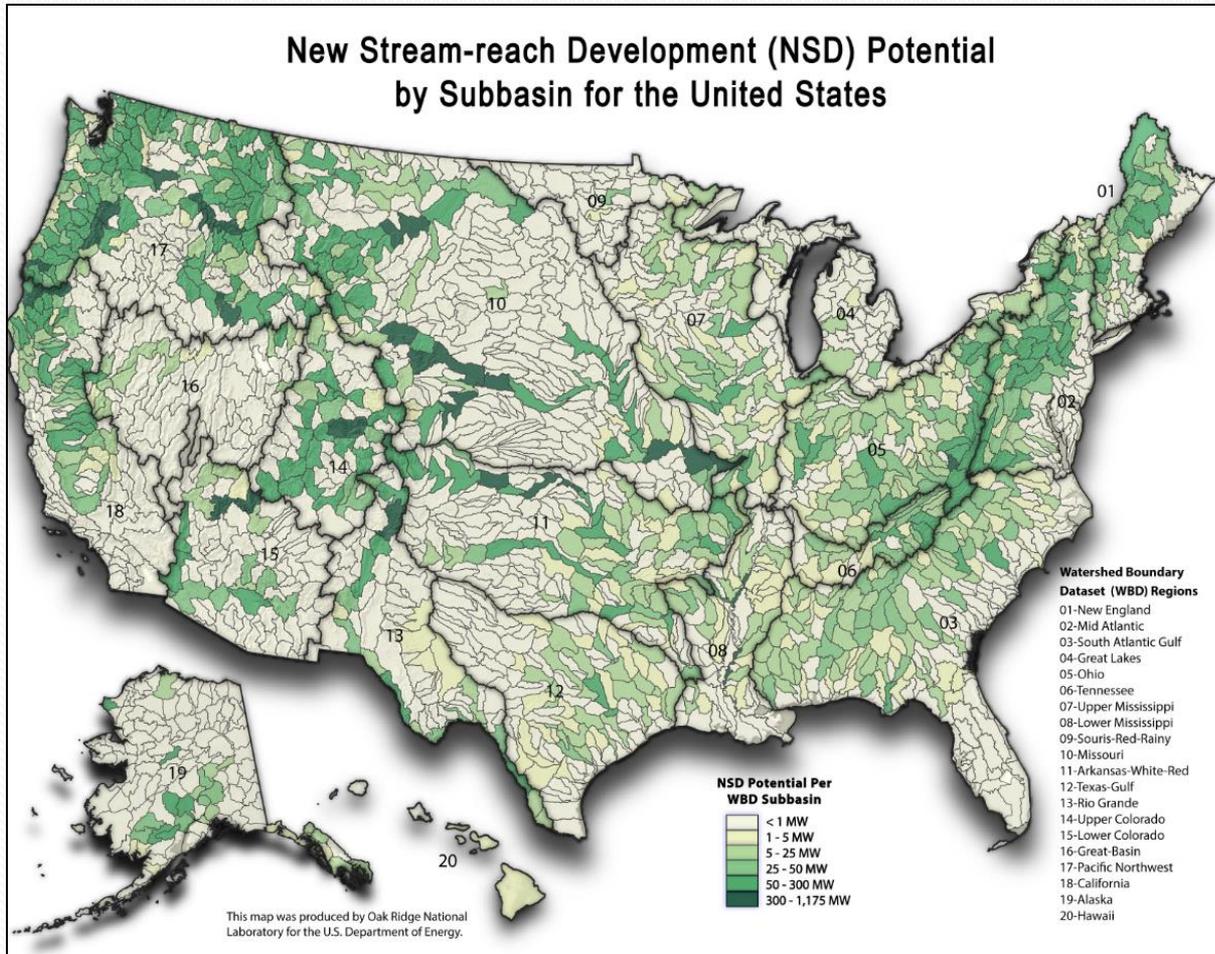
Emissions Are Not Being Counted.

- Kyoto Protocol and the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines, included methane emissions.
- However, no one is reporting!
- “Intended Nationally Determined Contributions” (INDC) – not one COP21 country is including or reporting emissions from hydropower
- New IPCC protocol is being considered but facing extreme political pressure from “Big Hydro”



“Thus, countries that are completely destroying their rivers and their climate with hydropower including Malaysia, Brazil, Guatemala, Russia and even the U.S. don't even list hydropower as a methane emissions source in their INDC, while including hydropower as a clean energy source, all under the auspices of likely misconstrued or purposely ignored IPCC guidelines.” – Gary Wockner, Nov. 2015

United States, Dept. of Energy, Considering Hundreds of New Hydropower Projects



“New Stream-reach Development: A Comprehensive Assessment of Hydropower Energy Potential in the United States” – 2014, under Obama’s DOE

Mekong River – Case Study

The Mekong River is not for sale!



12 May 2016

Vietnam China Thailand Laos

The landscape – and the local peoples' livelihood – have irrevocably changed, Gary Wockner reports in this photo essay.



Mr. Chak Kineesse, Program and Outreach Director at the Mekong School for Local Knowledge. © Gary Wockner



Maranon River – Case Study

CANOE KAYAK GEAR | SKILLS | DESTINATIONS | PHOTOS | VIDEOS | NEWS

OP-ED: DON'T DAM THE GRAND CANYON OF PERU

The biggest tributary to the Amazon is facing massive dam threats, but it's not too late save the Marañón River

July 21, 2016 | By CanoeKayak.com



The Marañón River Canyon is deeper than the Grand Canyon and collects all the water that flows off the east slope of the Andes Mountains in Peru. The river is barely visible 6,000 feet below where this photo was taken.

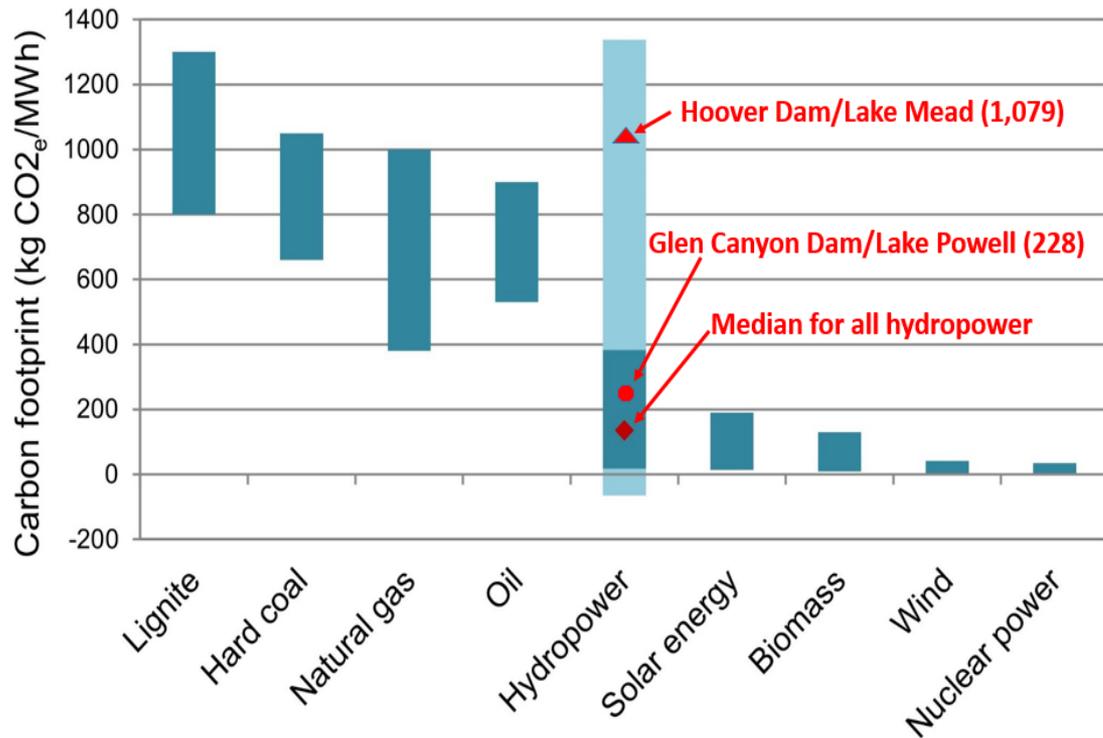
by Gary Wockner



Figure 1 - Proposed dams on the Marañón (Image SierraRios)

Hoover Dam and Lake Mead:

Hoover Dam is a hydroelectric plant that supplies electricity to all of southern California



WRITERS ON THE RANGE

California isn't accounting for this major emitter

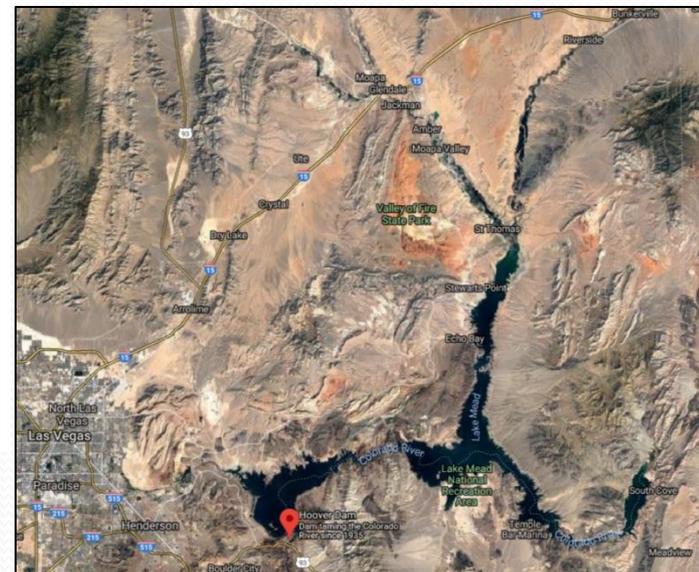
Even though large reservoirs emit methane, the state doesn't off-set their impact.

Gary Wockner | OPINION | April 11, 2017 | [PRINT](#) [SHARE](#)

Note: the opinions expressed in this column are those of the writer and do not necessarily reflect those of High Country News, its board or staff. If you'd like to share an opinion piece of your own, please write Betsy Marston at betsym@hcn.org.



Gary Wockner is a contributor to Writers on the Range, the opinion service of High Country News. He is the director of the Save The Colorado River Campaign and the author of River Warrior: Fighting to Protect the World's Rivers.



Five Things You Can Do To Fight The Myth of Clean Hydro and Protect Rivers

1. – “Education” and Address The Greenwashing

- By the Hydropower Industry (Hydro Quebec).
- By Elected and Government Officials.
- By the Big Banks.
- By Environmental Groups.
- When Speaking Out, Be Careful and Be safe.

 **THE WORLD BANK** | Working for a World Free of Poverty
IBRD · IDA

Maximizing potential for healthy rivers and low-carbon energy

 SUBMITTED BY MICHELLE LAKLY ON WED, 05/03/2017

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A new report, [The Power of Rivers: A Business Case](#), published by The Nature Conservancy in partnership with McGill University, the University of Manchester, and PSR, brings decision makers a first-of-its-kind global analysis to help yield better economic, social, and environmental outcomes in hydropower planning and management. This is the foundation of a system-scale approach we call Hydropower by Design.

2. Support and Encourage Efforts to Calculate and Count Emissions

- The City of Fort Collins, Colorado, gets electricity from the Platte River Power Authority.

Hydroelectricity

Platte River Power Authority
Estes Park • Fort Collins • Longmont • Loveland

Operations

- Largest source of purchased power for Platte River system
- Provides 19% of delivered energy on an average annual basis
- Provides firm power capacity with firm transmission

Financials

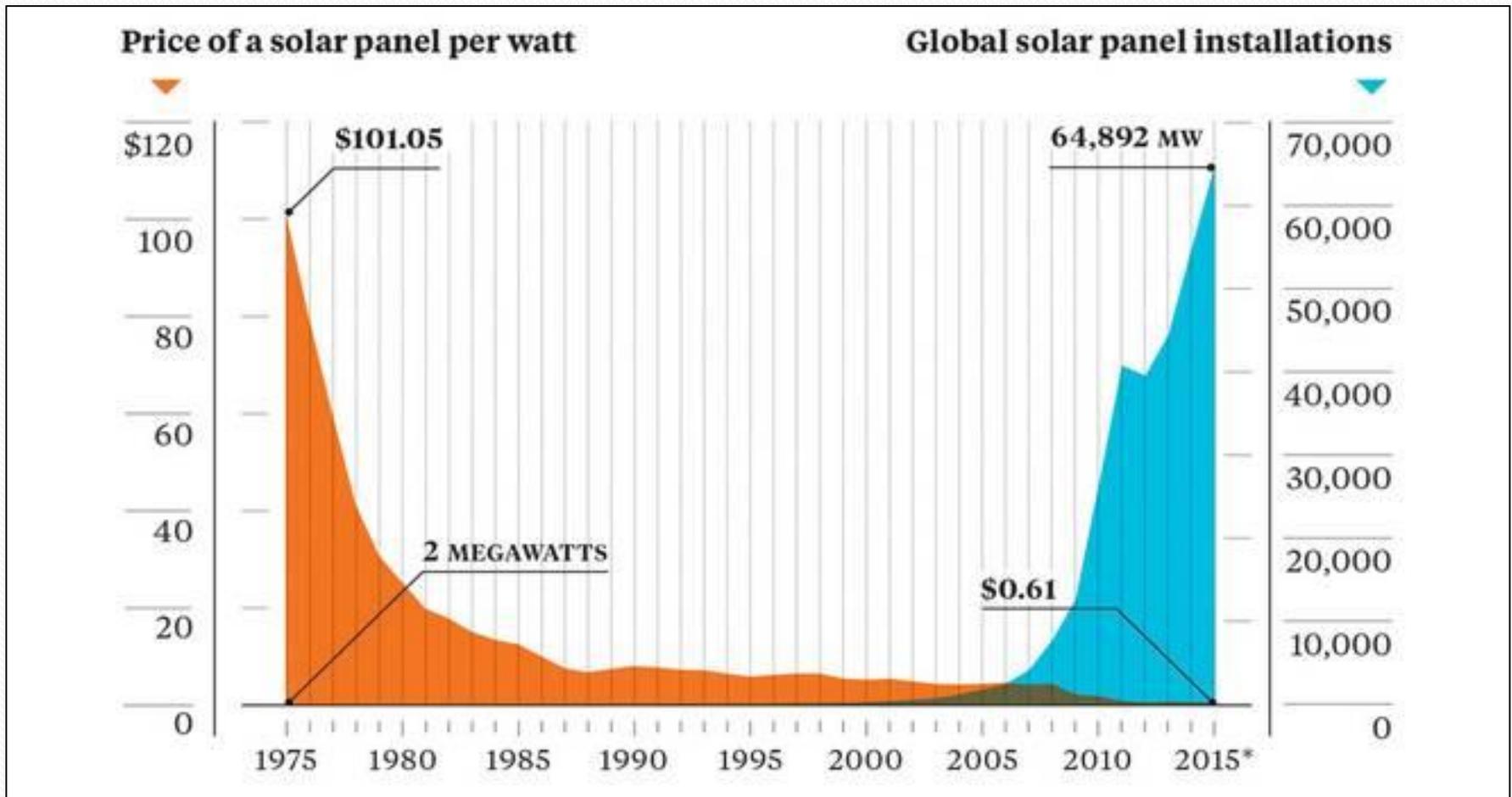
- Secure through long-term contracts with WAPA
- Third-lowest cost resource, following Rawhide Unit 1 and Craig Units 1 & 2

Environmental

- Emissions free resource

3. Promote Alternatives to Hydropower: SOLAR POWER

In 2018, the price hit 35 cents/watt



4. Support Organizations and Colleagues Who Are Fighting Dams Across The Planet

- International Rivers
- Bankwatch
- BalkanRivers.Net
- SaveTheWorldsRivers.org
- North American Megadams Resistance
- Dam Watch International
- Mekong Groups



5. Get online – especially on twitter – and share work, successes, and problems so we are connected across the planet

- #TheDamTruth #DirtyHydro

