



"Can you swim out there and charge my cell?"

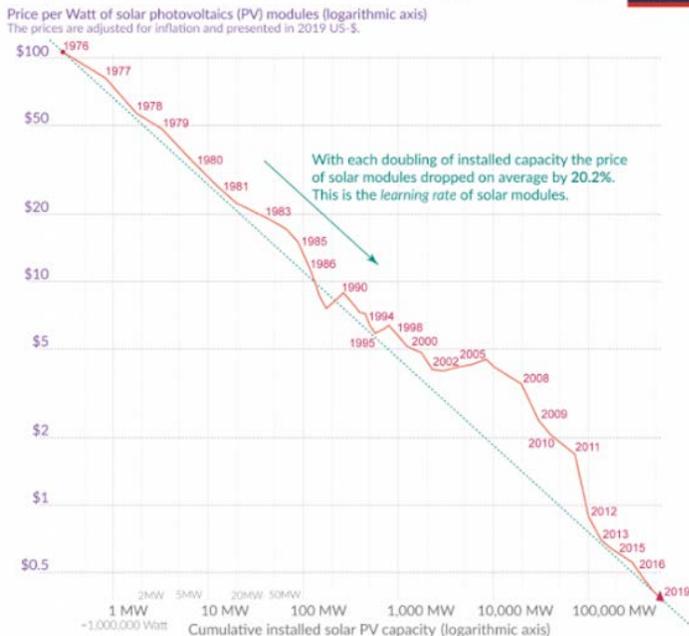
For the world to transition to low-carbon electricity, energy from these sources needs to be cheaper than electricity from fossil fuels.

Fossil fuels dominate the global power supply because until very recently electricity from fossil fuels was far cheaper than electricity from renewables. This has dramatically changed within the last decade. In most places in the world power from new renewables is now cheaper than power from new fossil fuels.

The fundamental driver of this change is that renewable energy technologies follow learning curves, which means that with each doubling of the

cumulative installed capacity their price declines by the same fraction. The price of electricity from fossil fuel sources however does not follow learning curves so that we should expect that the price difference between expensive fossil fuels and cheap renewables will become even larger in the future:

The price of solar modules declined by 99.6% since 1976 



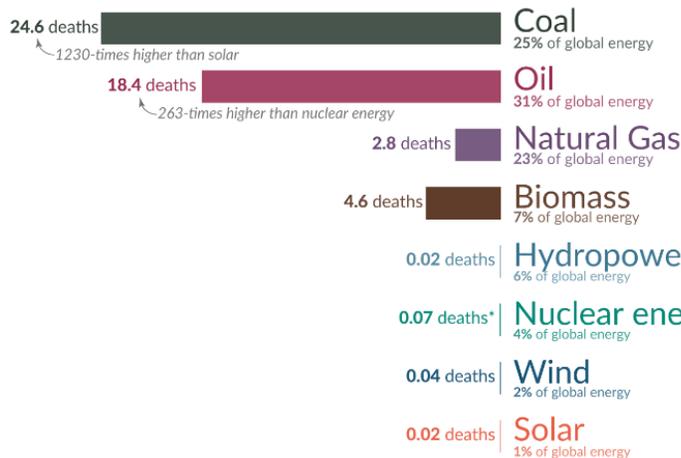
Data: Lafond et al. (2017) and IRENA Database; the reported learning rate is an average over several studies reported by de La Tour et al (2013) in Energy. The rate has remained very similar since then. OurWorldInData.org - Research and data to make progress against the world's largest problems. Licensed under CC-BY by the author Max Roser

This is an argument for large investments into scaling up renewable technologies now. Increasing installed capacity has the extremely important positive consequence that it drives down the price and thereby makes renewable energy sources more attractive, earlier. In the coming years most of the additional demand for new electricity will come from low- and middle-income countries; we have the opportunity now to ensure that much of the new power supply will be provided by low-carbon sources. Falling energy prices also mean that the real income of people rises. Investments to scale up energy production with cheap electric power from renewable sources are therefore not only an opportunity to reduce emissions, but also to achieve more economic growth – particularly for the poorest places in the world.

What are the **safest** and **cleanest** sources of energy? Our World in Data

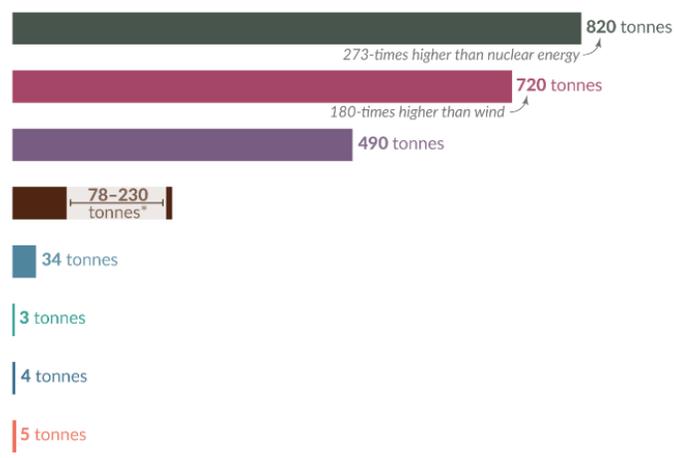
Death rate from accidents and air pollution

Measured as deaths per terawatt-hour of energy production.
1 terawatt-hour is the annual energy consumption of 27,000 people in the EU.



Greenhouse gas emissions

Measured in emissions of CO₂-equivalents per gigawatt-hour of electricity over the lifecycle of the power plant.
1 gigawatt-hour is the annual electricity consumption of 160 people in the EU.



*Life-cycle emissions from biomass vary significantly depending on fuel (e.g. crop residues vs. forestry) and the treatment of biogenic sources.
*The death rate for nuclear energy includes deaths from the Fukushima and Chernobyl disasters as well as the deaths from occupational accidents (largely mining and milling).
Energy shares refer to 2019 and are shown in primary energy substitution equivalents to correct for inefficiencies of fossil fuel combustion. Traditional biomass is taken into account.
Data sources: Markandya & Wilkinson (2007); Sovacool et al. (2016); IPCC AR5 (2014); Pehl et al. (2017); BP (2019); Smil (2017).
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This is where funds like the **Mackenzie Global Environmental Equity** [<here>](#) look to capitalize on the great energy transition and build wealth for Canadians. To quote the Great One- Wayne Gretzky- go to where the puck is going, not where it's been. And we are confident that allocating retirement capital to ESG (Environmental, Social, Government) funds is where global commerce is going. It will take some time to be sure, but sustainable profits are only possible in a sustainable world. Green is Green (profits).

Be safe, be well!

Martin
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