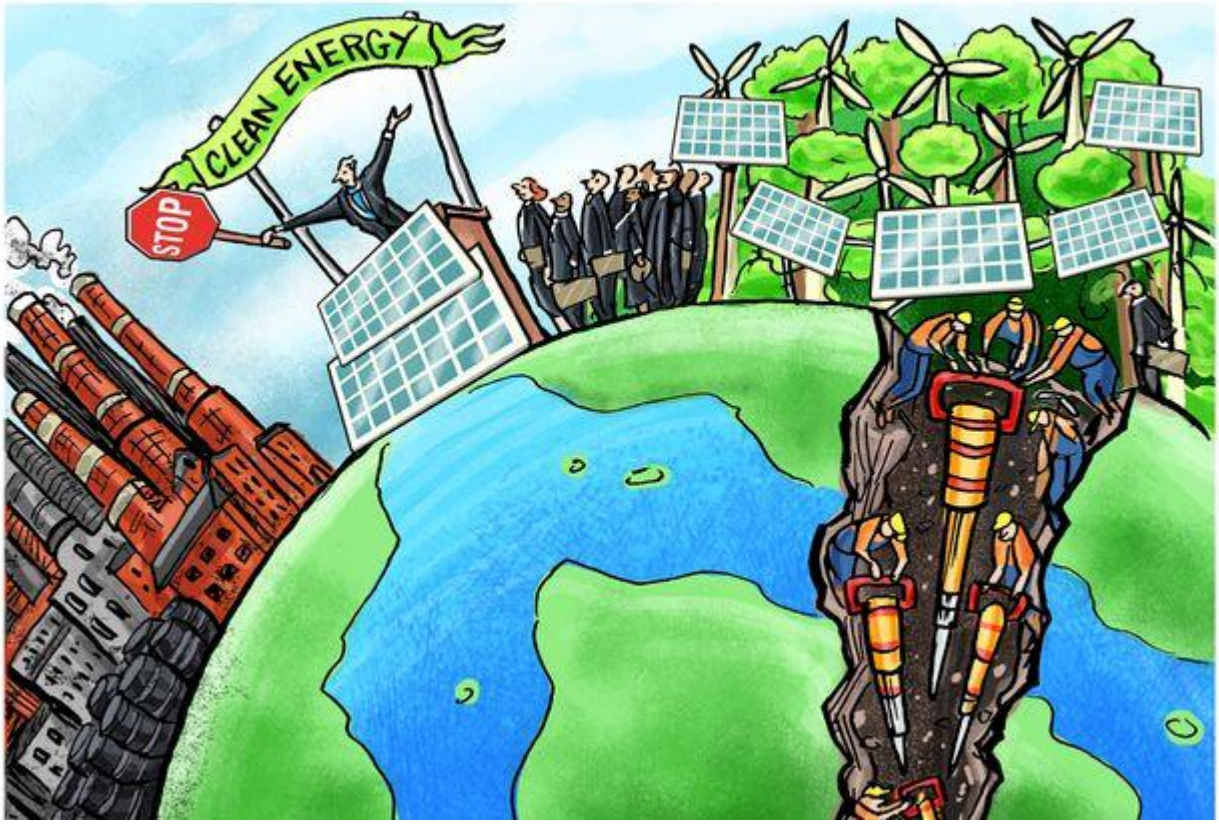
Biden’s Not-So-Clean Energy Transition

The International Energy Agency exposes the hidden environmental costs and infeasibility of going green.



The International Energy Agency, the world’s pre-eminent source of energy information for governments, has entered the political debate over whether the U.S. should spend trillions of dollars to accelerate the energy transition favored by the Biden administration. You know, the plan to use far more “clean energy” and far less hydrocarbons—the oil, natural gas and coal that today supply 84% of global energy needs. The IEA’s 287-page report released this month, “The Role of Critical Minerals in Clean Energy Transitions,” is devastating to those ambitions. A better title would have been: “Clean Energy Transitions: Not Soon, Not Easy and Not Clean.”

The IEA assembled a large body of data about a central, and until now largely ignored, aspect of the energy transition: It requires mining industries and infrastructure that don’t exist. Wind, solar and battery technologies are built from an array of “energy transition minerals,” or ETMs, that must be mined and processed. The IEA finds that with a global energy transition like the one President Biden envisions, demand for key minerals such as lithium, graphite, nickel and rare-earth metals would explode, rising by 4,200%, 2,500%, 1,900% and 700%, respectively, by 2040.

The world doesn’t have the capacity to meet such demand. As the IEA observes, albeit in cautious bureaucratese, there are no plans to fund and build the necessary mines and refineries. The supply of ETMs is entirely aspirational. And if it were pursued at the quantities dictated by the goals of the energy transition, the world would face daunting environmental, economic and social challenges, along with geopolitical risks.

The IEA stipulates up front one underlying fact that advocates of a transition never mention: Green-energy machines use far more critical minerals than conventional-energy machines do. “A typical electric car requires six times the mineral inputs of a conventional car, and an onshore wind plant requires nine times more mineral resources than a gas-fired power plant,” the report says. “Since 2010, the average amount of minerals needed for a new unit of power generation capacity has increased by 50% as the share of renewables has risen.” That was merely to bring wind and solar to a 10% share of the world’s electricity.

As the IEA notes dryly, the transition is a “shift from a fuel-intensive to a material-intensive energy system.” That means a shift away from liquids and gases whose extraction and transport leave a very light footprint on the land and are transported easily, cheaply and efficiently, and toward big-footprint mines, the energy-intensive transport of massive amounts of rocks and other solid materials, and subsequent chemical processing and refining.

Spooling up production can’t happen overnight. The IEA observes something every miner knows: “It has taken on average over 16 years to move mining projects from discovery to first production.” Start tomorrow and new ETM production will begin only after 2035. This is a considerable problem for the Biden administration’s plan to achieve 100% carbon-free electricity by 2035.

In what may become the understatement of the decade, the IEA concludes that such long lead times “raise questions about the ability of suppliers to ramp up output if demand were to pick up rapidly.” The conditional “if” is a discordant qualifier given the IEA itself has endorsed, and nearly all its member states have already pledged, a rapid transition. The clear consequence is that “deployment of clean energy technologies is set to supercharge demand for critical minerals.”

Credit the IEA for acknowledging that this will require a global mining boom that leaves in its wake all manner of environmental implications. “Mining and mineral processing require large volumes of water”—a serious issue when around half of global lithium and copper production takes place in areas of high water stress—and “pose contamination risks through acid mine drainage, wastewater discharge and the disposal of tailings.”

The IEA falls backs on the usual admonition that mitigating these risks will require “strengthening international collaboration” for everything from pollution to labor practices. But the history here isn’t promising. IEA data show that expanded ETM mining will occur mainly in countries with “low governance scores” where “corruption and bribery pose major liability risks.”

The IEA may be the first major agency to flag the geopolitical risks of the energy transition, again with copious data. Today the oil-and-gas market is characterized by supply diversity. The top three producers, among them the U.S., account for less than half of world supply. The top three producers for three key ETMs, however, control more than 80% of global supply. Here we find China utterly dominant while the U.S. isn’t even a player.

Well buried in the report is a warning about the “high emissions intensities” of ETMs. Energy use per pound mined is even trending up. This is no arcane nuance. It’s the key hidden factor that determines whether, or to what extent, a clean-energy machine actually reduces carbon-dioxide emissions on net. The IEA data show that, depending on the location and nature of future mines, the emissions from obtaining ETMs could wipe out much or most of the emissions saved by driving electric cars.

Worse yet, radical increases in demand will raise commodity prices, which reverberate throughout the global economy. When it comes to batteries, the IEA notes this could “eat up” the anticipated reductions in manufacturing costs expected from the “learning effects” of increased production. It’s an outcome that runs counter to the narrative of inevitably cheaper green-energy machines over time.

If such a report had come from a pro-hydrocarbon organization, the group would be dismissed, if not canceled outright. Credit the IEA for boldly going where few policy makers have gone before. As President Obama might say, we can't dig our way out of this problem.

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