ical Risks in Renewa
gy

position from the fossil fuel industry and the
ty of supply chains for rare earth elements a
or the renewable energy industry.

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2017, global renewable generation capacity increased
N), reaching 2,179 GW worldwide. According to the
Renewable Energy Agency
org/publications/2018/Mar/Renewable-Capacity-Statistics-2018)
s amounts to an annual growth rate of around 8.3 percent, the
ıe past seven years.

in wind and solar capacity installations in recent years
e amount of electricity that comes from renewable ene
cent in 2008 to around 25 percent today. That figure is
ercent by 2022.

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Solar photovoltaics (PV) grew by 32 percent in 2017, followed by wind energy, which grew by 10 percent. Meanw cost of electricity from solar PV by 73 percent, while the cost of e from onshore wind power dropp nearly a quarter between 2010 ar

By all accounts, renewable energy is a booming business. But it's not one without its fair share of risks. Here are seven of the risks that will challenge the grows and matures during the next few years.

sky Tariffs

ole growth of solar energy in the U.S. makes a clear cas leployment are closely tied to decreases in costs. Solar ith other low-cost fuel sources, so even the slightest increase in nodules can mean that homeowners, utilities and businesses will ernative for their power generation.

iese tariffs present significant risk to the domestic renewable ry. When hardware costs rise because of import fees, some never come to fruition, which hurts job growth and economic – a missed opportunity for growing the U.S. economy.

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likely continue to import 80 percent to 90 percent of solar cells But at a higher cost due to tariffs, some utility-scale projects ped or put on hold for budgetary reasons, and solar may be out nany homeowners, driving up prices for ratepayers.

ical Battle Over Green Energy

tates spends $37.5 billion on subsidies for fossil fuels every year, an estimate (http://priceofoil.org/fossil-fuel-subsidies/) by Oil national. Through direct subsidies, tax breaks, and other .S. taxpayers help fund the industry's research, operations and neration.

es have constrained the growth of renewable energy, while the lustry has simultaneously used its influence to spread formation about climate change. The industry has been aware f global warming since the 1970s, according to researchers, but d by funding climate disinformation campaigns .ucsusa.org/global-warming/fight-misinformation/climate-ssiers-fossil-fuel-industry-memos#.WfickGhSyCo), aimed at on both climate change and renewable energy.

tific consensus (https://www.ucsusa.org/scientists-agree-global-pening-humans-primary-cause#.Wfic3mhSyCo), climate action hly partisan issue in Congress, complicating efforts to move els to clean, renewable energy.

is shifting to center stage, since the Feb. 7 release of the Green posal, sponsored by Rep. Alexandria Ocasio-Cortez (D-N.Y.) Markey (D-Mass). The non-binding proposal calls for "meeting of the power demand in the United States through clean, nd zero-emission energy sources."

›rojection is for renewable energy to account for about 31
S. energy generation by 2050
.eia.gov/outlooks/aeo/pdf/aeo2019.pdf), with steep drops for
oal.

rsial proposal, however, suggests an accelerated timeline: global
greenhouse gas emissions from human sources of 40 to 60
2010 levels by 2030; and net-zero global emissions by 2050.

nst the proposal isn't likely to hamper growth of renewable
ction, but it could place increased scrutiny on industry
s. Widespread support for the proposal, on the other hand,
rapid growth that outpaces existing risk management controls.

Rare Earth Metals

are metals are vital for renewable energy technologies, such as
ınd solar panels. Solar panels require tellurium, one of the
ıts on Earth.

The amount of rare metals required for production isn't enough to raise concerns about shortages. However, production of many essential elements is concentrated in just a few countries. China in particular, mines 93 percent of the world's rare earth elements. If China's ports were impacted by a natural disaster, for instance, world trade and the global economy would feel the repercussions.

Having a near monopoly on crucial
› allows countries to take liberties with access. When a conflict
n Japan and China in 2010, for instance, China halted all

rare earth elements to Japan, which the country needs to hybrid cars and electronics.

ome critical and rare minerals are by-products of much larger ations, meaning that these by-products are vulnerable to market If the copper price falls, for instance, then the production of its oducts will also be at risk.

at Cats

nt related to solar and wind generation has proven reasonably ad weather. When Hurricane Maria tore through Puerto Rico, a ooftop solar array on San Juan's VA Hospital continued to ercent (https://pv-magazine-usa.com/2017/11/07/solar-survives-n-puerto-rico/) post-storm, despite 180 MPH winds, thanks to acking and anchoring system used to keep the solar panels in

mal" of Nat Cat frequency and severity, however, remains a cern. Average solar claims severity in the last five years has 87 percent, mostly as a result of the greater impact of weather-, wrote insurer GCube in its 2016 Cell, Interrupted gcube-insurance.com/reports/cell-interrupted/)report.

lar panels exploding into pieces after the wildfires across ifornia in October 2017 were cause for concern. While the as likely due to the overwhelming strength of the fire rather el quality, the industry is monitoring the situation to ensure that ndards are in place for panels and panel systems.

eather events continue to plague the United States, s and installers of renewable energy equipment will need to ing to ensure their products have the resilience necessary to creasingly volatile climate risks.

Risk

he continuous low-level hum of wind turbines has been roduce health problems including sleep disturbance, headaches, pressure, dizziness, vertigo, nausea, visual blurring, tachycardia, ritability, problems with concentration and memory, and panic se are grouped under a term “Wind-Turbine Syndrome” which eased use and generating a variety of studies.

ptoms claimed are actually associated with windfarm sound or ains something of a matter of debate, and engineers are mpen the noise generated by these devices.

concerns surround the strobe-like “Flicker effect,” or the reflections cast by the whirling blades of wind turbines may es in some individuals. The flicker affect predominantly affects uffer from photosensitive epilepsy and experience seizures in ertain environmental triggers.

n effects are also a concern. Wind turbine blades can be birds and bats, with the most significant number of encounters datory birds like hawks and eagles.

ators have brought criminal charges to protect wildlife in the arms placed in migratory paths. One site has incurred more o per year in bird strike mitigation measures.

owever, the Trump administration walked back a portion of the d Treaty Act of 1918, re-interpreting the Act to no longer nadvertent deaths of birds due to operations such as oil drilling, s and communications towers.

action would not prevent protest from environmental and ist groups, and the industry must remain cognizant of the brand risk exposure associated with a pattern of activity fatal to

Tax Credits

challenge for renewable energy is the extension and phase- Renewable Electricity Production Tax Credit (PTC) and ax Credit (ITC). The PTC and ITC have been key financial nd and solar power project development and help sustain the ruction, management and operation of renewable power sets.

The tax credits were extended through 2019, with a phase-down annually. For the U.S. wind industry, for example, the value of the PTC drops to 60 percent in 2022 and 40 percent in 2023 before disappearing entirely in 2024.

The wind industry insists the sunset of the PTC will not slow growth. But project owners will have a financial void to fill when the PTC expires. The use of conventional project finance could mean making wind power less competitive.

published by the Department of Energy noted that expected increases to 10–13 GW in 2020, “forecasts for 2021 to 2025 … turn in additions in part due to the PTC phase-out.”

y Give Investors Pause

for renewables came in the form of 2017's Tax Cuts and Jobs eping tax legislation decreased the federal corporate income tax ercent to 21 percent, reducing tax liabilities for companies and etite for tax credits.

ıe corporate tax cuts, the new tax law includes the Base Erosion ax (BEAT), which attempts to ensure that corporations cannot der payments to lower their tax bill. But it also lowered the roduction tax credits and investment tax credits that are used ce wind and solar projects, potentially making renewable s attractive investment.

estions remain as the tax credit drops down and it is uncertain if will lose their appetite for renewable projects. One or two tax ors left the market soon after the details of the bill were t's a small number, but still enough to impact a market that tal of 35 investors for both wind and solar in 2017. **&**

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