

Green transition creates new risks and rewards

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Different countries face different risks and opportunities as the world switches from fossil fuels to renewable energy, researchers say.

Green policies have traditionally been seen as costly to countries who

implement them, while other nations can do nothing and "free-ride"—leading to global inaction on the climate crisis.

However, the research team—led by the universities of Exeter, Cambridge, the Open University and Cambridge Econometrics—say this is a "poor description" of today's reality.

Instead, they say the transition is already happening and, for many countries, embracing it is the best strategy to reduce costs.

As the world economy transforms, free-riding may now be the risky approach—not only environmentally but also economically.

According to the new study, the risks and opportunities vary dramatically between countries, depending on their degree of competitiveness in fossil [fuel](#) markets.

Countries fall into one of three categories—each with different incentives driven by the green transition.

Large fossil fuel importers like the EU and China will gain multiple benefits from decarbonizing.

Meanwhile, "large competitive fossil fuel exporters" like Saudi Arabia may avoid [economic decline](#) by flooding global markets with cut-price [fossil fuels](#).

The third category—"large uncompetitive exporters" such as the US, Canada and Russia—could suffer due to stranded fossil fuel assets and lack of investment in new technological sectors.

However, the nations at the losing end can head off these impacts by diversifying their economies away from fossil fuels towards new

technology sectors, including low-carbon exports.

"The costs and benefits of decarbonisation and related politics have been misunderstood and misrepresented for some time," said Dr. Jean-Francois Mercure, of the Global Systems Institute at the University of Exeter.

"In fact, the green transition is well under way, whether people realize it or not, and those politics are already at play.

"Decarbonising is traditionally seen as expensive, but it really depends on how much high-carbon industry each country has to lose, versus how much can be gained in new technological sectors."

Professor Jorge Viñuales, of the University of Cambridge and co-author of the study, said: "The prevailing narrative that, while others decarbonise, you can free-ride them to your benefit must be turned on its head.

"As the economy transforms, if you do not decarbonise, you are shooting yourself in the foot.

"The key question is how to do it in the specific conditions of your country."

The study says the rapid replacement of fossil fuels with renewables will cause a "profound reorganization of industry value chains, international trade and geopolitics".

The researchers outline a structure of incentives that differ depending on countries' positions relative to the fossil fuel industry:

- Large importers including the EU, UK, China, India and Japan

have a win-win scenario in which they can shed their dependence of foreign fuels and create jobs as they spend that money domestically instead and develop new technology at home. These countries are already rapidly transitioning.

- Economic conditions may lead large competitive exporters (some [OPEC nations](#)) to flood fossil fuel markets to avoid declining export volumes as the demand peaks and declines.
- Large uncompetitive exporters (the US, Canada, Russia and possibly some South American nations such as Brazil) would be unable to compete on price in this flooded market, suffering a double blow from declining demand and low oil and gas prices. However, unlike major importers, the fossil fuel industry is much more important for economic activity and jobs—reducing economic incentives or creating political barriers to decarbonise in the short run. Free-riding would mean exposing these sectors to structural change without a clear exit strategy. Countries in this situation should consider carefully how to reduce their exposure to stranded assets, and how to reap benefits from the transition which can be used to shield exposed workers.

The research suggests that unless this new geopolitical game is recognized and addressed, the world could become stuck in a deadlock in which some countries embrace the new technological wave, while others could become trapped in a vicious cycle of declining and obsolete fossil fuel-related industry, and ultimately, post-industrial decline.

The solution to industrial decline remains innovation in new sectors and economic diversification.

"The disruptive nature of the low-carbon transition makes untenable a macroeconomic strategy based on 'business-as-usual'," said Dr. Pablo Salas, from the University of Cambridge Institute for Sustainability Leadership (CISL).

"Supporting low-carbon innovation is the only way to maintain long-term competitiveness in a decarbonising economy."

The researchers stress that they are not advocating particular climate policies, but merely identifying the new global geopolitical situation ahead of the vital COP26 UN Climate Change Conference in Glasgow.

Professor Neil Edwards, who led the UK Natural Environment Research Council-funded project from The Open University, which provided the climate modeling used for the work, said: "It remains a widely held belief that politicians have no motivation to enact the policies needed to protect the climate as laid out in the Paris Agreement.

"Our paper clearly shows there are strong political incentives and furthermore that change is under way."

Commenting on the choices facing countries such as the US, Canada and Russia, Cambridge Econometrics Chief Economist Hector Pollitt said: "We are predicting a bleak outlook that is conditional to policy-makers, businesses and people in those countries not changing their strategic behavior and decision-making.

"However, this bleak outlook can be turned around if they manage an orderly transition, support job creation in new sectors and facilitate the mobility of workers between the old and new industries."

Dr. Gregor Semieniuk, from the University of Massachusetts Amherst and another co-author on the study, said: "Developing countries face the largest challenges to insert themselves into the low-carbon technology supply chain.

"Richer countries with high-cost fossil fuel supply but a diversified economy actually have the choice to participate fully in the low-carbon

economy with appropriate industrial policy. They only have to manage to make that choice."

Dr. Mercure added: "Economic diversification away from fossil fuels is complex but necessary to protect economies from the volatility that usually occurs at the end of a technological era. We have to recognize that the end of the fossil fuel era is at our doorstep.

"We hope our paper helps to explain the current situation, and encourages global cooperation on the issue of climate change, to promote economic development worldwide."

The research was carried out by the University of Exeter, Cambridge Econometrics, the Open University, the University of Cambridge Institute for Sustainability Leadership (CISL), the Cambridge Centre for Environment, Energy and Natural Resource Governance (C-EENRG), the University of Massachusetts Amherst and the University of Macau.

The paper, published in the journal *Nature Energy*, is entitled: "Reframing incentives for climate policy action."

More information: Jean-Francois Mercure, Reframing incentives for climate policy action, *Nature Energy* (2021). [DOI:](https://doi.org/10.1038/s41560-021-00934-2)

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