

# Artificial Intelligence: Profit Versus Freedom



*Richard D. Wolff*

Artificial Intelligence (AI) presents a profit opportunity for capitalists, but it presents a crucial choice for the working class. Because the working class is the majority, that crucial choice confronts society as a whole. It is the same profit opportunity/social choice that was presented by the introduction of robotics, computers, and indeed by most technological advances throughout capitalism's history. In capitalism, employers decide when, where, and how to install new technologies; employees do not. Employers' decisions are driven chiefly by whether and how new technologies affect their profits.

If new technologies enable employers to profitably replace paid workers with machines, they will implement the change. Employers have little or no responsibility to the displaced workers, their families, neighborhoods, communities, or governments for the many consequences of jobs lost. If the cost to society of joblessness is 100 whereas the gain to employers' profits is 50, the new technology is implemented. Because the employers' gain governs the decision, the new technology is introduced, no matter how small that gain is relative to society's loss. That is how capitalism has always functioned.

A simple arithmetic example can illustrate the key point. Suppose AI doubles some employees' productivity. During the same work time, they produce twice as much as before the use of AI. Employers who use AI will then fire half of their employees. Such employers will then receive the same output from the remaining 50 percent of their employees as before the introduction of AI. To keep our example simple, let's assume those employers then sell that same output for the

same price as before. Their resulting revenues will then likewise be the same. The use of AI will save the employers 50 percent of their former total wage bills (less the cost of implementing AI) and those savings will be kept by employers as added profit for them. That added profit was an effective incentive for the employer to implement AI.

If we imagine for a moment that the employees had the power that capitalism confers exclusively on employers, they would choose to use AI in an altogether different way. They would use AI, fire no one, but instead cut all employees' working days by 50 percent while keeping their wages the same. Once again keeping our example simple, this would result in the same output as before the use of AI, and the same price for the goods or services and revenue inflow would follow. The profit margin would remain the same after the use of AI as before (minus the cost of implementing the technology). The 50 percent of employees' previous workdays that are now available for their leisure would be the benefit they accrue. That leisure—freedom from work—is their incentive to use AI differently from how employers did.

One way of using AI yields added profits for a few, while the other way yields added leisure/freedom to many. Capitalism rewards and thus encourages the employers' way. Democracy points the other way. The technology itself is ambivalent. It can be used either way.

Thus, it is simply false to write or say—as so many do these days—that AI threatens millions of jobs or jobholders. Technology is not doing that. Rather the capitalist system organizes enterprises into employers versus employees and thereby uses technological progress to increase profit, not employees' free time.

Throughout history, enthusiasts celebrated most major technological advances because of their “labor-saving” qualities. Introducing new technologies would deliver less work, less drudgery, and less demeaning labor. The implication was that “we”—all people—would benefit. Of course, capitalists' added profits from technical advances no doubt brought them more leisure. However, the added leisure new technologies made possible for the employee majority was mostly denied to them. Capitalism—the profit-driven system—caused that denial.

Today, we face the same old capitalist story. The use of AI can ensure much more leisure for the working class, but capitalism instead subordinates AI to

profiteering. Politicians shed crocodile tears over the scary vista of jobs lost to AI. Pundits exchange estimates of how many millions of jobs will be lost if AI is adopted. Gullible liberals invent new government programs aimed to lessen or soften AI's impact on employment. Once again, the unspoken agreement is not to question whether and how the problem is capitalism nor to pursue the possibility of system change as that problem's solution.

In an economy based on worker coops, employees would collectively be their own employers. Capitalism's core structure of enterprises—the employer versus employee system—would no longer prevail. Implementing technology would then be a collective decision democratically arrived at. With the absence of capitalism's employer versus employee division, the decision about when, where, and how to use AI, for example, would become the task and responsibility of the employees as a collective whole. They might consider profitability of the enterprise *among* their goals for using AI, but they would certainly also consider the gain in leisure that this makes possible. Worker coops make decisions that differ from those of capitalist enterprises. Different economic systems affect and shape the societies in which they operate differently.

Across capitalism's history, employers and their ideologues learned how best to advocate for technological changes that could enhance profits. They celebrated those changes as breakthroughs in human ingenuity deserving everyone's support. Individuals who suffered due to these technological advances were dismissed as, "the price to pay for social progress." If those who suffered fought back, they were denounced for what was seen as anti-social behavior and were often criminalized.

As with previous technological breakthroughs, AI places on society's agenda both new issues and old contentious ones. AI's importance is NOT limited to productivity gains it achieves and job losses it threatens. AI also challenges—yet again—the social decision to preserve the employer-employee division as the basic organization of enterprises. In capitalism's past, only employers made the decisions whose results employees had to live with and accept. Maybe with AI, employees will demand to make those decisions via a system change beyond capitalism toward a worker-coop based alternative.

*Author Bio:*

Richard D. Wolff is professor of economics emeritus at the University of

Massachusetts, Amherst, and a visiting professor in the Graduate Program in International Affairs of the New School University, in New York. Wolff's weekly show, "Economic Update," is syndicated by more than 100 radio stations and goes to 55 million TV receivers via Free Speech TV. His three recent [books with Democracy at Work](#) are *The Sickness Is the System: When Capitalism Fails to Save Us From Pandemics or Itself*, *Understanding Socialism*, and *Understanding Marxism*, the latter of which is now available in a newly released 2021 hardcover edition with a new introduction by the author.

*Source:*

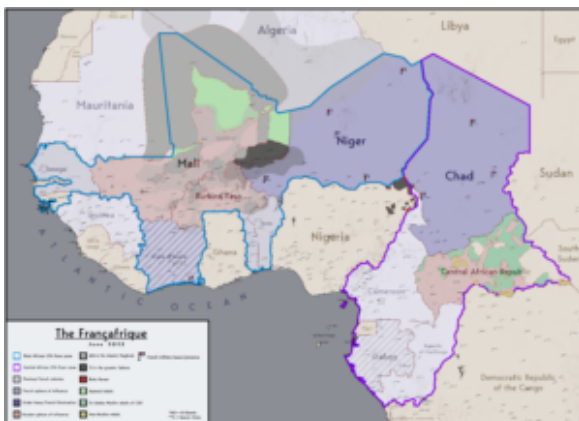
Independent Media Institute

*Credit Line:*

*This article was produced by [Economy for All](#), a project of the Independent Media Institute.*

---

# Is This The End Of French Neo-Colonialism In Africa?



*Françafrique - en.wikipedia.org*

In Bamako, Mali, on September 16, the governments of Burkina Faso, Mali, and Niger [created](#) the Alliance of Sahel States (AES). On X, the social media platform

formerly known as Twitter, Colonel Assimi Goïta, the head of the transitional government of Mali, [wrote](#) that the Liptako-Gourma Charter which created the AES would establish “an architecture of collective defense and mutual assistance for the benefit of our populations.” The hunger for such regional cooperation goes back to the period when France ended its colonial rule. Between 1958 and 1963, Ghana and Guinea were part of the Union of African States, which was to have been the seed for wider pan-African unity. Mali was a member as well between 1961 and 1963.

But, more recently, these three countries—and others in the Sahel region such as Niger—have struggled with common problems, such as the downward sweep of radical Islamic forces unleashed by the 2011 North Atlantic Treaty Organization (NATO) war on Libya. The anger against the French has been so intense that it has provoked at least seven coups in Africa (two in Burkina Faso, two in Mali, one in Guinea, one in Niger, and one in Gabon) and unleashed mass demonstrations from Algeria to the Congo and most recently in [Benin](#). The depth of frustration with France is such that its troops have been ejected from the Sahel, Mali [demoted](#) French from its official language status, and France’s ambassador in Niger (Sylvain Itté) was effectively held “hostage”—as French President Emmanuel Macron [said](#)—by people deeply upset by French behavior in the region.

Philippe Toyo Noudjenoume, the President of the West Africa Peoples’ Organization, explained the basis of this cascading anti-French sentiment in the region. French colonialism, he said, “has remained in place since 1960.” France holds the revenues of its former colonies in the Banque de France in Paris. The French policy—known as *Françafrique*—included the presence of French military bases from Djibouti to Senegal, from Côte d’Ivoire to Gabon. “Of all the former colonial powers in Africa,” Noudjenoume told us, “it is France that has intervened militarily at least sixty times to overthrow governments, such as [that of] Modibo Keïta in Mali (1968), or assassinate patriotic leaders, such as Félix-Roland Moumié (1960) and Ernest Ouandié (1971) in Cameroon, Sylvanus Olympio in Togo in 1963, Thomas Sankara in Burkina Faso in 1987 and others.” Between 1997 and 2002, during the presidency of Jacques Chirac, France [intervened militarily](#) 33 times on the African continent (by comparison, between 1962 and 1995, France [intervened militarily](#) 19 times in African states). France never really suspended its colonial grip or its colonial ambitions.

### *Breaking the Camel's Back*

Two events in the past decade “broke the camel’s back,” Noudjenoume said: the NATO war in Libya, led by France, in March 2011, and the French intervention to remove Koudou Gbagbo Laurent from the presidency of Côte d’Ivoire in April 2011. “For years,” he said, “these events have forced a strong anti-French sentiment, particularly among young people. It is not just in the Sahel that this feeling has developed but throughout French-speaking Africa. It is true that it is in the Sahel that it is currently expressed most openly. But throughout French-speaking Africa, this feeling is strong.”

Mass protest against the French presence is now evident across the former French colonies in Africa. These civilian protests have not been able to result in straight-forward civilian transitions of power, largely because the political apparatus in these countries had been eroded by long-standing, French-backed kleptocracies (illustrated by the Bongo family, which ruled Gabon from 1967 to 2023, and which leeches the oil wealth of Gabon for their own personal gain; when Omar Bongo died in 2009, French politician Eva Joly [said](#) that he ruled on behalf of France and not of his own citizens). Despite the French-backed repression in these countries, trade unions, peasant organizations, and left-wing parties have not been able to drive the upsurge of anti-French patriotism, though they have been able to assert themselves

France intervened militarily in Mali in 2013 to try to control the forces that it had unleashed with NATO’s war in Libya two years previously. These radical Islamist forces captured half of Mali’s territory and then, in 2015, proceeded to assault Burkina Faso. France intervened but then sent the soldiers of the armies of these Sahel countries to die against the radical Islamist forces that it had backed in Libya. This created a great deal of animosity among the soldiers, Noudjenoume told us, and that is why patriotic sections of the soldiers rebelled against the governments and overthrew them.

### *Anti-Intervention*

After the coup in Niger, the West hoped to send in a [proxy force](#)—led by the Economic Commission of West African States (ECOWAS)—but the African military leaders demurred. Across the region, people set up solidarity committees to defend the people of Niger from any attack, with the threat provoking “revolt and indignation among the populations,” Noudjenoume explained. Nigerian President Bola Ahmed Tinubu was even forced to back down from ECOWAS’s crusade when

his country's Congress rejected the measure and mass protests occurred against militarily intervening in the neighboring country. As ECOWAS's ultimatums to restore the deposed Nigerien leader Mohamed Bazoum expired, it became clear that its threat was empty.

Meanwhile, not only did it appear that the people of Niger would resist any military intervention, but Burkina Faso and Mali immediately promised to defend Niger against any such intervention. The new AES is a product of this mutual solidarity.

But the AES is not merely a military or security pact. At the signing ceremony, Mali's Defense Minister Abdoulaye Diop [told](#) journalists, "This alliance will be a combination of military and economic efforts [among]... the three countries." It will build upon the February 2023 [agreement](#) between Burkina Faso, Guinea, and Mali to collaborate on a fuel and electricity exchange, to build transportation networks, to collaborate on mineral resource sales, to build a regional agricultural development project, and to increase intra-Sahel trade. Whether these countries would be able to develop an economic agenda to benefit their peoples—and therefore guarantee that France would have no means to exert its authority over the region—is to be seen.

*Author Bio:*

*This article was produced by [Globetrotter](#).*

*Zoe Alexandra is the co-editor of [Peoples Dispatch](#).*

*Vijay Prashad is an Indian historian, editor, and journalist. He is a writing fellow and chief correspondent at Globetrotter. He is an editor of [LeftWord Books](#) and the director of [Tricontinental: Institute for Social Research](#). He has written more than 20 books, including [The Darker Nations](#) and [The Poorer Nations](#). His latest books are [Struggle Makes Us Human: Learning from Movements for Socialism](#) and (with Noam Chomsky) [The Withdrawal: Iraq, Libya, Afghanistan, and the Fragility of U.S. Power](#).*

*Source: Globetrotter*

---

# Breaking Europe's Hold On Football



*John P. Ruehl - Source:  
Independent Media  
Institute*

*09-15-2023 ~ Initiatives from Saudi Arabia and the United States continue to put pressure on Europe's traditional stranglehold over FIFA.*

The 2022 FIFA World Cup in Qatar brought together nations from around the world, and [1.5 billion people tuned in](#) to watch the final. But while soccer is a source of local pride, passion, and personal and community identity globally, its official governing institution is headquartered in Europe. Founded in Paris in 1904 and now based in Switzerland, the Fédération Internationale de Football Association (FIFA) oversees international soccer promotion and development, from rule changes to hosting rights for major tournaments.

The Union of European Football Associations (UEFA), alongside England's Premier League (EPL), Germany's Bundesliga, Spain's LaLiga, Italy's Serie A, and France's Ligue 1, play significant roles in global soccer and generate substantial



revenue for FIFA. European clubs and national teams attract top talent, and through “[sports diplomacy](#),” can project their cultural, political, and economic interests to the world and influence FIFA.

This dominance has long been a source of criticism. African teams in [1966](#) organized boycotts to protest their lack of representation at the World Cup. Even UEFA and João Havelange, president of FIFA from 1974 to 1998, [became increasingly critical](#) of each other, while Havelange’s successor, Sepp Blatter, also criticized FIFA’s Eurocentric influence [in 2015](#).

Recently, this strain of critique has become even more apparent. During the 2022 World Cup in Qatar, European teams were [rebuked by FIFA](#) to abandon plans to wear pro-LGBT armbands, while [UEFA-affiliated teams and FIFA clashed](#) over Qatar’s human rights record in the lead-up to the tournament. But throughout 2023, Europe’s traditional dominance has been challenged by notable developments in Saudi Arabia and the United States.

[Saudi Arabia’s Vision 2030](#), announced in 2016, aims to diversify its economy and attract foreign investment. While hosting and sponsoring motorsports, golf, boxing, and other sports tournaments form part of this, soccer serves as the cornerstone of Riyadh’s attempts to portray and promote the country. This charm offensive has drawn Western allegations of “[sportswashing](#),” wherein sports are used to improve a country’s public image and divert attention from negative actions.

[Like other Gulf States](#), Saudi Arabia has purchased major European teams in recent years. Saudi Arabia’s Public Investment Fund acquired the EPL’s Newcastle United [in 2021](#), and Sheffield United, bought by the Saudis in 2013, will again play in the EPL in the 2023-24 season. The Saudis also reportedly made a [multibillion-dollar bid](#) to buy the EPL’s Chelsea, while tournaments like the [Supercoppa Italiana](#) and [Spanish Super Cup](#) are increasingly held in Saudi Arabia.

Nevertheless, Riyadh’s major sporting aim is to elevate the prestige of the Saudi Professional League (SPL). With backing from the oil-fueled Public Investment Fund, the Saudis have [invested heavily in the SPL](#), turning it into one of the world’s most high-profile leagues. This investment has already yielded results—SPL team Al-Hilal finished as runners-up in the [2022 FIFA Club World](#)

[Cup](#), losing to Spanish club Real Madrid.

In 2023, [a series of high-profile SPL deals](#) poached top talent from Europe and around the world. Unconstrained [by UEFA's spending limits](#), Saudi clubs snatched up players like Portugal's Cristiano Ronaldo, Senegal's Édouard Mendy, England's Jordan Henderson, Spain's Gabri Veiga, and Brazilian superstar Neymar. While some are nearing the end of their careers, others are in their primes or just beginning, and SPL clubs have also managed to attract [notable coaches](#).

Concerns have grown over Saudi Arabia's influence in global soccer, with human rights issues often cited. Saudi Arabia was [prohibited from sponsoring](#) the FIFA Women's World Cup in Australia and New Zealand in 2023 due to these concerns. However, upcoming efforts will continue to boost Saudi Arabia's soccer standing, including hosting the men's FIFA Club World Cup [in December 2023](#) and exploring [cohosting the 2030 FIFA World Cup](#) with Egypt and Greece, with an offer to finance their new stadiums if three-quarters of the matches are played in Saudi Arabia.

Amid increasing Saudi attempts to influence FIFA and the global soccer stage, U.S. entities have also made major inroads. In the EPL, [eight of 20 teams are now fully or partially U.S.-owned](#). However, like Saudi Arabia, the primary U.S. challenge to European soccer dominance stems from the growth of its domestic league, Major League Soccer (MLS). The league has seen steady growth for decades, aiming to tap into the potentially massive domestic U.S. market.

Following the success of the 1994 FIFA World Cup held in the U.S., the MLS's inaugural season commenced in 1996. MLS received a significant boost in 2007 with the signing of English superstar David Beckham to the LA Galaxy. [The contract](#) introduced the designated player rule, enabling teams to exceed the salary cap for certain players, and included a clause allowing Beckham to purchase the rights to an expansion team after his five-year contract ended.

Since then, MLS has expanded from [13 to 29 teams](#), and Beckham now co-owns Inter Miami, which signed Argentina's Lionel Messi in mid-2023 from French club Paris Saint-Germain. Messi's contract includes an [equity share in Inter Miami](#), illustrating how MLS continues to attract superstars by giving them a vested interest in the league.

Since Messi's signing, MLS has experienced what is known as the "[Messi effect](#)." Inter Miami has witnessed record jersey sales, hundreds of millions of dollars in ticket sales, and has [gained 14 million](#) Instagram followers. Apple's streaming service for MLS games has gained almost 300,000 subscribers as of September 7, and celebrities at [recent Miami games](#) included Leonardo DiCaprio, LeBron James, and Prince Harry. Other soccer stars who recently joined Miami include Messi's former Barcelona teammates [Sergio Busquets and Jordi Alba](#).

MLS's growth has also been fueled by the significant increase in the Latino population since its 1996 inception, capitalizing on Latin America's passion for the sport, as well as the success of the U.S. national women's team in recent years. To strengthen ties to Latin America, a new expanded Leagues Cup between MLS and Mexico's Liga MX commenced in 2023, with Inter Miami [emerging as victors](#).

The U.S. will host the [2024 Copa América](#) in coordination with the Confederation of North, Central America and Caribbean Association Football (CONCACAF), and South American Football Confederation (CONMEBOL). The U.S., Mexico, and Canada will also host the 2026 Men's World Cup.

[Younger Americans](#) are also increasingly interested in soccer, and in an attempt to match European youth development leagues, MLS [launched MLS Next in 2020](#) (the Saudis launched their own [in 2023](#)). The U.S. now has the [largest number of youth players](#) playing soccer recreationally, with European leagues increasingly [recruiting talent](#) from MLS.

FIFA is naturally keen to capitalize on MLS's potential for growth. The U.S. is already one of FIFA's [most important revenue sources](#) for the FIFA World Cup, both in terms of sponsoring brands and in the number of citizens traveling to World Cups. FIFA may also be looking to appease Washington. In 2015, American officials [initiated a series of legal actions and investigations into corruption in FIFA](#), and in 2020, the Justice Department [accused](#) FIFA of accepting bribes from Qatar and Russia to secure their World Cup hosting bids.

Nonetheless, both the SPL and MLS [trail the major European leagues](#) in viewership. [Saudi](#) and [American](#) soccer stadiums are generally far smaller than their [European](#) counterparts, and their teams also lack the prestige of established European teams. MLS salaries are still [lower than in Europe](#), and while some

clubs have enjoyed financial success, more than [half of MLS teams still lose money](#). U.S. sports culture still favors other sports, and both the EPL and Mexico's [Liga MX also have higher viewership](#) in the U.S. than MLS.

UEFA's dominance over FIFA has also thwarted previous challenges. The U.S. launched the International Soccer League in 1960 but it faltered after five years, overshadowed by the Intercontinental Cup featuring the best teams from Europe and South America (later evolving into the FIFA Club World Cup). More recently, the [Chinese Super League struggled](#) after huge investments beginning in 2017.

But historical discontent within UEFA also recently resurfaced. Frustration has led to two attempts, one [in 1998](#) and one in [2021](#), to establish a separate "Super League" outside of FIFA and UEFA control. [The influx of money](#) from Russia, Gulf states, and the U.S. into European clubs over the last few decades played an essential role in fueling discontent from major teams toward UEFA and its Financial Fair Play regulations.

UEFA's chief Aleksander Čeferin recently [brushed off concern](#) over the SPL's spending spree and has remained largely silent on the MLS. Nonetheless, these simultaneous challenges have undermined Europe's traditional global soccer dominance. Furthermore, [suspicions have arisen](#) that Chelsea owners Todd Boehly and Clearlake Capital, a U.S. investment firm, are offloading Chelsea players to the SPL at inflated prices, suggesting how influential Saudi and U.S. figures have become even in Europe's football world.

The SPL and MLS may breathe new life into FIFA by allowing the organization's resources to be distributed more evenly. However, the significant influence of Saudi and American money in enhancing their profiles raises concerns that decentralizing global soccer could merely shift the source of financial power from Europe to new players, potentially introducing a different set of challenges. FIFA must navigate this shift carefully, aiming for true equity without creating fresh imbalances.

*Byline:*

John P. Ruehl

*Author Bio:*

This article was produced by [Globetrotter](#).

*John P. Ruehl* is an Australian-American journalist living in Washington, D.C. He is a contributing editor to *Strategic Policy* and a contributor to several other foreign affairs publications. His book, [\*Budget Superpower: How Russia Challenges the West With an Economy Smaller Than Texas\*](#), was published in December 2022.

Source: Globetrotter

---

# A Mass Climate Mobilization Is Taking Place Sunday. Here's Why It's Urgent.



*Robert Pollin*

*Economist Robert Pollin analyzes the state of the global green transition in the lead-up to Sunday's mass protest.*

A [UN climate report](#) ahead of the upcoming COP28 summit says that governments are failing to cut emissions fast enough for the planet to avoid an unmitigated disaster and calls in turn for the phasing out of fossil fuels. In the wake of the hottest summer on record, climate advocates have organized a "March to End Fossil Fuels" in New York City as part of the wave of global mobilizations with the aim of putting an end to the poisons that are killing the

planet. The action will take place Sunday, September 17.

Amid this crucial mobilization, the climate movement is working hard to expose the roots of this crisis and chart an alternate course, wrestling with questions such as: Why do governments continue to subsidize fossil fuels? Aside from the obvious resistance of the fossil fuel industry, what are the economic and technological challenges we would face by moving to a post-fossil fuel future? How do we actually get to zero emissions?

Robert Pollin, one of the world's leading progressive economists and an expert on the macroeconomics of climate change and energy, tackles these questions in an extensive and exclusive interview for *Truthout*. Pollin is distinguished professor of economics and co-director of the Political Economy Research Institute (PERI) at the University of Massachusetts Amherst. He has published scores of books and articles on jobs and macroeconomics, labor markets, wages and poverty, and environmental and energy economics. He was selected by *Foreign Policy Magazine* as one of the "100 Global Thinkers for 2013." His latest book, coauthored with Noam Chomsky, is *Climate Crisis and the Global Green New Deal: The Political Economy of Saving the Planet*.

*C. J. Polychroniou: On Wednesday, September 6, the European Copernicus Institute reported that the summer of 2023 was the [hottest ever recorded](#) in history by a large margin, prompting in turn UN Secretary-General António Guterres to issue a statement saying "climate breakdown has begun." And speaking of the UN, on Friday, September 8, it released an [assessment of the progress on cutting emissions](#) in which it said that countries are failing to make good on their commitments to curb emissions and that, subsequently, "there is a rapidly closing window of opportunity to secure a livable and sustainable future for all."*

*First, what's the current picture of energy-related carbon dioxide (CO2) emissions and that of renewable energy, respectively, and why is it that eight years after the Paris Agreement the world is still falling short of its climate goals?*

*Robert Pollin: To have any chance of moving onto a viable global climate stabilization path, the single most critical project at hand is straightforward. It is to phase out the consumption of oil, coal and natural gas, so that, by 2050, fossil fuel consumption for producing energy will have fallen to zero. This is because*



producing and burning fossil fuels to produce energy is responsible for about [90 percent of all CO2 emissions](#).

As of the most recent data from the International Energy Agency (IEA), the leading mainstream organization focused on global energy market conditions, global CO2 emissions were at around [36 billion tons in 2021](#). This represents a roughly 70 percent emissions increase since 1990 and a 14 percent increase just since 2010. More to the point, according to the IEA's estimates for future emissions under two alternative realistic scenarios — what they term as their “stated policies” and “announced pledges” scenarios — emissions will fall barely at all by 2030 and will not come close to achieving the zero emissions target by 2050.

The IEA does also develop a scenario through which the world can reach zero emissions by 2050. The difference between the IEA's stated policies and announced pledges scenarios relative to their net zero emissions by 2050 scenario is what the IEA demurely terms an “ambition gap.” The question for getting to zero emissions is therefore to figure out how to close this “ambition gap.”

Closing this ambition gap must, of course, recognize that people do still need to consume energy to light, heat and cool buildings, to power cars, buses, trains and airplanes, and to operate computers and industrial machinery, among other uses. As such, to make progress toward climate stabilization requires a viable alternative to the existing fossil fuel dominant infrastructure for meeting the world's energy needs.

Specifically, we need to be building a high-efficiency clean renewable energy-dominant global energy system as we also phase out to zero the fossil fuel dominant global energy infrastructure. There are important, if still not nearly adequate, positive developments here. First of all, on costs: The International Renewable Energy Agency (IRENA) [reports](#) that, as of 2021, fossil fuel-generated electricity ranged between 5-15 cents per kilowatt hour within the high-income economies. By contrast, the global average costs for generating a kilowatt of electricity from existing utility-scale onshore wind, at 3.3 cents, or solar photovoltaic technology, at 4.8 cents, were already at the low end of the fossil fuel-generated electricity cost range. It is therefore reasonable to assume that, even with existing clean energy technologies, electricity can be delivered now at approximately half the costs of fossil fuel-generated electricity. This is without

taking account of any policy incentives to support clean energy investments or, for that matter, any environmental costs from continuing to burn fossil fuels.

In addition to these figures on costs, IRENA reports that global investments in renewables and high efficiency reached a record high of \$1.3 trillion in 2022. However, IRENA also emphasized that this wasn't nearly enough, stating that annual investments need to "[at least quadruple](#)" to be on track for bringing global emissions down to zero by 2050.

Putting it all into some basic arithmetic: As of 2021, total fossil fuel energy consumption amounted to [502 quadrillion British Thermal Units](#) (Q-BTUs). To bring fossil fuel consumption down to zero by 2050 would entail, in absolute figures, cutting consumption by an average of about 19 Q-BTUs per year over 27 years, starting in 2024. This amounts to a 3.8 percent cut in fossil fuel consumption each year relative to the 2021 consumption level.

Technically speaking at least, this is an entirely realistic path to zero CO<sub>2</sub> emissions, as long as the clean energy infrastructure is advancing in full force while fossil fuel energy consumption falls to zero. But it will obviously require a massive political movement to overcome the power of the global oil companies, who continue to reap record-breaking profits from destroying the Earth. In 2022, profits for the major oil corporations reached an all-time high of [\\$200 billion](#). The oil companies and their shareholders have no intention whatsoever of relinquishing these riches. That is the simple answer to your question as to why we have accomplished so little on behalf of saving the planet eight years after 193 countries formally endorsed the Paris Climate Agreement in 2015.

Clearly, the "March to End Fossil Fuels" coming up this Sunday, September 17, in New York City, could not be more timely and important. I myself very much look forward to being out there with hopefully hundreds of thousands of other marchers.

*The 2015 Paris Agreement failed, ironically enough, to make any mention of fossil fuels even though these poisons are responsible for most greenhouse gas emissions and hence global warming. Yet, the UN assessment of global progress on cutting emissions calls for the immediate phase out of fossil fuels and even the European Union is pushing for fossil fuel phaseout "well ahead" of 2050 at COP28 climate summit. Undoubtedly, leaving oil, coal and gas in the ground is the most*



*effective way to curb global warming, but this is not happening. Are economics or lack of technological innovation in any way responsible for delaying the transition to a post fossil fuel future?*

Inevitably, there are major economic and technical challenges involved in completely transforming the global energy system from being dominated by fossil fuels to one being dominated by clean renewable energy sources and high efficiency. But these challenges are by no means overwhelming, much less insurmountable. By my own calculations, the level of new global investment spending on clean renewables and high efficiency will need to average about \$4.5 trillion per year, every year until 2050 — a figure that is very close to the IRENA estimate that I cited above. This amounts to an average of about 2.5 percent of global GDP per year between now and 2050. It is also less than 1 percent of the current level of total global financial assets of \$470 trillion. So, considering the big global financial framework, the transition project is an entirely realistic proposition.

There are three major sets of challenges in building a high-efficiency/renewable-energy dominant global energy infrastructure. These concern the issues of 1) intermittency with solar and wind energy; 2) mineral requirements as inputs in building the clean energy infrastructure and 3) land-use requirements for renewables, especially solar and wind. Let's briefly consider these.

Intermittency refers to the fact that the sun does not shine and the wind does not blow 24 hours a day. Moreover, on average, different geographical areas receive significantly different levels of sunshine and wind. As such, the solar and wind power that are generated in the sunnier and windier areas of the globe will need to be stored and transmitted at reasonable costs to the less sunny and windy areas.

In fact, these issues around transmission and storage of wind and solar power will not become pressing for many years into the clean energy transition, probably until the mid-2030s. This is because fossil fuels, along with nuclear energy, will continue to provide a baseload of nonintermittent energy supply as these energy sectors proceed toward their phase out while the clean energy industry rapidly expands. Fossil fuels and nuclear energy now provide roughly 85 percent of all global energy supplies. Even with a phase out to zero by 2050 trajectory, with fossil fuel supply cut on average by 18 Q-BTUs per year, fossil fuels will continue

to provide the majority of overall energy demand through about 2035. Meanwhile, fully viable solutions to the technical challenges with transmission and storage of solar and wind power — including around affordability — should not be more than a decade away, certainly as long as the market for clean energy grows at the rapid rate that is necessary. For example, IRENA estimates that global battery storage capacity could expand between 17- to 38-fold as of 2030.

Building a global clean energy infrastructure will entail a massive expansion in demand for the set of minerals that are used intensively in clean energy technologies. Some of the most heavily required minerals include lithium, graphite, cobalt, nickel. Several rare earth minerals will also experience heavily increasing demand, including tellurium, used for solar cell production and neodymium, used in producing wind turbines and electric vehicles.

Short-term supply shortages will likely emerge with some of these minerals as demand for them expands rapidly. But none of the likely shortages should be insurmountable. One solution will be to greatly expand the industry for recycling the needed metals and minerals. At present, average recycling rates for these resources are below 1 percent of total supply. By contrast, [recycling rates](#) for aluminum throughout the world are at around 75 percent. Increasing recycling rates by even relatively modest amounts will make a substantial contribution towards overcoming supply shortages.

Beyond these considerations are the equally critical issues relating to where, and under what conditions, these required minerals will be extracted. To begin with, the majority of deposits of the key minerals are located in the Global South. Thus, over 50 percent of all lithium deposits are located in the so-called “[lithium triangle](#)” of Chile, Argentina and Bolivia. Nearly 50 percent of all cobalt deposits are in the Democratic Republic of Congo, with another 12 percent in Indonesia and the Philippines. Indonesia, Brazil and the Philippines account for 44 percent of all nickel deposits, while South Africa and Brazil account for 61 percent of all manganese deposits.

The rapid expansion of mining in these regions creates conditions for both significant positive as well as negative impacts. The positive possibilities include the employment creation, infrastructure investments and export earnings that could result through the large-scale expansion of the respective regions’ mining operations. On the negative side, the major expansion of these mining operations

will almost certainly create harmful environmental impacts. For example, in the Chile/Argentina/Bolivia lithium triangle, approximately 500,000 gallons of water are needed to produce one ton of lithium through the particular “brine pumping and solar evaporation” extraction technique deployed there. This alters the natural hydrodynamics of the region and reduces the availability of water for local communities.

It will also always be an open question as to how large a share of the export revenues generated by these mining operations will accrue to the host country governments or local enterprises. This will depend on the terms established between the respective countries’ governments and local enterprises vis-a-vis the multinational corporations who obtain concessions to develop and operate the mines. Unless the local governments and enterprises succeed in gaining favorable terms, the profits from these mining operations will then mostly be repatriated back to the shareholders of the multinational firms, thereby replicating a pattern of [corporate imperialism](#) that has deep historical roots.

The issue of land use requirements is frequently cited to demonstrate that building a 100 percent renewable energy global economy is unrealistic. But these claims are not supported by evidence.

As one individual country case, the situation in Greece is useful in demonstrating how land use issues with respect to renewable energy development can be managed either poorly or well. In fact, land use for renewable energy projects has been controversial in Greece for several years. This is primarily because wind turbines have already been erected in environmentally sensitive areas such as mountaintops and pristine ecological sites. These installations are scarring the impacted land areas and contributing to biodiversity losses.

My coauthors and I have developed a series of scenarios through which Greece can supply 100 percent of its energy needs with renewables by 2050 while creating minimum impact on undeveloped or agricultural land areas. In one specific case, we show how the 100 percent renewable energy requirement by 2050 can be met while locating renewable installations on a total of 709 square kilometers (km<sup>2</sup>) of land, which amounts to only 0.5 percent of Greece’s total land area. Crucially, within this scenario, we show that renewable installations would need to be located on only about 0.2 percent of Greece’s roughly 88,000 km<sup>2</sup> of agricultural and undeveloped areas. We also exclude altogether the roughly

37.000 km<sup>2</sup> of forests and woodland shrub areas of land cover in Greece. The key to minimizing solar and wind installations on environmentally sensitive sites is to maximize installations on the full range of available artificial surfaces, including commercial, industrial and residential rooftops, along roadways and rail lines, at airports, sports and leisure facilities and at mineral extraction sites.

*How much of a role do subsidies play in hindering fossil fuel phaseout?*

One of the few postulates in economics that you can actually count on is: “If you pay people lots of money to do something, you will get more of that something than if you didn’t pay them.” This pretty much sums up the situation with fossil fuel subsidies all over the world today. Despite reams of official pledges and resolutions over many years from virtually every international and national governmental body, governments continue to pay out huge sums of money to underwrite the production and consumption of fossil fuels and thus, the ongoing destruction of a livable planet.

There are [different estimates](#) as to exactly how much governments are now spending on fossil fuel subsidies. In my view, the most relevant measure — combining figures from the International Energy Agency and Organization for Economic Cooperation and Development (OECD) — is [\\$1.4 trillion for 2022](#). This figure is roughly equal to the record amount of global clean energy investments in 2022 that I cited above. It is also roughly double the total fossil fuel subsidy figure of \$650 billion from 2019, just prior to the COVID lockdown of 2020.

Why are governments still paying out fossil fuel subsidies in the face of all the commitments they have made to eliminate them? The most benevolent explanation is that these subsidies have been critical for keeping low-income people afloat. This is true, most especially in poor countries but in high-income countries as well. However, governments would be able to provide much more generous levels of support to low-income people, at much lower costs, through other measures, including simple cash transfers or subsidized prices for food.

In fact, the overwhelming amount of support provided by fossil fuel subsidies is not received by poor people, but rather flows to high-income households and the fossil fuel companies. To take [the case of Indonesia](#), the share of total fossil fuel subsidies going to the richest 10 percent of households is approximately 10 times greater than the amount going to the poorest 10 percent. This results because

every Indonesian is able to buy fossil fuel energy at the same subsidized retail prices. The only difference is that, on average, rich households spend 10 times more on energy than poor households.

Still more lavish benefits go to the fossil fuel companies. If these subsidies were channeled instead into clean energy investments, as they should be, the fossil fuel companies would face steadily mounting competition from clean energy sources and their markets would dry up. Instead, thanks to ongoing subsidy support, fossil fuel companies continue to reap outsized profits.

*What do you think of the idea of a [Fossil Fuel Non-Proliferation Treaty](#) as a way of stopping the expansion of fossil fuel exploration?*

The Fossil Fuel Non-Proliferation proposal is being led by the Pacific Island nations of Vanuatu and Tuvalu that are being severely impacted by the rising sea levels resulting from global warming. The website for this initiative states: “It’s time to leave behind the pollution, economic and climate and security risks caused by coal, oil and gas. There is enough affordable, renewable energy capacity in every nation of the world to power people’s lives and communities.” I completely agree with this. Of course, we have to embrace all forms of mobilization to save our planet, including this important one.

*Hundreds of international, national and local organizations have endorsed the September 17, “March to End Fossil Fuels” in New York City, which is part of a mass global escalation to put an end to fossil fuel production. Similar demonstrations have already taken place in different parts of the globe, including London on April 24, 2023, where some 50,000 people gathered outside Parliament to demand that the U.K. government stop all fossil fuel explorations immediately. What should we make of concerns and claims that demands for climate regulations are driving voters straight into the arms of extreme populist parties and movements?*

The point here is that building a clean energy economy cannot just be seen by voters only in terms of “demands for climate regulations.” It is critical to understand the clean energy transition as a great source of new opportunities, along multiple dimensions. First, investments to build a clean energy economy have already become a major new source of job creation in all places that clean energy investments are being mounted. This expansion of job opportunities will

continue growing as the clean energy transition proceeds. As we have seen, clean renewable energy, combined with high efficiency, will also deliver energy at lower prices than the current costs of fossil fuel energy. Further, low-income economies will be able to build relatively small-scale, lower-cost, clean energy infrastructures in their rural regions. To date, working within the conventional massive fossil fuel infrastructure scale, governments in developing economies have failed to deliver electricity to roughly half of their rural populations. Finally, of course, there will also be major health benefits everywhere through eliminating both indoor and outdoor pollution generated by burning fossil fuels. These are all in addition to the fundamental goal of driving emissions to zero.

Still, there is also no question that workers and communities throughout the world whose livelihoods depend on people consuming oil, coal and natural gas will lose out in the clean energy transition. As such, just transition policies for these workers and communities have to be understood as central features of the overall clean energy transition project.

Along with several coworkers, I have developed [just transition programs for eight U.S. states](#), as well for the U.S. economy overall and for other countries, most recently [South Korea](#).

Focusing on transition policies for the fossil fuel industry dependent workers, I would argue that, as a first principle, the aim of such policies should be, simply, to truly protect them against major losses in their living standards. To accomplish this, the critical components of a just transition policy should include three types of guarantees for the workers: 1) a guaranteed new job; 2) a guaranteed level of pay with their new job that is at least comparable to their previous fossil fuel industry job and 3) a guarantee that their pensions will remain intact regardless of whether their employers' business operations are phased out.

The imperative of generous just transition policies was recently described by Norman Rodgers. Rodgers has been an oil refinery worker in Los Angeles for 24 years and is a leader of the United Steelworkers Local 675 that represents the region's oil refinery workers. Rogers [writes](#) as follows:

'Many speak of a 'just transition,' but we've never seen one. No worker or community member will ever believe that an equitable transition is possible until we see details fully funded state safety net and job creation programs.... With a fully funded equitable transition plan — meeting the immediate need for a safety

net for workers and communities and offering a bold vision to restructure our economy — we can ... move California workers, communities and the planet toward a more secure future.’

Following from Norman Rodgers, I hope that Sunday’s “March to End Fossil Fuels” will highlight and celebrate the massive opportunities — including the immediate tangible opportunities, like jobs, greater access to affordable electricity, and healthy environment — that will result through creating our clean energy future. Of course, these are all in addition to saving the planet by driving C2O emissions to zero. Equally, I hope we marchers will loudly insist on just transition policies for all workers and communities whose livelihoods now depend on the fossil fuel industry.

*Copyright © Truthout. May not be reprinted without [permission](#).*

—

*C.J. Polychroniou* is a political scientist/political economist, author, and journalist who has taught and worked in numerous universities and research centers in Europe and the United States. Currently, his main research interests are in U.S. politics and the political economy of the United States, European economic integration, globalization, climate change and environmental economics, and the deconstruction of neoliberalism’s politico-economic project. He is a regular contributor to *Truthout* as well as a member of *Truthout*’s Public Intellectual Project. He has published scores of books and over 1,000 articles which have appeared in a variety of journals, magazines, newspapers and popular news websites. Many of his publications have been translated into a multitude of different languages, including Arabic, Chinese, Croatian, Dutch, French, German, Greek, Italian, Japanese, Portuguese, Russian, Spanish and Turkish. His latest books are *Optimism Over Despair: Noam Chomsky On Capitalism, Empire, and Social Change* (2017); *Climate Crisis and the Global Green New Deal: The Political Economy of Saving the Planet* (with Noam Chomsky and Robert Pollin as primary authors, 2020); *The Precipice: Neoliberalism, the Pandemic, and the Urgent Need for Radical Change* (an anthology of interviews with Noam Chomsky, 2021); and *Economics and the Left: Interviews with Progressive Economists* (2021).



---

# Colombia, From The Guerrilla To The Ballot Box

*A conversation with Pastor Alape, former guerrilla mayoral candidate for the Comunes Party.*

On May 4, 2023, during the International Summit on Nonviolence held in Antioquia, Colombia, a [handshake](#) shocked those who were present. The handshake was between two men with vastly different histories. One of the men was Daniel Gaviria, whose father—Guillermo Gaviria, former governor of Antioquia—was killed in 2003 when he was a hostage of the Revolutionary Armed Forces of Colombia-People's Army (FARC-EP). The other man was Pastor Alape, former commander of the FARC-EP. Gaviria said that the handshake took place because Pastor Alape was "taking steps toward nonviolence." "That gives me confidence and leads me to extend forgiveness to him," said Gaviria.

Pastor Alape commanded one of the FARC-EP's regions and was part of its highest body, the Estado Mayor Central. FARC-EP, founded in 1964, signed a peace agreement with the Colombian state in 2016. It was then [transformed](#) into the Comunes Party, comprising former guerrillas and members from various social movements. This party, which has contested elections, focuses its attention on the need to implement the peace agreement and advance the cause of social justice in Colombia. One of the lingering problems in the country is the full incorporation of former guerrilla fighters into the country's social and political life.

Not long after the handshake, we spoke to Pastor Alape about the process of reintegration. He told us that as part of this process, he has decided to be the first former member of the national leadership of the FARC-EP to run for regional elections. Pastor Alape is [running](#) to be the mayor of Puerto Berrío in Antioquia, where he grew up. In his new civilian life, the former combatant decided to combine the name given to him by his parents (Félix Antonio Muñoz Lascarro)



with the name given to him by the guerrilla struggle (Pastor Alape) and be called Pastor Lisandro Alape Lascarro. Earlier in July, he [said](#) that he joined the FARC-EP to “change the country with a lead” and now through Comunes he wants to “change it with the votes.”

### *Resistance of a Legal Kind*

In 1974, Pastor Alape—at the age of 15—joined the Communist Youth. That year, a pact that was formed in 1958 between the Liberal and the Conservative parties to govern together as a National Front ended. It was this political turmoil that led to the armed struggle of the FARC-EP and other groups in the 1960s. But, in 1974, the Colombian Communist Party (PCC)—which had been underground—became politically active again. His work in the Communist Youth from that time, Pastor Alape told us, allowed for his “political formation through legal resistance.” This time was short-lived, and when the violence restarted, Pastor Alape joined the FARC-EP.

After 53 years of armed resistance, the warring parties [signed](#) a historic peace agreement in Havana in 2016 and Comunes entered the electoral domain. As part of the peace agreement, to incorporate Comunes into legal politics, the party is represented in Congress by 10 members. But it has thus far not been able to win many seats in the different local and regional bodies. In the October 29 regional elections, Comunes will contest 145 seats, including for the mayor’s office in Puerto Berrío, which Pastor Alape is running for.

### *A Community That Survives*

“I have not been very fond of electoral politics,” Alape told us. “But when I arrived in the town of Puerto Berrío and met with old and new friends and family, these interactions gave me the impetus to try and use the political system to initiate state action on behalf of marginalized communities.”

Puerto Berrío or El Pueblo, as Pastor Alape calls it, is a small municipality of around 51,000 people in the province of Antioquia, which is located on the banks of the Magdalena River. On December 17, 1979, Pastor Alape left his home on a small boat on this very river to go to Matarredonda in Chaparral (Tolima) to join the FARC-EP. Now, he walks along the riverbanks and campaigns to become its mayor.

Pastor Alape told us that his campaign is “a very demanding exercise in

listening.” One of the main aspects of his campaign is to involve the people of the town in the “construction of public policies.” During the meetings with the community, he concentrates on gathering people’s thoughts and ideas about how to improve things in the town. “These communities,” he told us, “have had the power to survive the most adverse conditions.” Due to this, they already know how to “govern their homes, their communities, their villages.” But they have faced barriers from the state, which rather “than guaranteeing rights has a policy of violating rights.”

### *The Guerrilla’s Campaign*

As a new party and as a party of the left, Comunes does not possess the resources of established parties of the wealthy. That is why Alape’s campaign is managed by a very small team. To compensate for this, Pastor Alape said that he is drawing upon his experience as a guerrilla fighter. He is also utilizing the experiences of various local governments and building knowledge from their experiments and their failures.

The point of his campaign is to “broaden democracy,” which is a phrase that could mean a variety of things but with Alape it means something specific. His campaign aims to, “design the lines of action based on community commitment.” If the community will not commit itself to making certain changes, then Alape is not going to go ahead with them. The community must, he said, “feel part of the government,” and change must happen with community involvement. If the community is not committed, then the policy will fail, which is why Alape said that he will not “promise what cannot be fulfilled.” If the community is not committed to a certain agenda, then that agenda will have to be set aside for now. “We might have to postpone the aspirations we have,” he said.

“We do not have economic resources,” Pastor Alape told us. “But we have people.” And if “everyone contributes, we will magnify our work.” If policies that are possible are backed by the community, and if these are realized, then more people will begin to imagine deeper policies and more enduring solutions. This momentum will increase “the expectation of change.” This method of doing politics, Pastor Alape said, comes from his experience during the guerrilla struggle.

Countries like Colombia as well as Nepal have shown not only that peace agreements can hold after decades of conflict but also that the guerrilla fighters

can bring their experiences in the armed struggle and use them in civilian life. If it works in Colombia, as it seems to be [working](#) in Nepal, it should be able to work in other long-term conflict zones too.

*Byline:*

Taroa Zúñiga Silva and Laura Devia López

*Author Bio:*

This article was produced by [Globetrotter](#).

*Taroa Zúñiga Silva* is a writing fellow and the Spanish media coordinator for Globetrotter. She is the co-editor with Giordana García Sojo of [Venezuela, Vórtice de la Guerra del Siglo XXI](#) (2020). She is a member of the coordinating committee of [Argos: International Observatory on Migration and Human Rights](#) and is a member of the [Mecha Cooperativa](#), a project of the [Ejército Comunicacional de Liberación](#).

*Laura Devia López* is a Colombian historian and teacher. She lived in exile in Cuba until the signing of the Colombian peace accord in 2016. She works in Colombia as an activist for peace and feminism.

*Source:* Globetrotter

---

# Ancient Roots: A Promising New Project To Organize Humanity's Universal Heritage



*Eric Laursen*

*An international group of researchers and data scientists are creating a comprehensive database of the world's archaeological knowledge—and changing our understanding of humans' prehistoric heritage.*

Archaeology isn't what it was in Indiana Jones's heyday. The traditional image of the khaki-clad researcher scrambling over an excavation site with rock hammer and camel-hair brush has been supplemented by aerial and satellite photography, CT scanners and 3D modeling, and lidar that can isolate the smallest details of long-buried settlements. What archaeologists do with the artifacts and data they gather is changing dramatically as well, as they use network science and new software tools to map the complex connections between regional economic networks in the millennia before written history.

With this new, technology-driven approach, researchers can form a far more comprehensive picture of early communities' ties with other human clusters sometimes thousands of miles away, by examining the goods and raw materials they exchanged and tracing these from their points of origin to the far-flung places where they were abandoned and then rediscovered centuries later. This is yielding additional insights into social inequality and power relations within communities, differences and similarities between communities living next to each other, and patterns of migration and settlement.

"You get more of a sense of a dynamic," says Tim Kerig, an archaeologist at Kiel University's ROOTS Cluster of Excellence in Social, Environmental, and Cultural Connectivity in Past Societies, in Germany, "of people coming from other places and how, over the generations, they filled that landscape. So we're looking at the *whole* system, over not centuries but millennia."

Network science is the study of complex relationships—and probable relationships—between physical, biological, social, and cognitive phenomena.

Applying network science to archaeology was an idea in the minds of researchers as far back as the 1960s, says Kerig, whose own work focuses on the European Neolithic period—from about 8000 BC to 2000 BC—and the evolution of social inequalities. But while interest grew in succeeding decades, archaeologists lacked the tools to easily collate and analyze the millions of data points that had been gathered over many decades. The few efforts to do so proceeded punishingly slowly, on top of which, there was less interest at the time in exploring the connections that material and economic exchanges between far-flung communities could reveal.

“Sociological questions were mostly answered by looking at goods that were found in graves—the ‘sphere of kings’—which tended to be highly valued luxury items,” Kerig says, while archaeologists were less interested in “the daily stuff”: fragments of flint or stone objects or implements that made up the fabric of most people’s everyday lives. This was partly due to an overabundance of these humbler items. “Don’t forget that at a Stone Age site in Denmark, for example, you might have 100,000 artifacts to deal with, and they all look to most of us exactly the same.”

“Big Exchange” is the name of a project that an international cluster of scholars and data scientists, including Kerig, launched in 2020 with the aim of using digital tools to break down the barriers to applying network science to archaeology. The most critical hurdle they faced was overspecialization. Traditionally, archaeologists have focused on specific objects or raw materials—amber, obsidian, jade, flint, other metals—rather than the totality of findings at a given site, which prevented them from seeing the totality of that community’s networks of exchange. Big Exchange’s first objective is to create a database that collates all these materials and makes them available for more sophisticated, cross-referenced study and analysis.

“The approach of our project is to include all recordable raw materials, their find locations and places of origin in the analysis for the period from the end of the Middle Stone Age [or Mesolithic, 10,000 years ago,] to Antiquity,” Johanna Hilpert, a Big Exchange postdoc researcher at the ROOTS Cluster, [told](#) Phys.org in July 2023. “This can only be done by means of network analysis and with AI [artificial intelligence].”

*A Deeper, More Granular Understanding*

As of July 2023, Big Exchange has already collated data from [6,000 sites](#) from which millions of artifacts have been recovered, and expects to complete the task in another two and a half years. The objective is to collect and digitize as much information as possible and establish classifications for all of it—for example, by site location, time period, and how far a material was found from its place of origin.

Establishing the database itself has not proven to be an easy task. Some of the source data for Big Exchange had already been digitized in some form; some of it is being digitized for the first time. It quickly became clear that the way researchers analyze these findings has changed over the past hundred years, “and so you can imagine all kinds of technical problems,” Kerig says.

Big Exchange used PostgreSQL, a common relational database management system. Working bottom-up, they started by inputting the individual datasets, developing the formal structure of the database, including comparisons of attributes and concepts, as they went along. Once all existing data is integrated, the database can be used by researchers working to reconstruct long-vanished economic and social networks.

But the project is already producing results. One study, published this year in the journal [Antiquity](#), analyzed the geographic expansion of one of the most studied Neolithic cultures, the Linear Pottery culture (LPC) that extended from roughly the present-day Netherlands to the Black Sea and flourished from about 5500 BC to 4500 BC.

Applying a heterogeneous information network (HIN) analysis—a sophisticated graphic model that can map the relationships between diverse but interconnected sets of data—to raw materials in circulation at the time, researchers were able to detect differences in material culture between the northwest subgroup of the LPC and other subgroups that surrounded it. For example, sites associated with the northwest group contained no shells of *Spondylus*, a bivalve mollusk, that were a prestige good in Neolithic burial sites farther east in the Carpathian Mountains.

Previously, researchers assumed this was because of poor conditions for preservation in the area that the northwest group occupied. But HIN mapping revealed that the region lacking *Spondylus* shells was much wider than the area where preservation was difficult, and that it contained a good supply of flint that

had originated much farther west. This suggested that the blend of raw materials used by the northwestern group wasn't dictated by local availability, but by cultural or economic choice, linking the group to exchange networks that other LPC subgroups didn't participate in, in spite of the fact that those other subgroups were close neighbors.

The HIN analysis allowed the Big Exchange researchers to develop a deeper, more granular understanding of the LPC—a culture that archaeologists thought they had already acquired a detailed knowledge of—that teases out previously undetected cultural and economic differences between subgroups.

Combining Big Exchange's practice of looking at all the objects found at a particular excavation site with its focus on networks of exchange, the project is also producing new insights into inequality and power relations within groups. "The meaning of these objects changes depending on the regional and chronological context," says Kerig. For instance, a fragile item found in a protective leather wrapping, with no evident practical use, will tend to come from a greater distance than more common items, indicating that a distant origin and the difficulty of obtaining it conferred a prestige value on the object. A large finding of such objects would indicate that an elite was emerging in the community connected with that site.

### *Clearing Away Cultural Bias*

Already, however, the researchers are confronting limitations in the data they are collecting: limitations that point to larger issues. The vast majority of known archaeological sites outside the Americas are in Europe and, to a lesser extent, the Near East—a comparatively small area—with far fewer elsewhere, Kerig notes. Exchange networks in the Neolithic era certainly stretched far beyond these two regions. The more connections revealed by projects like Big Exchange, the more urgent will be the need to expand excavation and recovery into other parts of Eurasia; one goal of Big Exchange is to offer guidance as to where the most promising sites might be located.

Cultural bias is another issue. "We are not only collating datasets; we are also collating the authors of the datasets," Kerig says. For some sites that he and his colleagues wanted to include, no actual data is available; perhaps research began in those areas but then was interrupted, or else documentation was lost during wartime, and all that remains are published or unpublished writings, often with

less quantitative content and heavily informed by the preconceptions of the time. While evidence can be teased out of these sources, it has to be handled with care.

“These more qualitative things are very, very important—perhaps worth more than the actual datasets,” says Kerig. “But we meet regularly to discuss these things, and it’s new for all of us. I would expect that we will get a bloody nose if we don’t.” This is where technologies like artificial intelligence could become more useful in the future, by helping researchers to tease out valid observations from the mass of culturally biased material.

Big Exchange’s most pressing challenge, however, is keeping the project going. The painstaking work of inputting and mapping data into the project’s evolving database is currently being carried out by students at the Kiel ROOTS Cluster. “It’s a very labor-intensive thing,” says Kerig. He is now looking for a long-term home for Big Exchange that can host its growing data-analytic treasure trove and make it available to archaeologists and other investigators in coming decades.

But he remains hopeful about Big Exchange’s future. “I am pretty sure that something is coming in in this direction,” he says.

*Byline:*

Eric Laursen

*Author Bio:*

Eric Laursen is an independent journalist, historian, and activist. He is the author of [The People’s Pension](#), [The Duty to Stand Aside](#), and [The Operating System](#). His work has appeared in a wide variety of publications, including In These Times, the Nation, and the Arkansas Review. He lives in Buckland, Massachusetts.

*Source:*

Independent Media Institute

*Credit Line:*

This article was produced by [Human Bridges](#), a project of the Independent Media Institute.