



Just Energy Transition and Workforce Development

Critical Challenges for the Fledgling
U.S. Offshore Wind Energy Industry

MOCEAN Kickoff Meeting

January 4, 2023

Tufts University

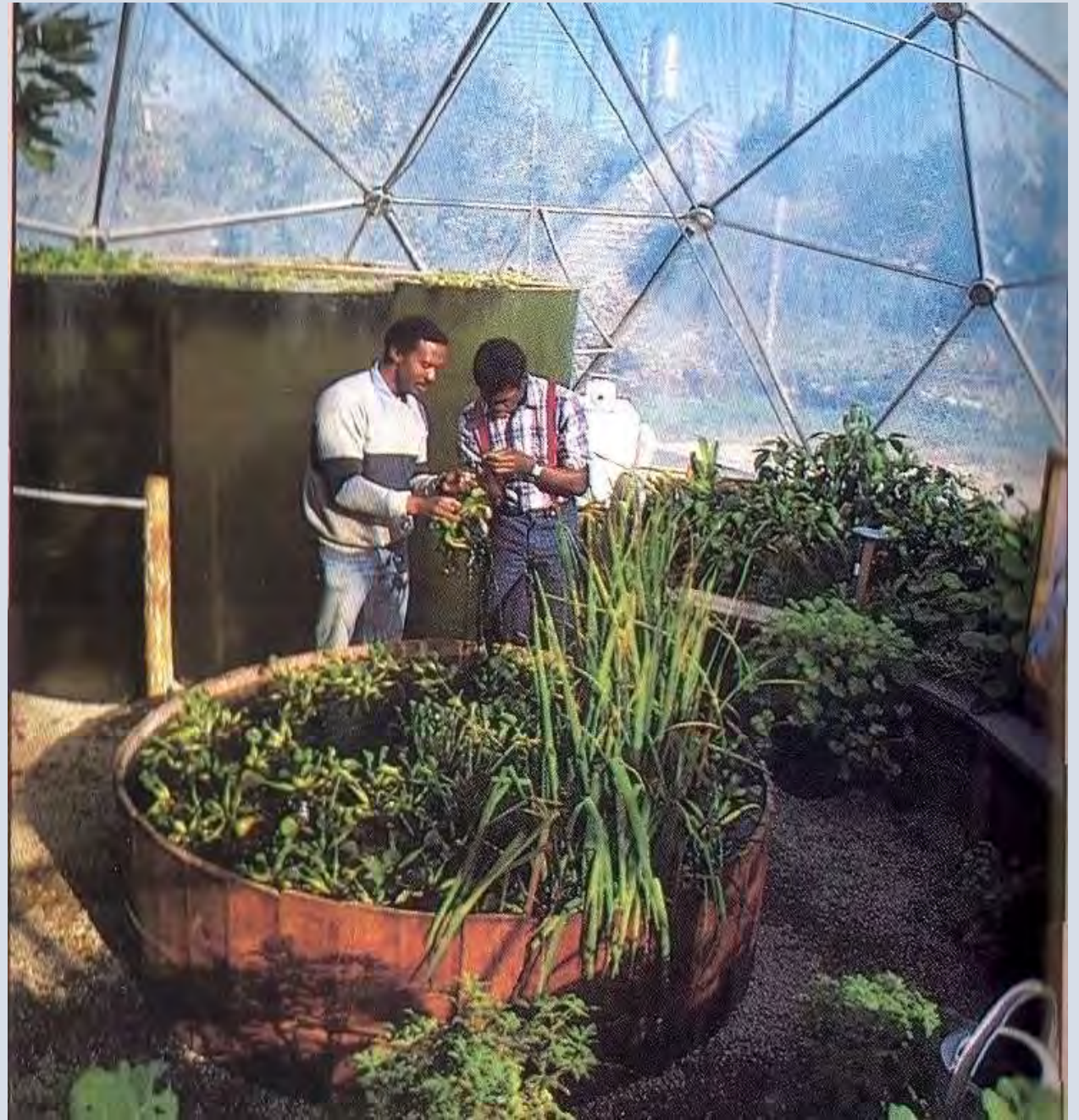
Greg Watson

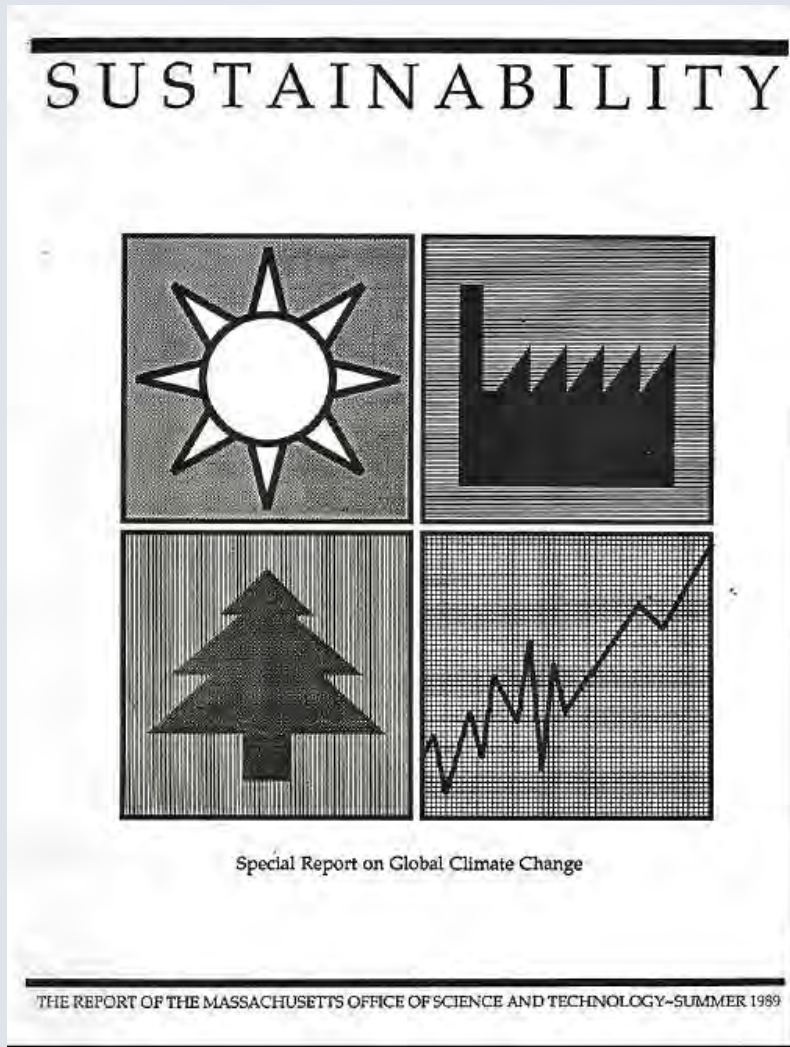
World Game Workshop

World Grid Project

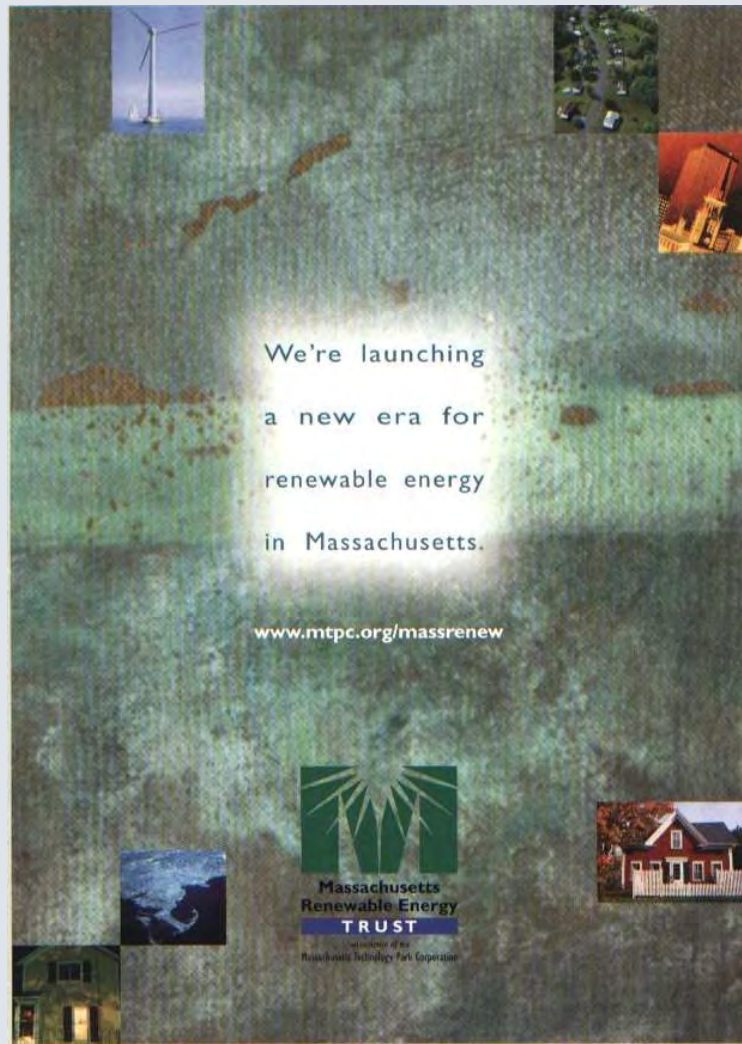




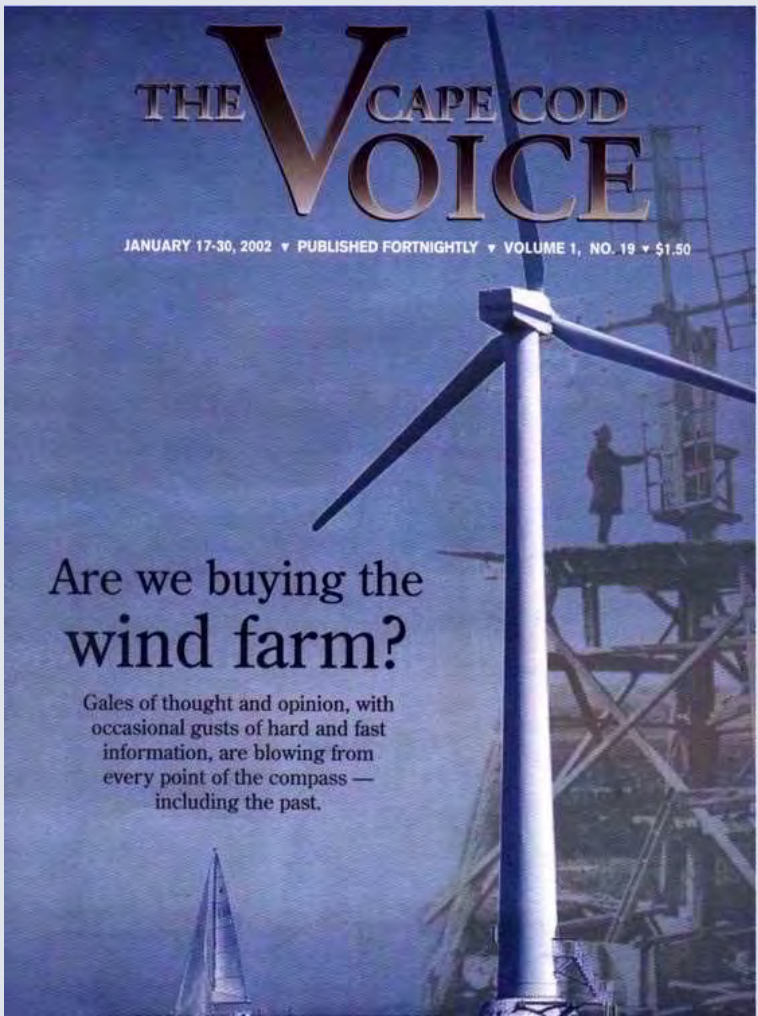




1989



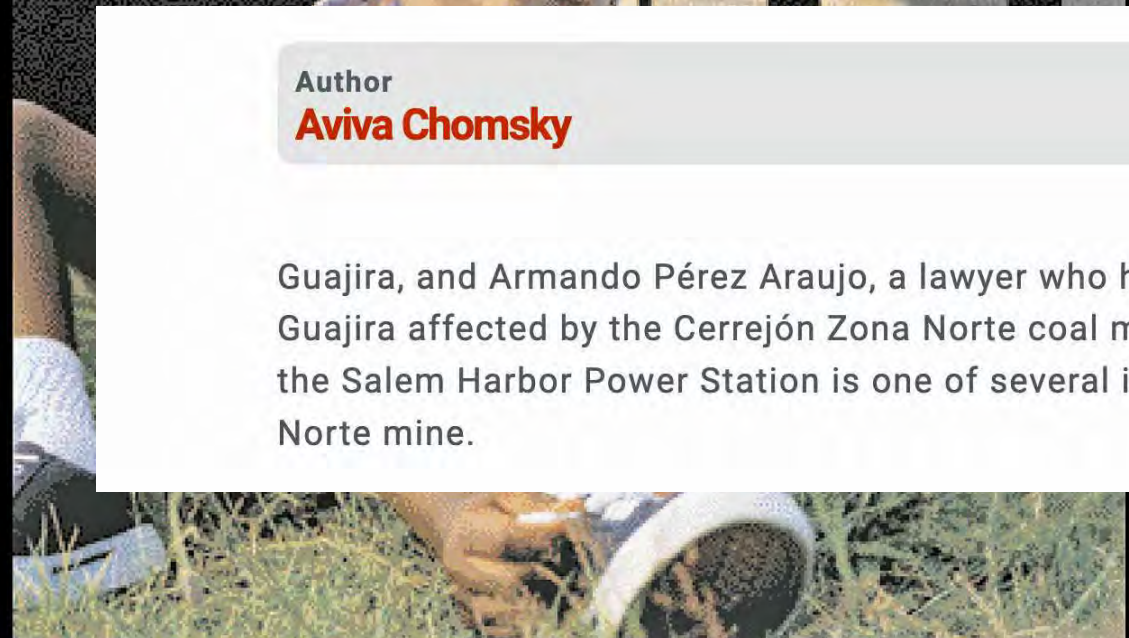
2000



2002

Air of Injustice

October 2002



26-4 Indigenous Responses to Plan
Colombia

May 5, 2010

The Massachusetts Connection: Colombian Indigenous Residents Bring Coal Mine Concerns to U.S.

Author

Aviva Chomsky

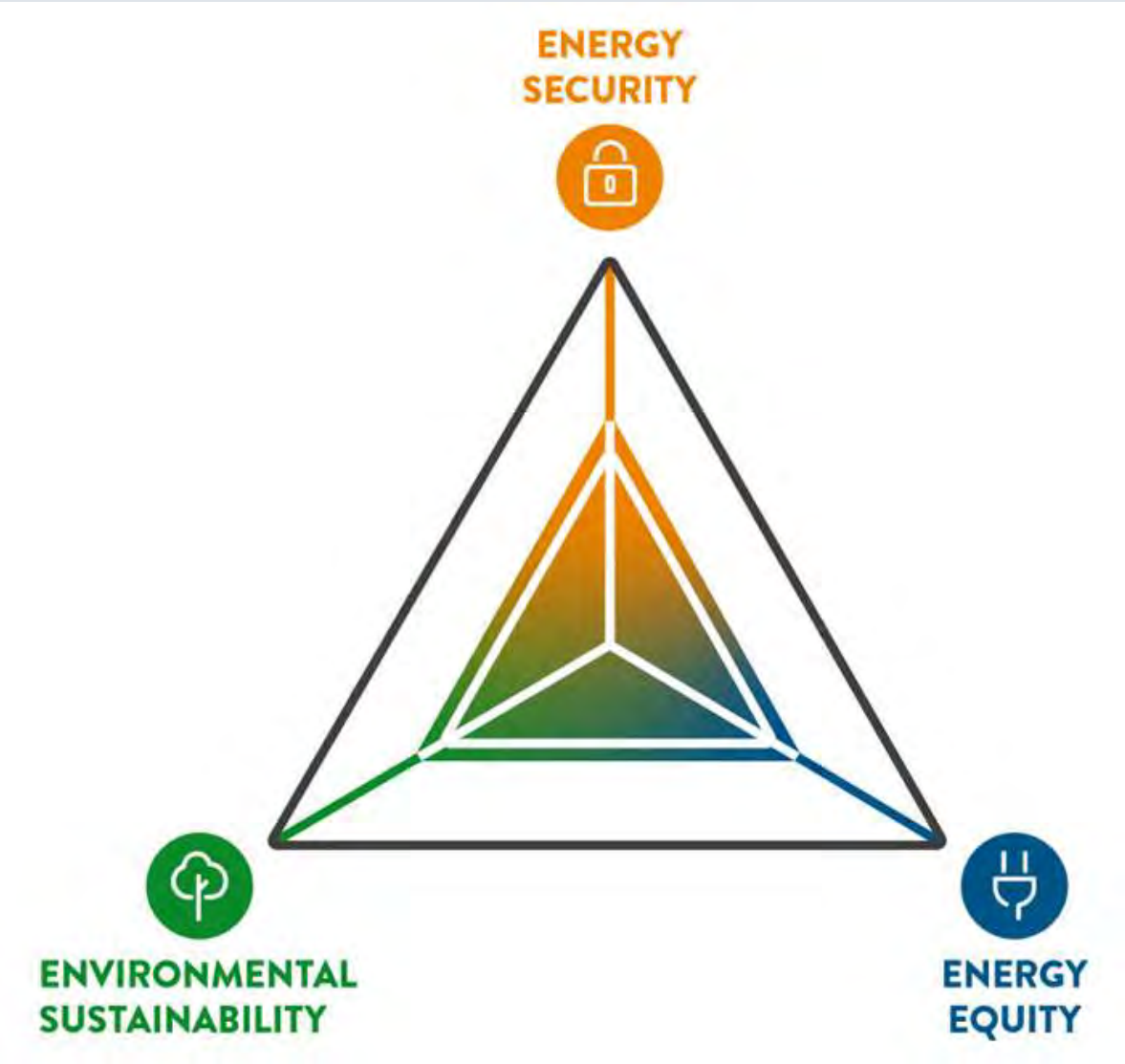
Guajira, and Armando Pérez Araujo, a lawyer who has worked for the past decade defending communities in the Guajira affected by the Cerrejón Zona Norte coal mine. This visit was particularly poignant for both sides, because the Salem Harbor Power Station is one of several in the United States that purchase coal from the Cerrejón Zona Norte mine.

In May the North Shore Colombia Solidarity Committee (NSCSC) in Salem, Massachusetts, hosted Remedios Fajardo, an indigenous Wayúu who in 1982 founded the indigenous rights organization Yanama in the Colombian

ENERGY TRANSITION



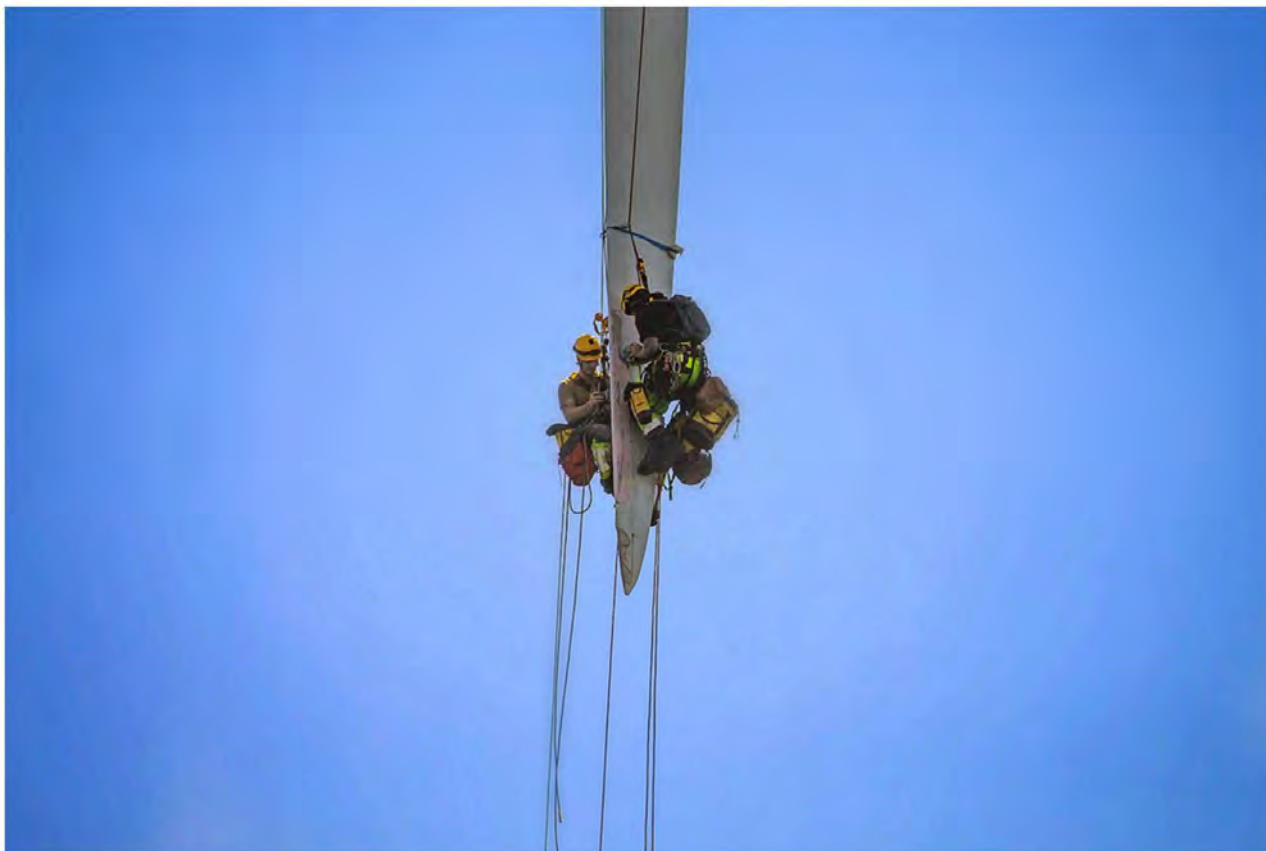
Energy Trilemma





Offshore wind is America's new industry. Who will build it?

By Benjamin Storrow, Miriam Wasser | 10/13/2021 06:25 AM EDT



Nearly 2,000 Mass. residents have worked on Vineyard Wind project so far, new report shows

By Jon Chesto Globe Staff, Updated December 14, 2023, 3:36 p.m.



GE Haliade-X Turbines stand in the Vineyard Wind 1 Project Area south of Martha's Vineyard.

Nearly 2,000 Massachusetts residents have worked on the massive \$4 billion Vineyard Wind offshore project so far, according to a new report out Thursday from UMass Dartmouth and Springline Research Group.

Union Wage Premium

Much of the construction work is being performed by union labor under a Project Labor Agreement (PLA). A PLA specifies the wages, overtime wages, and fringe benefits to be paid on a project and is usually higher than the prevailing wage required on public projects. The University of California Berkeley's Center for Labor Research and Education recently found that nationally, in 2015, union construction workers were

The union wage premium is particularly significant for people of color and women.¹⁷ For example:

- Wages for black union workers are 14.7% higher than those of their nonunion counterparts, while white union workers make 9.6% higher hourly wages than their nonunion peers.¹⁸
- Black union workers are 17.4 percentage points more likely than nonunion workers to have employer-provided health insurance and 18.3 percentage points more likely to have an employer-sponsored retirement plan.¹⁹
- Women represented by labor unions earn an average of 30.9% more per week than women in nonunion jobs (among full-time workers aged 16 and older).²⁰
- Hispanic women represented by labor unions have median weekly earnings that are 42.1 percent higher than those without union representation.²¹

Employing union labor under PLAs not only provides a living wage for construction and trades workers employed on the project, but it also boosts the regional economic impact of a project through higher induced impacts as a result of the higher disposable income of union members working on the project.

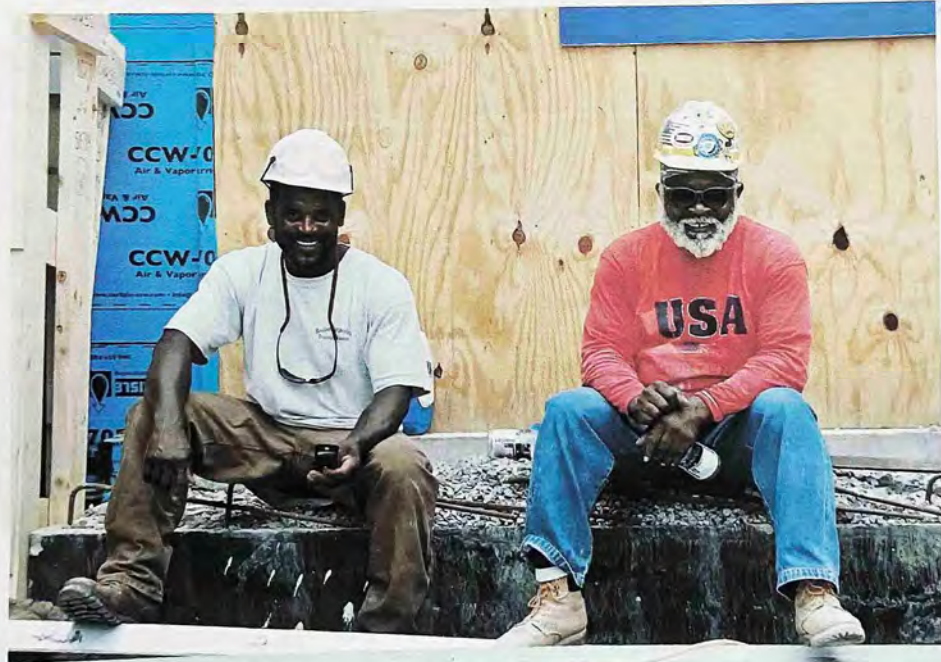
A HISTORY OF BLACK ACTIVISM IN BOSTON'S CONSTRUCTION INDUSTRY

TRAVIS WATSON OCTOBER 2023



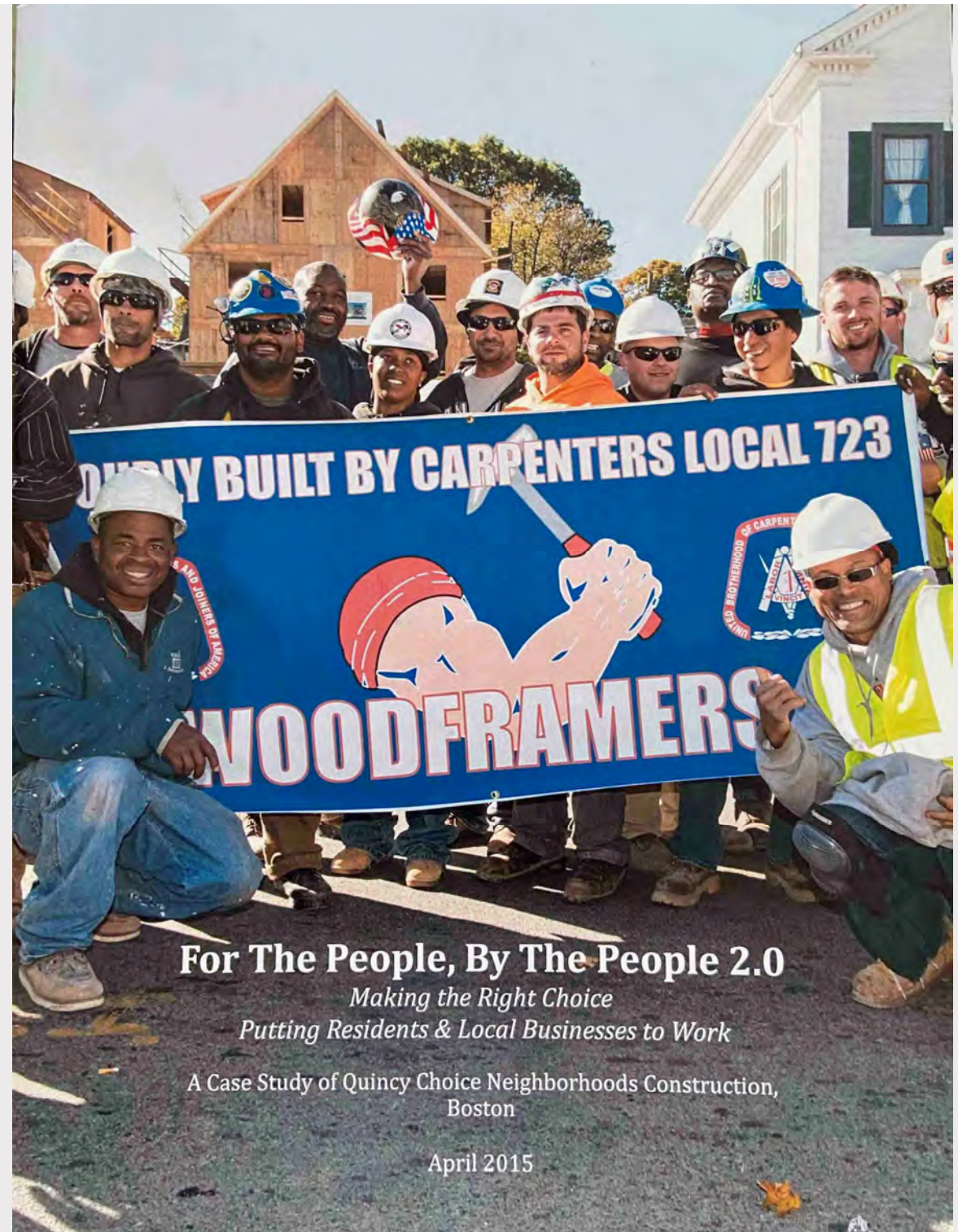
MEMBERS OF THE UNITED
COMMUNITY CONSTRUCTION WORKERS

FOR THE PEOPLE, BY THE PEOPLE



best practices for maximizing resident, minority and female participation on construction projects

as learned through the construction of
The Salvation Army Ray and Joan Kroc Corps Community Center, Boston



For The People, By The People 2.0

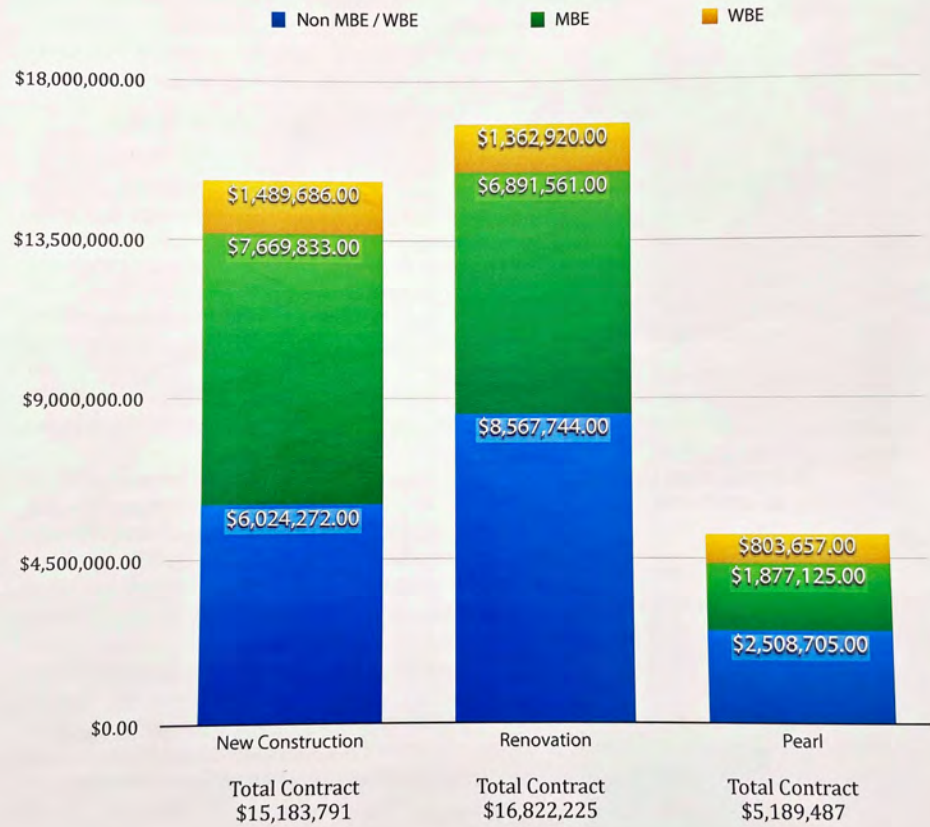
*Making the Right Choice
Putting Residents & Local Businesses to Work*

A Case Study of Quincy Choice Neighborhoods Construction,
Boston

April 2015

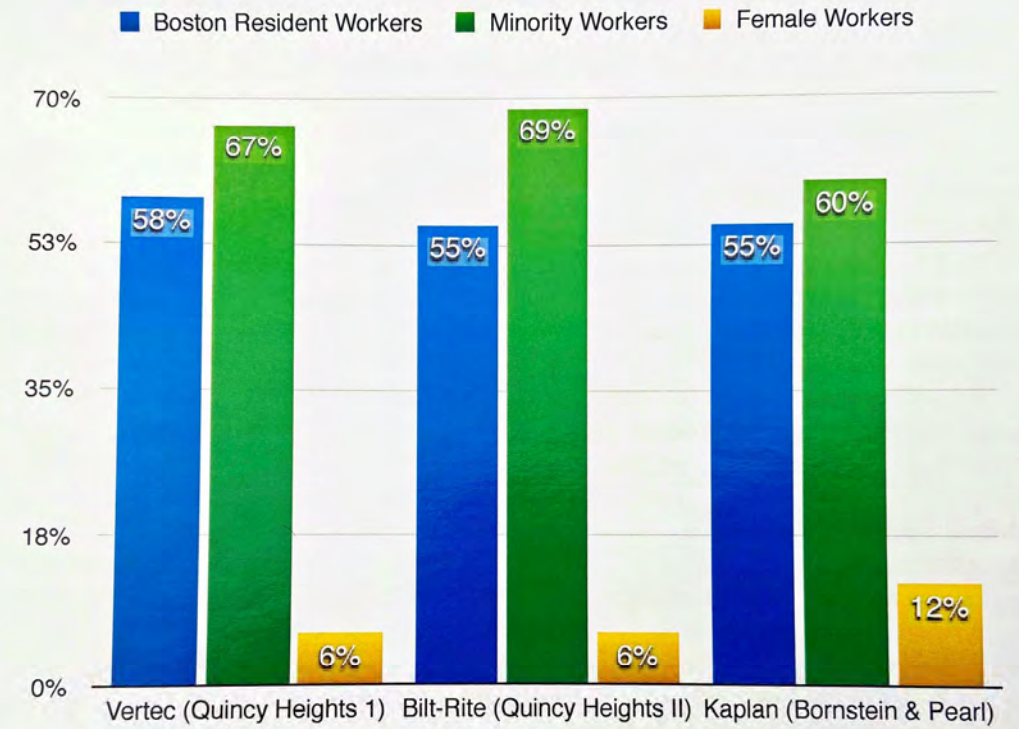
MBE and WBE Economic Impact

Minority and women-owned business economic impact on Choice Neighborhoods Projects



Workforce Requirements

51% Boston residents, 51% Minority workers & 15% Female workers

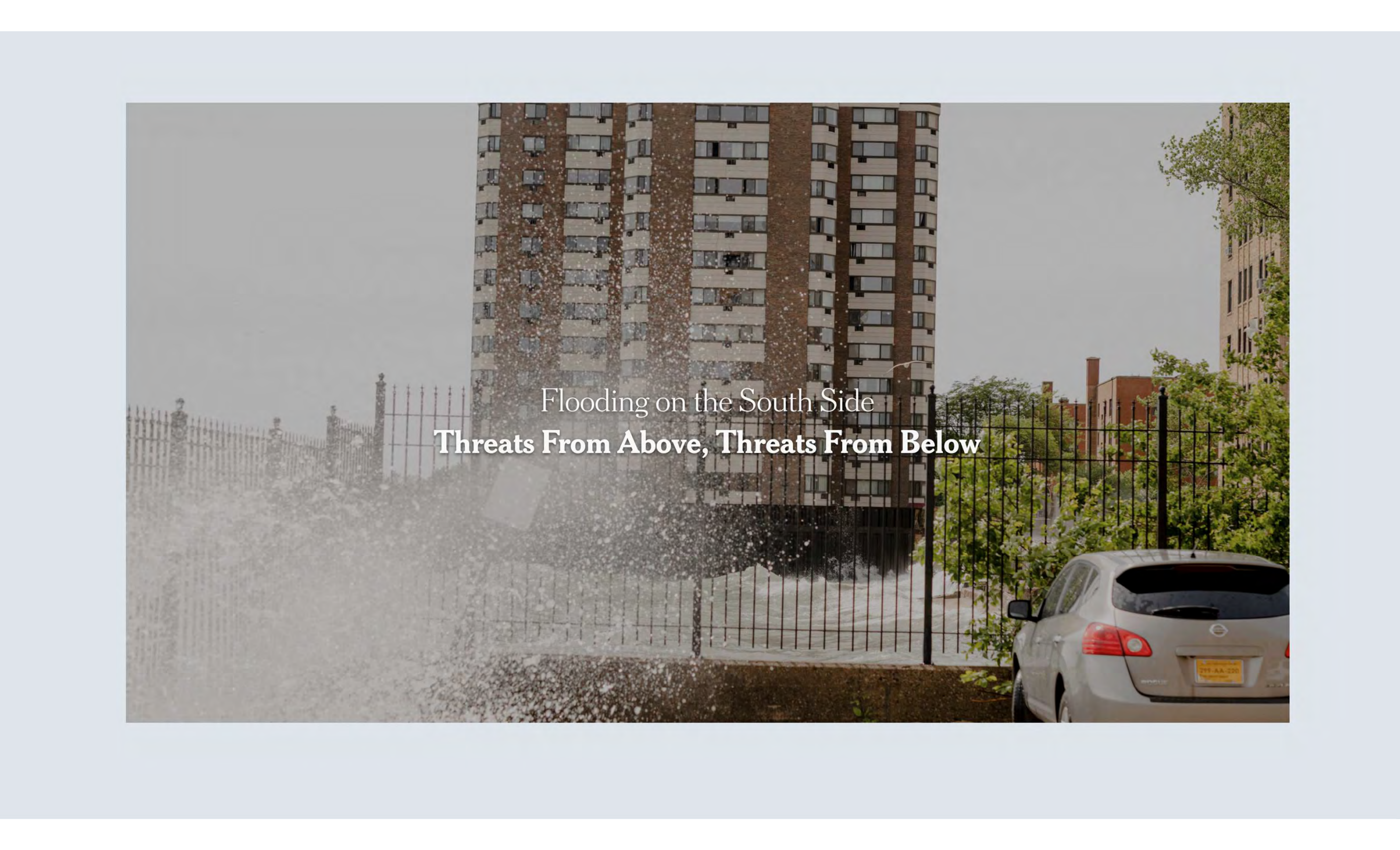


An aerial photograph of Chicago, showing the dense city grid and the coastline of Lake Michigan. The city is in shades of grey and brown, while the lake is a deep blue. The text is overlaid on the right side of the image.

The climate crisis haunts Chicago's future. **A Battle Between a Great City and a Great Lake**

By DAN EGAN
JULY 7, 2021

Photographs By
LYNDON FRENCH



Flooding on the South Side
Threats From Above, Threats From Below



RUST BELT TO
GREEN BELT

OFFSHORE WIND

**Bring offshore
wind to Illinois &
create jobs in
Black & Brown
communities**

Sign the petition today



New alliance aims to turn this Rust Belt city into a ‘Green Belt’ hub

The public-private alliance wants \$1 billion in federal funding for a “Rust Belt to Green Belt Initiative,” indicating the region is ready to move past its nickname from the 1970s.

Published Oct. 10, 2023



FRIENDS OF WIND SERIES: BUILDING AN INCLUSIVE OFFSHORE WIND INDUSTRY IN ILLINOIS

How Offshore Wind Can Deliver Community Benefits and Help Close the Racial Wealth Gap

A “Rust Belt to Green Belt” bill on Illinois Offshore Wind is now being promoted and could be passed into law this year.

Who should get the jobs, incentives, and other publicly-funded benefits? Join our discussion series with community and other stakeholders to learn more!

Experts will include: Senator Robert Peters, Representative Marcus Evans, Greg and Travis Watson, Blacks in Green, Climate Jobs Illinois, Illinois Sierra Club, and Diamond Offshore Wind

THURSDAY, NOVEMBER 3, 2022 | 6:00PM - 7:30PM
BLACKS IN GREEN LIVING ROOM, 6431 S COTTAGE GROVE
RSVP: [BIT.LY/WINDSERIESNOV3](https://bit.ly/windseriesnov3)





A Brooklyn neighborhood's long fight for green jobs is paying off

In New York City's Sunset Park, Equinor's plan for a wind turbine hub is part of the community's larger vision to clean up and revive the waterfront.

13 October 2022



Climate activists march in Sunset Park, Brooklyn. (Erik McGregor/LightRocket/Getty Images)

November 2023

Equinor has recognized a \$300m impairment on its US offshore wind projects.

According to the group's third quarter report, the three projects, 1230MW Beacon Wind, 816MW Empire Wind 1 and 1260MW Empire Wind 2, which are being developed alongside bp on the US Northeast Coast, were negatively impacted by cost inflation and supply chain constraints.

UPROSE, a grassroots organization that serves the neighborhood, and other local groups have pushed for years to revitalize the dormant waterfront. Not by building luxury apartments and retail shops, which they say would hasten gentrification, and not by adding dirty factories that further pollute the air — but by developing clean-energy industries in their own backyard.

Albany residents offered training for offshore wind jobs



November 2023

New York's First Offshore Wind Project Marks Historic Milestone in Offshore Construction
130-Megawatt Project Will Generate Enough Renewable Energy to Power Approximately 70,000 Long Island Homes

The developers of a wind farm 30 miles off the shore of Long Island are providing \$300,000 to train residents of Albany's South End neighborhood to help build it.

Real Estate Local News

NYC Plans a New Wind Farm in Staten Island

By Tyler Williams Updated August 9, 2022



Staten Island wind turbine facility gets big boost: \$48M in federal funding

Updated: Oct. 26, 2022, 9:16 p.m. | Published: Oct. 26, 2022, 6:20 p.m.



An artist's rendering depicts the proposed Arthur Kill Terminal in Richmond Valley. (Courtesy Atlantic Offshore Terminal)

November 2023

STATEN ISLAND, N.Y. — One of Staten Island's most sought-after offshore wind projects missed another round of state funding announcements, but its developers said this week that they're confident it will get done.

The project's construction phase will directly create 600 jobs and produce an estimated \$276 million, before ongoing operations directly employ around 150 people annually, help create hundreds of more jobs and generate more than \$100 million.

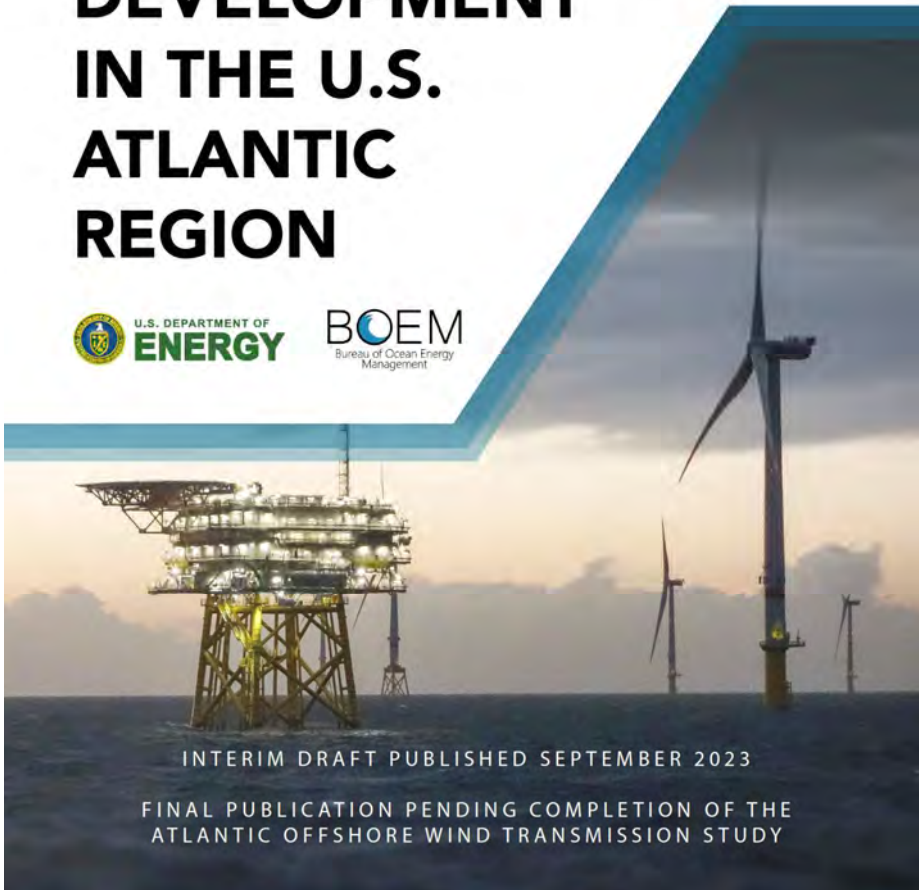
A photograph of a woman in a white hard hat and an orange safety vest smiling at the camera. In the background, there are other workers in hard hats and a large white wind turbine against a clear blue sky.

University of
Massachusetts
Amherst

**OFFSHORE WIND
PROFESSIONAL CERTIFICATE**

AN ACTION PLAN FOR

OFFSHORE WIND TRANSMISSION DEVELOPMENT IN THE U.S. ATLANTIC REGION



INTERIM DRAFT PUBLISHED SEPTEMBER 2023

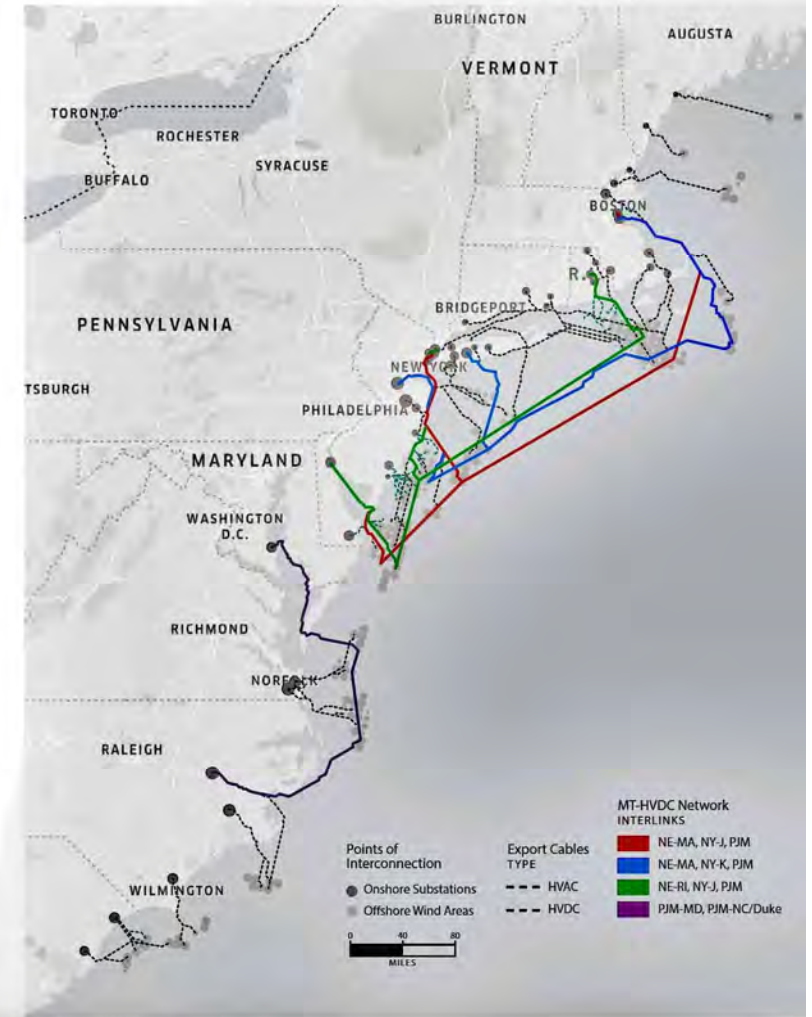
FINAL PUBLICATION PENDING COMPLETION OF THE ATLANTIC OFFSHORE WIND TRANSMISSION STUDY

THE OFFSHORE TOPOLOGY PROPOSAL

The AOSWTS final report is scheduled to be published at the end of 2023; however, preliminary analysis from the ongoing study found that connecting large volumes of offshore wind along the Atlantic coast over the next several decades will provide a unique opportunity to use interregional transmission links to reduce electricity production costs and bolster reliability and resilience onshore. The AOSWTS has also incorporated environmental, ocean co-use, and other siting considerations by implementing a path routing methodology.

Although radial generator lead lines and radial shared lines will be essential for the deployment of offshore wind along the Atlantic, DOE and BOEM are recommending further reliability studies on four interregional high-voltage direct current (HVDC) interlinks (Figure 1). The interregional meshed interlinks analyzed in the AOSWTS have been designed to take advantage of opportunities to maximize production cost savings while attempting to minimize overall cable distances (relative to other potential configurations of interlinks).

Figure 1. DOE- and BOEM-recommended offshore wind transmission topology scenario, informed by the Convening Workshops and preliminary AOSWTS analysis. The map represents a hypothetical transmission build-out for the 2050 Low Carbon Scenario as currently analyzed in the AOSWTS, which is ongoing.





THE BUSINESS NETWORK FOR OFFSHORE WIND

BUILDING A NATIONAL NETWORK OF OFFSHORE WIND PORTS

A \$36B Plan for Domestic
Clean Energy Infrastructure

Authored By:
Brian Sabina, Clean Energy Terminals
Business Network for Offshore Wind Ports Working Group

SEPTEMBER 2023

Green Upheaval

The New Geopolitics of Energy

By **Jason Bordoff and Meghan L. O'Sullivan** January/February 2022

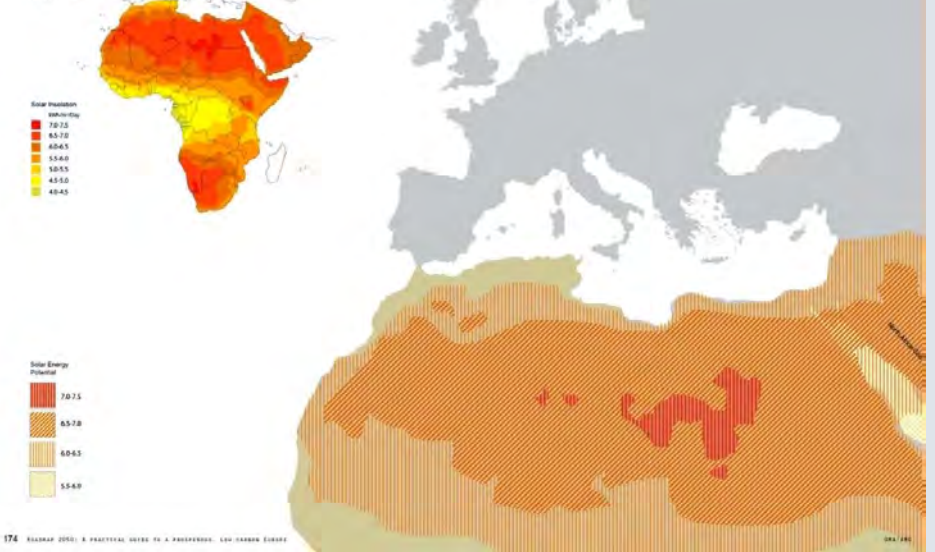


Mining for coltan in North Kivu, Congo, September 2013

Marco Gualazzini / Contrasto / Redux

NORTH AFRICA SOLAR ENERGY POTENTIAL

NORTH AFRICA IS WELL LOCATED TO TAKE ADVANTAGE OF THE HIGH SOLAR POTENTIAL AND RELATIVE PROXIMITY TO THE EU-27.

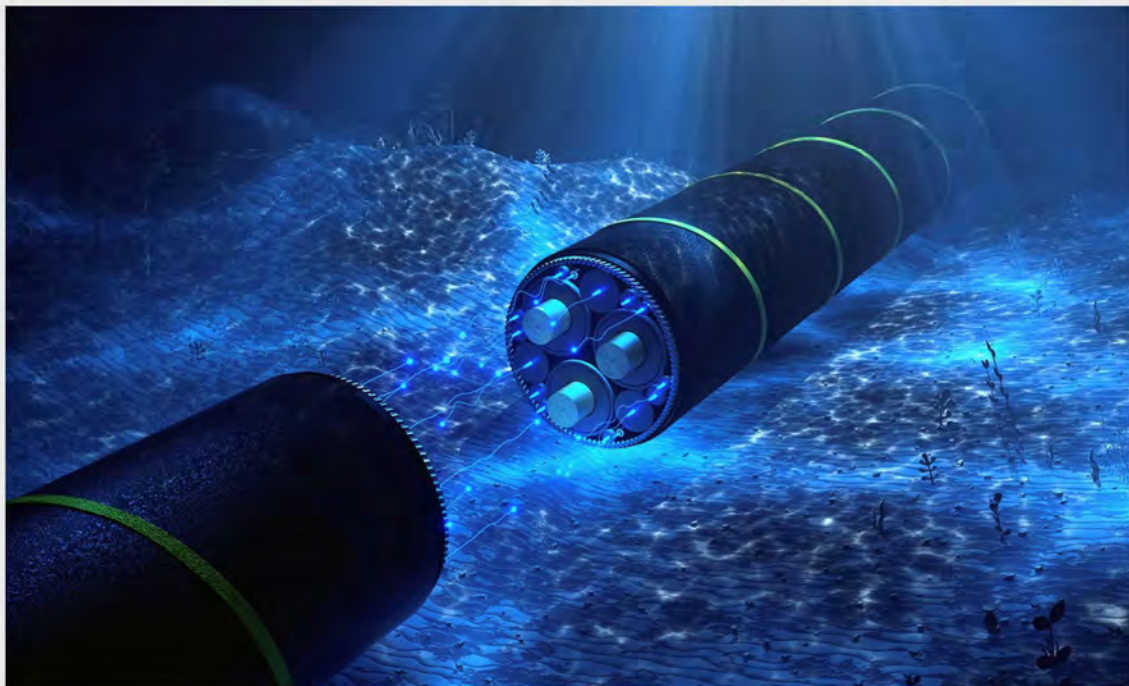


At a rare-earth smelter in Damao, China, October 2010

IEEE Spectrum 3,800-km Cable Offers Glimpse of a Global Power Grid

Grid > Xlinks hopes to send solar and wind power from Morocco to Britain by 2029

BY RAHUL RAO | 30 NOV 2023 | 5 MIN READ



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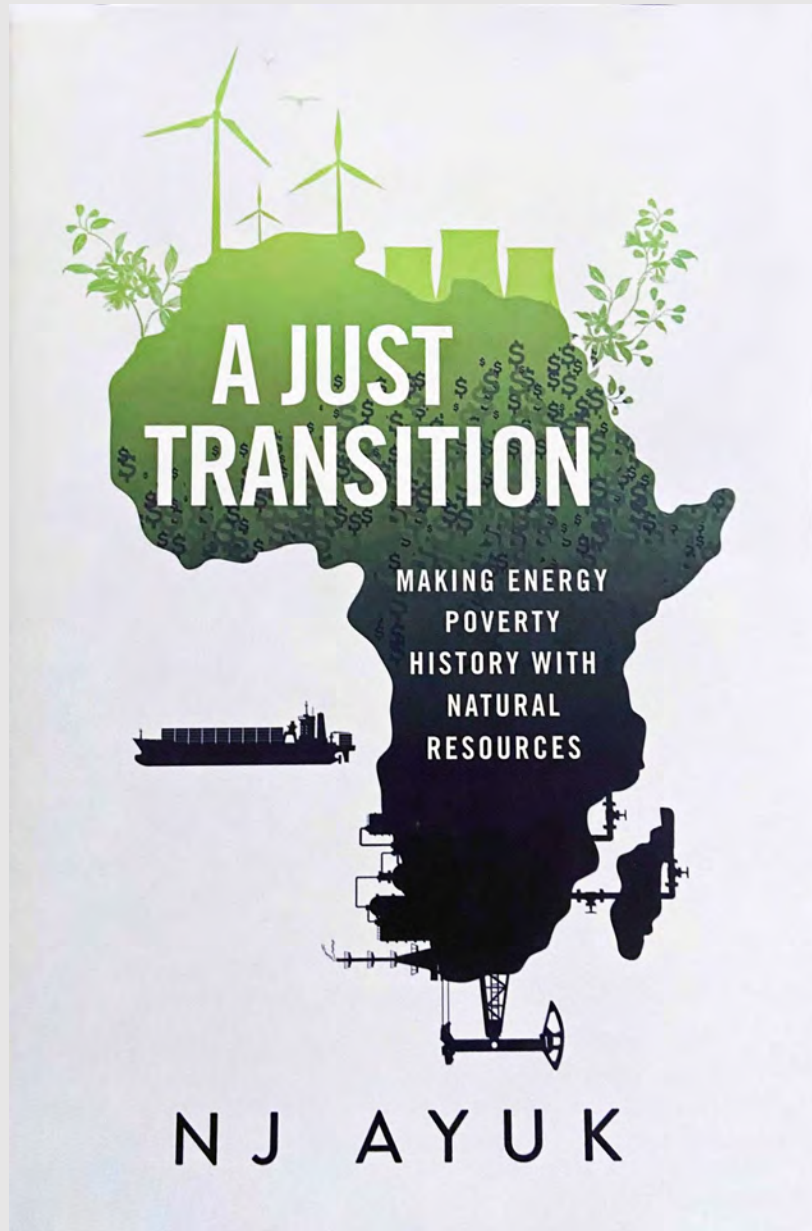


Egypt to Build Undersea Interconnection Cable with Europe



November 24, 2023





Norway Greenlights World's First Commercial Deep-Sea Mining Project

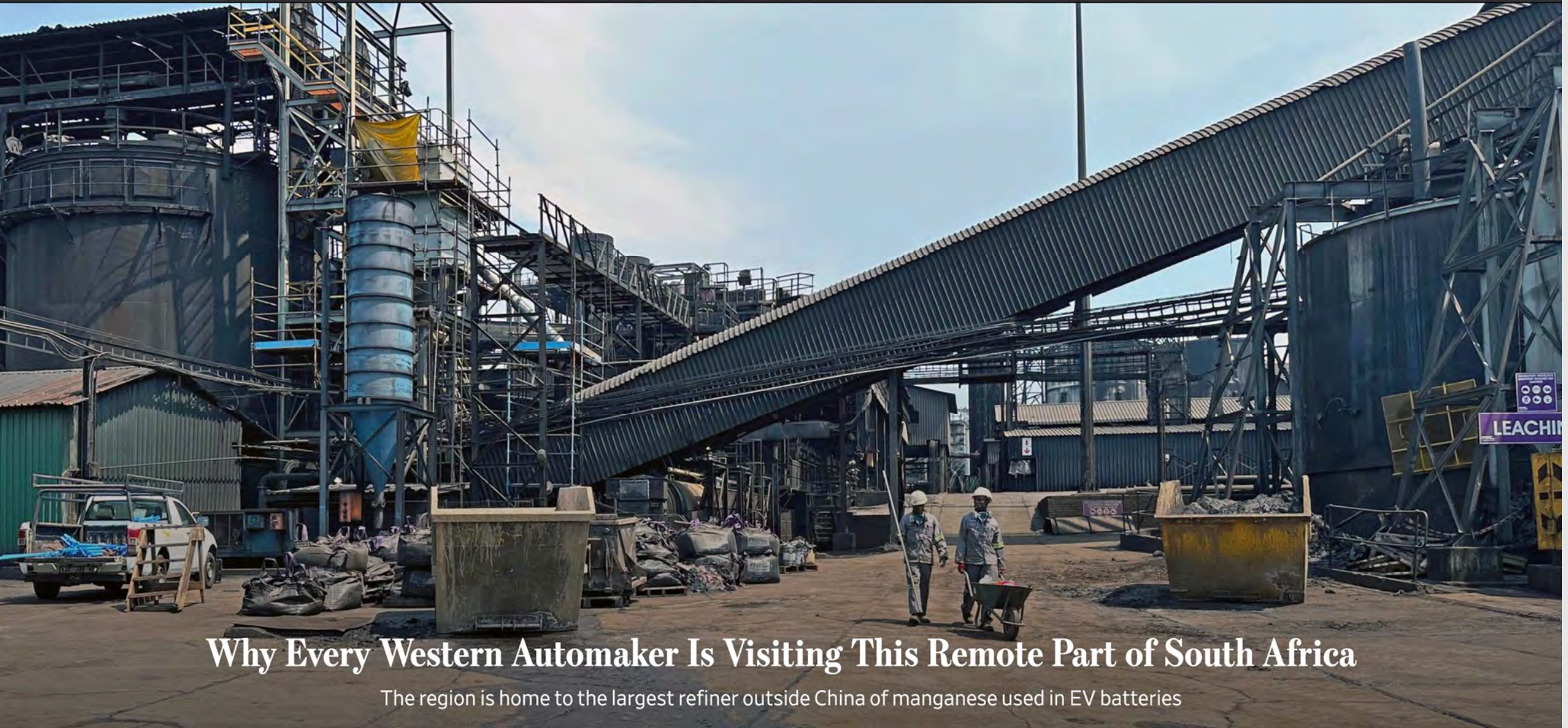
Here's what the new project means for the US and other countries beyond the Nordic region

By **Elyse Hauser**

December 16, 2023



A supply ship at the Edvard Grieg oil field in the North Sea. | Photo by Hakon Mosvold Larsen, NTB scanpix via AP



Why Every Western Automaker Is Visiting This Remote Part of South Africa

The region is home to the largest refiner outside China of manganese used in EV batteries



In the struggle to combat climate change, the world is fighting the last war. Since the dawn of the Industrial Revolution, countries have released one and a half trillion metric tons of carbon dioxide into the atmosphere. The largest cumulative emissions have come from the United States, European countries, China, and Russia, in that order. The top emitting countries of the future could come largely from the developing world—countries such as Brazil, India, Indonesia, and South Africa, which face the herculean task of bringing millions out of poverty while simultaneously adapting to the harsh realities of climate change.

The Coming Carbon Tsunami | By [Kelly Sims Gallagher](#) | Foreign Affairs | January/February 2022

Schumacher Center for a New Economics Global Systems Literacy Initiative

BUCKMINSTER FULLER'S WORLD GAME™ WORKSHOP



Earth by Zoe Watson, Age 7

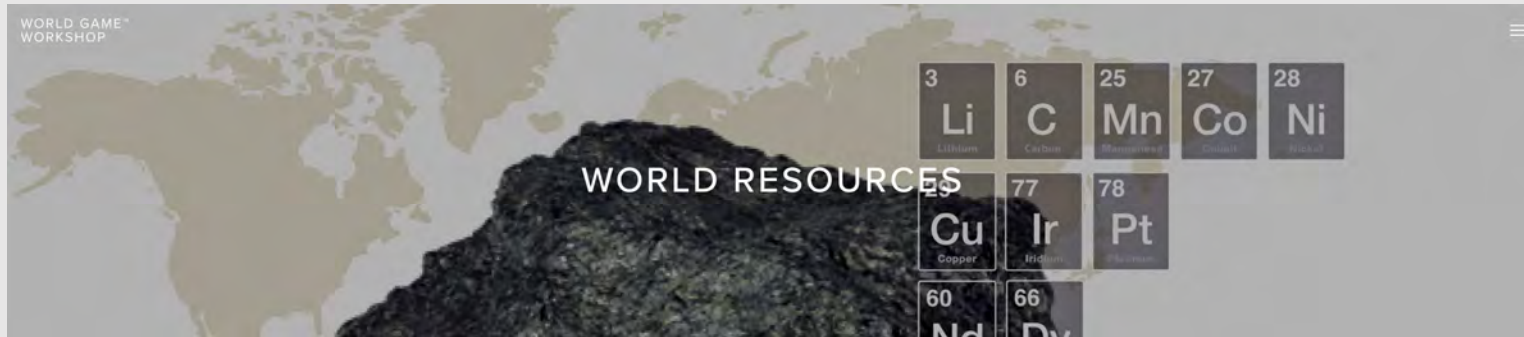
THE WORLD GRID PROJECT

"We must integrate the world's electrical-energy networks. Electrical-energy integration of the night and day regions of the Earth will bring all the capacity into use at all times, thus overnight doubling the generating capacity of humanity because it will integrate all the most extreme night and day peaks and valley. From the Bering Straits, Europe and Africa will be integrated westwardly through the U.S.S.R., and China, Southeast Asia; India will become network-integrated southwardly through the U.S.S.R. Central and South America will be integrated southwardly through Canada, the U.S.A., and Mexico."

Buckminster Fuller: *Critical Path*



FIGURE 5.16 Illustration of Backbone Structure of Globally Interconnected Energy Network



The 92 regenerative elements are Nature's minimum inventory/maximum diversity toolkit

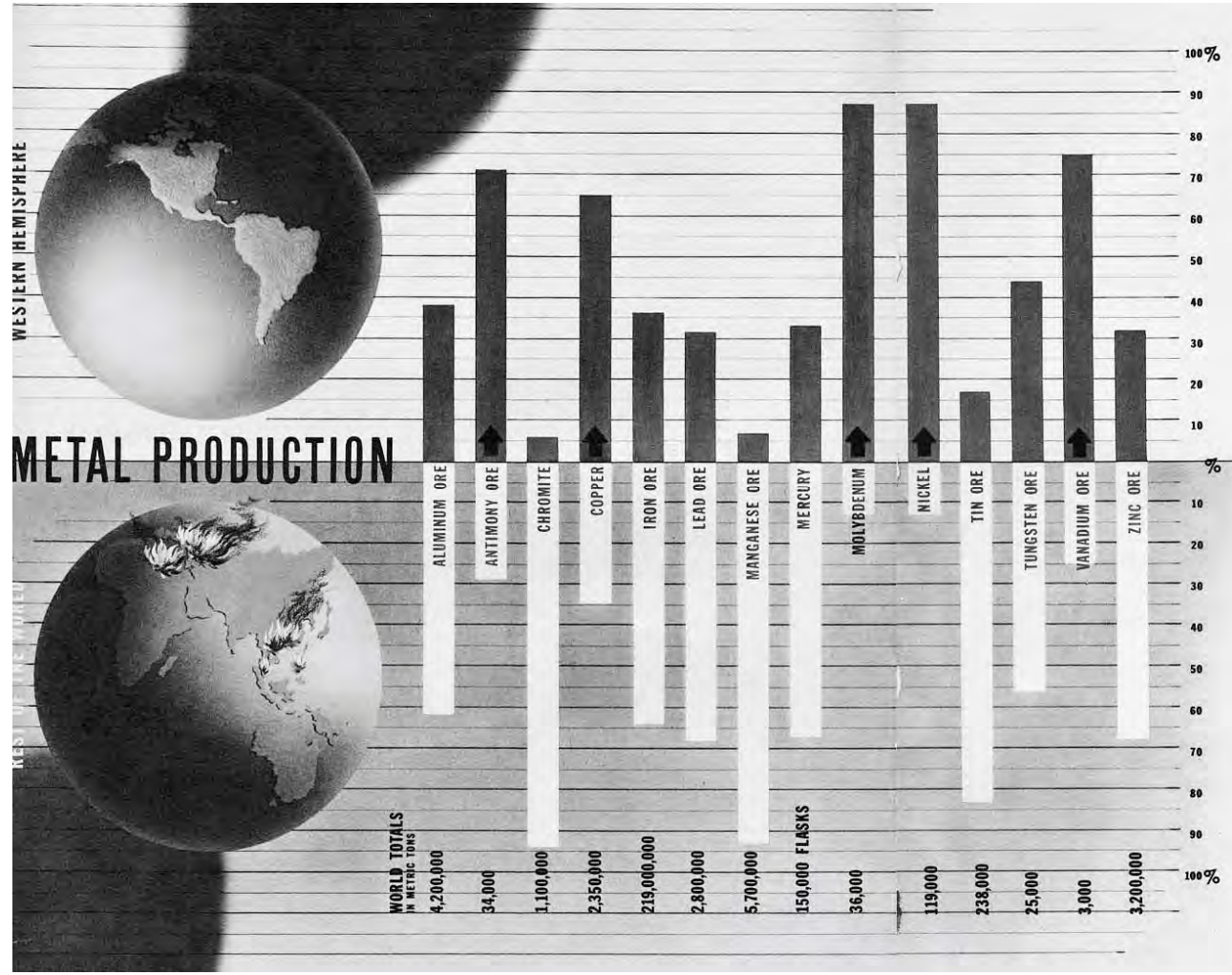
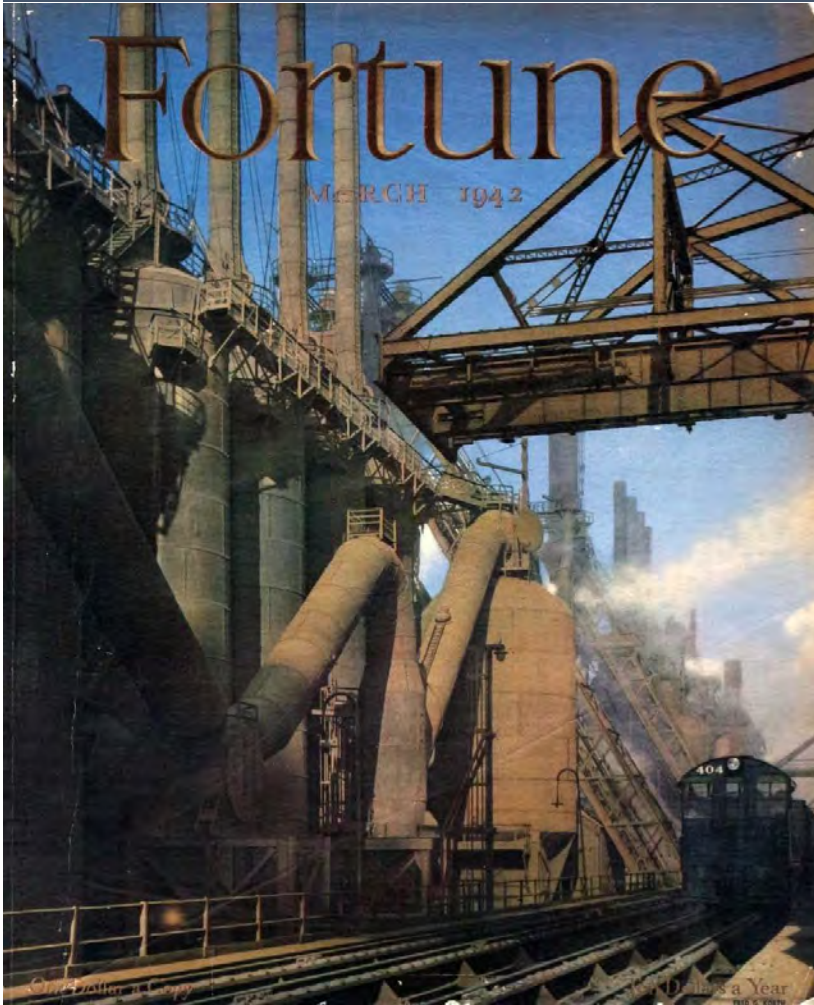


Evolving trends and needs can drive technological innovation



New technologies may create new resource demands

Comprehensive Anticipatory Design Science



THE RACE FOR METALS

U. S. TECHNOLOGY IS PRESSING THE GREATEST HEMISPHERIC HUNT FOR METALS IN HISTORY. IT WILL TIP THE WAR'S BALANCE OF POWER.

The overturning of the Philippines knocked out at one murderous blow a quarter of the U.S. supplies of chromite. Without chromite the U.S. cannot make a pound of armor plate. The overturning of Malaya cut off three-fourths of the U.S. imports of tin. Without tin the U.S. cannot make certain vital solders and alloys, or keep its military commissariat moving smoothly. War on all fronts has crippled the flow of three-fourths of the U.S. supplies of manganese. Without manganese the U.S. cannot make a ton of steel. Such are the first, bitter losses of ground in those strategic metals that are found in such small or low-grade (that is, low metal content) deposits within the continental U.S. that America must import or die. Meanwhile enemy raiders close in on the seven seas. And shipments from everywhere are caught in the squeeze between a shortage of ships and wartime shipping rates. The whirlwind sown by those who refused to understand the technical basis of their civilization, and refused to consider the Philippines worth defending, is here.

The crisis is barely realized. Few people are aware that one month after Pearl Harbor a squad of top U.S. specialists, metallurgists, and geologists packed themselves into a plane for South America to set going an all-out metals survey of Latin America. Few more realize that for over two years a small army of U.S. experts, state geologists, and engineers has been scouring this country by pack horse and mud-spattered automobile in a similar exploration of the continental U.S. With this survey now broadening into hemispheric scope the greatest hunt for metals in the history of the Western Hemisphere is on. It is brute weight of metal that must count in the next eighteen crucial months of this war, and the speed with which the hemisphere is made to disgorge new metal supplies may well tip the balance. The Axis has indicated its realistic grasp of the issue by making a beeline for metal resources in every country it has overrun. And the latest, smashing report of the U.S. Bureau of Mines is that the Axis by conquest is now almost evenly balanced against the Allies in vital metal supplies—one grim fact to underline the length of the contest.

This is the basic war map of the war of continents. It represents world metal production in 1940—the last year of complete metal data—divided percentage on the realistic basis of the Western Hemisphere versus the rest of the world. Some shifts upward in hemispheric percentages were recorded in 1941, but not enough to change materially the balance of power. This is a chart of our strength and weakness. It must be read with an eye to the critical interdependence of alloys in modern metallurgy. Without relatively small amounts of manganese and chromite, for instance, the hemisphere's vaunted strength in iron and steel production is meaningless. Without manganese and chromite no steel or armor plate can be made. These are the strategic points of battle.

“History Teaches, But Has No Pupils”

Antonio Gramsci



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Humanizing sociotechnical transitions through energy justice: An ethical framework for global transformative change

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Original research article

The dark side of the energy transition: Extractivist violence, energy (in) justice and lithium mining in Portugal

Joana Canelas^a, António Carvalho

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Just transition: Integrating climate, energy and environmental justice

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Perspective

Just transitions: Histories and futures in a post-COVID world

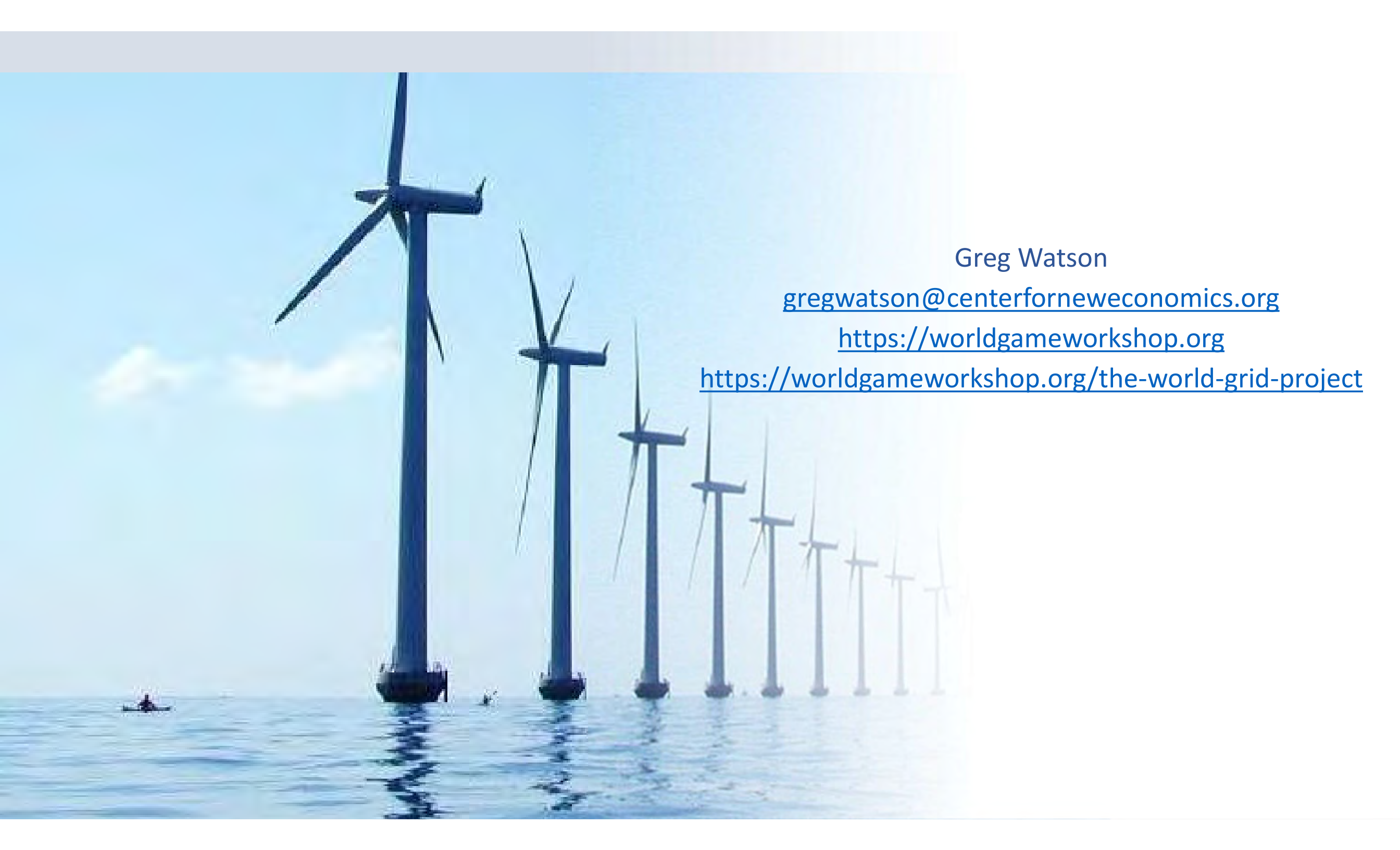
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<https://worldgameworkshop.org>

<https://worldgameworkshop.org/the-world-grid-project>