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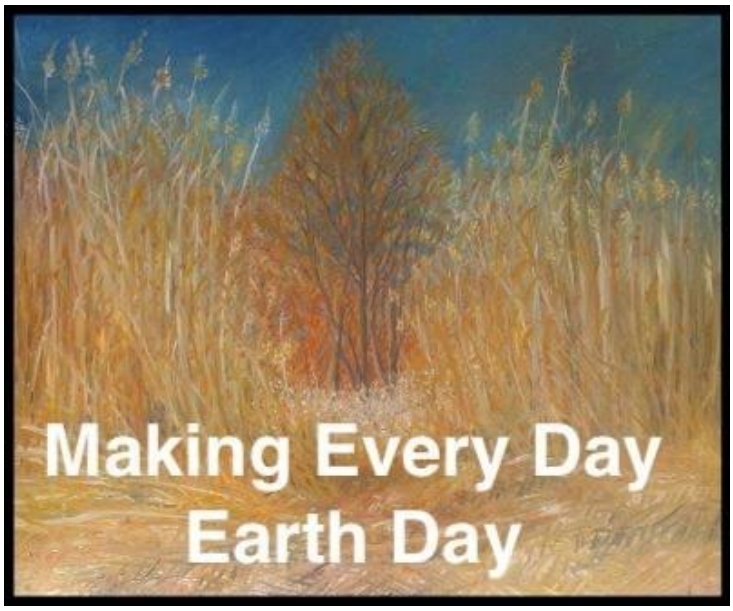
Normalizing Renewable



“These are exciting times as sustainability increasingly becomes a way of life rather than a cause."

– Mark Kruse, Director of Utilities Services, Iowa State University

In our previous issue, we explained how inequality, climate change, and environmental degradation presented existential threats to systems we rely on to sustain modern civilization. This time, we want to offer a more hopeful view, one that is ambitious, but still achievable in the near-term. It is a vision based on the premise that governments soon begin to implement Green New Deal (GND) policies globally including transition away from using coal, oil, and gas.

Renewable energy has the potential to transform our world to one that is resilient, sustainable, and healthy. This applies to the ecosystems in which we live, the systems we devise to enable modern living, as well as to ourselves as individuals and communities. It is about much more than the source of electricity. With the potential *now* at hand, the upholding of unjust and unhealthy systems becomes less politically and economically justifiable.

We discuss how renewable energy could help us in the near-future in four key areas: energy, agriculture, transport, and healthcare. For each, we suggest realistic outcomes involving renewable energy that governments could enable and pursue to address climate change, our environment, and our health. We also speculate how renewable energy could markedly reduce the ecological and health impacts of material consumption. Our next and final issue will highlight some of the inspiring projects and movements making this vision a reality.

ENERGY

Generation of clean and reliable electricity at a large scale is one of myriad possible ways in which renewable energy can transform our lives and our health. Large-scale need not mean huge plants generating vast amounts of power in one place; the most reliable, resilient, and ecologically sound way to generate large amounts of power will be to integrate many different sources across a large smart-grid, combined with significant battery capacity.

This model of energy production has many advantages since it can scale quickly. With the right incentives, many more home and business owners would install solar panels or wind turbines and sell excess energy to the power grid. A distributed network of energy production can accommodate a variety of different energy sources—geothermal, tidal, wave, wind, solar, and more. Such a system is much more resilient to climate change-driven extreme weather and natural disasters. Furthermore, the advancement of battery and other storage technology will ensure that energy production and availability remain flexible and reliable 24-hours a day, seven days a week.

The economic case for renewable energy alone makes the potential for rapid change all the more plausible. With the optimal policy mix and generous investment in research and development, fossil fuel companies would be induced to adapt as their market share is eaten away by less costly small scale renewable energy enterprises. For example, this is already beginning to happen as farmers across our nation and the world search for ways to diversify their income and sustain farms under increasing climatic and economic strain.

AGRICULTURE

Agriculture faces a crisis across the U.S. and around the world. At only 1° C of warming, unpredictable weather patterns are already reducing grain and crop yields globally, while trade wars, high commodity prices, and an inability to compete with huge corporate farms are putting thousands of smaller farmers out of business every year.

Given the growing population and the urgent need for better stewardship of our land to combat climate change and biodiversity loss, the loss of small farmers and their restorative and regenerative agricultural skills could not come at a worse time. Fortunately, governments can do a great deal to encourage and support more farmers, especially smaller farmers, looking for ways to combine soil regeneration, sustainability, and economic productivity.

For example, making it easier for farmers to convert part of their land to wind or solar energy production provides a lucrative and reliable income stream that also reduces a farm’s energy bills. Support for farmers wishing to produce eco-friendly renewable energy on their land already occurs abroad and is emerging in the U.S. through methods known as "agrivoltaics." Agrivoltaics refers to co-developing the

same area of land for both solar voltaic power as well as for agriculture. The coexistence of solar panels and crops implies a sharing of light and land between these two types of production.

A federal program that supports a national smart grid to include agrivoltaics could alter the landscape of agriculture for the better. Reforming zoning codes and offering interest-free loans to small farmers to set up these agrivoltaic arrangements could make small farms economically viable.

Using farmland for energy production need not mean losing important food production capacity. Agrivoltaics can be organized in a variety of ways. For example, using semi-transparent solar panels arrayed high above crops improves moisture retention and production of valuable crops. Such dual-use of farmland is especially effective in hot, arid climates where the solar panels provide partial shading during the hottest hours of the day.

As a highly mobile, non-polluting, and non-invasive form of energy production, solar installations can also be paired with fallow land through crop rotation, or encourage farmers to allow more of their land to rewild. This is crucial to stem the high rate of biodiversity loss, and to protect pollinators whose numbers have been decimated by monocropped farmlands sprayed with neonicotinoids and other pesticides.

If these reforms come to pass and make small farms profitable again, more people could be encouraged to start farming. At the same time, enabling more urban farming could ameliorate food deserts where people currently have little to no access to quality, affordable food. Investing in local marketplaces, incentivizing supermarkets to buy local, and placing tariffs on imported produce would also support small farmers and build community, while dramatically reducing emissions due to long-distance transportation of food.

Fully half of all greenhouse gas emissions in the entire food sector come from the transportation of goods. Given there is currently no way that huge volumes of goods could be transported globally in an ecologically sustainable way, making our food system as local as possible is vital in the fight against climate change.

TRANSPORT

As with making food local, we will need to do more than simply “green” existing practices. We cannot simply switch gasoline for electric and expect nothing else to get better. If every gasoline-powered car on the road today were replaced with an electric vehicle, it would be an ecological disaster. The extraction of minerals required, the carbon emitted through the production process, and the piles of expended toxic batteries make no ecological sense.

The answer, once again, is within the grasp even of this system: public electric transport, walkable cities, and bicycles. Huge investments in green public transit and bike lanes, combined with adequate free charging points, could see cities transformed and do wonders for our health. If we are to be serious about it, however; we *must* make this infrastructure free at the point of use. Good-quality, electric, well maintained, and free public transport would *drastically* cut the number of cars in our cities, and save both lives and dollars through cleaner air and reduced respiratory illnesses, heart disease, and cancer. Road networks could be reclaimed for more trees, flowers, and green spaces, helping to cool urban areas, support biodiversity, and improve the mental wellbeing of urban dwellers, especially those in low-income neighborhoods.

For long distance travel, it is inconceivable that air travel will be sufficiently greened anytime soon. Transport by sea is also incredibly polluting due to the use of bunker fuel. Just a handful of the worst freight and cruise ships emit more sulphur oxides than all of the world's cars combined. If we are serious about curbing harmful emissions, we must transition away from transporting so much of the world's goods by sea, produce more goods locally, and invest in long-distance rail networks for both goods and people.

The potential positive impact of making these changes to our transport sector is difficult to overstate; it is estimated that air pollution from fossil fuels could be responsible for as many as eight million deaths a year, or 20% of all deaths globally. A recent study estimated the global cost of externalities of the energy and transport sectors amounted to around $24 trillion per year, much of which are healthcare costs.

"It is not that these costs are never paid by society, they are just not reflected in the costs of energy. And unfortunately these hidden costs are not distributed equally or fairly. The most affected parties are under-represented in the marketplace, and have external costs imposed upon them, whether that be the families forced to live in areas of highest air pollution and toxicity because they have no other choice, to the inhabitants of low-lying island states such as the Maldives or Vanuatu who are threatened most immediately by rising sea levels."

– Prof. Benjamin K. Sovacool, Science Policy Research Unit, University of Sussex

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HEALTHCARE

Reliable, cheap, renewable energy can drive a revolution in the provision of healthcare. The COVID-19 pandemic has shone a light on both the global disparities in healthcare and the interconnected nature of our health interests. Even beyond the moral case for universal access to healthcare, it is vital for control of this and the next pandemic that everyone, globally, be vaccinated as quickly as possible.

Solar panels are easily moveable and an efficient way for remote or mobile clinics anywhere in the world to provide healthcare services for underserved populations, keep medicines and vaccines cool, power medical equipment, and deliver babies safely. Additionally, replacing diesel generators with solar avoids the risk of running out of fuel in emergency situations like natural disasters or war.

BEYOND A GREEN NEW DEAL

Renewable energy is going to transform our lives for the better regardless of government policy. Trends boosted, but not initiated by the Covid-19 pandemic, like working from home, socializing online in more immersive ways, an increased appreciation and concern for the outdoors are rapidly becoming normalized. These trends drive synergy between culture and policy.

Increased remote interaction with the world includes a wide array of human experience: sport, entertainment, community, and the everyday bureaucracy of modern life. Similarly the rise of "virtual reality" may be set to explode and encompass art, fashion, and much else. Electric power-dependent digitalized experiences and resources theoretically could reduce material consumption and lessen attendant unsustainable transportation and agricultural practices. Whether the increased digitalization trends, themselves, will translate into environmental sustainability is yet to be seen.

Everything described up to here could realistically be achieved within the next decade, not just in terms of technology but also in terms of political will and viability. Subsequent reforms will need to be more structural and ideological than is currently conceivable, coming up against other so-far intractable human behaviours like racism, militarism, and imperialism. These problems will still need to be addressed lest all our hard work over the coming decade is thrown away in wars over water, mass refugee crises, or a Roaring Twenties-like post-pandemic backlash.

Real material change that makes a difference to people's lives can be a great motivator. Green New Deal policies will only increase the pressure to continue positive progress and not backslide, especially as the impacts of climate change worsen. Change begets change. Once we begin to see that a new world is possible, it will spark the imagination, conviction and belief required to overcome whatever obstacles remain.

Steps we can take

Much can be accomplished via individual initiatives as demonstrated over recent decades. However, the climate crisis has continued to advance despite these individual efforts. The disparities, inequities, challenges and urgency are now so large that significant structural, political, and cultural changes are required to bring about the changes at the pace and scale required.

It is time to think and act boldly together to urge our elected officials to:

- Support and promote the principles embedded in the Green New Deal.
- End Citizen's United and reclaim the People's role and voice in democracy.
- Support the For the People Act to halt the rollback of voting rights.
- Support and promote the THRIVE Agenda (Transform, Heal, and Renew by Investing in a Vibrant Economy).
- End support, subsidies, or assistance in advancing the agendas of the fossil fuel industries.

Learn more

Exploring Farming and Solar Synergies. An analysis using Maryland Data (February 2021) Arjun Makhijani, PhD, *Institute for Energy and Environmental Research*

A Practitioner's Guide to Pollinator-Friendly Solar Development (February 4, 2020) *Clean Energy Finance Forum*

Will electric vehicles soon approach the tipping point to acceptance? (March 29,2021) John Paul MacDuffie and Sara E. Light, *Bulletin of the Atomic Scientists*

Green investing "definitely not going to work"—former BlackRock exec (april 7, 2021) Dominic Rushe, *Bulletin of the Atomic Scientists*

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