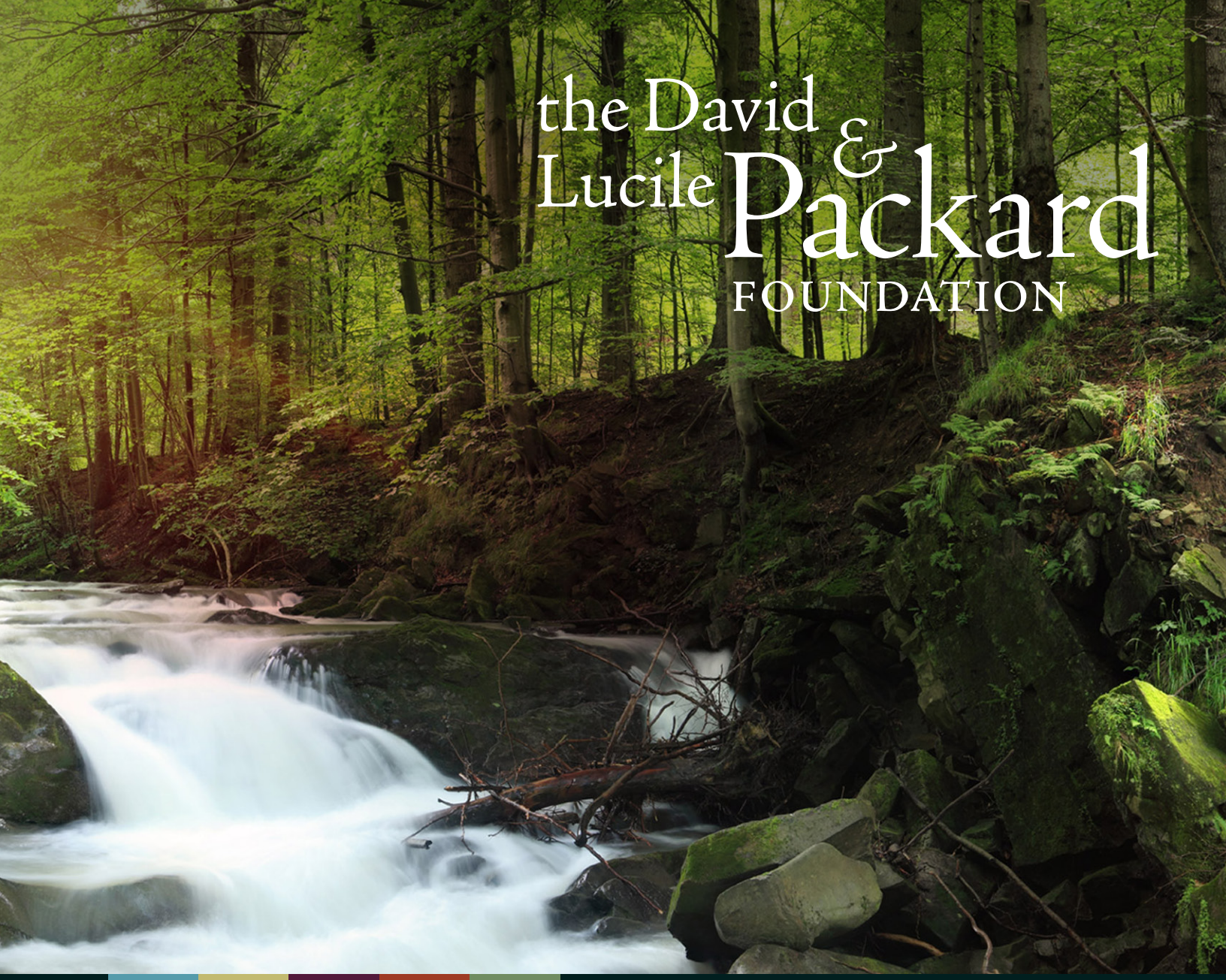
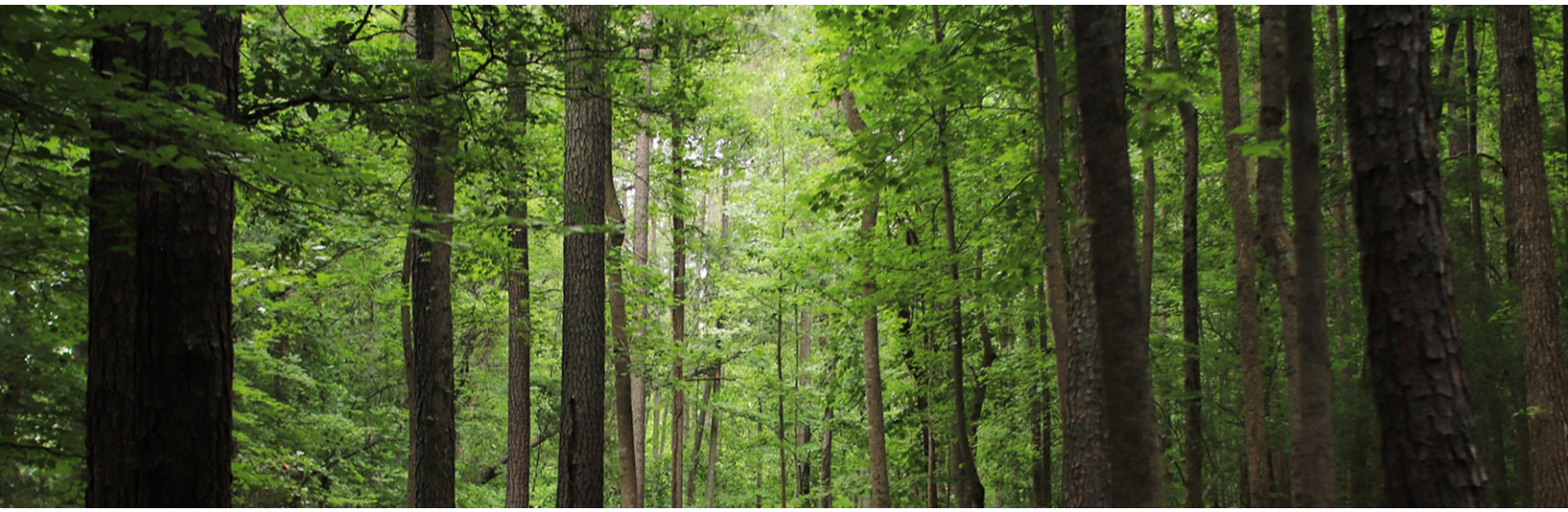


Beyond Bioenergy

Toward a Clean Energy and Forest-Positive Future with Social Justice at its Heart

Strategy Overview | 2020 - 2024

October 2020



Over the last decade, our societies have made incremental progress toward building a clean energy and forest-positive future to fight the climate crisis and safeguard the well-being of our children and grandchildren. Despite continuing progress, the threat to our climate is escalating. Renewable energy deployment is only just keeping pace with growth in energy demand, political polarization limits our ability to conserve critical carbon-sinks like the Amazon rainforest, and continued reliance on fossil fuels puts us at significant risk of overshooting the Paris agreement targets.

Although often overlooked, our forests contain more carbon than all exploitable oil, gas, and coal deposits.

Together with oceans and wetlands, they play a vital role in stabilizing our planet's climate by removing large amounts of carbon from the atmosphere, while also ensuring the livelihoods of billions of people, providing clean air, water, food and medicines, and protecting endangered species. Yet we continue to see these life support systems erode and disappear at an alarming rate. Deforestation and unsustainable agricultural practices alone are estimated to be responsible for 25 percent of global carbon emissions.

To help address the complex challenges affecting forests, the Packard Foundation's **Climate and Land Use Program** supports diverse stakeholders engaged in developing policies and partnerships to halt and reverse forest loss, secure the rights of Indigenous Peoples and local communities, and advance sustainable land use and agriculture, in line with the joint philanthropic statement on **'Supporting Forests, Rights, and Lands for Climate.'** Our support is intended to contribute to global cooperation efforts to achieve the Paris agreement targets, international human rights frameworks, and the United Nations Sustainable Development Goals.

Although much of this strategy is focused on reducing demand for bioenergy that does not support climate stability or other Sustainable Development Goals (e.g. food security, forest health), the Packard Foundation supports the development and use of those bioenergy resources that generate benefits for the climate as well as local communities.

"Climate-positive" bioenergy includes organic waste streams (i.e. feedstocks that would otherwise be sent to a landfill or open burned) such as some agricultural residues, forest processing residues, and used cooking oil. Advanced biofuels, for example cellulosic feedstocks, also have the potential to be beneficial depending on the nature of the land footprint required for production.

However, it is important to note that the scale of climate-positive bioenergy resources is limited and that the risks of "false positive" bioenergy feedstocks are greater than the risks of "false negative." A recent analysis by ICCT, for example, found that demand for jet fuel in 2050 is estimated to be 24-37 EJ but that the maximum availability of cellulosic biofuels that could be available to the industry by this date is only around 4 EJ.[1]

WHY BIOENERGY?

Most of our renewable energy today comes from bioenergy, rather than solar, wind or geothermal power.

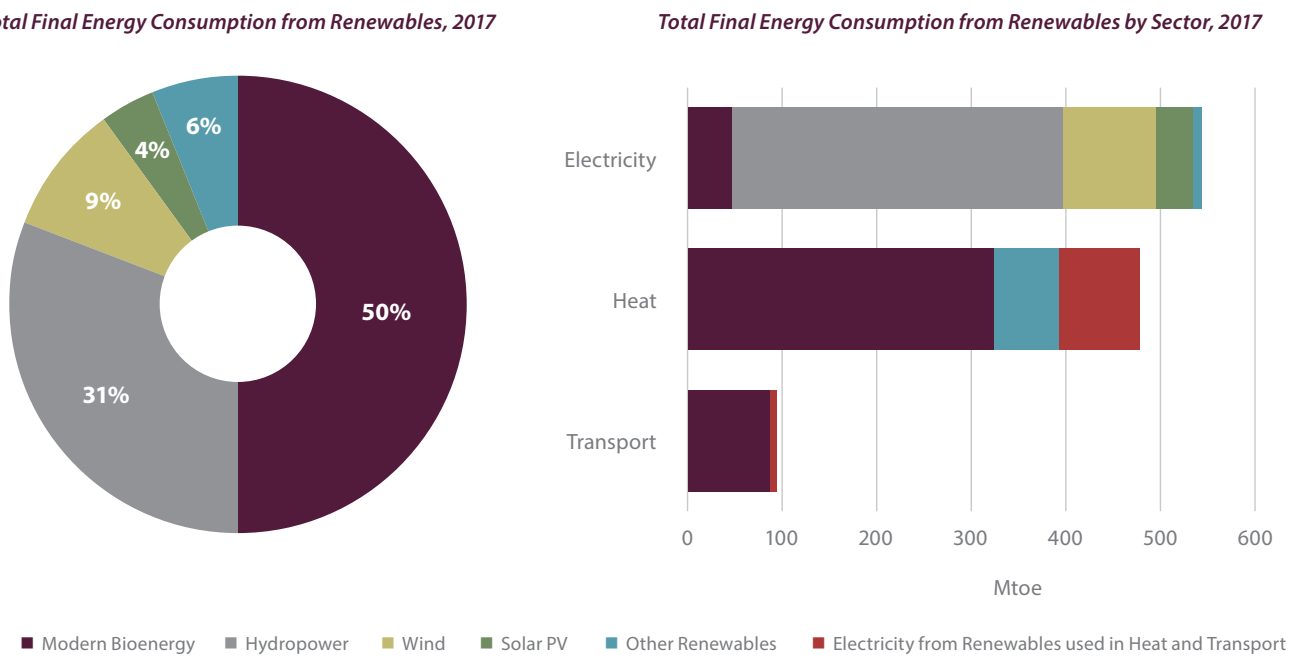
Bioenergy accounts for 50% of global renewable energy and for almost 60% of the European Union's renewable energy consumption.[2]

However, not all bioenergy is low carbon or low cost. Many of the most common forms of bioenergy in use today, such as soy and palm oil biofuels in the transport sector, are not only associated with significant increases in food prices, but also with deforestation, generating near-term emissions greater than the fossil fuels being replaced. Biodiesel in the European Union, for example, is estimated to emit nearly twice as much greenhouse gas as fossil diesel.[3]

Over the coming decade, bioenergy demand is projected to increase significantly, not only in Europe, but also in East Asia, in Indonesia, and in the aviation and maritime sectors. If these new trends were to continue unabated over the next decade, driven by well-intentioned but poorly conceived clean energy targets and public subsidies, they could have significant unintended impacts on climate stability, community well-being and forest health.

Demand for palm biodiesel alone could increase more than six-fold to 67 million tons by 2030, driven mainly by emerging markets. This has the potential to drive 4.5 million hectares of deforestation, an area roughly the size of The Netherlands, resulting in 7 billion tons of additional carbon emissions over the next two decades, which is slightly more than the annual emissions of the United States.[4]

FIGURE 1: FIFTY PERCENT OF GLOBAL RENEWABLE ENERGY CONSUMPTION IS MET THROUGH BIOENERGY



Total final energy consumption from renewables in 2017 (left) and broken down by sector (right). Source: IEA Press webinar for Renewables 2018 report.

EXCLUDING HIGH CARBON BIOENERGY FROM OUR CLIMATE ACTION PLANS

Clearing carbon-rich forests for fuel negates the original purpose of bioenergy policies. Yet our climate action plans continue to treat high-carbon forms of bioenergy as low-carbon sources of renewable energy, in part because it can easily replace oil and coal in existing infrastructure.

High-carbon forms of bioenergy also benefit from substantial government incentives and public subsidies in the tens of billions of dollars. Because the planet is land-constrained, these incentives actively compete with other high-priority policies such as protecting and restoring forest carbon sinks (SDG 13), conserving biodiversity (SDG 15), ensuring food security (SDG 2), and achieving sustainable consumption and production (SDG 12). To achieve the core objective of renewable energy policy to reduce greenhouse gas emissions, greater efforts are needed to exclude high-carbon forms of bioenergy from climate action plans and renewable energy subsidies. Proponents of green deals and stimulus packages, and private investors seeking to reduce near-term emissions, should aim to avoid infrastructure 'lock-in' of land-intensive bioenergy, and instead focus large-scale investments on the next generation of low-carbon technologies such as wind and solar energy, innovation, as well as demand reduction approaches, including energy efficiency of buildings and shared modes of transport.[5]

One hectare of photovoltaics, for example, can produce 50-100 times more electricity than a hectare of forest biomass.[6]

To ensure that the transition to low-carbon renewables is powered responsibly and equitably, materials should be sourced in ways that reduce dependence on new mining and respect human rights.[7]

Encouragingly, there are signs that decision-makers are beginning to address high-carbon bioenergy. For example, the French constitutional court recently upheld a law removing palm oil from its list of permitted biofuels on the basis of its climate and deforestation impacts, thereby eliminating its tax advantages and rejecting an appeal by energy company Total. North Carolina, a major producer of globally traded wood pellets, also excluded the use of forest biomass for electricity generation from its 2019 Clean Energy Plan, which states that *"…large scale use of NC's natural resources to meet foreign markets' carbon reduction goals by taking advantage of current accounting methodology should be challenged at the national and international level."* [8,*]

BIOENERGY POLICIES COMPETE WITH INVESTMENTS IN NATURAL CLIMATE SOLUTIONS

Bioenergy policies enacted in one region have strong potential to counteract policies aimed at conserving forest carbon sinks in another. For example, a recent European Commission study estimates that 45% of the expansion in global palm oil production, including for palm oil biofuels, has caused deforestation.[9] However, from 2014-2019 the EU spent an average of 2.2 billion EUR to import palm oil, while spending 3.4 billion EUR to conserve nature and forests through its LIFE program between 2014-2020.[10,11] Given that natural climate solutions have the capacity to deliver one third of the emissions reductions needed to meet the Paris agreement targets, and help protect the one million species currently at risk of extinction, new approaches are needed to ensure that our climate mitigation investments do not inadvertently cancel each other out.

[*] *As practiced, the reporting and accounting rules adopted by the UNFCCC Parties under the Kyoto Protocol for forest bioenergy lead to "missing" emissions. Specifically, the IPCC advises that emissions from bioenergy be treated as land-use emissions rather than energy sector emissions. Greenhouse gas inventories and national accounts that report bioenergy emissions as "zero" in the energy sector have led many policy-makers to perceive forest biomass as a zero-carbon energy source, equivalent to wind and solar. "Missing" emissions are particularly common for bioenergy from forest biomass that is traded across national borders. Many of the largest forest biomass exporters, such as the US, Canada, and Russia, do not account for GHG emissions under the Kyoto Protocol. Neither do any developing countries. As a result, it is frequent for 'country A' to trade forest biomass to be burned in 'country B,' and for neither country to fully count or report the resulting carbon emissions, which are often substantial.*

GLOBAL BIOENERGY TRENDS TO 2030

The global bioenergy trends of highest concern in terms of their potential impacts on climate, people and forests include: (i) the conversion of coal infrastructure to burning forest biomass as a way of meeting renewable energy targets in Europe and East Asia; (ii) potential large emerging markets for food-based biofuels in the aviation and maritime sectors, and in Indonesia; and (iii) large-scale bioenergy with carbon capture and storage (BECCS) as a primary carbon removal strategy.

Trend 1: Conversion of coal infrastructure to burning forest biomass

- Proposed coal-to-biomass conversions in Europe could increase the consumption of wood pellets by 36 million tons, which is equivalent to logging an area half the size of Germany's Black Forest annually.[12]
- Growth in forest biomass demand is driven by large public subsidies, which were estimated to be over 6.5 billion EUR in 2017 in fifteen European Union countries.[13]
- In 2017, Japan approved 11.5 GW of biomass electricity projects, 40% of which would be fueled by palm oil.
- South Korea is forecast to add approximately 1,200 MW of biomass projects to its grid in the coming decade. In 2018, South Korea imported more than 3 million tons of wood pellets, twenty-five times more than in 2012.[14,15]

Trend 2: Potential large emerging markets for food-based biofuels

- By 2030, global demand for palm oil for biofuels could increase to 61 million tons (90% of current production), and for soy oil to 41 million tons (nearly 75% of current production), driven mainly by emerging markets in the aviation sector, and in Indonesia and Brazil. This could cause 7 million hectares of deforestation and generate CO2 emissions in the region of 11.5 billion tons (more that China's current annual emissions from fossil fuels).[16]
- Growth in demand for food-based biofuels is driven by public incentives. Biodiesel tax credits in the United States are estimated to have cost 12 billion USD between 2004 and 2019, and the latest available estimates put EU biofuel subsidies at 5.5-6.9 billion EUR in 2011.[17,18]
- Indonesia's domestic mandate for palm oil biofuels has increased from a 5% blend in 2006 to 30% by 2020. To meet its current domestic biofuels mandate, consumption could grow from 3.7 billion liters in 2016 to nearly 19 billion liters in 2030.[19]

Trend 3: BECCS as a primary carbon removal strategy

- The IPCC found that the average amount of BECCS in climate scenarios that achieve a 2-degree future would require 25–46% of arable and permanent crop land in 2100, which is equivalent to an area one to two times the size of India. It concluded that BECCS would face significant constraints from land competition, availability of water and nutrients, and potential social conflict.[20]

REPLACING COAL WITH FOREST BIOMASS: POTENTIAL IMPACTS ON THE CLIMATE AND PUBLIC HEALTH

Because it is less energy dense, burning wood releases substantially more CO_2 per unit of energy generated than burning coal.[21] Once emitted, this carbon stays in the atmosphere for decades to centuries, creating a large 'carbon debt' that contributes to accelerating global warming until it is fully reabsorbed by forest regrowth.[22] These long 'carbon payback' times are incompatible with the urgency of the climate crisis, which requires drastic emissions cuts by 2030.[23] If even a small proportion of the world's coal plants, which generate 40% of global electricity, were to be converted to burning forest biomass, this could have significant climate implications. Supplying an additional 3% of global energy through forest biomass would also likely require doubling commercial wood harvests, greatly impacting biodiversity.[24]
In addition to carbon, wood burning plants emit levels of air pollutants comparable to coal-fired plants, including nitrogen oxides, carbon monoxide, particulate matter, black carbon, dioxins and a range of volatile organic compounds such as benzene and formaldehyde. Incentives for forest biomass in the power and heat sectors are therefore likely to contribute to adverse air quality. Impacts on public health can be high and often disproportionately affect disadvantaged and minority communities. Evidence has also recently emerged that air pollution, including that from wood burning power plants, significantly increases susceptibility to COVID-19.[25]

SOCIAL JUSTICE

Decarbonizing our economies will require far-reaching, complex decision-making across a multitude of sectors within a short timescale, including the energy, land-use, and transport sectors, to name a few.

We recognize that in the past, the decisions we have taken as a society across these sectors have often harmed minority communities, Indigenous peoples and the most vulnerable. For example, in the southern US, highly polluting power plants and industrial sites are mostly built near communities of color, greatly impacting their health and well-being.

Going forward, a system-wide transformation is needed to ensure that climate action fully addresses racial and social justice, as well as a just transition for workers, in a meaningful, equitable and lasting way.

To drive this transformation, scaling support for those who are best placed to lead effective social and environmental justice solutions, including frontline communities and youth groups, will be key.

SCALING SUPPORT FOR FRONTLINE COMMUNITIES

Across geographies, communities on the frontline of bioenergy supply are disproportionately rural, low income, politically disenfranchised, and comprised of racial or ethnic minorities. Large-scale bioenergy projects are often developed with little public input or informed consent and result in a host of challenges for Indigenous Peoples and minority communities, including displacement, pollution of natural resources, and increased public health risks. It is likewise true that bioenergy plays an important role in a number of local economies, and that many people depend on this industry to support their families. This reality, and the necessity to ensure access to high quality economic opportunities for rural communities in the context of a just transition, is equally integral to social, environmental and economic justice concerns.

To scale support for frontline communities and their leaders, we will implement a two-year pilot project to provide small grants for community organizing, coalition building, and storytelling and communication. Based on the outcomes of this pilot, which will focus on North America, we aim to design a second phase of support through a participatory process with frontline communities. We will also work with diverse partners to support research on the impacts of bioenergy on Indigenous Peoples, minority communities, rights, food security, ecosystems, air pollution, public health and the UN Sustainable Development Goals.

WHAT WE SUPPORT

Our overarching goal is to support diverse groups working collectively to phase-out high-carbon bioenergy from the long-term energy mix, and to re-direct public subsidies and private investment toward accelerating the transition to a clean energy and forest-positive future with social justice at its heart.

We focus our support on stopping forests from becoming the new coal, reducing demand for high-carbon biofuels that drive deforestation, and empowering communities and movements advocating for their rights and for forests.

Our approach is centered on the demonstrated capacity of community, civil-society and youth-led campaigns to drive change and transformation. By supporting policy advocacy based on sound science showing the fallacy of governments treating bioenergy emissions as zero-carbon, as well as the economic and climate benefits of alternatives like solar and wind, these campaigns can persuade governments and investors to end the substantial subsidies and investments that drive the industry, to properly account for emissions and public health impacts, and to recognize that land-intensive bioenergy is a fuel of the past, not a fuel of the future.

STRATEGIC PRIORITIES

1 STOPPING FORESTS FROM BECOMING THE NEW COAL

By 2030 the risk of the coal phase-out driving the large-scale use of forests in our energy systems is averted. Several politically influential countries no longer rate forest biomass as zero-carbon against climate targets and have re-directed biomass incentives and subsidies toward low-carbon renewables, such as wind and solar energy, and toward natural climate solutions that provide co-benefits for communities.

Geographic Focus: *Europe, East Asia, North America*

WHERE WE FOCUS

- **Preventing** the 'lock-in' of coal-to-forest biomass conversions and new biomass plants (Outcome 1)
- **Empowering** frontline communities and their leaders, and enhancing forest carbon sinks in regions where forest biomass is sourced (Outcome 2)
- **Identifying and scaling** zero-carbon alternatives to forest biomass and fossil fuels in the heat sector (Outcome 3)

2 REDUCING DEMAND FOR HIGH-CARBON BIOFUELS THAT DRIVE DEFORESTATION

By 2030 global demand for high-carbon biofuels, particularly biodiesel, has peaked and is starting to decline. The risk of additional tropical forest loss from biofuels policies and subsidies is averted, helping to secure the rights and livelihoods of Indigenous Peoples and rural communities, and protecting biodiversity and carbon sinks.

Geographic and Sectoral Focus: *Europe, Indonesia, Aviation and Maritime Sectors, North America*

WHERE WE FOCUS

- **Phasing out** high-carbon biofuels, particularly palm and soy biodiesel, in major existing markets (Outcome 4)
- **Supporting** large emerging markets transition directly to clean transportation systems, based largely on electrification and innovation rather than high-carbon biofuels (Outcome 5)
- **Ensuring** that the use of fuels in industries that are likely to depend on liquid fuels to 2050 is sustainable and 'climate positive' (Outcome 6)

3 EMPOWERING COMMUNITIES AND MOVEMENTS ADVOCATING FOR THEIR RIGHTS AND FOR FORESTS

By 2030 the capacity of communities and movements to advocate for their rights and for forests on the global stage, and to raise awareness of the risks and limitations of bioenergy, is significantly enhanced. Several geopolitically important countries show leadership by minimizing future reliance on bioenergy in their climate action plans, accurately accounting for bioenergy carbon emissions, excluding high-carbon forms from 'green' investment criteria, and by setting targets for carbon removal through natural climate solutions, such as forest restoration.

Geographic Focus: *Global*

WHERE WE FOCUS

- **Supporting** Indigenous Peoples, local communities and youth movements advocating for their rights and for natural climate solutions (Outcome 7)
- **Encouraging** 'honest reporting' of bioenergy carbon emissions at the UNFCCC and in national accounts (Outcome 8)
- **Expanding** accessibility and usage of sound information on the climate, food-security, public health and biodiversity impacts of bioenergy (Outcome 9)

THE COVID-19 PANDEMIC AND RECOVERY

The COVID-19 pandemic has spread rapidly across the world, affecting hundreds of millions of people. Minority groups, Indigenous Peoples, and rural communities, particularly in the Global South, have borne the brunt of the twin public health and economic crises due to pre-existing social inequalities, limited access to medical care, and threats to food security. Although this strategy was prepared prior to the pandemic's spread, its focus on supporting diverse stakeholders working toward a clean energy future that reduces our reliance on high-carbon bioenergy, promotes community well-being, and protects healthy forests that build resilience against future pandemics, continues to be central to the challenges that we face in a post-pandemic world.

However, the strategy's priorities and approaches will necessarily shift. For example, 'green recovery' has become a central priority in the wake of COVID-19. Many civil society organizations, community groups and research institutions are already actively engaged in advancing inclusive climate and nature-friendly policies that can reboot our economies, eliminate subsidies for high-carbon bioenergy that is incompatible with climate action, and redirect those incentives toward wind and solar, as well as natural climate solutions. Going forward, the Packard Foundation will continue to be flexible in its grantmaking approach and to seek to support its partners and grantees as they adapt to changing conditions.

HOW WE WORK

This strategy was prepared on the basis of an 18-month review process that included consultation with partners, a formal review paper, a survey on diversity, equity and inclusion, and guidance from external and internal advisory committees. It forms part of a wider commitment by the Packard Foundation to support diverse communities working together to envision, develop and implement socially just solutions to the climate and extinction crises. Related strategies and initiatives include the Foundation's **Palm Oil** and **Agriculture, Livelihoods and Conservation** strategies, as well as the **Climate and Land Use Alliance**, which aims to realize the potential of forests and land use to mitigate climate change, benefit people, and protect the environment.

The grantmaking budget target is 5 million USD annual, with a total of 25 million USD expected to be granted over the 5-year lifetime of the strategy. We anticipate an annual grantmaking volume of between 15 and 20 grants. Our approach is anchored in the **Conservation & Science Program's** Diversity, Equity and Inclusion Vision and its commitment to *"…promoting diversity, addressing structural inequality, and advancing equity and inclusion as it works toward greater environmental protection and equitable access to natural resources and healthy ecosystems."*

We recognize that more than our Foundation's planned 25 million USD investment will be needed to achieve the objectives of this strategy. For some aspects of this work, we believe that our funding can be particularly effective because it is complementary to other larger flows of resources. For example, our funding leverages the much larger amount of philanthropic funding supporting work to stop coal-fired power production. By aligning with these campaigns to ensure that coal is not replaced with forest biomass, our relatively limited funding can have an outsized impact. In addition, we will be working to bring new donors into this work. To fully achieve the outcomes we have laid out across the many geographies involved, we believe that at least an additional 25 million USD will be needed over the next four years.

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