

CATHOLIC THEOLOGICAL ETHICS IN THE WORLD CHURCH

James F. Keenan, Series Editor

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JUST SUSTAINABILITY
*Technology, Ecology, and
Resource Extraction*

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Published by Orbis Books, Maryknoll, New York 10545-0302.
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Library of Congress Cataloging-in-Publication Data

Just sustainability : technology, ecology, and resource extraction / edited by
Christiana Z. Peppard and Andrea Vicini, S.J.

pages cm. — (Catholic theological ethics in the world church; 3)

Includes bibliographical references and index.

ISBN 978-1-62698-132-4 (pbk. : alk. paper)

1. Human ecology—Religious aspects—Catholic Church. 2. Sustainable
development—Religious aspects—Catholic Church. I. Peppard, Christiana Z.

BX1795.H82J87 2015

241'.691—dc23

2014035465

BY NIGHT IN A PILLAR OF FIRE

A Theological Analysis of Renewable Energy

Erin Lothes Biviano

How do the histories of humanity and nature converge?

In an essay titled “The Climate of History: Four Theses,” the historian Dipesh Chakrabarty documents an influential interpretation of the histories of humanity and nature in which these histories were largely viewed as distinct. This influential interpretation originates, perhaps, with a misreading by Benedetto Croce of the historian Giambattista Vico; but it is a famous and powerfully enduring misreading that marked twentieth-century historiography through its impact on R. G. Collingwood, who concluded that “all history properly so called is the history of human affairs.”¹ Human persons remained the classic subject of historical narrative precisely as free agents.²

Against this current, Fernand Braudel, the influential leader of the *Annales* School, insisted on nature’s role in the dynamic unfolding of history, protesting historiographies in which the environment was viewed as merely a stage, a “silent and passive backdrop.”³ In Braudel’s more nuanced historiography, nature plays an active role in human history. In fact, nature’s role was the more powerful. For most of history humanity has endured nature’s power, passively experiencing storms, droughts, and floods, without affecting the earth in turn. Yet even acknowledging that “ships sail on a real sea that changes with the seasons,” Braudel remained within a paradigm that viewed nature as essentially changeless—or changing at rates so slow to be virtually imperceptible.

Now the balance of power between nature and humanity is shifting at an accelerating rate. As Lynn White Jr. famously asserted in 1967, between the invention of agriculture and the “Baconian creed that scientific knowledge means technological power over nature,” humans have exercised increasing power over nature.⁴ And environmental historians such as Alfred Crosby Jr. further demonstrate how natural history and human history converge by exploring the concept of “biological agency.” As biological agents, humanity may slaughter individual animals, alter the landscape via small-scale farming, and even trigger regional collapse.⁵

Lynn White Jr. wrote well before global, anthropogenic climate change was visible on the scientific horizon. And even Crosby’s concept of biological agency, developed as recently as 1995, predates the awareness of humanity’s present global impact. Chakrabarty describes this now ironically innocent awareness as “still a

vision of man ‘as a prisoner of climate,’ as Crosby put it quoting Braudel, and not of man as the maker of it.”⁶ In the first decades of the twenty-first century, it is now quite clear that humanity as “the maker of climate” has taken over nature’s ancient prerogative of setting the rhythms of seedtime and harvest, summer and winter. Humanity’s power over the earth has expanded to the atmosphere itself.

Neither the paradigm of separate natural and human histories nor the paradigm of humanity passively enduring nature’s power can be sustained. Historians join climate scientists and geologists to recognize that humanity has evolved from biological agent to geological force. The narrative of freedom in which humanity first played the prisoner is returning full circle. In the ecological suffering that is and will be caused by climate change, humanity is again the “prisoner of climate.” Under the pressure of the radical new thesis of human geological agency, the narrative of freedom demands revision, and Chakrabarty concludes: the Anthropocene is a critique of freedom.⁷

The Anthropocene: The Colliding History of Nature and Humanity

Scientists and scholars in multiple disciplines agree that natural and human histories *have* converged; indeed, they have collided. Geologists assert that human action is the dominant shaper of the earth system by labeling the industrial era as a new geological era, the Anthropocene.⁸ Climate scientists document the increasing scale and speed of humanity’s impact on earth’s multiple systems, causing increased greenhouse gas concentrations, melting surface ice, and increasing ocean acidification. Ecologists observe deforestation, desertification, and the loss of biodiversity. Political scientists identify the correlation between anthropogenic climate change and major social trends, such as climate refugees, internally displaced persons, mega-urbanization, and political unrest. Competition for contested resources then accelerates ecological exploitation and further alters the earth’s geophysical contours in a vicious cycle.

Today, the risk of a global collapse of stable climate systems is a reality starkly assessed by the Intergovernmental Panel on Climate Change. The Fifth Assessment Report of September 2013 states that “increases in the intensity and/or duration of drought in the twenty-first century are likely, and increased incidence and/or magnitude of extreme high sea level is very likely.” The report concludes that it is “extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century.”⁹

To move forward into a renewed future, a new paradigm of freedom is needed, one that acknowledges the necessary limits of human impact on the earth and the restraint or elimination of technologies that disrupt nature’s ancient patterns. Yet from a theological perspective, this paradigm of freedom with inherent limits is not new. The gift of human freedom is oriented to God’s future, and its authentic exercise cannot contradict God’s will that the gift of freedom be fulfilled in a history

of salvation. What do we find at the convergence of these two paradigms—one pertaining to global climate, one theological? How do we theorize embodied human freedom within twenty-first-century limits?

The crisis of climate change is a critique of modern civilization and reveals the instability of a future civilization built on the apparent freedoms bought by fossil fuel. Yet a theological reading demands a second critique: a critique of the uncounted cost of those freedoms in the injustices absorbed by global civilization.

In what follows, I first retrieve a theological view of the moral dimensions of freedom that honors the limits of the earth, the limits of technology, and the claims of the vulnerable global neighbor. Next, since freedom is always exercised in concrete situations, I discuss the scale of renewable energy needed in a renewed future. The chapter concludes with a scriptural image of hope and transcendence, God in the pillar of fire leading former slaves into a new future.

Karl Rahner writes that God “has willed absolutely and attained the realization of the world’s salvation, not only in the sense that he merely ‘willed’ to offer it to human freedom.”¹⁰ This powerful sign of hope amid the disruption of climate change also challenges humanity to transcend the current course of history with its specific energy technologies and act decisively. That such audacious hope can be realized is evident in the history of empires that have fallen, by the protest and resolve of those who reimagine freedom and creatively reshape history.

Freedom Betrayed: Climate Change and Suffering

The Enlightenment theme of freedom inspired the narratives of Kant and Hegel, of progress and class struggle, abolition, Nazi resistance, decolonization, and civil rights.¹¹ Industrialization itself belongs to this narrative of freedom as a quest for freedom from labor. Global warming is a bitterly unanticipated consequence of fossil-fuel technology, and so is an unwitting betrayal of the industrial age’s desire for legitimate and often lifesaving improvements in lifestyle. Thus the first critique targets freedom as an “Enlightenment theme,” a “blanket category for diverse imaginations of human autonomy and sovereignty” during the modern period. The industrial age has ironically betrayed its own hope for autonomy by creating the instability of climate, and the injustices of global capitalism have betrayed the hope of its underclass for sovereignty.

It must be acknowledged that the exercise of freedom depends on the stability of natural systems, just as culture flourishes during the stability of peacetime. In the Anthropocene, the *nature* of freedom itself (a phrase used advisedly) is called into question. Human civilization has occurred during the stability of nature’s “long summer,” the thousands of years of relatively mild weather that overlap with recorded history.¹² Modern civilization stands on artificial warmth, so to speak: “The mansion of modern freedoms stands on an ever-expanding base of fossil-fuel

use. Most of our freedoms so far have been energy-intensive,” avers Chakrabarty.¹³ The United States Conference of Catholic Bishops concurred as early as 1981 that “cheap oil and natural gas not only powered the dramatic transformation of Western society in the 20th century, they underlie much of the material progress developing countries have made.”¹⁴

Going forward, it is a bitter irony that now fossil fuels, far from establishing freedom, are unraveling the climate stability that has enabled human societies to flourish and within them, the pursuit of individual freedoms. Assertions that fossil-fuel use supports freedom and civilization must also now be revised, and carbon-free technologies sought. But the moral imperative goes beyond re-deploying reason to invent new technologies in a similar global economy. Climate change, which most harshly affects the poor and vulnerable, is a forceful reminder that global capitalism has often betrayed those who labored, or were constrained to labor, without fully participating in capitalism’s benefits. The benefits of capitalism, like the benefits of colonialism, are rarely equitably distributed. These economies were and are powered by slaves, sweatshop labor, and trafficked persons. Freedom in the industrial age meant freedom from toil, to be sure—for some, but not for all. The suffering “resulting from fossil fuel labor via the impacts of global warming mirrors the suffering inherent to human labor, and particularly to historical and contemporary slave labor.”¹⁵ Strikingly, the nexus of ecological exploitation and human trafficking is arguably stronger than ever today.¹⁶

Pope Francis uses the language of ethical limits to challenge unfettered economic freedom: “Just as the commandment ‘Thou shalt not kill’ sets a clear limit in order to safeguard the value of human life, today we also have to say ‘thou shalt not’ to an economy of exclusion and inequality. Such an economy kills.”¹⁷ Likewise, the carbon economy, like other environmental toxins, has a cost in human life borne disproportionately by persons who are economically poor and racially marked.¹⁸ The most vulnerable are at risk, as witnessed in the suffering of those unable to flee from Hurricane Katrina. Their suffering is disregarded by what Patricia Williams has called the “actuarial devaluation of brown bodies.”¹⁹ The poor, the low-lying lands, and future generations are traded for fossil fuel—the contemporary equivalent of a biblical image: sold for a pair of sandals (Amos 8:6).

Climate change will intensify these inequalities as the costs of energy, food, and transport increase. Low-lying lands and nations without recourse to adaptation literally lose ground, and the future becomes saddled with the carbon debt of the present. The ethicist Michael Northcott compares these intensifying inequities to an assault, an invasion of developing nations by fossil-fuel use of the wealthy.²⁰ Yet all will, eventually, be affected. To continue a business-as-usual fossil-fuel-intensive civilization that disrupts the stability on which civilization depends is foolhardy at best; at worst, it is an insanely ecocidal desecration of creation.

Anthropogenic stress on the environment risks elevating the intersection of human and natural history from convergence to collision to collapse. Given that

risk, the point, as Marx said, is not to interpret the world, but to change it. Collapse may be preventable—that is, if great change toward a path of renewable energy is accelerated through recourse to a truly transcendent and authentic freedom that seizes on new choices, partnering with God's grace in the task of co-creation.

Retrieving Theological Insights: The Moral Dimensions of Freedom

An Enlightenment view of freedom may have struck its limits. But a theological view has always understood freedom as a life-giving response to God's invitation to exercise transcendence in the concrete particularities of history. True freedom cannot be reduced to Enlightenment reason, still less to arbitrary choice, but is the creative response to God's invitation to become fully alive. By reconceiving limits as a foundation for freedom, inscribed in a narrative of sustainability, humanity may avoid being the prisoner of climate.

Although "the most common shape that freedom takes in human societies" may be politics, as Chakrabarty states, freedom is also expressed in economic decisions, cultural traditions, and moral choices. Likewise, freedom's limits are evident in each sphere of human activity, including the use of reason for environmental decisions. Environmental decision theory punctures the myth of the rational actor, showing the psychological determinants of economic choices. Social psychology and decision theory identify the influences that drive environmental decisions. Ecological economists question the imperative of growth, blind to physical resource flows and argue for prosperity within limits. Theological and ethical discourse analyzes the limits of cognition and behavior in ways that are not only fallible, but destructive—even sinful.

The moral dimensions of freedom include the material limits proper to creatures, and freedom's orientation to God as proper to a divine gift. Thus a theological analysis of freedom always affirms the material and moral limits of freedom's exercise. Such a reading of freedom has much to offer an analysis of the ecological crisis as the use of energy also has material and moral limits.

Material Limits as Earthly Creatures

Freedom is exercised in concrete, material situations as a moral response to God's invitation to salvation. Karl Rahner asserts, "History is ultimately the history of transcendental itself." This is no idealistic assertion of unfettered reason because transcendence occurs in the world, in particular and historical contexts. God's self-communication is offered as an invitation to human freedom, and that invitation is accepted or rejected "in the concrete, historical corporeality of man and of mankind."²¹ And humanity works out its freedom in relation to the material creation. As the theologian John Zizioulas writes, "The difference between divine and human freedom is that humans are dependent on the material and embodied

order of creation for the constitution as agents." We depend on a right relationship with creation for our redemption and salvation.²²

The contemporary context for exercising human freedom with its transcendence and limitations is climate change. Situating the human exercise of freedom in the context of this reality makes possible a renewed exercise of human freedom, guided by love of the vulnerable neighbor in history. Such love is capable of creative sacrifice for the beloved, discovering a kenotic freedom to change. This necessity, the necessity of exercising freedom in the context of a profound and heartbreaking, even terrifying and paralyzing, reality, is not an inhuman limit on freedom. The demands of the moral limits to freedom are the inescapable conditions of *human* freedom precisely because the human creature is not God.

Moral Limits as Freedom's Divine Orientation

The freedom of finite creatures is offered by the Creator God and must be shaped creatively in a life-giving way. The "spiritual movement of man in his transcendental knowledge and freedom is oriented towards the absolute immediacy of God, towards his absolute closeness."²³ Grace is a divine invitation that communicates God's own desire for a renewed earth. The history of freedom offered by God is oriented toward God and is an invitation not only to a sustainable future, but to an abundant future. In Jesus Christ, that invitation is made concretely again and again as an invitation for all to join an abundant banquet.

God makes space for human freedom by the very gift of creating free persons. Their freedom is enacted through the physical creation, the space of co-creation, a world whose future is not determined. Rahner writes, "Christianity conceives humankind's relationship to God as a reciprocal relationship of freedom, God's freedom and the freedom of humankind."²⁴ This history is "still running its course," and so the freedom of co-creation is an enormous responsibility and a difficult burden.

Thus the Anthropocene does not present a new, shocking ecological limit to freedom. In the light of faith, freedom has always been read as having moral limits that more profoundly express freedom as the invitation given to humanity to love God and the neighbor. It is in fact not freedom that faces limits, but freedom's unruly offspring, technology.

Technology and Its Discontents

Pope Benedict XVI has written that technology "is a profoundly human reality, linked to the autonomy and freedom of man." Thus technology is an invention of reason; it expresses human genius and freedom. Technology is a tool that "reveals man and his aspirations; it expresses an inner tension that impels him gradually to overcome material limitations." Technology is a "manifestation of absolute freedom, the freedom that seeks to prescind from the limits inherent in things." Yet

although Benedict observes that technology enables humanity to transcend material limits, he also insists that, “human freedom is authentic only when it responds to the fascination of technology with decisions that are the fruit of moral responsibility.” Technology must “serve to reinforce the covenant between human beings and the environment, a covenant that should mirror God’s creative love.”²⁵ In the final analysis, freedom cannot in fact prescind from the limits inherent in things precisely because of freedom’s material expression—the moral use of materially expressed freedom must respect material limits.

The tension between technology and moral freedom thus immediately presents itself. Technology offers a way past material limits, while moral freedom must be a way of shaping its proper boundaries. In fact, as the philosopher Hans Jonas writes, responsibility increases in proportion to the impact of modern technological power. Modernity has made the gift of rationality more costly for the environment by orders of magnitude. There is a radical difference between the impact of a plow and the disruption caused by horizontal hydraulic fracturing, shearing underground layers of rock, saturating water tables with chemicals, and releasing toxic methane and benzene. Thus the question of moral responsibility, of heeding the moral limits of technology, becomes always more urgent, if not always answered. As John Paul II wrote in *Redemptor Hominis*, the “ascendancy of technology . . . demands a proportional development of morals and ethics . . . [which] seems unfortunately to be always left behind.”²⁶

The ascendant power of technology to take nature’s common resources must accord with humanity’s moral responsibility to serve the needs of the global community, prudently protect the common good, and respect the limits of the earth. The theological paradigm of freedom explored here requires humanity to accept limits to its technological choices without denying or willfully ignoring technology’s real consequences, and to accelerate progress toward a new global energy system. The transcendence of freedom means precisely that free choices can be changed, when people are open to a conversion to reality and engage their consciences in the specific situation. Our immediate situation is the climate change crisis, and our moral choices must engage energy systems that minimize climate change and reduce greenhouse gas emissions.

Society must now choose realistically to assess and restrict the specific form of technology—fossil-fuel use—that has made so many institutions of advanced civilization seemingly effortless, but endlessly costly to the earth and its vulnerable living communities.

What are the specific, concrete choices for charting a new course in energy?

Correcting the Consequences: Choices in the Energy Mix of the Future

Models of global energy technologies for the twenty-first century predict different energy mixes, using diverse energy sources, deployment scales, speed, and

costs. Scientists agree that a temperature increase above two degrees Celsius will create climate instability, ecosystem degradation, human suffering, and geopolitical strife: conditions that threaten the dignity and well-being of all life. In order to chart a path for achieving deep carbon-dioxide emissions reductions, and to remain below a two-degree Celsius temperature increase, all models agree that in 2100, at least half of all primary energy sources will need to be renewable.

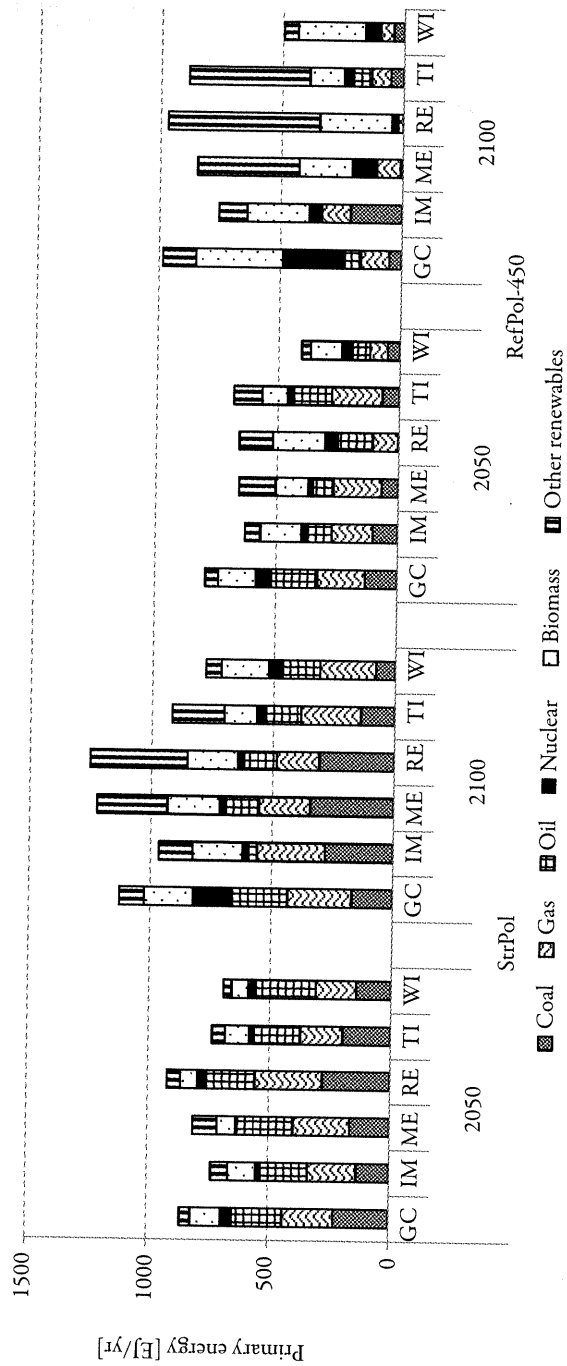
How is this prediction attained? A recent study has examined six models that analyze a mix of global energy technologies that might emerge in the twenty-first century.²⁷ Each model predicts how coal, gas, oil, biomass, solar, wind, and nuclear energy will be used by 2100. These patterns of use are called patterns of technology diffusion, and they represent a potential global energy mix. Each model makes different assumptions about the rate of research, development, and implementation, as well as about land use, resource cost, and scarcity, in addition to assumptions about the modeling simulations themselves. As a result, each model predicts a global energy mix that includes different types of energy, with diverse deployment scales, speed, and costs. But by comparing multiple models, and finding trends within them, the study’s authors reach well-grounded conclusions about the profile of energy use needed in 2100 to maintain a two-degree Celsius temperature increase.

Consider the chart on the next page. On the left, the six models are shown with their predicted energy mixes for 2050 and 2100. On the right, the same six models are shown for 2050 and 2100. The difference between the models on the left and the right is the stringency of environmental regulation assumed. The models on the left (labeled StrPol)²⁸ are “far from ambitious enough to reach a [two degree Celsius] maximum” increase. The models on the right (labeled RefPol)²⁹ simulate reductions in greenhouse gases deep enough to have a 70 percent probability of an increase of at most two degrees Celsius. Thus the models on the right are the only models that represent a viable future with a somewhat stable climate. All these models are based on 50–75 percent renewable energy sources.

The take-away from this complex graph is that if we are to have a 70 percent chance of remaining below a two-degree Celsius temperature increase by 2100, then by that time the global energy supply must use 50–75 percent renewable energy. All models expect fossil fuels plus nuclear energy to account for 25–50 percent of energy supply. Many of the models also depend on carbon capture and sequestration. This cross-analysis of technology models raises three important questions:

1. How will global society concretely achieve 50 percent renewable energy by 2100?
2. Will international governance mechanisms act strongly and in time to require and invest in renewable energy?
3. Will carbon capture and sequestration work?

Let us take them in reverse order.



Global primary energy use in 2050 and 2100 in scenarios StrPol and RefPol-450. Bob van der Zwaan et al., "A Cross-Model Comparison of Global Long-Term Technology Diffusion under a 2° C Climate Change Control Target," *Climate Change Economics* (2014).

Regarding the third question, assumptions about carbon capture and sequestration are deeply embedded in the models' calculations. If these assumptions fail, even more renewable energy will be needed. Additionally, critics of nuclear energy must acknowledge that without the contribution of nuclear energy, even more renewable energy will be needed.

Regarding the second question, if all nations do not cooperate in their commitments, those who seek to be the light forward into a new future—in our case, especially faith communities—must sponsor even more renewable energy. Can faith communities trust in the self-interest of competitive nations? Ban Ki-moon, the chief representative of the collective body of nations, the United Nations, does not express hope for this outcome.

Regarding the first question, a now-classic article published in 2004 by Stephen Pacala and Robert Socolow demonstrates that we have the needed technologies now.³⁰ It is time to use the currently available technology to leave the wasteland of an energy regime that undermines society's well-being.

Human actions have consequences. This is both a climatic reality and a theological datum. Indeed, Rahner acknowledges that "God . . . burdens man with the grace and the responsibility for his own accountable acts."³¹ That burden lies heavy on the decision makers of this generation. Change will be difficult. Making the transition to renewable energy may even seem like a Galilean journey.³² Rapidly transitioning to renewable energy means accepting the Galilean journey of suffering, struggling to change accepted and comfortable habits, making a sacrificial redirecting of resources, and confronting entrenched power—literally, the energy and power systems. The Galilean journey means change, uncertainty, lost income, investment portfolios in upheaval, conflicts with supervisors about commuting, changes in diets and traditional meals, shifting to efficiency and conservation from the habits of unthinking consumption. Yet the cross of this journey cannot be denied. It can only be deferred. The Galilean journey will be taken up by this generation or laid on the next, the Simon of Cyrenes of climate change.

As the climate ethicist Michael Northcott writes, the true power of the powerless is truth itself, and not simply effectiveness. Authenticity lies in part in "living true to the character of creation by bringing human making back into service of God's creation, and of local ecological and human communities." To cry out for authentic witness to the truth is not to abandon a claim for concrete agency that insists on change in the systems of political and economic power. Indeed, it is a necessary condition for it. For these reasons, Northcott calls for "proper accounting and confession" of the connection between global warming, modern imperialism, and neoliberal global capitalism.³³ This confession can be made by every modern first-world consumer. The powerless may be the first to protest, since they exist outside of the system of benefits linked to entrenched power and privilege. Good news can be seen: Their voices are already heard more loudly in corporate boardrooms, advocating for a sustainable future, from global activism efforts such as 350.org and fossil-fuel divestment campaigns in corporate governance and university contexts.³⁴

Still, what can Christians hope for in an era of anthropogenic climate change? Theologically, as Pope Francis has said, hope is of God, and “God does not mislead hope.”³⁵ St. Paul called for faith and hope to be fulfilled in love (1 Corinthians). Hope enables the struggle to continue in face of the overwhelming obstacles involved in transforming the global power system. Faith recalls the unimaginable liberating power of God recorded in the Exodus story, and sees that alongside the possibility of climate-induced disaster, there is also the possibility of an alternate future yet unseen. Faith is the evidence of things hoped for, writes the author of the Letter to the Hebrews. And love of God’s earth and love for the global neighbor fuels the will, renewing the energy to struggle through the transitional desert toward a renewed energy economy.

Other theologians urge hope as well. Jürgen Moltmann points to God’s ongoing creativity as a grace that approaches us as the incoming future. Karl Rahner identifies grace as the troubling awareness of a larger horizon beyond our comfortable, small island of knowledge, as the gift of questioning.³⁶ In this perspective, it may even be considered a grace to be troubled by the specter of climate instability, a grace to question the myths of affluenza. It is a grace to accept the responsibility invited by the question, to act decisively. This invitation is issued today by the negative contrast of global ecological suffering. Grace experiences the love of God poured out in our hearts, the presence of the Holy Spirit sharing her renewing love of all creation, inviting us to allow the earth to find favor with us.

Choosing a New Future: The Charge to Faith Communities

Faith communities are then obliged in conscience to seek ways forward out of concern for creation and the most vulnerable. What must be done?

Catholic magisterial teaching insists on humanity’s responsibility to protect life and to care for creation.³⁷ The 1981 Statement by the Committee on Social Justice and World Peace of the United States Catholic Bishops, “Reflections on the Energy Crisis,” offers principles for assessing energy choices. This document emphasizes finding energy solutions that are affordable for the poor, provide energy security, protect life, do not exploit the earth, finding the blessing of life beyond possessions, just economic distribution of benefits of energy, awareness of racial and global inequalities, and participation in decision making. Most significantly, the bishops call for the freedom to change our lifestyles. Energy savings, efficiency, and lifestyle changes are critical pathways to sustainability.³⁸

Christian communities at many levels should respond diligently to the challenge of transitioning to a just, sustainable energy system, and advocating for the greater well-being offered by nonpolluting and sustainable systems. Catholics can act through their parishes through conservation and advocacy, in schools teaching about science and morality, in universities advancing the ethical and practical

debates, in seminaries preparing social justice leaders, and in all Catholic organizations and interfaith coalitions.³⁹

Recognizing the needed scale of change discussed above, faith communities should therefore choose institutional practices and prophetic education that leads society toward at least 50 percent renewable energy usage. Advocacy and systemic change are necessary parts of this work.

For example, the United States Catholic Bishops instruct Christians to work for the just distribution of energy and fair prices, and the transparent communication of energy sources and risks. Christians will “not only offer a neighborly hand to distressed individuals . . . they will back public energy assistance for all low-income people offered in a spirit of respect for the recipients’ dignity.”⁴⁰ Recognizing that the concentration of economic power in massive corporations risks granting such corporations undue political power and abuse, the bishops emphasize prudent prevention of the abuse of power through regulation and citizen participation. Such citizen intervention might take the form of “orderly protests to testimony at public hearing to consumer representation of corporate boards,” as well as political advocacy for legislation.⁴¹

Fossil-fuel divestments—as well as leveraging positive investment—are critical options for Christians who find themselves shareholders and investors in large corporations. Indeed, investment in renewable energy is absolutely essential to reach the goals described above. Benedict XVI has already urged this transition to renewable energy.⁴² The critical need to intensify investments that will deploy renewable energy at a massive scale cannot be emphasized enough. It is very likely that even more renewable energy is needed sooner than that.⁴³

The Kenosis of Freedom

Faith communities must be a light dispelling the myth of carbon-based progress and integrate into their moral teaching the difference between livelihood necessity and luxury emissions. This is neither a call to asceticism nor to “shiver in the dark,” but a faith invitation to reimagine the implications of authentic Christian freedom for energy decisions.⁴⁴

Because fossil fuels ground many of society’s current desires and visions of the good life, confronting the climate crisis and exercising freedom in light of its reality will mean individual, cultural, and global kenosis, a reimagining of freedom and the good life. The confrontation with freedom’s ecological limits imposed by the climate crisis demands a reconfiguration of human consumption, a reconfiguration of global energy, but it is not a new vision of freedom as the always expressive, always kenotic, and creative enacting of one’s life decisions within the limitations of one’s concrete situation. Climate change invites the kenosis of freedom, a creative self-limiting of freedom that leads to renewal, even to Resurrection.

Following a Pillar of Fire

Making changes in institutional investments and communicating the urgency of change in wider society against the current energy regime are great challenges requiring enormous will. But history shows that regimes have fallen: Empires have fallen due to the unimaginable power of the powerless. In modern times, liberation has occurred in South Africa, in India, at the Berlin Wall, and during the abolition and Civil Rights movements. Although the full promise of liberation is still striving for fulfillment, history can point to times when a way has been made where there is no way.⁴⁵ Civil society can respond to changing paradigms of the person, the human species, biotic communities, human rights, market justice, and ecological limits, and it can confront existing patterns of governance and capital.

The stories and metaphors from Scripture can serve as succor for upsurges of collective cries for freedom. The Exodus is the paradigmatic story of the powerless whom God liberated from their crushing labor. In the present day, too, faith communities must move out of this desert waste, not looking back to the ways of the past, “the fleshpots of Egypt.” Old ways, the old gods of outdated views of progress, must be renounced. Like the biblical Exodus, this is an uncharted and frightening journey into a new land, demanding openness to forms of life. The current fossil-fuel regime does not offer a viable future. It is an oppressive regime, and like the Israelites escaping their oppression, we must find a path forward through an uncertain landscape. The image of the pillar of light leading the people out of the wasteland testifies to God’s will for a renewed future. As Rahner suggests: “God has offered this history as not merely a *possibility* of salvation but rather that God has through himself transformed this possibility of salvation into reality—and this in an irrevocable way.”⁴⁶ Christians may look with the audacity of hope on a renewed future as an invitation from God, who leads as if by a pillar of fire.

God’s creative will invites freedom to new choices. Sir John Houghton, the former chair of the Intergovernmental Panel on Climate Change, casts this choice as a way to “to chart a path for the future that quietly, radically and effectively will not only save us from the worst ravages of anthropogenic climate change but also bring about change toward a more sustainable, fairer, safer and happier world.”⁴⁷ In theological perspective, God, as the “inmost dynamism and definitive goal offered and communicated . . . to the world,” invites humanity to continue the forward journey of history, transcending the strictures of the past.⁴⁸ Faith communities and all people of goodwill can answer the scriptural invitation spoken by Moses to “choose life” and to chart a course toward a renewable, sustainable future.

Notes

1. Dipesh Chakrabarty, “The Climate of History: Four Theses,” *Critical Inquiry* 35, no. 2 (2009): 203. Contemporary corrections to that misreading include Thomas Berry’s interpretation of Vico, which interprets the successive ages of human history as defined by

distinctive types of consciousness, including the overly rational consciousness of the Enlightenment and contemporary ecological consciousness. Mary Evelyn Tucker, “Thomas Berry: A Brief Biography,” *Religion and Intellectual Life* 5, no. 4 (1988): 109–10.

2. For the distinguished pedigree of natural history as distinct from human affairs, from Aristotle through the English parson-naturalists, see Donald Worster, *Nature’s Economy: The Roots of Ecology* (San Francisco: Sierra Club Books, 1977).

3. Chakrabarty, “Climate of History,” 204.

4. Lynn White Jr., “The Historical Roots of Our Ecologic Crisis,” *Science* 155 (1967): 1203.

5. The devastation of societies as they overexploited their natural resources is documented in Jared Diamond, *Collapse: How Societies Choose to Fail or Succeed* (New York: Penguin, 2005). New interdisciplinary research further demonstrates the intersection of natural and human histories in events such as the Irish potato famine, the American Dust Bowl, the Darfur crises, and the Arab spring. Social upheaval can be plotted against changes in precipitation, agricultural yields, and other (formerly) natural conditions. Natural crises also lead to political, social, and theological crises, as the Lisbon Earthquake and the Black Death were watersheds in the history of European doubt. See Martin Stuber, “Divine Punishment or Object of Research? The Resonance of Earthquakes, Floods, Epidemics and Famine in the Correspondence Network of Albrecht Von Haller,” *Environment and History* 9, no. 2 (2003): 171–93.

6. Chakrabarty, “Climate of History,” 206.

7. Ibid. Chakrabarty also analyzes the limits of freedom through critiques of capitalist globalization. Although beyond the scope of this essay, for an excellent discussion of the limits of capitalism and earth’s resources, see Tim Jackson, *Prosperity without Growth?* (London: Sustainable Development Commission, 2009).

8. Paul J. Crutzen, “Geology of Mankind,” *Nature* 415 (2002): 23.

9. Working Group I Contribution to the Fifth Assessment Report, *Climate Change 2013: The Physical Science Basis* (Intergovernmental Panel on Climate Change, 2013), <http://www.ipcc.ch>.

10. Karl Rahner, “The Specific Character of the Christian Concept of God,” in *Theological Investigations: Science and Christian Faith* (New York: Crossroad, 1988), 193.

11. Chakrabarty, “Climate of History,” 208.

12. Tim Flannery, *The Weather Makers: How Man Is Changing the Climate and What It Means for Life on Earth* (New York: Grove Press, 2006), 63.

13. Chakrabarty, “Climate of History,” 208.

14. United States Conference of Catholic Bishops, Committee on Social Development and World Peace, *Reflections on the Energy Crisis: A Statement by the Committee on Social Development and World Peace* (Washington, DC: United States Catholic Conference, 1981), “Introduction.”

15. Joshua P. Howe, “History and Climate: A Road Map to Humanistic Scholarship on Climate Change,” *Climatic Change* 105 (2011): 360.

16. See Kevin Bales, “The Deadly Link between Slavery and Environmental Destruction,” in *Center for the Study of Science and Religion Seminar* (New York: Columbia University, 2012).

17. Francis, “Apostolic Exhortation *Evangelii Gaudium*” (2013), <http://www.vatican.va>.

18. Robert D. Bullard, Paul Mohai, Robin Saha, and Beverly Wright, *Toxic Wastes and Race at Twenty, 1987–2007: Grassroots Struggles to Dismantle Environmental Racism*

in the United States: A Report Prepared for the United Church of Christ Justice and Witness Ministries (Cleveland, OH: United Church of Christ, 2007).

19. Patricia Williams, "Looking for Lyricism: Black Maternity in an Unforgiving Land," in *Columbia University Seminar on Memory and Slavery* (New York: Columbia University, 2013). See also M. Shawn Copeland, *Enfleshing Freedom: Body, Race, and Being* (Minneapolis: Fortress Press, 2010).

20. Michael S. Northcott, *A Moral Climate: The Ethics of Global Warming* (Maryknoll, NY: Orbis Books, 2007), 59.

21. Karl Rahner, *Foundations of Christian Faith: An Introduction to the Idea of Christianity*, trans. William V. Dych (New York: Crossroad, 1976), 143.

22. John Zizioulas, "Proprietors or Priests of Creation?" in *Fifth Symposium of Religion, Science, and the Environment* (Vancouver: Regent College, 2003).

23. Rahner, *Foundations of Christian Faith*, 148.

24. Rahner, "Specific Character of the Christian Concept of God," 191.

25. Benedict XVI, *Caritas in Veritate* (2009), <http://www.vatican.va>, no. 69.

26. John Paul II, *Redemptor Hominis* (1979), <http://www.vatican.va>, no. 15.

27. Bob van der Zwaan, Hilke Rösler, Tom Kober, Tino Aboumahboub, Katherine Calvin, David Gernaat, Giacomo Marangoni, and David McCollum, "A Cross-Model Comparison of Global Long-Term Technology Diffusion under a 2° C Climate Change Control Target," *Climate Change Economics* (2014).

28. StrPol is the abbreviation for Stringent regional climate policies with enhanced Copenhagen Accord ("plus") pledges during the twenty-first century.

29. RefPol-450 is the abbreviation for Reference regional climate policies (Copenhagen pledges) until 2020 and global coordinated action to 2.8 W/m² from 2020.

30. Robert H. Socolow and Stephen Pacala, "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies," *Science* 305, no. 5686 (2004): 968–72.

31. Rahner, *Foundations of Christian Faith*, 142.

32. Virgilio Elizondo, *Galilean Journey: The Mexican-American Promise* (Maryknoll, NY: Orbis Books, 1983).

33. Northcott, *A Moral Climate*.

34. Randall Smith, "A New Divestment Focus: Fossil Fuels," *New York Times*, September 5, 2013.

35. Antonio Spadaro, SJ, "A Big Heart Open to God," *America Magazine* 209, no. 8 (2013).

36. Jürgen Moltmann, *God in Creation: A New Theology of Creation and the Spirit of God*, trans. Margaret Kohl (Minneapolis: Fortress Press, 1985); Karl Rahner, "The Concept of Mystery in Catholic Theology," in *Theological Investigations*, vol. 4, trans. Kevin Smith (Baltimore: Helicon Press, 1966), 36–73.

37. Marjorie Keenan, *From Stockholm to Johannesburg: An Historical Overview of the Concern of the Holy See for the Environment, 1972–2002* (Vatican City: Pontifical Council for Justice and Peace, 2002).

38. Hannah Choi Granade, Jon Creyts, Anton Derkach, Philip Farese, Scott Nyquist, and Ken Ostrowski, *Unlocking Energy Efficiency in the U.S. Economy* (Milton, VT: McKinsey, 2009).

39. United States Conference of Catholic Bishops, *Reflections on the Energy Crisis*, V, "Conclusion."

40. Ibid., IV, "The Distribution of Energy."

41. Ibid., IV, "The Control of Energy."

42. Benedict XVI, "Address to the Diplomatic Corps" (2010), <http://www.vatican.va>.

43. The physicist Michael Oppenheimer notes that the effectiveness of carbon capture and sequestration is not currently known; furthermore, society needs intensified levels of renewable energy long before 2100. Personal communication.

44. Northcott, *Moral Climate*, 78. See also David Cloutier, "American Lifestyles and Structures of Sin: The Practical Implications of Pope Benedict XVI's Ecological Vision for the American Church," in *Environmental Justice and Climate Change*, ed. Jame Schaefer and Tobias Winright (New York: Lexington Books, 2013).

45. Delores S. Williams, *Sisters in the Wilderness: The Challenge of Womanist God-Talk* (Maryknoll, NY: Orbis Books, 1993).

46. Rahner, "Specific Character of the Christian Concept of God," 193.

47. John Houghton, Foreword to Michael S. Northcott, *A Moral Climate: The Ethics of Global Warming* (Maryknoll, NY: Orbis Books, 2007), ix.

48. Rahner, "Specific Character of the Christian Concept of God," 195.