

Faithful Alternatives for Engagement with Climate Change: A Consultation Document

This Consultation Document is a report from a Synod of the Sun *ad hoc* community of interest convened to assess the issues surrounding climate change and the Divestment overture, and to identify alternatives that the church should consider. Participants in this community of interest are:

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I. Introduction

Greenhouse gas emissions are a serious issue and the church is called to a faithful response. Greenhouse gas emissions, primarily arising from human behaviors, have the potential to cause adverse changes in the future global climate. Changing the historical trajectory requires changes in human behavior – our behavior, both corporate and individual. Addressing adverse climate change is a moral imperative, but how should we proceed? Divestment from fossil fuel companies has been proposed as a solution. Is divestment from an industry whose products we actively consume an appropriate, faithful response? Are there more faithful ways to address climate change while also encouraging economic development that benefits the poor?

Reliable, affordable energy enables our advanced society. It sustains our way of life, allowing us to clothe and feed ourselves. This complicates the task of achieving sizable reductions in greenhouse gas emissions. Forcing reduction of fossil fuel use without providing adequate, affordable alternatives would punish economies globally, and this punishment would be felt most severely among “the least of these.” Faithful action must not only address potential climate change, but also facilitate a just, stable and improving quality of life for those most vulnerable.

In this Consultation document, we say very little about the underlying science. The science is important, but, given the abundance of information elsewhere about the science, we believe our role is to focus on the discussion of solutions. From our perspective, the essential conclusion from the science is that there is a problem that calls for a faithful solution. We believe we are called to action.

The purpose of this Consultation document is to advance the discussion within PC(USA) of the alternatives available. We begin, as we ought, with a discussion of the theological foundations that should guide our decisions: How do we know that a response is a faithful response? Working from that theological framework, we describe alternatives that we are aware of, and we discuss an assessment of each alternative according to the criteria from our theological framework. Finally, we discuss a path forward for action at the 222nd General Assembly (2016). We who have prepared this report wish to emphasize our personal commitment to remaining engaged in this discussion both within the church and in society more broadly. We believe that it is vitally important for people of good faith to remain “at the table” for debate about complex issues, even if – perhaps especially if – those discussions become contentious. In addition to this Consultation document, we will be convening one or more symposia to discuss these issues. These symposia will provide us an opportunity to explain our thoughts and concerns more fully than we can in this document, and will provide all who are concerned with these issues an opportunity for discussion outside the parliamentary framework of yes/no votes. It is our hope that this Consultation document and those symposia will contribute to a richer, more informed discussion at General Assembly; to a wiser, more faithful decision by our denomination; and to prompt realization of real changes in human behavior adequate to address the problem.

II. Theological and Ethical Foundations

Presbyterians have been seeking faithful responses to environmental concerns for more than 40 years. In 1990, PC(USA) produced an eco-justice policy paper “*Restoring Creation for Ecology and Justice*” (“RCEJ”).¹ The study paper holds together two fundamental commitments: (1) to care for creation as a good in itself, and (2) to use creation responsibly as an act of economic justice for the community. These themes were reinforced in the 2008 report “*The Power to Change: U.S. Energy Policy and Global Warming*.”²

This emphasis on both ecology and justice is implicit in the story of creation itself: “The Lord God took the man and put him in the garden of Eden to *till it and keep it*” (Gen. 2:15, emphasis added). As the 1990 study observes, “tilling” requires a community effort that establishes an economy; “keeping” is an act of environmental stewardship that regards the creation as a gift to be cared for. RCEJ identifies four norms that characterize “a new faithfulness” reflecting God’s love for the world: sustainability, participation, sufficiency, and solidarity.³ These highlight the inherent tensions. We cannot address only the good of the creation without also considering the good of the community. We cannot address only the good of the community without considering the good of creation. Global climate change, regardless of its cause, threatens both the community and the earth over which we are stewards. Our call is to address these threats responsibly, with meaningful effect, while promoting economic justice.

A. Global economic justice

Elimination of fossil fuels poses problems for international economic justice. It is essential that greenhouse gas emissions be limited to a rate and an overall amount below what the environment can naturally remove. And the gross inequality in global economic development can only be addressed if developing economies have access to cost-effective energy. Given current technologies and market structures, there is no energy source more cost-effective than fossil fuels. Radical restrictions on their production will perpetuate global economic disparities. While access to affordable energy is certainly not the entire solution, the pervasiveness of global poverty demands an equality of opportunity that, given current technology and markets, artificial restriction of fossil fuels would deny.⁴

¹ https://www.presbyterianmission.org/site_media/media/uploads/environment/pdf/restoring-creation-for-ecology&justice.pdf

² http://www.pcusa.org/site_media/media/uploads/acswp/pdf/energyreport.pdf

³ *Sustainability* means “the ongoing capacity of natural and social systems to thrive together—which requires human beings to practice wise, humble, responsible stewardship, after the model of servanthood that we have in Jesus. *Participation* refers to the inclusion of all members of the human family in obtaining and enjoying the Creator’s gifts for sustenance. *Sufficiency* provides for all to have enough through equitable sharing and organized efforts to achieve that end. *Solidarity* means “steadfastness in standing with companions, victims, and allies... to the realization of the church’s potential as a community of support for adventurous faithfulness.”

⁴ Rational pricing of carbon emissions, as discussed below in section III.B, would accelerate the transition to a world in which fossil fuels are no longer the most cost effective, reliably available energy source. In that day, this conflict between the two goals will no longer exist. But that day is not yet.

RCEJ sees the global inequality between rich and poor as a sign of our failure “to till and to keep.” This prompts the question of how to achieve a more equitable global economy while responsibly using the gifts of creation. It is not reasonable to suppose that the *developed* world will surrender its standard of living and the benefits it has accrued. Neither is it reasonable to expect the *developing* world, which has witnessed the disparity in economic power (and its attendant benefits), simply to forgo efforts to attain economic parity, and accept a permanent underclass status in the global community. The RCEJ paper notes the connection between fossil fuel use and economic development, at least until cost-effective renewable energy resources can be developed on a global scale. This disparity has been taken into account in subsequent international accords such as the 1997 Kyoto Protocols. The twin goals of economic justice and global stewardship require reduction in greenhouse emissions within a framework that minimizes negative economic impact, especially on the global poor.

B. The Ethics of divestment

Jesus taught that great possessions convey great responsibility. In the Gospel of Luke, the examples of the Rich Ruler and Zacchaeus (18:18-30; 19:1-10) show different responses to the obligations of wealth. In managing its corporate assets, the Presbyterian Church has recognized a dual obligation to invest in a morally responsible manner and to use its influence for the transformation of society (including its economic institutions) to become more just, humane, and environmentally responsible.

The criteria for the just investment of resources were addressed by the General Assembly in the 1984 policy, “The Divestment Strategy: Principles and Criteria” (*Minutes*, 1984, 193-207. See Appendix A). The policy is clear that we Reformed Christians ordinarily follow an ethic of responsibility as opposed to an ethic of purity (which would be more characteristic of the Holiness and Anabaptist traditions), and that divestment, where necessary, is the final step in a process that has emphasized engagement and consultation as preceding steps.

Perfection and separation are not ultimate. They must be held in tension with faithfulness and effectiveness, which may involve compromise to gain some important proximate goal. Thus, Reformed churches have sought to be in the world, not withdrawn from it; to serve the perfect-purpose of God in less than perfect structures in order to change them, not to live apart in communities of holiness. The church as a community seeks engagement, not isolation.⁵

Only when the church has made every effort to fulfill its call to holiness through responsible efforts at transformation, when it is prepared to respond pastorally to those economically affected by divestment, and when it is acting in concert with other Christian bodies should withdrawal from engagement be considered as an ethical option.

⁵ *Minutes*, 1984, p. 201.

C. The Consistency of our witness

The social witness of the church demands that our actions be consistent with our values. We are charged to consider not only the ideological purity of our response, but also its practical effect. If we decry the production and use of fossil fuels, then our actions must be consistent. If we decry the production, should we not also decry the consumption – including our own? If we choose divestment, should we not also abstain from fossil fuel products? But fossil fuels are employed in every field of human endeavor. The enormous range of hydrocarbon-based products staggers the mind. Computers, medical prostheses, even mass alternative energy technology would not be possible without hydrocarbon-based plastics and resins. The expansion of agricultural production is in part attributable to hydrocarbon-dependent processes for the production of fertilizers and pesticides. The economic development of emerging economies is tied closely to efficient, cost-effective, and readily available personal and commercial transportation. Every member of the PC(USA) uses fossil fuels every day in hundreds of applications that significantly improve quality of life. If we commit to divestment, then we should assure that those less fortunate, who do not have ready access to replacements for fossil fuels in all their applications, continue to have reliable and affordable access, even while we act consistently with that commitment by moving toward abstention from fossil fuels.

D. Faithful alternatives

If divestment is not a faithful, effective, and just response to climate change, what is? How can we assess the faithfulness of alternatives? The balance of this paper addresses these questions. In considering what constitutes a faithful response, the church should keep in mind:

- Does it address the problem (rather than simply make a judgment)?
- Does it advance economic justice (both globally and domestically)?
- Will it have a practical effect?
- Does it propose behavior we are willing to adopt ourselves?

Summary

We Presbyterians approach creation with the twin perspectives of responsible use (“tilling”) and sustainable care (“keeping”). An ethic of stewardship therefore must consider creation both as a good in itself and as a resource for economic justice. The responsibility of holding wealth is directed toward an ethic of engagement that seeks to use the wealth to transform injustice and immorality, rather than an ethic of purity that shuns such engagement. By General Assembly action, divestment should only be considered after long-term efforts at transformation have failed. Faithful witness requires our behaviors to be consistent with our values and statements; thus a statement of divestment from fossil fuel should be accompanied by behaviors of moving toward abstention from fossil fuels.

III. Alternatives for Engagement with Climate Change

A. Divestment

The 221st General Assembly (2014), in response to an overture from the Presbytery of Boston *et al*, referred to MRTI a proposal that the General Assembly declare our intention to categorically divest from fossil fuels within five years. This divestment proposal arises from a deep-seated concern about the effect of greenhouse gas emissions on climate change, and the effect of climate change on all God’s creation. We wish to express our gratitude to the overture proponents for catalyzing action on this issue. Our focus has been to identify faithful alternatives to the divestment proposal, and to assess the divestment proposal and these alternatives with respect to the dual criteria of (i) economic development and justice for all people and (ii) faithful and responsible stewardship of God’s creation. This section of the Consultation provides a brief summary of the rationale for the divestment proposal and our assessment of that proposal.

The proposal calls for divestment from fossil fuel companies, specifically, from approximately 200 publicly traded coal and petroleum firms.⁶ (This includes the major Organization for Economic Cooperation and Development oil companies, but notably does not include the national oil companies of the various oil-producing governments although these national oil companies hold the vast majority of global reserves). The overture Rationale states in part⁷:

Purpose

The realities of climate change require prophetic and strategic action by people of faith seeking to be faithful to the everlasting covenant God has made with us, with every living creature, and with all future generations. ...

Biblical and Theological Rationale

The actions this resolution recommends are rooted in an expression of several of the most foundational theological and biblical principles of our Presbyterian identity. In Genesis 9, God makes a covenant not only with Noah, but with all of humanity; a covenant not only with all of humanity, but with every living creature; a covenant not only with all creatures alive today, but with all future generations. ...

In Matthew 25: 31–46 Jesus calls us to care for the “least of these.” ...

Because we are a covenant people and affirm Jesus’ call in Scripture to love our neighbors as ourselves, we recognize our obligation as people of faith to take into account how our decisions and activities affect all of creation now and into the future.

⁶ <http://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf> at pages 13-14. Last visited April 24, 2015.

⁷ The overture, including the full Rationale, and the action by General Assembly may be found at [http://pc-biz.org/PC-Biz.WebApp_deploy/\(S\(5u5o3nucdsz5ed2fjws3idn3\)\)/Explorer.aspx?id=4587](http://pc-biz.org/PC-Biz.WebApp_deploy/(S(5u5o3nucdsz5ed2fjws3idn3))/Explorer.aspx?id=4587), last visited June 30, 2015.

We are in substantial agreement with many aspects of this Rationale, and we believe this Rationale is closely consistent with the second of our two criteria for faithful alternatives – faithful and responsible stewardship of God’s creation. However, in assessing the divestment proposal against both of our criteria, we believe the proposal falls short.

First, the divestment proposal fails to consider the importance of economic development. Our first criterion of economic justice seems to have no analog in the divestment Rationale. That Rationale fails to recognize the importance of low-cost energy for economic development, and the divestment proposal – if it were effective in achieving its aims – would likely condemn to eternal poverty those poor who need access to low-cost energy to emerge from poverty.

Second, we believe the divestment proposal is highly unlikely to achieve its aims. We see no causal connection between the concern expressed – climate change – and the action proposed – sell certain stock investments. The contribution we as individuals and institutions make to the emission of greenhouse gases is the result of the consumption decisions we make, not the investments we own. Therefore, actions that alter investment portfolios but leave our consumption decisions unchanged should not be expected to change our contribution to greenhouse gas emissions. To be effective, a proposal must lead to changes in our behaviors.

Third, we are concerned that to divest is to abandon the field and thus to abrogate our duty to engage with political and corporate powers to find effective solutions to this problem. We cannot be part of the solution if we are not at the table.

In summary, we believe the church needs faithful alternatives to the divestment proposal because (i) divestment fails to recognize the continuing importance of economic development for the relief of poverty and the significant role low energy costs play in economic development and (ii) divestment is unlikely to achieve the result for which it aims because there is no causal link between the proposed action and that target. We believe the alternatives discussed below provide a more faithful response.

B. Motivating consumption and investment changes

As indicated in our review of Theological Foundations, an essential element of a faithful response is its potential to change human behaviors, because only by changing human behaviors, both corporate and individual, can we change the path of greenhouse gas emissions over the next 50 to 100 years. We need to change both how we consume energy, especially how we consume hydrocarbons, and how we invest in future energy sources, especially how we invest in carbon-free alternatives. In our economic system, our consumption and investment decisions are driven by prices. This works well when the price we pay fully reflects all the benefits and cost associated with the consumption or investment. If there are costs that are not reflected in the price but that do affect society in total, the market system doesn’t work properly. This problem is referred to as a “negative externality,” which simply means that our behavior imposes costs on society as a whole that are not reflected in the price we use to make our decisions.

Our consumption of hydrocarbons is increasing atmospheric greenhouse gases. However, in our market structure – the market structure that we applaud for its potential to provide wide-spread economic sufficiency – this contribution to greenhouse gases and associated problems is not reflected in the price charged for energy: there is a negative externality. Since the price we pay directly is too low (because it omits these broader social costs), we consume too much. If the price were to increase to include the full social cost, our consumption would go down, and our contribution to greenhouse gas emissions would go down. Similarly, if the price for energy from a particular source reflects the full social costs, investment incentives are reduced for high-emission sources of energy, and increased for low-emission or zero-emission sources. Getting the price right would lead us to shift investment away from hydrocarbons and toward low-carbon alternatives.⁸ (Section III.D below describes some of these alternatives.)

The simplest way to get the price right is to tax all sources of these emissions at a rate equal to the social cost of these emissions that is not captured in the price currently.⁹ Whatever mechanism may be chosen, and at whatever price, we note with urgency that this mechanism is inherently regressive, imposing hardship disproportionately upon the poor. We believe that such an inherently regressive measure is inherently unjust; it must therefore be accompanied by a mechanism to redress the regressive effect. One mechanism to achieve such correction would be to assure that the pricing mechanism is revenue neutral by rebating all funds collected through the mechanism in equal *per capita* shares to everyone.¹⁰

If a simple *per capita* rebate is deemed insufficient to offset the regressive nature of this tax or fee, there are additional steps that can be implemented. Perhaps the simplest additional mechanism would be to deem the rebate to be taxable as ordinary income, and then scale-up the rebate to reflect the collection of income tax revenues. This would allow the progressive nature of ordinary income tax rates to offset the regressive effect of the greenhouse gas tax.

No one should invest in fossil fuel companies who doesn't wish to, but there is not a compelling moral imperative to refrain from such investment. Access to energy is necessary for human survival, and affordable energy is a driver of human economic advancement. Affordable energy is a source of net public good, and with current technologies hydrocarbons are the least expensive widely available source of energy. However, to the extent there is a negative externality, we have overstated this net contribution to the social good. Getting the carbon price

⁸ A similar argument is made in *The Power to Change: U.S. Energy Policy and Global Warming* and in *Hope for a Global Future: Toward Just and Sustainable Human Development*; approved by the 208th General Assembly (1996) PC(USA). These are available at: http://www.pcusa.org/site_media/media/uploads/acswp/pdf/energyreport.pdf and http://www.pcusa.org/site_media/media/uploads/acswp/pdf/hope-for-a-global-future.pdf, respectively.

⁹ A good summary of carbon tax issues may be found at <http://www.carbontax.org/>. A “cap and trade” system is an alternative that, if implemented properly, can have many of the market benefits of a carbon tax. A carbon tax is simpler, and less prone to government manipulation. Regulations can change behaviors without reliance on market mechanisms, but regulations are likely to have unintended consequences and are expensive to administer.

¹⁰ The Citizens Climate Lobby, <https://citizensclimatelobby.org/>, has defined and is actively promoting a “fee and dividend” system along these lines. This proposal is summarized in Appendix B.

right will address not only the economic problem of the over-consumption of hydrocarbons and under-investment in alternatives, but also the moral problem of knowing whether our consumption and investment behavior contributes to or detracts from the public good.

There are many details that must be addressed to implement a carbon tax proposal, including the size of the tax or fee (which should reflect the full social cost that is not captured in the private price).¹¹ It is also necessary to consider how the mechanism in one country interacts with the approaches taken – or not taken – by other countries. Ideally, all the major economies would implement consistent approaches simultaneously. In the absence of such an ideal case, a carbon tax system should also have a provision for border adjustments – adding taxes to greenhouse gas-intensive imports from countries with systems that do not reflect the full social cost; rebating taxes for exports to countries without such a compatible system.¹²

The current low cost of hydrocarbons in the US provides the perfect opportunity to implement a tax and rebate system with minimal adverse effect. Industries from energy to airlines to banking to high tech already have a significant price of carbon included in their plans. Many segments of the oil industry including Chevron, ConocoPhillips, ExxonMobil, and Shell support a price on carbon as the best way to reduce our greenhouse gas emissions.

There are several specific steps that PC(USA) can and should take to support pricing carbon:

1. Education – Facilitate education about carbon pricing as a solution.
2. Member Lobbying – Encourage ethical engagement of our membership in organizations committed to implementation of a carbon pricing solution.
3. PC(USA) Lobbying – Encourage Presbyterian (and other Christian) lobbyists to lobby for a carbon pricing solution.
4. Corporate Advocacy – Vote shares at corporate annual meetings in favor of responsible steps to price of carbon rationally and introduce proposals to that effect as appropriate.

C. Reducing energy consumption as individuals and institutions

Rational pricing for greenhouse gas emissions creates the economic incentive for people to change behaviors and reduce emissions. We also have an incentive to change our behavior simply because that is the right thing to do. The Church is called to proclaim that our two-fold duty to the poor and to creation requires change, and we – individuals, congregations, and institutions – are called to change course. This is the literal meaning of repentance. This ministry of proclamation and repentance is not in place of the economic argument, but in addition to it. Change does not depend solely on repentance; neither does the economic argument operate in a theological vacuum. We are pleased to note signs of precisely this

¹¹ Appendix C discusses in more detail the issues in setting the price.

¹² These border adjustments are described more fully in the discussion of the Citizens Climate Lobby proposal in Appendix B. For a discussion of a European “climate club” approach to border adjustments, see <http://www.nybooks.com/articles/archives/2015/jun/04/new-solution-climate-club/>

repentance in many different forms across our denomination.¹³ In the discussion that follows, we lift up a few of these examples, “first shoots” that may be emulated by others.

Huguenot Memorial Church, in Pelham, New York, has launched a program called Sustainable Huguenot (<http://www.huguenotchurch.org/sustainable-huguenot.html>). The initiative includes replacement of oil-fired boilers with geothermal heating and cooling. More generally, several certification programs have been offered to recognize congregations that have made substantial efforts related to environmental stewardship. PC(USA) Environmental Ministries started the Earth Care Congregations program in 2010. As of May 2015, 162 Presbyterian congregations have completed the Earth Care Congregations certification.

We within the Synod of the Sun (where this Consultation document originates) see examples close to home. Twenty churches in Arkansas and Texas are Earth Care Congregations. Ferncliff Camp and Conference Center (in Little Rock, Arkansas) has received a “Cool Congregation Award”. Ferncliff features a geothermal heating and cooling system for some buildings, as well as other energy saving features. It is home to “Solar under the Sun”, an award-winning mission of the synod, and includes a model “eco-center” guest facility for demonstrating environmentally sustainable energy use. Austin Presbyterian Theological Seminary (APTS) worked with an energy consulting company to conduct an energy audit and make substantial changes (at no up-front cost to APTS) that are projected to save \$1.1 million over 30 years. The changes included replacement of existing light bulbs with LEDs and installation of a sophisticated thermostat/sensor system to reduce costs when the buildings are not in use. In the first six months after implementation of these changes, electricity consumption was reduced 38%.

Reducing energy consumption and increasing energy efficiency even in the absence of rational pricing of greenhouse gas emissions are important and faithful steps to combat climate change. However, the challenge of changing individual behaviors on the necessary scale likely requires establishment of rational market incentives in addition to these faithful responses.

D. Practical alternatives for a greener energy future

We have discussed above the need for behaviors to change and two strategies to motivate the required changes – economic incentives and faithfulness. It is also important that people know that practical alternatives exist, that these alternatives are implementable now, and that they have the potential to drive reductions in greenhouse gas emissions sufficient to address the problem.

We begin with some good news: the United States has been gradually reducing its greenhouse gas emissions in recent years. Between 2004 and 2013, emissions in total have declined nearly 9%, while per capita emissions are down more than 15%.¹⁴ Two major factors contributing to

¹³ And no doubt elsewhere as well, although our discussion here is limited to PC(USA).

¹⁴ Emissions data per EPA <http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf>; population data per <http://www.multpl.com/united-states-population/table>.

the reduction are the turnover in the vehicle fleet to newer models with better fuel efficiency, and an increase in the proportion of electricity generated from natural gas (displacing coal).¹⁵

This section discusses alternatives to select a cleaner mix of energy sources so that we can reduce emissions while we continue to grow our economy. We will highlight five sources of energy that we believe have the greatest potential to make a significant difference within the next 10 to 30 years. Two of these are established technologies with low to zero carbon footprint and substantial potential for broader deployment. The others are newer technologies, not yet mature but already a non-trivial contributor to our supply, each with arguably zero carbon footprint once installed, and each with huge potential for growth.¹⁶

1. Natural gas

Natural gas should play a significant role in the transition to a future where greenhouse gas emissions are constrained, displacing fuels that are more carbon intensive. It is plentiful, inexpensive (even with rational pricing of its carbon content), and flexible. It is an important fuel for electricity generation because the output of natural gas-powered generators can be readily adjusted to accommodate swings in demand and the variability of supply of wind or solar energy. Generating electricity by combusting natural gas generates about half as much CO₂ per unit of electricity produced as coal-fired generation. A large number of gas-fired power plants are likely to be built in response to marketplace economics even without pricing emissions. Rational pricing of carbon would accelerate the transition from higher-carbon fuels to natural gas.

2. Nuclear energy

Nuclear energy is an amazing source of electricity because it is so dense and efficient. A quarter of one ounce of uranium has the same energy production capability as a ton of coal. Nuclear reactors have demonstrated the ability to operate consistently at 90% of capacity (compared to perhaps 25% of capacity for solar and 50% for wind). It has no greenhouse gas emissions, is highly scalable, and has a safety record better than that of other sources of electricity¹⁷. The biggest constraint to building new nuclear plants is the public perception of risks related to disposal of operating by-products, or due to acts of nature or terrorism. Reactions to the perceived risk vary widely across the globe. In Germany, the government is halting any plans for new capacity and seems to be moving toward shutting down existing plants, while France is expanding its already large fleet. The U.S. government has shown definite interest in encouraging more nuclear capacity and has permitted four projects on existing sites, but no producers have made commitments to move forward yet. Many experts believe that achieving a greener energy future will not be possible without a robust contribution from nuclear energy.

¹⁵ Overall economic activity is a significant driver of total emissions, and the 2008 financial crisis and recession substantially reduced economic activity and emissions. By 2013, however, the economy had recovered to pre-crisis levels. GDP in 2013 was about 14% above 2004 levels. See <https://research.stlouisfed.org/fred2/series/GDPA>

¹⁶ We do not discuss here any emerging technologies, although these will surely play an important role over the next 50 to 100 years.

¹⁷ <http://www.oecd-nea.org/ndd/reports/2010/nea6862-comparing-risks.pdf>, Table 2 at page 35

3. Wind energy

Wind accounted for 4% of U.S. electricity supply in 2013. Wind energy is technologically simple to generate, modular (one turbine at a time), clean, and much faster to permit and install than conventional power facilities. It suffers from intermittency since it can go zero to full output depending on wind conditions, and on average operates at less than 50% of its full capability. This means backup electricity supply must be available, either from alternative generation sources, improvements to the distribution grid that transmits power from one area to another, or electricity storage. Wind power is also perceived by the public to be somewhat unsightly, so it is unlikely to be installed in the more populated areas where most electricity is used. Wind electricity benefits from some subsidies, but is already cost competitive in areas where wind supply is sufficient, so economic incentives may not be as important to its growth. Wind energy seems to be making steady progress in the United States. Rational pricing of greenhouse gases (in place of existing scattered subsidies) would facilitate investment and encourage growth.

4. Direct Solar

Solar power is ubiquitous and free, if only we can capture it. Until recently, the process for direct conversion of solar to electric power has been uneconomic in anything other than highly specialized applications. Over the last 20 years, photovoltaic efficiencies have increased markedly, and full-cycle costs are now approaching power plant-generated costs. It is notable that this technical and economic progress has been achieved even in the absence of a consistent pricing of carbon, although there are subsidies for solar power. Solar power generation is obviously emission free, although the manufacture and installation of solar power plants or photovoltaic cells has a non-zero carbon footprint. Solar solutions are clearly beneficial, and a rational approach to pricing carbon would accelerate their rational economic adoption¹⁸.

5. Biofuels

The term “biofuels” refers to fuels made from organic material, including plants and animal waste. Biofuels are hydrocarbons, as are fossil fuels, the distinction being that fossil fuels are sourced from organic material deposited 100 million or more years ago, while biofuels are sourced contemporaneously. Biofuels may be consumed directly, or the material may be converted into ethanol, biodiesel, or other forms. While the four technologies discussed above are deployed almost entirely for generation of electricity, biofuels are often used as transportation fuels, including aviation. The recent use of biofuels originated as a means to increase supplies of hydrocarbons in response to concerns about reliable access to foreign sources of crude oil. As concerns about greenhouse gases have grown, biofuels have been put forward as part of a sustainable solution. The greenhouse gas argument for biofuels is mixed. Consumption of biofuels releases CO₂ just as does the consumption of fossil fuels. In each case, the carbon thus released into the atmosphere is carbon that was removed from the atmosphere when the source organic material was created. The difference, of course, is that in the case of biofuels that source organic material was created quite recently, perhaps as recently as the

¹⁸ A more thorough discussion of solar energy may be found at <https://mitei.mit.edu/futureofsolar>.

previous growing season. Some therefore argue that biofuels are net zero carbon emissions (although that argument omits the environmental and greenhouse gas implications of the processing required to turn the source material into consumable fuel, and concerns about carbon that may be released if fallow or forest land is converted to grow the fuel).¹⁹ Biofuels at present benefit from a patchwork of subsidies that may or may not mimic the outcome that one would expect from consistent rational pricing of the carbon effects. Rational pricing of carbon would correctly value the net carbon emissions and accelerate the development, introduction, and growth of biofuels with very low net carbon emissions. Some biofuels, especially ethanol produced from corn, also have the negative effect of converting a product that could be used for food into fuel, disadvantaging those who are dependent upon affordable access to corn-based products for food. To date, this adverse effect has not been reflected in the pricing of biofuels.

6. Electricity storage and the intermittency problem

Wind and solar are nearly ideal technologies for generating electricity, but they suffer from the problem of intermittency – the wind doesn’t always blow, the sun doesn’t always shine, and neither may be available when you need electricity. In any other industry, this problem would be solved by using inventory. It is very hard, however, to hold inventories of electricity, and the technologies necessary to store electricity on the necessary scale are in general uneconomic. In the absence of economic storage, power systems that depend on wind or solar require a back-up generation source that can quickly come on stream. Those sources must keep the generators powered-up and spinning in order to supply “on demand” electricity. (Generation fueled by natural gas is well suited to this role.) Although industrial-scale power storage technologies are not currently economic, those technologies are advancing at a remarkable pace even without rational emissions pricing. A market with a consistent, rational price for carbon would greatly facilitate accelerating this pace. Practical industrial-scale power storage appears to be a critical enabler of adoption of wind and solar generation on the scale likely to be necessary.

7. Transportation, farming and other practices

Other reductions in society’s consumption of fossil fuels may play smaller roles, but collectively make a substantial difference. Adoption of efficient mass transit for goods and people will reduce our carbon footprint. These efforts will also foster community development as coordinated planning creates meaningful jobs for diverse social and economic groups. (The Blue-Green Alliance, <http://www.bluegreenalliance.org/work/initiatives/transportation>, provides an example illustrating this approach.) Sustainable farming practices such as no-till agriculture and polyculture will reduce reliance on synthetic fertilizers and pesticides, cut erosion, and produce agrosystems more resistant to drought and floods. While such efforts may not garner the publicity of new energy technologies, they encourage cooperative behaviors in addressing the threat of climate change, provide for local positive engagement, and more deeply connect us to our brothers and sisters in renewing God’s creation.

¹⁹ There are forms of biofuels under development, notably algae-produced biofuels and cellulosic ethanol, that have tremendous potential to provide meaningful amounts of energy.

IV. Path Forward

We began this document by stating that greenhouse gas emissions and the potential for adverse climate change are a serious problem and the church is called to a faithful response. We have four specific proposals to provide that faithful response.

1. **We in PC(USA) should remain in dialogue with one another and the world, seeking together to find and represent the will of Christ.** It is essential that this process of dialogue begin prior to the 2016 meeting of General Assembly, and that it continue outside of and in addition to General Assembly. We are to be in dialogue and discernment within and among our congregations, and with all the interested parties outside our denomination, seeking faithful individual and collective responses.
2. **PC(USA) should hold in abeyance any steps toward divestment from fossil fuel companies.** As we have discussed in section III.A above, it is our view that divestment is not an adequately faithful response. The divestment program initiated by the 2014 overture does not meet the denomination's long-established criteria for divestment, nor will divestment directly address the true source of the problem – emissions of greenhouse gases. Divestment neither assures protection of the earth nor promotes the economic well-being of the disadvantaged.
3. **PC(USA) should advocate for national and international policies to create a consistent, rational price for emissions of CO₂ and other greenhouse gases as discussed in section III.B above, including those policy steps necessary to offset the regressive nature of the pricing mechanism.** Consistent rational pricing of emissions will enlist market forces to drive those changes in individual and institutional consumption necessary to reduce greenhouse gas emissions, and will provide the economic incentive necessary to promote investment to develop and implement low-carbon or zero-carbon infrastructure and technologies. Affordable energy would continue to be available to drive responsible economic development, while emissions driven by our consumption would decline. We thus address our dual responsibility to promote the well-being of the disadvantaged and to protect the earth. As the global economy adapts to rational pricing of emissions, we would expect our investment managers to adjust our portfolios. We would expect investments to be shifted away from firms and industries that adapt poorly to the new economy and toward firms and industries that should benefit. These shifts in our investment portfolio should not require explicit direction from PC(USA), although MRTI might wish to monitor the matter.
4. **PC(USA) should urge individuals, congregations, and institutions to continue or initiate steps to reduce our carbon footprints,** including emulation as appropriate of the examples discussed in section III.C, and to continue adoption of lower-carbon or zero-carbon technologies and lifestyles as discussed in section III.D. The changes in behaviors required to do this are easier when emissions are rationally priced, but we should be prepared to support our advocacy with our behaviors in any event.

V. Appendices

A. Appendix A: General Assembly Statement on Divestment Strategy

The Divestment Strategy: Principles and Criteria²⁰

The Presbyterian Church (U.S.A.) faces the responsibility for investing assets accumulated over many years. Such investment holdings function in two ways in relation to the mission of the church. First, they are a source of income for the support of mission program and institutional objectives.

Second, investment holdings represent power and influence for pursuing mission objectives of the church directly.

It has been the Reformed tradition's bias toward pragmatic involvement in the world that allowed for church investments in the first place and then for the attempt at responsible investment. The theology of mission extends the concept of stewardship into society and insists that the full influence and impact of church investment be seen in the larger social context, with motivation beyond financial gain, important as that is.

The means of administering the investment activity of the church is known as trusteeship. Trusteeship within the church reflects both the particular purposes of the Christian community and the fiduciary responsibilities, legal requirements, and specific terms of trust that govern trustees.

In this context, divestment of holdings in a particular firm or class of firms is both part of the normal management of funds and potentially an occasion for Christian witness to God's call for justice and the renewal of society.

These criteria are further intended to serve as an aid to trustees of related institutions and organizations throughout the church:

1. The issue on which divestment is proposed should be one reflecting central aspects of the faith.
2. The issue on which divestment is proposed should be one that the church has addressed by a variety of educational and action efforts, such as:
 - correspondence with companies; discussion with company managers and directors;
 - statements, questions, and shareholder resolutions at stockholder meetings, and
 - legal action against companies.
3. The analysis supporting the proposed action:

²⁰ 1984 Statement – PC(USA), p. 193; found at [http://index.PC\(USA\).org/NXT/gateway.dll?f=templates&fn=default.htm&vid=pcdocs:10.1048/Enu](http://index.PC(USA).org/NXT/gateway.dll?f=templates&fn=default.htm&vid=pcdocs:10.1048/Enu), last visited June 8, 2015

- a. should be clearly grounded in the church's confession and unambiguously present in the social policy of the General Assembly;
 - b. should clearly define the behavior and stance of the corporate entities whose policies or practices are at issue; and
 - c. should state the ends sought through divestment.
4. The decision should be taken after Consultation with the ecumenical community, whenever possible. The implementation of a divestment action should ordinarily be in solidarity with other Christian bodies.
 5. Efforts should be made to examine the probable effects and consequences of the action with affected communities, particularly Presbyterians.
 6. The proposed action should be sufficiently precise that the effect of its application can be evaluated.
 7. Any proposed divestment action should include provision for:
 - a. informing appropriate church constituencies;
 - b. giving appropriate public visibility to the action;
 - c. engaging other governing bodies and members in advocacy for the ends that prompt the divestment;
 - d. giving pastoral care to those directly affected.

B. Appendix B: A summary of the Citizens Climate Lobby Proposal

The most effective way to motivate the changes in our behavior required to reduce greenhouse gas emissions is to price the emissions (typically measured in metric tonnes of CO₂ equivalent – “MT”). One efficient way to accomplish this is a carbon fee, with provision for a dividend to offset the regressive nature of the fee. (A carbon fee is equivalent to a carbon tax, but “fee” seems the more accurate term if the funds collected are fully rebated and the government is not determining how to spend the money.)

The Citizens Climate Lobby (“CCL”) has developed and is advocating for a comprehensive approach to implement such a plan. This Appendix is intended to provide a brief summary of the CCL proposal. Full details may be found at the CCL website <https://citizensclimatelobby.org/>. The fee is collected on the major greenhouse gases (which include CO₂ and methane) when they are produced (at the well or mine) or imported, and the amount is based on the amount of CO₂-equivalent produced when burned or emitted. The dividend is the return of 100% of the fees to the public on a *per capita* basis. The carbon fee and dividend should be implemented as soon as practical at a moderate level of \$15/MT to \$35/MT. (The current official CCL proposal starts at \$15/M, while others advocate starting somewhat higher.) That level is increased every year (at a rate of \$10 per MT per year) to provide clear price signals to consumers and industry.

This provision for an annual increase in the fee illustrates another detail that must be addressed in the implementation plan: How do we transition from the status quo in which emissions are not priced to a future world where the price reflects the full social cost? The CCL plan phases in the emissions price over time, rather than jumping from an effective price of zero to the full social cost all in one step, and then raises the fee annually to continually increase the incentive to shift to cleaner energy sources.

This predictable increase will allow industry to make the large investments necessary to expand alternative energy sources and become more efficient while providing the energy we and the world need. The fee assures that market prices favor lower carbon energy sources, while the dividend redresses the inherently regressive nature of the fee. For example, electricity produced by natural gas generates a bit less than 50% of the CO₂ produced by generating from coal. A \$35/MT carbon fee will add about 3.7¢/kwhr to the price of electricity from coal, but only 1.5¢/kwhr for electricity from natural gas-based electricity (assuming a U.S. average price of 10¢/kwhr. After a decade the fee will have increased to \$135/MT, adding 14.2¢/kwhr for coal but only 5.9¢/kwhr for natural gas. Looking at the example of gasoline, a \$35/MT fee will add about 35¢/gallon at the pump, increasing to \$1.35/gallon over a decade.

In the CCL plan, the dividend would be allocated based on “shares”, with one share per person up to 4 shares per family and a half share for children under 18. At the current levels of consumption and energy mix, the dividend would start at a several hundred dollars per year (distributed monthly) and would rise to over a thousand dollars in a decade. A carbon fee and dividend transfers money from capital intensive to more labor intensive segments of the

economy, and is projected to provide economic stimulus. One study of the distributional effects of such a system shows that the U.S. households among the lower two-thirds in spending would receive a net gain from those in the highest one-third, since households that spend more also pay more carbon tax or fee. This result indicates that the proposed rebate system would be sufficient to offset the regressive nature of the fee.²¹

A third implementation detail that a carbon fee and dividend must address is a system of border adjustments to assure that production of energy-intensive products is not forced off shore. These import fees on products imported from countries without a carbon price (along with rebates for countries with a higher price of carbon) will create a fair competitive environment for exporters. A carbon fee and dividend is the most transparent, predictable and transportable method of pricing greenhouse gases around the world. When the United States enacts such a proposal, our huge economy will be a powerful driver for the countries without a price on carbon to adopt similar carbon pricing policies.

There is tremendous energy inequality around the world. The developed nations (which have contributed the most to the carbon emissions that are driving climate change) need to lead the development of low-carbon and no-carbon alternatives. A carbon fee and dividend will drive the growth of alternative energy sources and efficiency improvements that will benefit developing countries, allowing them to have greater access to lower-carbon energy sources and thus partially leap frog the “carbon stage”. A key requirement of any energy and climate action is that it must support developing countries to provide greater access to energy and allow all people to reach their full potential.

²¹ REMI Study, -“The Economic, Climate, Fiscal, Power, and Demographic Impact of a National Fee-and-Dividend Carbon Tax” Prepared by Regional Economic Models, Inc. (REMI) – Washington, DC Synapse Energy Economics, Inc. (Synapse) – Cambridge, MA. <https://citizensclimatelobby.org/remi-report/>

C. Appendix C: What is the right price for greenhouse gas emissions?

This appendix is intended for readers interested in the theory and practicality of the greenhouse gas pricing that forms one of our primary alternatives to divestment. In section III.B of this Consultation document, we described the benefits of pricing emissions, and we alluded to some of the difficulties in setting an appropriate level for that price given uncertainty about the future effects of emissions. While setting a price will ultimately be a political endeavor, our congregations might consider what a faithful goal should be. This Appendix briefly describes a simple model to guide more rigorous thinking about the appropriate level of the price.

The two approaches most commonly discussed to price emissions are emission taxes and cap-and-trade systems. Either system can work, and implementation of either must address many practical details. These details include the issues of the inherently regressive nature of the mechanism and the need for border adjustments mentioned in III.B and discussed more fully in Appendix B. (We note with particular concern the burden emissions pricing will place on the poor, in part because it will make transportation more expensive.) Cap-and-trade also requires a robust legal and enforcement framework, which is not always present in developing nations. An emissions tax system is in many respects the simpler and more easily implemented approach.

Such a system imposes a tax on some defined set of emissions, where the tax is defined as \$X per metric tonne of CO₂-equivalent emissions. How big should X be? Public sources seem to suggest a price on the order of \$40 per metric tonne of CO₂-equivalent, while some observers suggest that this price is too low to motivate the necessary changes in behavior. This issue can be analyzed as a question of risk. For any value of X that we might select, X could be too high, too low, or exactly right. There are risks created by setting X too high, and there are risks created by setting X too low. The “correct” value of X is the level where the expected harm of X being too high is equal to the expected harm of X being too low. The term “expected harm” incorporates three concepts: (i) the probability that X is too high or too low, (ii) the consequences of X being too high or too low, and (iii) the harm that arises from those consequences. “Expected harm” is the product of the probability times the harm.

If X is set too high, the consequences include more investment in renewables and infrastructure than was necessary. In general, these consequences take the form of investing in one thing, when in hindsight we ought to have invested in something else, and we are therefore disappointed by the returns on our investments. The “harm” associated with these “consequences” is the value of this disappointment.

Alternatively, if we set X too low, the consequences include the reverse of all the above, but the most important consequence is the possibility that our behaviors will not change sufficiently to prevent the potential extreme outcomes that are among the predictions from models of climate change. The harm in this scenario includes the disappointment associated with having made wrong decisions (this is approximately symmetric with the harm in the “too high” scenario), but it also includes the extraordinary cost of exposure to the potential extreme outcomes.

Because the “too low” scenario carries this exposure to events with extreme harm, the “too high” scenario and the “too low” scenario are not symmetric. Those extreme outcomes may have low probability, but still significantly affect “expected harm”. Our thinking about the “right” value for X must reflect this exposure to low probability/high harm events. The reasoning should be:

- The decision rule is to balance probability times harm in the “too high” case and the “too low case”.
- “Harm” in the too low case includes some extreme outcomes, and so is worse than the harm in the “too high” case.
- Therefore, the probability of the “too low” case must be lower than the probability of the “too high” case, so that the lower probability offsets the greater harm.
- We can’t actually observe any of these factors, so this model is useful only as a guide to clear thinking, not as a measurement tool.

Another issue in setting the emissions price is how the price varies over time. How should we transition from a world in which the price of emissions is near zero to a future world where the price reflects the full social cost? How should prices increase after that transition to maintain appropriate incentives and to keep pace with the full social cost? The CCL plan phases in the emissions price over time, rather than jumping immediately to the full social cost, and then annually raises the fee to maintain incentives to shift to cleaner energy sources.

The above discussion focuses on a tax mechanism as the tool to price emissions. In a cap-and-trade mechanism, the problem is the same, but the policy tool is not the level of the tax, but the quantity of emission allowances made available in any time period. Providing too many allowances has the same effect as setting a tax too low; too few allowances is analogous to setting the tax too high. The reasoning on “expected harm” is the same for either mechanism.

Finally, as noted briefly in III.B, there has been discussion about other “negative externalities” associated with our consumption of fossil fuels. These include adverse ramifications for personal health and foreign policy, and environmental concerns other than climate change. The personal health issues arise largely as a result of increased exposure to particulate emissions (especially from coal) and ground-level ozone. The foreign policy argument is that our reliance on crude oil has the effect of making bad regimes rich, which creates threats to global security. All these issues are important, but beyond the scope of this work. In each case it would be desirable to price the externality rationally, and in each case the implication appears to be that the price of emissions should be higher than one might conclude if looking only at climate change. For perspective, a recent IMF working paper²² suggests that the price for these other externalities at least equals, and might be up to three times, the climate change externality.

²² <http://www.imf.org/external/pubs/ft/wp/2015/wp15105.pdf>

D. Appendix D: References for Steps to Reduce Energy Consumption

The PC(USA) General Assembly and study papers have emphasized the importance of action by individuals and congregations to conserve energy for many years. In 1990, *Restoring Creation for Ecology and Justice*²³ emphasized the importance of individual responsibility. These policies have led to some PC(USA)-wide initiatives and actions by congregations, as well as individuals taking responsibility as stewards of God’s creation. Thus, reduction of energy consumption by churches and individuals meets both theological criteria for a faithful alternative to divestment from fossil fuels. Energy consumption may be reduced in many ways. We advocate lifestyle changes that decrease energy use and increase energy efficiency. A later statement, *The Power to Change*, also urged synods and presbyteries to “become models of energy-efficient institutions” and to lead in terms of education and advocacy²⁴.

To what extent have PC(USA) members heeded the denomination’s call to make lifestyle changes and increase energy efficiency? While data specific to Presbyterians are not available, surveys in the U.S. have generally found that about half of Americans are skeptical about the threat of climate change. A 2014 survey found that overall, 50% of respondents were “very concerned” or “somewhat concerned” about climate change. These results suggest that, within Presbyterian congregations, the majority of members do not feel a strong sense of urgency to conserve energy, and are likely to be influenced by other factors (including prices) in their energy choices²⁵. This illustrates the importance of combining market mechanisms with the theological call.

To what extent would concerted individual action conserve energy and reduce carbon emissions? Households and individuals consume nearly 40% of total U.S. energy²⁶. Thus, individual efforts to reduce energy consumption and increase energy efficiency could be an important component of climate change mitigation strategies. This report suggested that multiple individual actions, some of which would be costly, would be necessary for a substantial reduction in energy consumption. For an individual or household, for example, the single action that would reduce energy use the most would be to purchase a more fuel-efficient vehicle²⁷.

²³ Presbyterian Church (U.S.A.). *Restoring Creation for Ecology and Justice: A Report*. 202nd General Assembly (1990), at page 30. http://www.presbyterianmission.org/site_media/media/uploads/environment/pdf/restoring-creation-for-ecology&justice.pdf

²⁴ Presbyterian Church (U.S.A.). *The Power to Change - U.S. Energy Policy and Global Warming*. Approved by the 220th General Assembly, 2008, at page 1. [http://www.PC\(USA\).org/resource/power-change-us-energy-policy-global-warming/](http://www.PC(USA).org/resource/power-change-us-energy-policy-global-warming/).

²⁵ Jones RP, Cox D, Navarro-Rivera J. *Believers Sympathizers, and Skeptics: Why Americans Are Conflicted about Climate Change, Environmental Policy, and Science*. Public Religion Research Institute, 2014. <http://publicreligion.org/site/wp-content/uploads/2014/11/2014-Climate-Change-FINAL1.pdf>.

²⁶ Dietz T, Gardner GT, Gilligan J, Stern PC, Vandenbergh MP. Household actions can provide a behavioral wedge to reduce carbon emissions. *PNAS* 106(44):18452-18456, 2009. <http://www.pnas.org/content/106/44/18452.short>.

²⁷ Gardner GT and Stern PC. The short list: The most effective actions U.S. households can take to curb climate change. *Environment: Science and Policy for Sustainable Development* 50(5):12-25, 2008. Updated 2009. http://www.climateaccess.org/sites/default/files/Gardner_The%20Short%20List.pdf.