Beyond a Band-Aid:

A Discussion Paper on Protecting Workers and Communities in the Great Energy Transition

Arjun Makhijani, Ph.D.

June 10, 2016

A Joint Project of:

Institute for Energy and Environmental Research
6935 Laurel Avenue, Suite 201
Takoma Park, Maryland 20912
301-270-5500
info@ieer.org
website: www.ieer.org

Labor Network for Sustainability
11 Pine Avenue
Takoma Park, Maryland 20912
info@labor4sustainability.org
website: www.labor4sustainability.org

Beyond a Band-Aid:

A Discussion Paper on Protecting Workers and Communities in the Great Energy Transition[1]

Arjun Makhijani, Ph.D.

Introduction

This discussion paper[2] presents a strategy for protecting workers and communities that may be threatened by the current and future transformation of the U.S. energy system. It is derived from the recognition that recent technological developments have made solar and wind energy, in combination with efficiency, cheaper than continued reliance on fossil fuels.[3] An economical transition to an energy system that is nearly emissions-free is possible. The transition will provide enormous benefits, both in terms of climate protection and to workers and communities. The new energy system will be cleaner, and more resilient. Air pollution will decline. Solar and wind energy require essentially no water at a time when stress on water resources is becoming an ever larger economic and ecological issue.[4]

Notwithstanding these benefits, significant issues of justice will be raised by the transition to a clean energy future. Even though large numbers of new jobs will be created, there is no guarantee that workers and communities which lose existing jobs will have them replaced by new ones. Indeed, unless proactive policies are in place, many current workers in fossil fuel industries will become unemployed. The communities they live in will be disrupted by loss of tax revenues.

Too often these downsides are disregarded because they seem insignificant compared to the benefits of energy transition and climate protection. But no job is insignificant if it is *your* job; and it will be of little comfort to low-income households if utility bills go down on average, but *theirs* do not.

Some proposals for transitioning to clean energy include assistance programs for workers who lose their jobs. But often these are little more than extended unemployment compensation and training for jobs that may or may not exist. Often they would be both too little and too late – more like putting a Band-Aid on an accident victim than a well-considered plan to keep people from getting run over. And they disregard some of the most devastating impacts of energy system change, like the loss of the local tax base that often funds critical community services like libraries and parks and provides supplemental money for schools and for fire and police departments.

"Beyond a Band-Aid: A Discussion Paper on Protecting Workers and Communities in the Great Energy Transition" proposes direct investments in local economies dependent on fossil fuel jobs *before* devastating economic disruption begins. And it proposes a strategy to protect low-income consumers from the effects of that tax increase. However, this discussion paper does not cover the more general longstanding problem of energy affordability for low-income households. Tens

of millions of households face high home energy bills, often exceeding 10 or even 20 percent of income. IEER has examined this issue in detail in an energy justice study specific to Maryland and proposed a three-pronged solution that is broadly applicable: limiting bills of low-income households to 6 percent of gross income, increasing energy efficiency, and providing universal solar access to low-income households.[5]

This paper presents three proposals for dealing with the downsides of transition to climate-safe energy.

- A community and worker protection fund (CWP Fund). The fund would collect money *in advance* to replaces taxes and fees paid by fossil fuel facilities and to invest in good jobs in affected communities.

- Advance investment in job creation. The CWP Fund, in cooperation with other private and public sources, would make targeted investments in fossil fuel energy communities designed to create jobs before or at the pace that fossil fuel jobs are declining. Examples would include:
    - Exporting renewable energy
    - HVAC conversion
    - Decommissioning facilities
    - Economic diversification

The paper also lays out a variety of ways to pay for these proposals. They include:

- Levying a modest carbon fee or tax.
- Eliminating fossil fuel subsidies and tax breaks.
- Setting aside funds for decommissioning facilities.
- Leveraging other investments with the CWP Fund

Policies to protect those who might be adversely affected by the transition to a climate-safe economy are necessary as a matter of elementary justice. It is not fair that a small proportion of workers and communities should be left as economic road-kill by policies adopted to benefit society as a whole. But they are also essential because workers who face job losses are understandably nervous, since they have no assurance that once their jobs are gone there will be good ones to replace them. Advocates of fossil fuel energy often use loss of jobs and burdens on the poor as pretexts for opposing climate protection and energy system transformation. This paper shows how, with proper policy planning and implementation, the transition to a climate-safe economy can benefit even those whom it might otherwise threaten.

This paper is focused on energy policy. The transition to a just and worker-friendly society will involve far more than energy policy. But in fact a transformation of our energy system is already under way, and it must accelerate even more if we are to protect against the most devastating forms of climate change. To be successful – and just -- that transformation must ensure that fossil fuel communities, like all others, share equitably in the economic benefits.

1. The problem: Protecting fossil fuel workers and communities

About a million workers in the fossil fuel industry are in communities that are likely to be severely impacted by a transition to renewable energy. There is no guarantee that dispersed jobs in efficiency and renewable energy will be available in time or in the quantity and quality needed to avert severe economic disruption for them. Therefore, it is necessary to make direct investments *proactively* in communities where the local economy is dominated by fossil fuels. That way jobs will be created and training provided, including in renewable energy, in these communities before they are economically disrupted.

Table 1 below shows the number of jobs in various parts of the fossil fuel sector (2014 data). I have put them in two categories: jobs concentrated in communities where the loss of the industry would have high or even devastating impact and jobs that are highly dispersed – mainly gas stations and, secondarily, petroleum supply.

Table 1: Jobs in the United States fossil fuel sector, 2014

Oil and natural gas extraction	211,500
Coal extraction	76,600
Oil and natural gas support	312,400
Coal mining support	157,500
Oil and natural gas pipeline construction	140,300
Oil natural gas, and mining field machinery	94,800
Petroleum and coal products manufacturing	113,100
Subtotal: jobs with high impact on communities	*1,106,200*
Petroleum supply	98,300
Gas stations	876,800
Subtotal: dispersed jobs	*975,100*
Total, direct jobs in fossil fuel industries	**2,081,300**

Source: Adapted from Martin Tillier, "The Fossil Fuel Industry May Not Help the Planet, But It Employs Millions," *Oilprice.com*, July 9, 2014, at http://oilprice.com/Energy/Energy-General/The-Fossil-Fuel-Industry-May-Not-Help-the-Planet-But-It-Employs-Millions.html

The paper examines the high impact direct fossil fuel jobs – that is, jobs in the industries themselves -- on the thesis that the dispersed jobs, can, with appropriate policies and investments in renewable energy, efficiency, smart grid, etc., be replaced as they are lost. (A better safety net, universal health insurance on the Medicare principle, for instance, would also help immensely.) Since, the proposal here is to proactively invest in communities that are likely to be significantly impacted, it follows that sufficient job creation would protect the indirect jobs (schools, grocery stores and farmer's markets, libraries, shops, restaurants, etc.).

The problem of a just transition for the affected communities and workers will be difficult, complicated and big, but the needs of a just transition and climate protection are bigger than that:

- We have a deadline to accomplish the transition. The world passed, in 2011, the greenhouse gas (GHG) CO_2-equivalent concentration limit of 430 ppm required to limit

temperature rise to 1.5°C. It is therefore imperative to phase out fossil fuel use (and reduce or phase out emissions from other sources) as rapidly as possible.

- It is necessary to make provision for the U.S. share of the $100 billion per year promised by 2020 to developing countries (about $20 billion to $25 billion per year), without which reducing emissions globally may become difficult or impossible.
- Since the GHG concentration for limiting temperature rise to 1.5°C has already been exceeded, climate protection will require increased storage of carbon in the soil.[6] One answer is a transformation of the food system. Like the energy sector, a food sector transformation can produce immense benefits, not least of which would be better health. And like the energy sector, it will involve large numbers of workers and communities. We should aim for healthy energy and healthy food to achieve net zero CO_2 emissions as soon as possible, with net negative emissions after that.

2. The opportunity

The technical key to getting the resources for a just energy transition is to recognize that renewable energy plus efficiency is now economical. The combination makes energy services (heat, light, motive power, energy for vehicles) less expensive as a fraction of income than fossil fuels or new nuclear energy. As a result, ***we do not need a carbon tax to make fossil fuels more expensive and renewable energy more affordable***. The combination of solar, onshore wind, and efficiency is already more affordable than new fossil fuels and new nuclear.[7] Offshore wind is a nascent industry and needs policies to promote it. But a variety of combinations of solar, onshore wind, offshore wind, and efficiency are more economical than nuclear and fossil fuel business-as-usual.

We need suitable mandates (like renewable portfolio standards) and regulations (like appliance and building efficiency standards) and a timetable to get the energy transition done. We will also need to convert direct fossil fuel use in buildings and vehicles to electricity. Such a large-scale conversion can, with the right policies and incentives, create a large number of manufacturing jobs in the United States. An overall manufacturing strategy is needed; renewable energy sector manufacturing and appliance and electric vehicle component manufacturing are potentially very important components for achieving the goal of "making a living on a living plant."[8]

Given renewable energy affordability, a carbon tax and other revenue generating mechanisms can be dedicated to ensuring a just transition.[9] Such revenues can be used for transition purposes. Of course, the political hurdle of getting a tax will remain. But as discussed below, the tax does not have to be large; moreover, it can decline over time. There are also other potential revenue streams (see Section 5).

3. A community and worker protection fund

A targeted approach is needed to protect communities and workers directly affected by an energy transition *before the damage occurs*. The creation of a Community and Worker Protection Fund (CWP Fund) would accomplish that purpose.

The CWP Fund would be in two parts. One part would replace taxes or fees paid by fossil fuel plants and perhaps also by nuclear and ethanol plants, since they are shutting down with some regularity. The other part would proactively create good jobs in affected communities.

Consider the state of Maryland, which IEER has studied extensively.[10] The taxes and fees paid by the two-reactor Calvert Cliffs nuclear plant in Maryland amount to $23.5 million per year; [11] almost all of the revenues accrue to the local government. Revenues of this magnitude from a carbon tax set aside for 10 to 15 years would enable schools, libraries, police and fire departments, and other public services now financed partly by plant fees to continue after the plant is shut (now scheduled for the mid-2030s). A similar concept would apply to Maryland's fossil fuel power plants and to the two counties where coal mining takes place. Total revenue requirements to replace such taxes and fees are probably on the order of $50 million to $60 million per year, statewide. Such a community protection fund represents only a fraction of the funds needed for a just transition, but it is critical to support government services in the affected communities.

In Maryland, about 2,000 utility workers in fossil fuel and nuclear plants would be affected by plant closures in the transition to a renewable grid. There are no petroleum and natural gas production facilities in Maryland.[12] Transmission and distribution utility jobs as well as jobs in the gas industry would increase, though the latter would be hydrogen- and possibly biogas-related rather than natural gas-related. Overall, a transition may require revenues on the order $200 million per year for 15 or 20 years to create jobs proactively and to protect community services and facilities in the event of closure of fossil fuel plants, and, as per the current schedule, the nuclear plant (in the mid-2030s).

4. Creating jobs prospectively

The worker part of the CWP Fund would create jobs and training *prospectively*, before or approximately at the pace that fossil fuel jobs decline. The training would be for the jobs that are being created, not some hypothetical jobs that may or may not materialize. If they do, as is happening in Texas, they may not be sufficient in number and compensation may not be comparable.[13] This prospective and concurrent creation of good jobs in fossil fuel-dependent communities is essential to prevent widespread disruption; it could also increase support for keeping fossil fuels in the ground. These are *targeted investments*, made in addition to general investments in renewable energy and efficiency which are necessary but may occur elsewhere in the country.

Here are some examples of jobs that can be created in fossil fuel energy communities:

- *Exporting renewable energy*: Communities that now export fossil fuels or generate electricity from fossil fuels could export renewable energy. The CWP Fund can leverage such investments. If such investments are not forthcoming, the Fund can make the investments itself. The most important oil and gas production areas are also rich in renewable energy, notably onshore and offshore wind. These areas include Texas, Louisiana, Oklahoma, Wyoming, and North Dakota. This is not a new idea. Scotland is using offshore oil infrastructure and expertise for developing offshore wind.[14] Another

possibility is converting caverns now used to store natural gas to store compressed air, one of the more economical forms of energy storage, if a pre-existing site is available.[15] Exporting renewable energy would be a key objective of Fund investments, since that would keep external revenues flowing into the communities.

- *HVAC conversion*: Conversion from fossil fuel space heating and conventional air-conditioning to advanced heat pumps can be mandated in construction regulations and efficiency programs, along with existing and new incentives. This can open the door for negotiations to promote manufacturing of these devices in affected communities. San Antonio negotiated solar module and tracker manufacturing by tying it to a large order for a solar PV plant by the city-owned utility, CPS Energy.[16] San Antonio's increased emphasis on renewables followed the collapse of a proposal for two new nuclear reactors, one of which would have been owned by CPS Energy. The central reason for the collapse was the high and escalating estimated cost, which approximately tripled even before construction had begun or the license to build the reactors had been secured.[17]

- *Decommissioning facilities*: Decommissioning nuclear and coal plants and fossil fuel production facilities can involve many jobs. Nuclear plants are required to have decommissioning funds; all of them do. Just transition strategies should include advocacy for increasing these funds, since they are often inadequate. A quick start to decommissioning can result in the maintenance of many or most of the jobs at these sites, although plant workers may not be the ones who get the decommissioning jobs. Adequate funds for decommissioning coal plants can be mandated by Public Service Commissions in regulated areas. The problem is more complex where generation is deregulated as in the mid-Atlantic and Northeastern regions.

- *Investment in economic diversification*: This is desirable for many reasons, including coupling training to jobs that are going to be created because the investments are already planned.

Many other examples could be added.

5. Revenues

To protect threatened workers and communities in advance requires raising funds in advance. Funds are necessary for investments to create jobs and reserve funds to protect communities. Many streams of revenues can be considered:

i. A carbon fee or tax for creating jobs prospectively in communities we know will be affected adversely if we keep fossil fuels in the ground.
ii. Eliminating fossil fuel subsidies and tax breaks.
iii. Decommissioning funds.
iv. Using the Community and Worker Protection Fund to leverage other investments.
v. A possible charge on electricity supply after renewables become 50 or 60 percent of the energy system.
vi. General funds from income taxes.

I will discuss the first four here.

i. A carbon tax

A carbon tax sufficient to influence market behavior for reducing greenhouse gas emissions is estimated to be on the order of tens of dollars per metric ton of CO_2-equivalent, approaching a hundred dollars a metric ton or more.[18] Such high levels of taxes would significantly increase the cost of energy during the transition. Fortunately, a carbon tax to make renewables competitive relative to fossil fuels is not needed; the transition can be accomplished in various ways, including by mandating renewable energy and efficiency targets. This means that a high carbon tax is not needed for the transition. A more modest tax could be used for a just transition and for an affordable energy program to protect low-income households.

For instance, ten dollars per metric ton of energy-related CO_2 emissions would amount to about $50 billion per year initially. This level of tax would correspond to about a 4 percent increase in the final cost of energy. Another $2 to $3 per metric ton would provide monies to be refunded to low-income households to offset the effects of the tax on them. It is possible that a smaller tax could be used to leverage much larger investments. This is routinely done in energy efficiency, where public (ratepayer) funds are used to leverage larger private investments in energy efficient lighting and appliances. Private manufacturing investment leveraged by the decision of a city-owned utility in San Antonio to invest in solar energy, cited above, provides another example.

As investments are made they would generate jobs; therefore, the need for additional revenues would decline over time. So in contrast to carbon taxes proposed for stimulating a fossil fuel phase out, *the carbon tax for the CWP Fund can be reduced;* it can go to zero, as fossil fuels are phased out. This is because the CWP Fund would be used specifically to create jobs for workers in the communities affected by that phase-out before or concomitantly with the end of fossil fuel production.

The indirect jobs would still be there if the jobs for workers in fossil fuels and related industries are created prospectively or concurrently and if the pay in the new jobs is comparable to the ones phased out.

ii. Ending oil and gas subsidies

Ending governmental subsidies and tax breaks to the coal, oil, and gas industries would generate about $20 billion per year, initially.[19] This is approximately the amount needed to make good on the U.S. share of the $100 billion per year promised to developing countries as part of the Paris Agreement. Another revenue source, potentially general tax revenues, would be needed over time as fossil fuel use declined. Potentially, the initial funds could be used to leverage investments and speed the transition in developing countries.

iii. Decommissioning funds

Decommissioning funds would be available in many areas (nuclear plants, many coal plants, and some fossil fuel production areas). The amounts over time could be very substantial. The development of a just transition plan should include careful consideration of decommissioning funds and related jobs.

iv. CWP Fund leverage

The CWP Fund can be used to leverage other investments, including private and public capital, in a variety of ways. For instance, some of the funds could be used to seed a Green Bank in affected communities. It could provide assistance for converting fossil fuel heating to efficient electric systems on a large scale and leverage that to bring manufacturing to fossil-fuel-dependent communities. Creating targets for exports of renewable electricity could also leverage manufacturing investment in solar- and wind-energy-related manufacturing. The CWP Fund should be large enough to create such leverage.

6. Conclusion

Overall, the above indicates that a modest carbon tax declining to zero over time, plus decommissioning funds and ending fossil fuel subsidies should provide a very solid foundation for a just transition in the energy sector in the United States, while enabling the United States to meet its international climate obligations. These funds should be used to create jobs prospectively in communities likely to be severely impacted and to ensure that low-income households are not adversely affected by the carbon tax.

Endnotes

[1] This paper is being jointly published by the Institute for Energy and Environmental Research (IEER) and the Labor Network for Sustainability (LNS). On the IEER side, it emerged from the Renewable Maryland Project, funded by the Town Creek Foundation. On the LNS side, it is part of the Climate, Jobs, and Justice Project. The core idea in this paper goes back to my analysis, over 25 years ago, on the effects of the mobility of capital and, among other things, what communities and workers might do to protect themselves in that context. More recently, the ideas in this paper were part of the equity considerations in the Renewable Maryland Project, funded by the Town Creek Foundation. They were developed with input from Joe Uehlein of LNS in that context in 2015. He is part of the Advisory Board of the Renewable Maryland Project. They were further developed following the discussions on difficulties of a just transition at the LNS-organized meeting on "Making a Living on a Living Planet" at Georgetown University on April 20, 2016. I would like to thank Joe Uehlein (LNS), Becky Glass (LNS), Jeremy Brecher (LNS), and Jim Hare (Wisconsin Farmers Union) for their comments on an earlier draft of this paper. As part of his review, Jeremy Brecher drafted a portion of the introduction to clearly summarize the proposals and their motivation.

[2] We have chosen to call this a "discussion paper" rather than a "report" because we see this as the start of a new conversation about how to ensure a just transition. In particular, the means of funding the just transition need to be further explored as it is likely to be difficult to get a national carbon tax and there is a need to create jobs in many fossil-fuel centered areas in the near term.

[3] See, for instance, *Lazard's Levelized Cost of Energy Analysis – version 9.0* (Lazard, New York, November 2015, slide 2, at https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf) which shows that wind and utility-scale solar are cheaper than coal and nuclear; wind is cheaper than natural gas combined cycle plants; and solar is projected to be cost-competitive in a couple of years, even without factoring in natural gas price volatility risk. When wind and solar are combined with efficiency, the overall costs are considerably lower than fossil fuels or new nuclear. Distributed solar costs are declining. The Department of Energy's SunShot initiative aims for low costs by the year 2020. See *SunShot Vision Study* (DOE, Washington, DC, 2012, Executive Summary, p. xix, at http://www1.eere.energy.gov/solar/pdfs/47927_executive_summary.pdf (DOE 2012 SunShot)). The program appears to be on track.

[4] A number of studies have come to such conclusions, including *The Clean Energy Future: Protecting the Climate, Creating Jobs, Saving Money* (Labor Network for Sustainability; 350.org, and Synapse Energy Economics, Washington, DC, 2015, at http://www.labor4sustainability.org/wp-content/uploads/2015/10/cleanenergy_10212015_main.pdf (LNS et al. 2015)). The "research [was] conducted by a team led by economist Frank Ackerman of Synapse Energy Economics" (p. 2) IEER's comprehensive roadmap for a renewable energy future in Maryland, including a zero-emissions electricity sector and a detailed economic assessment, will be published in 2016. See Makhijani and Mills 2016.

[5] Arjun Makhijani, Christina Mills, and Annie Makhijani. *Energy Justice in Maryland's Residential and Renewable Energy Sectors*: *A report of the Renewable Maryland Project.* Takoma Park, MD: Institute for Energy and Environmental Research, October 2015. On the Web at http://ieer.org/wp/wp-content/uploads/2015/10/RenMD-EnergyJustice-Report-Oct2015.pdf

[6] I exclude geoengineering solutions from consideration as too risky.

[7] IEER's detailed analysis of Maryland's energy sector indicates that baseload electric power plants will not be needed in the smart, renewable grid-of-the-future. Moreover, nuclear and coal power plants are not flexible enough to complement variable wind and solar. Indeed, nuclear and coal plants can become a hindrance at high levels of wind and solar penetration because their response time (known technically as "ramp rate") is too slow for the needs of such a grid. The resources that fit a renewable energy future

include demand response, batteries, vehicle-to-grid technology, microgrids, and strategic efficiency investments.

[8] "Making a Living on a Living Planet" is a project of the Labor Network for Sustainability – for details see http://www.labor4sustainability.org/making-a-living-on-a-living-planet-2/.

[9] A tax is suggested rather than carbon trading to raise revenues. It is a more straightforward and predictable way to raise the necessary revenues for just transition purposes.

[10] Arjun Makhijani and Christina Mills, *Prosperous, Renewable, Maryland: A Roadmap for a Healthy, Economical, and Equitable Energy Future for Maryland* (tentative title). (Institute for Energy and Environmental Research, Takoma Park, MD, forthcoming 2016, at http://ieer.org/projects/renewable-maryland/.

[11] Timothy Hayden (Director, Department of Finance & Budget, Calvert County, Maryland), Email to Lois Chalmers (IEER) and others, Subject: RE: *Online Form Submittal: Contact Us [Calvert Cliffs related taxes]*, April 18, 2016 (Calvert County 2016).

[12] There are natural gas-related pipelines and a major storage facility (in Western Maryland). A liquefied natural gas export terminal has also been licensed. The transition discussed in this paper would cover the jobs in such centralized fossil fuel facilities.

[13] Lynn Cook, "As Oil Jobs Dry Up, Workers Turn to Solar," *Wall Street Journal*, April 21, 2016, at http://www.wsj.com/articles/as-oil-jobs-dry-up-workers-turn-to-solar-sector-1461280612.

[14] Scottish Enterprise, *Oil and Gas 'Seize the Opportunity' Guides: Offshore Wind* (SE, Glasgow, May 2016, at www.offshorewindscotland.org.uk/media/1116/sesdi-oil-and-gas-div-guide-offshore-wind.pdf).

[15] Site-specific studies are needed to establish feasibility. Natural gas storage caverns are common in the Appalachian region. See the Energy Information Administration map of underground natural gas storage facilities (*Underground Natural Gas Working Storage Capacity with Data for November 2015*, EIA, Washington, DC, March 16, 2016, at http://www.eia.gov/naturalgas/storagecapacity/, with link to 2015 map at http://www.eia.gov/cfapps/ngqs/images/storage_2015.png (EIA Natural Gas 2016)).

[16] The manufacturing project was launched in 2015. See OCI Solar Power, *OCI History* (OCI, San Antonio, accessed June 2, 2016, at http://www.ocisolarpower.com/about/company-history/) and Scott Wudel, "Mission Solar Energy creates 'made-in-San Antonio' panels," *Energized* (CPS Energy Blog), September 18, 2014, at http://newsroom.cpsenergy.com/made-san-antonio-solar-panels/ (CPS Energy 2014).

[17] David Hendricks, "CPS Energy writes off $391.4 million from South Texas Project nuclear expansion," *San Antonio Express-News*, February 24, 2016, updated February 26, 2016, at http://www.expressnews.com/business/local/article/CPS-Energy-writes-off-391-4-million-from-South-6852804.php.

[18] For instance, the Energy Information Administration has estimated that a CO_2 fee starting at $30 per metric ton and rising to about $107 per metric ton by 2040 (in constant 2011 dollars) would reduce CO_2 emissions by about 89 percent by 2040 relative to 2005. See the EIA's analysis (*Further Sensitivity Analysis of Hypothetical Policies to Limit Energy-Related Carbon Dioxide Emissions*. Supplement to the Annual Energy Outlook 2013, EIA, Washington, DC, July 2013, Figure 3, at https://www.eia.gov/forecasts/aeo/supplement/co2/. (EIA AEO 2013 CO_2 Supplement)

[19] Shakuntala Makhijani et al., *Cashing in on All of the Above: U.S. Fossil Fuel Production Subsidies under Obama* (Oil Change International, Washington DC, July 2014, p. 4, at http://priceofoil.org/content/uploads/2014/07/OCI_US_FF_Subsidies_Final_Screen.pdf).

References

Calvert County 2016	Timothy Hayden (Director, Department of Finance & Budget, Calvert County, Maryland). Email to Lois Chalmers (IEER) and others. Subject: RE: *Online Form Submittal: Contact Us [Calvert Cliffs related taxes]*, April 18, 2016.
Cook 2016	Lynn Cook. "As Oil Jobs Dry Up, Workers Turn to Solar," *Wall Street Journal*, April 21, 2016. On the Web at http://www.wsj.com/articles/as-oil-jobs-dry-up-workers-turn-to-solar-sector-1461280612.
CPS Energy 2014	Scott Wudel. "Mission Solar Energy creates 'made-in-San Antonio' panels," *Energized* (CPS Energy Blog), September 18, 2014. On the Web at http://newsroom.cpsenergy.com/made-san-antonio-solar-panels/.
CPS Energy 2016	CPS Energy. *New Energy Economy: Turning innovation into economic development*. San Antonio: CPS, accessed June 6, 2016. On the Web at https://www.cpsenergy.com/en/about-us/who-we-are/new-energy-economy.html.
DOE 2012 SunShot Executive Summary	United States. Department of Energy. *SunShot Vision Study: Executive*. (DOE/GO-102012-3037) [Golden, CO]: DOE, Office of Energy Efficiency and Renewable Energy, February 2012. On the web at http://www1.eere.energy.gov/solar/pdfs/47927_executive_summary.pdf, from links at http://energy.gov/eere/sunshot/sunshot-vision-study. Prepared by the National Renewable Energy Laboratory.
EIA AEO 2013 CO_2 Supplement	United States. Department of Energy. Energy Information Administration. *Further Sensitivity Analysis of Hypothetical Policies to Limit Energy-Related Carbon Dioxide Emissions*. Supplement to the Annual Energy Outlook 2013. Washington, DC: EIA, July 2013. On the Web at https://www.eia.gov/forecasts/aeo/supplement/co2/pdf/aeo2013_supplement.pdf, from link at https://www.eia.gov/forecasts/aeo/supplement/co2/.
EIA Natural Gas 2016	U.S. Department of Energy. Energy Information Administration. *Underground Natural Gas Working Storage Capacity* ***With Data for November 2015***. Washington, DC: EIA, March 16, 2016. On the Web at http://www.eia.gov/naturalgas/storagecapacity/, with link to 2015 map at http://www.eia.gov/cfapps/ngqs/images/storage_2015.png.
Hendricks 2016	David Hendricks. "CPS Energy writes off $391.4 million from South Texas Project nuclear expansion," *San Antonio Express-News*, February 24, 2016, updated: February 26, 2016. On the Web at http://www.expressnews.com/business/local/article/CPS-Energy-writes-off-391-4-million-from-South-6852804.php.
Lazard 2015	Lazard. *Lazard's Levelized Cost of Energy Analysis - Version 9.0*. [New York: Lazard Ltd. Global Power, Energy & Infrastructure Group], November 2015. On the Web at https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf, from a link at https://www.lazard.com/perspective/levelized-cost-of-energy-analysis-90/.
LNS et al. 2015	Labor Network For Sustainability, 350.org, and Synapse Energy Economics. *The Clean Energy Future: Protecting the Climate, Creating Jobs, Saving Money*. [Washington, DC]: LNS, 350, and Synapse, 2015. On the Web at http://www.labor4sustainability.org/wp-content/uploads/2015/10/cleanenergy_10212015_main.pdf, from link at http://climatejobs.labor4sustainability.org/national-report/. Frank Ackerman (Synapse) led the research team. Publication date from URL

LNS Project	Labor Network for Sustainability. "Making a Living on a Living Planet," [LNS Project]. Washington, DC: LNS, accessed June 2, 2016. On the Web at http://www.labor4sustainability.org/making-a-living-on-a-living-planet-2/.
Makhijani and Mills 2016	Arjun Makhijani and Christina Mills. *Prosperous, Renewable, Maryland: A Roadmap for a Healthy, Economical, and Equitable Energy Future for Maryland*, (tentative title). Takoma Park, MD: Institute for Energy and Environmental Research, forthcoming 2016. Links will be on the Web at http://ieer.org/projects/renewable-maryland/.
Makhijani et al. 2014	Shakuntala Makhijani, Stephen Kretzmann, and Elizabeth Bast. *Cashing in on All of the Above: U.S. Fossil Fuel Production Subsidies under Obama*. Washington DC: Oil Change International, July 2014. On the Web at http://priceofoil.org/content/uploads/2014/07/OCI_US_FF_Subsidies_Final_Screen.pdf. Researched and written by Shakuntala Makhijani, with assistance and contributions from Stephen Kretzmann and Elizabeth Bast.
Makhijani, Mills, and Makhijani 2016	Arjun Makhijani, Christina Mills, and Annie Makhijani. *Energy Justice in Maryland's Residential and Renewable Energy Sectors*: *A report of the Renewable Maryland Project.* Takoma Park, MD: Institute for Energy and Environmental Research, October 2015. On the Web at http://ieer.org/wp/wp-content/uploads/2015/10/RenMD-EnergyJustice-Report-Oct2015.pdf, from a link at http://ieer.org/resource/energy-issues/energy-justice-marylands-residential/.
NYS PSC 2016	New York Public Service Commission. *Order Adopting Low Income Program Modifications and Directing Utility Findings*, at a session of the Public Service Commission held in the City of Albany on May 19, 2016, Case 14-M-0565 - Proceeding on Motion of the Commission to Examine Programs to Address Energy Affordability for Low Income Utility Customers. Albany, PSC, Issued and Effective May 20, 2016. On the Web at http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7BBC2F31C9-B563-4DD6-B1EA-81A830B77276%7D.
OCI Solar 2016	OCI Solar Power. *OCI History*. San Antonio: OCI Solar, accessed June 2, 2016. On the Web at http://www.ocisolarpower.com/about/company-history/.
Scottish Enterprise 2016	Scottish Enterprise. *Oil and Gas 'Seize the Opportunity' Guides: Offshore Wind*. (SE/4504) Glasgow: SE, May 2016. On the Web at www.offshorewindscotland.org.uk/media/1116/sesdi-oil-and-gas-div-guide-offshore-wind.pdf.
Tillier 2014	Martin Tillier. "The Fossil Fuel Industry May Not Help the Planet, But It Employs Millions," *Oilprice.com*, July 9, 2014. On the Web at http://oilprice.com/Energy/Energy-General/The-Fossil-Fuel-Industry-May-Not-Help-the-Planet-But-It-Employs-Millions.html.