

I will present a brief synopsis of four chapters in the following section. Firstly, I explain the current situation of global warming with previous threats to the human race, which was covered in the first chapter of the book. Then, I explain the second chapter by clarifying the relationship between capitalism and the climate crisis. After that, I present "A Global Green New Deal" proposed by Robert Pollin. In this part, I also describe the contributions of Chomsky. Then, I clarify the discussion, conducted in the book's last chapter, about political mobilization affecting the global balance of power. Until this point, I give a summary of the book. Then, I pass on my assessments about the book. I criticize the book chapter by chapter.

2. Brief Synopsis

The first chapter, namely "The Nature of Climate Change," starts with Chomsky's situating the climate change crisis and comparing it with previous threats. The problem of climate change can only be solved with international effort because it is a threat to all nations worldwide. This is one of the crucial results stated at the beginning of the book. And people have particular responsibilities for combating climate change crises. Noam Chomsky emphasizes another possible threat to humanity. In the 20th century, humankind began to speed up the global termination by accelerating nuclear weapons. However, some successful attempts to prevent human extinction were experienced. ABM, INF, Open Skies, and New START were major controls. At the beginning of the 21st century, these controls began to be abolished one by one. The Bush II administration and Trump's administrations withdrew from ABM and INF Treaties. Therefore, there has been no need to maintain Open Skies or New START Treaties. In other words, humanity meets the again the convenient condition for racing to the global terminal. So, according to Chomsky, these two existential crises are related to each other. Because military outlays in a year of the world is roughly 1.8 trillion dollars. So, we need to ask, "how will it be possible to overcome climate change as massive resources needed to protect life in the world are flowing to the military? *"Who will defend the Earth?"*

According to the IPCC October 2018 report, it was concluded that we must stabilize the global average temperature at 1.5 degrees above the preindustrial level. Therefore, we have to reduce CO2 emissions significantly by 2050. We know that there is no plan B. We must immediately meet zero net carbon emission because the effects of climate change will not be reversible. *We are losing control of weather tipping happens.* In the following 30 years, we must achieve zero net emissions to save the human race. Then, Chomsky uses an impressive quotation from Israeli climatologists: *"They don't understand that everything is expected to change: the air we breathe, the food we eat, the water we drink, the landscape we see, the oceans, the seasons, the daily routine, the quality of life. Our children will have to adapt or become extinct... That is not for me. I'm happy I won't be here"*. In sum, Chomsky makes an essential connection between the environmental problem and nuclear arming. It is called a twin crisis.

On the other hand, Polychroniou asks Robert Pollin about the views, which are pro-market, of orthodox economists. Pollin states that some mainstream economists accept that climate change is the greatest market failure that the world has seen, whereas some consider that market failure is a result of government intervention. According to Pollin, climate change is one of the historical failures of the free market system. He highly criticizes neoliberalism which is the idea that outcomes of the free-market system are optimal and efficient. In this manner, Robert Pollin puts forward the idea of socialism for the capitalist class. That is, the free market system consists of giant corporations and non-government existence in managing the economy. So, the government allows them to pursue profit-seeking. However, firms request the government to bail out whenever the market system is collapsed. It is a practical problem for neoliberalism, consisting of a pure free-market system and highly deregulation in the financial system.

Pollin highlights the distinctive view of a mainstream economist. It is an exclusion of government in managing the economy. They continue to support the mentality that depends upon market perfections. First of all, the destructive effects of global warming are not newly known. In the 80s, there were studies made by researchers who worked for ExxonMobil and Shell, about fossil fuel consumption that will cause a 2-degree increase in the average temperature of the planet in 2060. These corporations earned a significant profit and governments granted them massive subsidies. Robert Pollin says that some mainstream economists recognize that the free market system can fail. But they point out that market failure is a result of government intervention. They propose to minimize government. They also suggest a policy for climate change that includes no government. They offer carbon tax. It redistributes the income to lower-income people due to an increase in the cost of standard of living. These economists do not support government investments in renewable energy sources. They continue to follow the idea of market perfections. In this chapter, Robert Pollin does not explain the problem's solution further because he later explains why the government is needed to overcome global warming in the third chapter.

Towards the end of this chapter, Robert Pollin talks about the impacts of industrial agriculture on global warming together with alternatives. Robert Pollin states that one of the crucial drivers of climate change is corporate industrial agriculture, responsible for approximately 25 percent of total greenhouse gas emissions. There are four main channels interrelated with each other: I. Deforestation, II. Use of land for cattle farming, III. The heavy reliance on natural gas-based nitrogen fertilizers, synthetic pesticides, herbicides, and IV. The vast amount of food that is grown but wasted.

Deforestation is the most significant issue driving climate change. Because trees are already absorbing CO₂ emissions that we have pumped into the atmosphere. So, deforestation accelerates to expand of CO₂ emission in the atmosphere. Robert Pollin adds that deforestation contributes to the rising incomes of profit-seeking firms and low-income families. Because forests are destroyed to open new land for mining and agriculture. So, deforestation is profit managed. Then, Pollin explains how profit-seeking agricultural firms drive 40 percent of deforestation in developing countries for cattle grazing. Cattle farming is devastating for forests. It continuously needs more new lands. What is an alternative to industrial farming? Organic farming is an alternative solution, but it is less productive. So, this means that we need more land for organic farming. However, according to Pollin, we know that there are huge wasteland and food waste. Forty percent of whole foods produced by developing countries are lost due to post-harvest processes such as storage and transportation. So, Pollin proposes that we can transform industrial agriculture into organic farming by needing no more land if we invest more in storage and transport infrastructure. We can compensate productivity loss of organic farming. He also points out the air pollution issue due to burning fossil fuels, firewoods, etc. In the developed world, conditions are not so bad. However, these issues are not solved yet in those countries.

The second chapter, namely "Capitalism and the Crisis," tries to connect capitalism and the climate crisis. Noam Chomsky begins to talk about the intention of Republican leadership undermining the Paris Agreement. An important point here is the connection between Republican Party and deniers in the business world. The members of business world have highly class-conscious on the issue of global warming. For instance, David Koch is an ultimate denier who rejects global warming. Chomsky highlights the influence of David Koch on the Republican Party. David Koch has worked to get rid of any moderate Republicans who suggested regulations on greenhouse gases. The Koch network has been forced to design Republican Party in its view, which does not only refuse to take action against global warming but continues to deny the reality of global warming. According to Chomsky, only 25 percent of Republicans recognize that the problem is accurate and that humanity is responsible. Then, Chomsky mentions Sanders' movement in the United States. He goes into the details of the worker movement and its historical background. Chomsky states that leaders of the worker movement in the past were prominent environmentalists. And he also explains the relationship between the struggle of unions and the struggle

of the environment. Chomsky gives an example of Tony Mazzocchi, the head of the Oil, Chemical, and Atomic Workers International Union. Under the leadership of Tony Mazzocchi, this union played a significant role in the establishment of the Occupational Safety Health in 1970. Being a pro-environmental, Tony Mazzocchi was a person who highly criticized capitalism. According to Chomsky, he considered that workers should control the plant environment while taking action for combating industrial pollution.

Chomsky concentrates more on the nature of capitalism. He states that the institutional and ideological functions of capitalism directly elicit the destruction of organized social life. We have practiced expanding fossil fuel production every day. ExxonMobil is one of the biggest firms which produce fossil fuels. Chevron is another example of the situation which plants' energy project is destroying the environment. Royal Dutch Shell is now establishing a considerable plant that aims to create non-biodegradable plastic that kills ocean life. Chomsky puts forward opportunities that have emerged with the 2008 financial crisis. When the crisis occurred, U.S auto industries were virtually nationalized by Obama. So, it provides a chance to talk more about the intention to produce. So, the capitalist property requires production for profit instead of considering human life. Chomsky concludes that socializing core industries and reorganizing production depending upon human needs under the community control of means of production is not a utopian dream.

After Chomsky's introduction on the relationship between capitalism and climate change, Robert Pollin starts a conversation connecting the rise of capitalism and burning fossil fuels to produce energy and machines. He gives an example of extensive coal production aiming at burning to get power for producing manufacturing commodities in the U.K in the 1830s. According to Robert Pollin, Britain is responsible for 60 percent of global CO2 emissions in the mid-1850. Global capitalism emerged depending upon fossil fuel-based energy systems. And clean energy transition might provide the critical cornerstone for improving democracy and egalitarian community. But it should be known that any type of technology, whether clean or not, cannot deliver social transformation. According to Robert Pollin, egalitarian communities can only emerge if people build a political movement.

Just as capitalism is a profit-driven system, fossil fuel production is lucrative. That is why they are produced. If the cost of renewable energy declines and if it is lucrative like fossil fuels, do firms invest in green energy? According to Robert Pollin, the energy cost generated by renewable sources is almost equal to the cost of power generated by fossil fuels. But fossil fuel industry is still expanding. However, we observe that billionaires have already begun to hold solar energy assets more in their portfolios. Over the decades, firms have invested large scale in the fossil fuel industry. The scale of the industry is too big to withdraw. Therefore, Robert Pollin states that clean energy transition cannot be achieved by an attempt that forces to fall rate of profit. However, government intervention to force capitalists to invest in renewable sources is necessary. Moreover, the government should exist in the economy to invest in critical economic sectors. Also, It should subsidy private green investments. According to Robert Pollin, a combination of these two policies, suggested by the mainstream economists, will move us to get rid of fossil fuels faster than the carbon tax policy.

On the other hand, Noam Chomsky highly criticizes the profit-based view. He suggests that worker-owned and managed enterprises might have different motives than privately owned firms that seek a profit. However, Robert Pollin does not think public ownership is a favorable framework for improving clean energy-based industries because 90 percent of the world's reserves and 75 percent of world production of fossil fuels are organized under the control of publicly owned or national companies.

The third chapter, titled "A Global Green New Deal," covers the possibility of a politically realistic and economically feasible project. IPCC reports state that we will have to reduce total CO2 emissions by 45 percent in 2030. And then zero net emission will be reached in 2050.

Fundamental issues of the Global Green New Deal proposed by Robert Pollin are hitting IPCC targets, job opportunities, and raising living standards for poor and working people. According to Robert Pollin, IPCC targets are realistic to be achieved. However, it requires a massive investment in green resources. What is targeted to reach net zero-emission is approximately 2.5 percent of global GDP per year until 2050. Pollin's projection assumes that average spending per year should be equal to 4.5 trillion dollars per year from 2024 to 2050 if the project is expected to begin in 2024. So, the total green energy investment is 120 trillion dollars between the period 2024 and 2050. Robert Pollin states that 2.6 trillion dollars are necessary for the clean energy transformation in the program's first year. He assumes that it can be undertaken equally by the public and private sectors. In 2018, the total investment involving green energy sources and energy efficiency was 570 billion dollars, equal to 0.7 percent of world GDP. So, to hit the IPCC target, 1.8 percent of world GDP, which is about 1.5 trillion dollars, is needed. The total investment level will be increased as the global economy grows. And consumption of coal, oil, and natural gas must be fallen during this period. The total consumption of fossil fuels and nuclear energy is equivalent to 85 percent of the global energy supply.

Land requirements constrain clean energy. Robert Pollin states that it is not realistic that 100 percent global renewable energy is built. Because it needs 100 times more land to plant than fossil fuel plants. Pollin evaluates several reports about building 100 percent renewable energy sources worldwide. For instance, 1 percent of US territory is enough to plant wind and solar energy sources to provide energy for the whole of the USA. And new opportunities to allow their land for building wind power will occur for farmers. And energy efficiency is developed by technological advancement. There also occur carbon-negative technologies. They are emerged through technological development. The first one is an aerosol injection into the atmosphere to reduce CO₂. The second one is carbon capture technologies which transport carbon through pipelines into the subsurface to be stored. However, the third one is that trees are already natural carbon absorbers. So, afforestation is a natural alternative. Robert Pollin refers to the report of Mark Lawrence that afforestation might realistically decrease CO₂ by the amount of roughly between 0.5 and 3.5 billion tons per year towards 2050. However, we know that today's total carbon emission is approximately 33 billion tons. So these three solutions do not deliver a significant result that global warming is reversing.

On the other hand, Noam Chomsky considers that geoengineering solutions are the last resort to be launched. Because their side effects cannot be estimated, they are ecologically harmful. By the way, quite similar methods are already used in agriculture. Artificial nitrogen fixation for fertilizers has been used for a long time. These types of practices are used due to the population boom. And we are sure that some side effects are unacceptable. According to Noam Chomsky, we can also be away from industrial meat production because its contribution to global warming cannot be ignored.

Nuclear power plants supply 5 percent of global energy. As some European countries are stopped planting nuclear energy, there are a lot of nuclear power construction in process. They do not cause air pollution or CO₂ emission. However, radioactive wastes are so dangerous for human life. Furthermore, storage of reactor fuels and the decomposition of nuclear plants, which are out of date, are two other issues. Moreover, there is a risk of operating reactors as an uncontrolled nuclear reaction, just like happened in Japan in 2011. Fukushima power plant was meltdown due to an unexpected earthquake. It elicited air and ocean contaminations. Then the last issue is political security because nuclear energy can be used to produce deadly weapons. Noam Chomsky and Robert Pollin are both against nuclear power as a solution to get rid of global warming.

This chapter includes another essential discussion about the growing literature connecting global warming and economic inequality. Robert Pollin says that the US and Western Europe through 1980 were responsible for roughly 70 percent of total cumulative emissions. If we consider the global population by

income levels, in 2015, the top 10 percent was responsible for almost 50 percent of total emissions due to private consumption. In contrast, the bottom 50 percent of the total population was just responsible for 10 percent of total emissions due to their consumption. Here, we need to seek an answer to the question: “who is incurring the cost of climate change? Fossil fuels are burned in rich countries more than in poor countries. At the country-based level, rich people benefit from a fossil fuel-based economy more than poor people in terms of the consumption of goods and services. On the other hand, poor countries and their people face the high cost of global warming. They breathe polluted air. They do not have the capabilities to invest in sea walls and air conditioners. They produce fossil fuel-based commodities, which are not allowed to produce in developed regions. Then, they export them to developed areas. The import composition of developed countries consists of largely non-eco-friendly commodities. These countries are blamed much more for global warming. And also, they are expected to sacrifice their economic growth. In fact, poor countries are less responsible for global warming.

Earth’s mean temperature has risen by roughly 1.1 degrees since the 1880s. So, there is a need to take significant action to protect nature and poor communities. The Global Green New Deal project aims at combating climate change and its impacts. First, protections should begin with constructing storage and expanding existing storage for fresh water and food, and seeds. The second one is organic farming. Industrial farming causes lots of side effects that are harmful to humans. The third is that protection should also involve effective and affordable financial insurance for poor communities.

In this paper, Robert Pollin presents an outline of his proposal for the investment route of the Global Green New Deal. He begins with industrial and financial policies to achieve zero carbon emissions for the global economy. Industrial policies should be made by improving technological innovation that promotes existing clean energy technologies. And there should be a price guarantee for the private sector in the investment of clean energy sources. Profitability is also essential for clean energy investors to provide a stable long-term market environment. Then, one of the most critical policies is a direct reduction in the consumption of fossil fuels. The carbon tax can manage this policy. And potential funds which are expected to come from taxing can be used for subsidies. Besides, the rising price of fossil fuels due to taxing will aggravate the standard of living for poor families because low-income families widely demand fossil fuels-based jobs market. So, the government should support them with new job opportunities for clean energy investments and the transfer of newly created income from the carbon tax.

Financing policies are required. The total financial asset in the world is roughly equal to 317 trillion dollars. Robert Pollin proposes that 2.4 trillion dollars, which should be begun in 2021, is 0.7 percent of total assets. Then, he suggests four primary sources of funding for clean energy transformation. These are carbon tax, some portion of funds flowed into military spending, green bond lending program, and elimination of subsidies in fossil fuel industries. He expects that 625 billion dollars can be generated by carbon tax at the beginning of the program. Thus, 25 percent of this, roughly equal to 160 billion dollars, can be used to finance clean energy investments. And 75 percent of tax income can be used to support poor families on earth. Total military spending of global economies was about 1,8 trillion dollars in 2018. The USA has nearly 40 percent of global military spending. He assumes that 6 percent of global military spending, equal to roughly 100 billion dollars, can be transferred into financing the global green new deal project. Then, as we experienced in the 2008 financial crisis, there is no limit on non-borrowed reserves of Fed, which some portion of it was used to bail out firms during the crisis. He proposes that Fed and ECB can supply separately 150 billion in Green Bonds financing. And last, 3 trillion dollars were subsidized globally into fossil fuel industries in 2015. It is roughly 0.4 percent of global GDP. He assumes that 25 percent of fossil fuel subsidies can be channeled into the investment in clean energy sources. With four primary funding sources, which are 25 percent of a carbon tax (160 billion dollars), military spending transfer (100 billion dollars), Green Bonds program of Fed and ECB (300 billion dollars), and 25 percent of total fossil fuel subsidies (750 billion dollars), 1.3 trillion dollars are necessary funds of public sector for

the first year of Green New Deal Project. This large-scale investment might not fully offset massive job losses in fossil fuel industries.

De-growth issue is also asked to both Robert Pollin and Noam Chomsky; they agree that the idea of de-growth cannot be a solution because degrowth will directly elicit a large scale of unemployment. And shifting green energy sources from fossil fuels requires growth, such as constructing new solar and wind panels, storage, transportation expansion, etc.

Chapter four, titled “Political Mobilization to Save the Planet,” covers global political movement and balance of power. The first thing we must understand is that no one and no country can escape from the risks of global warming. It is an international existential crisis for humanity. In addition, global warming and the Covid19 pandemic relate to each other. Both are the results of the destruction of natural habitats through deforestation. People also face health consequences of air pollution. Robert Pollin highlights a study about SARS which is related to Covid19. It shows that people who breathed dirtier air were influenced by the infection double times more.

The last point covered in chapter four is Eco-socialism. It is a political movement aiming at annihilating capitalism to prevent environmental disasters. So, as discussed earlier, it parallels a society of free, democratic, and community-owned ownership structure, like an example of Tony Mazzocchi’s attempt. According to Robert Pollin, ecosocialism and the green new deal are the same projects. Green New Deal aims at stabilizing climate change as well as combating the rise of inequality. Robert Pollin states that ecosocialism targets to prevent ecological disasters too. However, Robert Pollin does not think that clean energy transition can be achieved by only the route of publicly owned property. He emphasizes that large scales of fossil fuel industries are publicly owned. He shares the concerns of Eco socialists; however, he considers that changing the structure of ownership by destroying capitalism is a somehow radical idea, and it is not realistic. Chomsky and Pollin discuss the strategy of massive civil disobedience at the end of the chapter. They are both refer to Antonio Gramsci. Noam Chomsky states that neoliberalism is visibly dying. We have experienced its dying symptoms as deep meaning of Gramsci’s sentences: “The old is dying, and the new cannot be born, in this interregnum, a great variety of morbid symptoms appear.” On the other hand, Robert Pollin is more optimistic than Chomsky. He begins the discussion with another quotation from Gramsci: “Pessimism of the mind; optimism of the will.” And he points out that there is no alternative!

3. Critique of the book

Naturally, I do not totally agree with the authors throughout the book. There are some points that I agree with and partly agree with them. However, on some points, I am afraid I have to disagree. Let me start with the first chapter. I absolutely agree that climate change can be solved only with international attempts. There is no possibility of one country's solution for climate change. In this chapter, they complain about large-scale military spending. It is one of the main points to attack some people concerned about how the green transformation of industries is financed. Global military expenditure will be had to be cut down to overcome with financial issue of green transformation. Also, I partially agree with the authors about the idea that carbon tax alone cannot deliver green energy transformation. There is a need for government intervention. I agree that more than the carbon tax is needed. However, the possibility of government intervention without political mobilization of people almost does not exist. I explain this after the critique of Pollin’s project. The last idea in this chapter is that industrial agriculture is the main driver of global warming. The alternative is organic farming. However, it might not be easy to think that organic farming alone can generate a sustainable amount of food consumed by the world population if industrial agriculture is abolished. In the second chapter, the authors try to make a connection between capitalism and the climate crisis. They highlight Marxian ecology, such as the idea of metabolic rift developed by John Bellamy Foster. However, they do not go into the details of it. Noam Chomsky insists on the idea that

private property is a problem to overcome profit-led production. I totally agree with Chomsky. He enlightens the possibility of other types of ownership. On the other hand, Robert Pollin emphasizes the connection between burning fossil fuels and emerging capitalism. Here, in my opinion, burning fossil fuels is a result. It is not a reason for emerging capitalism. However, generating energy has indeed evolved as capitalism was expanded. In this part, I am close to the ideas of Chomsky rather than Robert Pollin. We cannot deal with ecological disasters unless we eliminate profit-led production and social relation because capitalists care only about profit. They do not have moral values, so they do not care about ecology. Besides, I agree that technology cannot deliver green transformation because it is organized and led by the idea of making a profit. Today, we observe that no pharmaceutical company is sacrificing the ownership rights of vaccines as millions of people on the earth are infected by Covid19. Because they care only about profit. So, without discussion on profit-led production and its social relation, we cannot find a robust solution to overcome global warming. After that, the third chapter covers the idea of the global green new deal. Robert Pollin presents his project. Moreover, he provides four main sources to finance green energy transformation on a global scale. He assumes and charges several duties to the government, such as carbon tax, cutting military expenditure, disable fossil fuel subsidies. However, he forgets that almost all governments on earth are managed by strong relationships with owners of large corporations. In the book, they explain the existing of Ketch brothers in the political system. This type of political existence of capitalists is almost in every geography on earth. Therefore, I do not consider that Pollin's plan is politically realistic. We need more than assumptions about types of government intervention. There is a need to force capitalists to transform their energy systems. It is nothing but political mobilization and civil disobedience of people globally. Furthermore, we need other types of property ownership. In the last chapter, they discuss political mobilization to save the planet. This chapter is the weakest chapter of the book. The authors give an example of Tony Mazzocchi to connect the history of unions and environmental movements. Moreover, one of the wrong ideas in this chapter is said by Robert Pollin. He thinks that ecosocialism and green new deal are the same projects. It is exactly not. The problematization of eco-socialists such as John Bellamy Foster is related to the fundamentals of capitalism. Moreover, they take the capitalist mode of production into the center of their studies. They think that it must be overcome to get rid of ecological disasters. However, Robert Pollin believes that ecological disasters can be solved under capitalism. I think that we cannot expect the government to take serious action. Lastly, I cannot entirely agree with the Pollin's idea that public ownership can not be a solution because publicly-owned companies generate 75 percent of fossil fuel production. He uses this argument to refuse other modes of production. However, we cannot understand socialism from public ownership companies of today's governments because they are organized to provide for the needs of the capitalist mode of production.

Peer-review: Externally peer-reviewed.

Conflict of Interest: The authors have no conflict of interest to declare.

Grant Support: The authors declared that this study has received no financial support.