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Renewable Energy Vrs Social Needs: What Do Environmentalists Must Do to Induce the Development of a Sustainable Market fueled only by Renewable Energy?

By

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Abstract

Calls for the need to be more environmentally friendly are getting louder and louder with time as the environmental consequences of economic development become easier and easier to document(e.g. deforestation, pollution, global warming, soil degradation, biodiversity loss…). Most of the current attention is being placed on moving from a market fueled by non-renewable energy to an economy driven by renewable energy. It seems that the need to take immediate green action to clean the non-renewable energy based market is leading to the implementation of any energy program as long as it is renewable regardless of the degree of social friendliness.

By doing this, it seems environmentalist are digging their own grave in the long-term as implementing renewable energy policies that compete or crowd out social concerns now will without doubt backfire later on. In other words, environmentalists appear to be failing to see people beyond the trees and this will undermine in the long haul previously set environmental objectives. The goals of this paper are three: To introduce a market model that varies depending on the type of energy that is fuelling it; To link one of these possible energy markets to the prevailing eco-economic market; and to stress through socially friendly conjuncturality what environmentalists must do to ensure the development of sustainable markets, including a sustainable market fueled only with renewable energy.

Introduction

i) The pure economic development model and non-renewable energy use

It is known that the original dominant model of development was the pure economic model(ED), a model that was both socially and environmentally unfriendly because within its structure only the economy(B) matters. This can be represented as follows:

ED = B

It is also known that the pure economic model(ED) was fuelled by non-renewable sources of energy such as oil, gas, and coal, with a high polluting capacity. The use of renewable energy sources or clean energy was minimal or non-existing in that model. Hence, pure economic development was linked to non-renewable energy production and use and this human activity is linked to environmental issues such as global warming. There is increasing evidence that these economic activities piled up in the last 50 years and are significantly connected to observed global warming(IPCC 2001).

In other words, this use of non-renewable sources of energy as pleased to support economic model has led to the so called human contribution to environmental issues such as pollution and global warming. For example, it is reported that a study of soot in ice from Greenland has found that after 1850 soot from industrial activities surpasses several times soot coming from natural activities like forest fires making it big human factor driving global warming(Schmid 2007). And it is pointed out that carbon dioxide is the most relevant human contribution to greenhouse gas; and that the primary source of the increased atmospheric concentration of this gas since the pre-industrial revolution comes from burning fossil fuel(IPCC 2007).

ii) The eco-economic development model and mixed sources of energy

Increasing environmental pressures has led to a transition from a model of economy only development(ED) to model of economy and environment only development or eco-economic development(EED), the current model of development. In other words, we can derive the eco-economic model(EED) by adding environmentally friendliness(C) to both sides of the pure economy mode(ED) as indicated below:

C[ED] = B[C] = BC

EED = BC, where EED = C[ED]

The relevance of environmental concerns within the eco-economic development model(EED) has led to calls for the use renewable sources of energy(e.g. wind, solar, tidal power, biomass, and so on) as much as possible to reduce reliance on only non-renewable sources as quick as possible. This sense of urgency is justified due to the increasing rapid deterioration of natural assets that has gone together with economic development to the point that it is believed that it is threatening the ability of the earth ecosystem to sustain future societies(MEA 2006). However, still within the eco-economic model non-renewable sources of energy continue to be heavily used. In other words, the eco-economic model is being fueled by mixed sources of energy, renewable and non-renewable ones.

As the supply of non-renewable sources of energy declines and its negative impacts on the environment increase, investments to develop renewable sources of energy should be expected to increase, specially in the long-term. Hence, eco-economic development is linked to renewable and non-renewable energy production and use or to a mixed energy system. But some forms of renewable energy may be more socially unfriendly than others, especially when pursued without any

specific social concern in mind. High oil prices have made recently the biofuel industry very competitive; and as this new industry expands, it will bring higher prices for basic foods(Runge and Senauer 2007); and it will take increasingly more and more water and land away from food production(Harbinson 2007) and other land uses. The positive impact of renewable energy development on crops and crop product prices was pointed out as one of the expected costs of developing this industry in an international conference on renewable energy in Germany in 2004(IEA 2004).

It can also be seen from the formula above, that this eco-economic model(EED) is also a socially unfriendly development model as social concerns are not reflected in this model. This can be seen clearly by adding socially unfriendliness(a) to both sides of this model as shown below:

a[EED] = a[BC]

a[EED] = [aB][aC]

Hence, it can be said based on the above formula that the eco-economic challenge right now is to find ways of dealing with the energy crisis in a socially friendly manner. Otherwise, we will create an eco-economic vrs social conflict that should be prevented, a conflict that may push social forces to mobilize to undermine eco-economic goals as a last survival tool. This points to the need to avoid socially irresponsible renewable energy programs such as those that place the need to produced cleaner energy in direct competition with social needs and rights(e.g. Planting corn for energy production to pump cars instead of social consumption). It is known that right now increasingly land previously dedicated to food production and other agricultural uses such as corn is now being used to produced industrial biomass to be converted into ethanol to power cars, which is socially unfriendly strategy for the poor or the poorest as it will lead to less and less land for food production and higher food prices(Dyer 2007). It is expected that the higher the demand for biofuels the higher the world prices for agricultural products will be(OECD-FAO 2007), which again left alone will work against the poor especially in the long-term. It seems that going full with bio-energy such as ethanol without social concerns will make the rich smile and the poor cry longer. The above indicates that the more attention is placed in the production of bio-energy, the more likely is that the poor will be facing starvation as a direct consequence of efforts to produce one type of renewable energy.

iii) The need to link eco-economic development and sustainability

General sustainability requires social, economic, and environmental sustainability at the same time. As indicated in the discussion above, the eco-economic model(EED) reflects only economic and environmental concerns. It lacks social friendliness. For example, investors are told that they can make money and help the environment at the same time through green portfolios(MacLellan 2007), yet not much attention is given to the fact these green investments may have a negative social impact. Moreover, some renewable energy programs such as biofuels may not be as environmentally friendly as indicated as they may have little or negative impact on CO2 savings as their production is very energy intensive powered usually by non-renewable resources(Harbinson 2007).

As described above too, the environmental concerns within the eco-economic model relate to both the concern about the continue use/production of non-renewable energy and the hope of increasingly using/producing more and more renewable energy sources. How these two types of energy are used/produced may or may not socially friendly too. In other words, energy production,

use and its effects such as global warming are linked to social issues and should be address systematically. For example, to minimize the impacts of global warming on achieving the Millennium Development Goals(MDGs) it is being proposed that development organizations have to do two things at the same time: a) to advocate for cuts in emissions of green house gases; and b) to advocate for the provision of help to the poor for climate change adaptation(Mitchell and Tanner 2006). In other words, steps needs to be taken to make eco-economic development and its impacts socially friendly: Governments, business, environmental, and social organizations should support only those clean or cleaner energy programs that are socially responsible to avoid putting eco-economic goals in direct clash with social needs and rights; and they should vigorously oppose those programs known to be capable of bringing out social despair..

Hence, there is a need to advance ideas on how the eco-economic model can be expressed in energy and social sustainability terms so as to be able to point out ideas about where pressure from interest groups should be focused in the short-term and in the long-term in order to make the eco-economic model sustainable.

Goals of the paper

The goals of this paper are three: To introduce a market model that varies depending on the type of energy that is fuelling it; To link one of these possible energy markets to the prevailing eco-economic market; and to stress through socially friendly conjuncturality what environmentalists must do to ensure the development of sustainable markets, including a sustainable market fueled only with renewable energy.

Terminology

B = Economy friendly	b = Economy unfriendly
C = Environment friendly	c = Environment unfriendly
A = Socially friendly	a = Socially unfriendly
ED = Economic development model	EED = Eco-economic development model
M = Market exist	m = No market exist
R = Renewable energy exist	r = Renewable energy does not exist
NR = Non-renewable energy exist	nr = Non-renewable energy does not exist
MinNR = Minimize non-renewable energy	S = Sustainable market
MaxR = Maximize renewable energy	s = Unsustainable market

Methodology

First, a market model that varies according to the type of energy that fuels it is introduced and the different types of market consistent with it are listed. Second, the eco-economic market and the mixed energy fueled market are linked. Third, how to make eco-economic development or mixed energy markets socially friendly is shown. Fourth, based on the socially friendly structure of markets described above, it is indicated which are the aspects on which environmental advocacy should be focused in order to create a sustainable mixed energy market or a sustainable renewable energy only fueled market. And finally, specific and general conclusions are highlighted.

Energy fueled market variability model

It can be said that there is a market(M) when there is renewable energy or non-renewable energy or both at the same time fueling it, as indicated below:

$$M = R + NR$$

There are three market possibilities consistent with the model above

i) The non-renewable energy fueled market(M1)

The first possibility is a market fueled by non-renewable energy(NR) only, which can be expressed as below:

$$M1 = NR$$

In this market, no source of renewable energy or technology is used.

ii) Renewable energy fueled market(M2)

The second possibility is a market fueled by renewable energy(R) only, which can be stated as:

$$M2 = R$$

In this market, no source of non-renewable energy or technology is used.

iii) Mixed energy fueled market(M3)

The third possibility is a market fueled by both renewable energy(R) and non-renewable energy(NR) at the same time, which can be indicated as:

$$M3 = R.NR$$

In this market, there are sources of renewable and non-renewable energy or technologies being used at the same time.

iv) There is no market without energy(m)

Notice that there is not market(m) when there is no renewable energy(r) and non renewable energy(nr) at the same time.

$m = r.nr$

In other words, the formula above indicates that without energy, there are no markets.

Linking the eco-economic market(EED) to the mixed energy fueled market(M3)

As shown in the introductions, the eco-economic market(EED), the currently dominant development model today, is a mixed energy market that is friendly to both, the economy(B) and the environment(C) at the same time, as indicated below:

$EED = BC$

As derived from the market variability model above(M), the structure of a mixed energy market(M3) is made up by the presence of renewable(R) and non-renewable(NR) sources of energy at the same time as shown below:

$M3 = R.NR$

Therefore, we can link the structure of the eco-economic market(EED) to that of the mixed energy market(M3) as follows:

$EED = BC = M3 = R.NR$

Notice that both, the eco-economic market(EED) and the mixed energy market(M3) do not reflect social friendliness as eco-economic policies or mixed energy policies are implemented as proposed regardless of their degree of social friendliness. And this places eco-economic policies or mixed energy policies in direct conflict with social goals/concerns, a constant source of unsustainability(s).

How to make eco-economic development or mixed energy markets socially friendly

We can make markets socially friendly by directly reflecting social concerns(A) within their models as done below:

$A[EED] = A[BC] = A[M3] = A[R.NR]$

When markets reflect economic, social, and environmental concerns at the same time, they are considered to be sustainable(S); therefore, the following holds true:

$S = A[EED] = A[BC] = A[M3] = A[R.NR]$, where S = sustainable market.

The formula above implies that the eco-economic market is socially friendly(A[EED]) when eco-economic policies are socially friendly(A[BC]) and when that happens that market is sustainable(S). And the mixed market is socially friendly(A[M3]) when the renewable and non-renewable energy policies implemented are socially friendly too(A[R.NR]) and when that happens that market is also sustainable(S).

Reorganizing to show the markets in sustainability terms we get the following:

S = ABC = A[R.NR]

The above clearly implies that a socially sustainable eco-economic market(ABC) is a socially sustainable mixed energy market[A[R.NR]].

What do environmentalists can do in the short-term to create a sustainable mixed energy fueled market?

To provide an answer to this question, it is useful to have a sustainable market(S) expressed in terms of mixed energy as follows::

S = A[R.NR]

Based on the formula above, to create a sustainable mixed energy market(S) in the short-term environmentalist must do the following two things: a) To advocate for the minimization of non-renewable energy(NR) use and maximization of renewable energy(R) use; and b) To advocate for the implementation of only socially friendly energy programs or technology. And this can be expressed as follows:

S = A[MaxR.MinNR]

The above formula clearly shows that in the case of a mixed energy model, the necessary and sufficient condition for the market to be sustainable(S) is the implementation of only energy policies and technologies[MaxR.MinNR] that are socially friendly[A].

What do environmentalists need to do to create a sustainable renewable energy only fueled market in the long-term

To ensure the development of a sustainable market fueled only by renewable energy then, environmentalists must do the following two things: a) To advocate for the elimination of non-renewable energy(NR) use. If the goal is to eliminate the use on non-renewable energy, then NR = 1; and b) To advocate for the implementation of only socially friendly renewable energy programs or technology. And this can be stated as follows:

S = A[R.1] = A[R]

The above model clearly indicates that in the absence of non-renewable sources of energy(NR=1), the necessary and sufficient condition for the market to be sustainable(S) is the

implementation of only renewable energy policies and technologies that are socially friendly[A[R]]. In other words, only renewable energy markets that are socially friendly(A[R]) are sustainable markets(S).

Conclusions

First, It was shown that there can be three types of energy driven markets. Second, it was pointed out that there are no markets without energy. Third, it was indicated how it is possible to link the eco-economic market[EED] with the mixed energy market[M3] as they are the dominant views of development today while stressing that both of them do not reflect social friendliness(a). Fourth, it was described how those dominant views of development can be made socially friendly, and therefore, how they can be made sustainable. And finally, it was pointed out what environmentalist can do to induce the development of sustainable markets fueled by energy both in the short-term, a socially friendly mixed energy market, and in the long-term, a socially friendly renewable energy only market.

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