

## **Sustainability thought 162: Can we transition from the environmentally dirty economy to the environmental clean economy with the use of dwarf green markets? If no, why not?**

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### **Abstract**

There is an environmental pollution problem separating the environmentally dirty economy from the environmentally clean economy; and this is because the environmentally dirty economy operates through the use of environmental pollution production markets. Since 2012 Rio +20, the world has been using dwarf green markets to manage pollution generation; and this is because the dwarf green economy works through the use of environmental pollution management markets, markets that are apparently delinked from the idea of the need to transition as soon as possible from the environmentally dirty economy to the environmentally clean economy, a permanent climate change friendly move. And this raises the question: Can we transition from the environmentally dirty economy to the environmental clean economy with the use of dwarf green markets? If no, why not?. What are the implications of this? Among the goals of this paper is to provide answers to all those questions.

### **Key concepts**

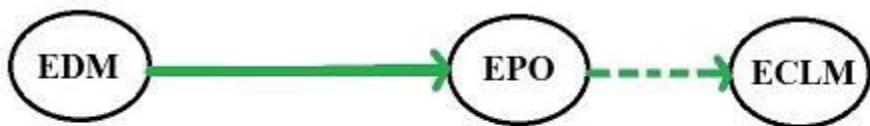
Traditional market, Green market, dwarf green market, dirty markets, clean markets, environmental pollution problem, pollution production market, pollution reduction market, pollution management market, environmentally dirty economy, environmentally clean economy, paradigm transition, paradigm shift

### **Introduction**

#### **a) The problem separating environmentally dirty markets from environmentally clean markets**

##### **i) The environmental pollution problem(EPO) in simple terms**

The ideal of environmental pollution problem(EPO) separating the environmentally dirty economy(EDM) from the environmentally clean economy(ECLM) has been pointed out recently in simple terms(Muñoz 2022) as indicated in Figure 1 below:



**Figure 1** There is an environmental pollution problem(EPO) that separates the environmentally dirty market(EDM) and the environmentally clean market(ECLM)

Figure 1 above tells us that there is an environmental pollution problem(EPO) separating the environmentally dirty economy(EDM) from the environmentally clean economy(ECLM); and therefore, to live under an environmentally clean market(ECLM) we need to get rid of the pollution production markets(PPM) like the environmentally dirty market(EDM). In other words, Figure 1 above indicates that we need to eliminate the environmental pollution problem(EPO) generated by the environmentally dirty market(EDM) fully to transform it into the environmentally clean market(ECLM), which means that the most climate change friendly action humanity can take is to transition to an environmental pollution free world under environmentally clean markets(ECLM).

## **ii) The environmental pollution problem(EPO) graphically**

We can transform the information in Figure 1 into graphical information in terms of supply and demand of the environmentally dirty market(EDM) as summarized in Figure 2 below:

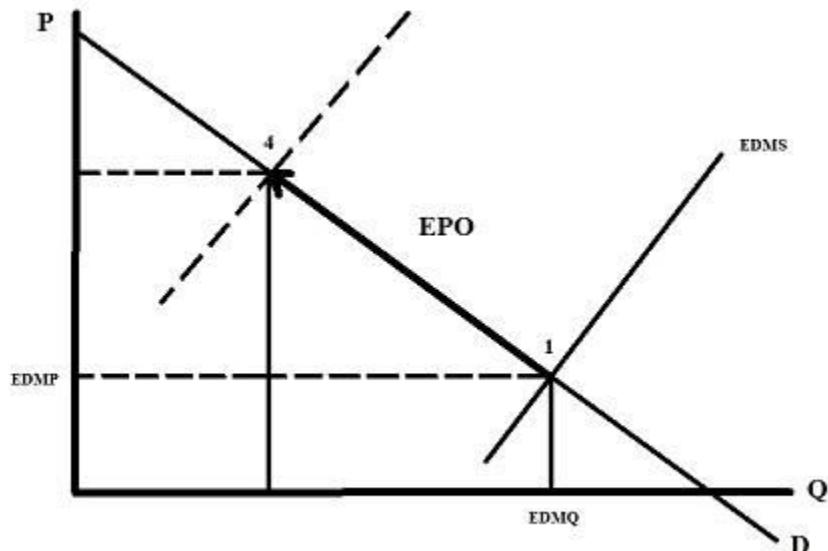


Figure 2 A look at the environmental pollution problem graphically

Figure 2 above tells us the following: i) that there is a environmentally dirty market(EDM) at point 1 where the environmentally dirty supply(EDMS) meets the environmentally dirty demand D determining the environmentally dirty market quantity(EDMQ) to be produced and consumed at the environmentally dirty market price EDMP; ii) that this market generates environmental pollution EPO going from point 1 to point 4; and iii) that as long as this pollution generation problem(EPO) exist there will be no environmentally clean markets(ECLM). Hence, the best climate change friendly policy based on Figure 2 above is to eliminate the environmental pollution problem(EPO) generated by the environmentally dirty market(EDM) at point 1 to transition it towards the environmentally clean economy(ECLM).

### iii) The expansion of the environmental pollution(EPO) generation problem

If the environmentally dirty market expands from EDM to EDM1 because there is a decrease in the environmentally dirty market price from EDMP to EDMP1, then the environmentally dirty market supply will shift from EDMS to EDMS1 expanding pollution levels as indicated in Figure 3 below:

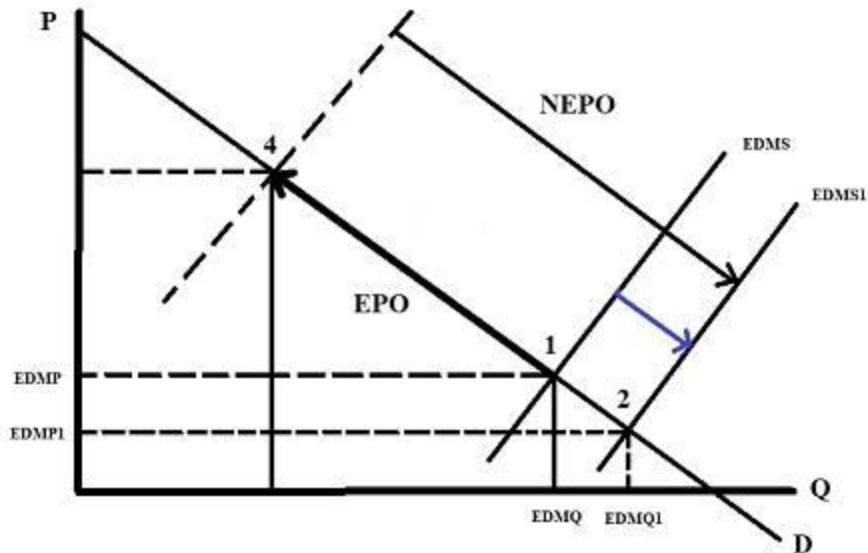


Figure 3 The expansion of the environmental pollution problem

We can see in Figure 3 above that when the environmentally dirty market expands from point 1 to point 2 the pollution problem(EPO) expands from point 4 to point 1 to point 4 to point 2 as the new environmental pollution problem(NEPO) is greater than the original environmental pollution problem(EPO) so that  $NEPO > EPO$  by the distance from point 1 to point 2 represented by the blue arrow. In other words, as the environmentally dirty market(EDM) expands more environmental pollution(EPO) is generated.

### b) Ways of dealing with the environmental pollution(EPO) problem

There are two possible ways of addressing the environmental pollution problem(EPO), one is through setting up environmental pollution management markets(EPOMM) if we just want to patch the pollution generation problem and live permanently under them; and the other one is setting up environmental pollution reduction markets(EPORM) if we want to fully fix the pollution problem and transitioning it to the environmentally clean economy(ECLM), which are summarized in Figure 4 below:

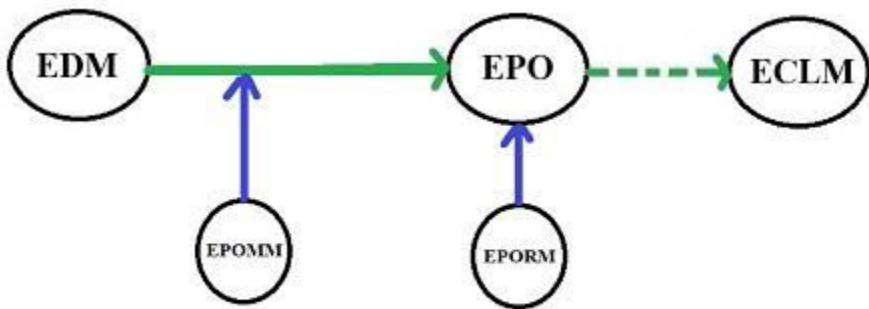


Figure 4 The environmental pollution management market solution(EPOMM) and the environmental pollution reduction market reduction market solution(EPORM) to the environmental pollution problem(EPO)

We can see in Figure 4 above that environmental pollution management markets(EPOMM) deal with a portion of the pollution generation problem(EPO) created by the environmentally dirty market(EDM) while environmental pollution reduction markets(EPORM) deal with the whole of the environmental pollution problem(EPO) through problem internalization. In other words, environmental pollution management markets(EPOMM) addresses the environmental pollution generation problem(EPO) through pollution management theory where, once markets are in place, pollution reduction is not a profitable business incentive as pollution management costs are set externally while environmental pollution reduction markets(EPORM) deal with the environmentally pollution problem through perfect pollution reduction market theory where, once markets are in place, pollution reduction is an excellent business opportunity as it leads to producing at the lowest pollution reduction market price possible.

### c) Dealing with the environmental pollution problem though dwarf green markets

Since the 2012 Rio + 20 conference(UNCSD 2012a; UNCSD 2012b) a process of green market paradigm shift avoidance has been taken place as dwarf green markets(DGM) are being used as environmental pollution management markets(EPOMM), where the environmental pollution problem(EPO) generated by the environmentally dirty market(EDM) is being patched with the use of dwarf green markets as indicated in Figure 5 below:

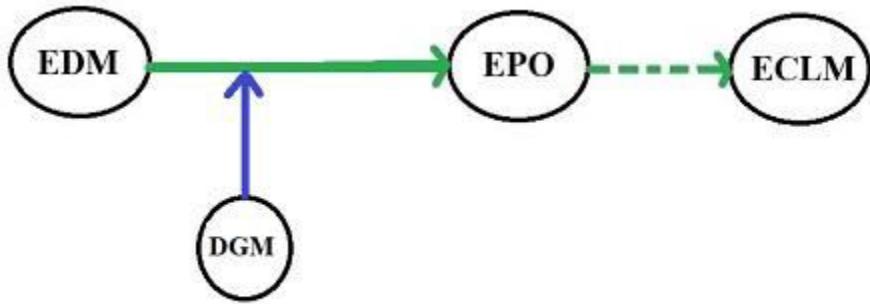


Figure 5 The dwarf green market solution(DGM) to the environmental pollution problem(EPO)

Figure 5 above indicates that dwarf green markets(DGM) are being used to manage the environmental problem(EPO) generated by the environmentally dirty market(EDM) as pollution generation takes place. Notice that the structure of the environmentally dirty market(EDM) in Figure 5 above is similar to the market structure of the environmentally dirty traditional market(ETM) of Adam Smith(Smith 1776) when under social externality neutrality assumptions so that  $EDM = ETM$ , which means that there is an environmental pollution problem(EPO) separating the environmentally dirty traditional market(ETM) from the environmentally clean market(ECLM), and this means too that the environmentally dirty traditional market(ETM) can also be patched with the use of dwarf green markets(DGM).

**d) The need to understand whether or not we can transition to the environmentally clean economy through the use of dwarf green markets**

In summary, based on the discussion above there is an environmental pollution problem separating the environmentally dirty economy from the environmentally clean economy; and this is because the environmentally dirty economy operates through the use of environmental pollution production markets. Since 2012 Rio +20(UNCSD 2012a: UNCSD 2012b), the world has been using dwarf green markets to manage the environmental pollution generation problem highlighted in 1987 by the Brundtland Commission(WCED 1987); and this is because the dwarf green economy works through the use of environmental pollution management markets, markets that are apparently delinked from the idea of the need to transition as soon as possible from the environmentally dirty economy to the environmentally clean economy and which work in opposite ways as perfect green markets do(Muñoz 2016; Muñoz 2019). And this raises the question: Can we transition from the environmentally dirty economy to the environmental clean economy with the use of dwarf green markets? If no, why not?. What are the implications of this? Among the goals of this paper is to provide answers to all those questions.

**Goals of this paper**

a) To highlight how dwarf green markets works in framework form and graphically; b) To point out how the expansion of dwarf green markets work analytically and graphically; c) To stress the structure of the problem of that comes along when leading humanity to living inside the environmentally dirty economy under environmental pollution management and climate change permanently with no way to transition to the environmentally clean economy; and d) To share the structure of the future of humanity under permanent bearable climate change in the eyes of those keeping the environmentally dirty economy alive.

**Methodology**

First the terminology used in this paper is shared. Second, the working of the dwarf green market is shared in Figure and its nature described. Third, the working of the dwarf green market is pointed out graphically and its implications stressed. Fourth, the working of dwarf green markets under environmental pollution management expansion is indicated in detail as well as its main implications. Fifth, the structure of the world under permanent dwarf green market based climate change dynamics with no way to transition to environmentally clean markets is presented and its implications discussed. Sixth, the structure of a world under permanent bearable climate change as apparently envisioned by those keeping the environmentally dirty economy alive is indicated as well as its implications. And finally, some food for thoughts and relevant conclusions are listed.

## Terminology

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TM = The traditional market

GM = The green market

EDM = The environmentally dirty market

PO = Pollution problem

EPO = Environmental pollution problem

E[C] = Environmental cost externalization

I[c] = Environmental cost internalization

CLM = The clean market

EPORM = Environmental pollution reduction market DM = The dirty market

ECLM = Environmentally clean market

DGM = Dwarf green market

POPM = Pollution production markets

EPOPM = Environmental pollution production market

PORM = Pollution reduction markets

EPORM = Environmental pollution reduction markets

RPO = Remaining pollution problem

REPO = Remaining environmental pollution problem

NEPO = New environmental problem

DGMP = Dwarf green market price

GMP = Green market price

EM = Environmental margin

TMP = Traditional market price

EDMP = Environmentally dirty market price

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## Operational concepts, relevant market structures and externalization and internalization rules

### A) Operational concepts

**1) Science**, the world based on the scientific truth, this world falls if invalidated.

**2) Ideology**, the world based on the non-scientific truth, this world will tend to persist even if invalidated.

**3) The theory-practice general consistency principle**, the world where the theory of the model must match the practice.

**4) The different model general inconsistency principle**, the world where the theory and practice of different models are inconsistent with each other.

- 5) **Academic facts**, the *science based truth*.
- 6) **Alternative academic facts**, the *non-science based truth*.
- 7) **Academic blindness**, the *inability to see academic facts due to the existence of knowledge gaps, paradigm shift based or otherwise*.
- 8) **Willful academic blindness**, the *willingness to ignore academic facts and consensus*.
- 9) **Sustainability**, the *world where the interplay of sustainability theory and sustainability practice is aimed at fixing or correcting embedded externality problems*.
- 10) **Sustainable development**, the *world where the interplay of sustainable development theory and sustainable development practice is aimed at patching or managing embedded externality problems*.
- 11) **Academic integrity**, the *duty to respect and defend academic facts and consensus*.
- 12) **Golden paradigm**, one that *does not creates abnormalities*.
- 13) **Flawed paradigm**, one that *creates abnormalities*.
- 14) **Kuhn's loop**, the *science based mechanism that leads to paradigm shift through abnormality correction*.
- 15) **Dirty economy**, a *pollution based economy*.
- 16) **Clean economy**, a *pollution less based economy*.
- 17) **Red Marxism**, *capitalism need to be replaced as it is destroying societies*.
- 18) **Green Marxism**, *dwarf green capitalism must be replaced as it is destroying nature*.
- 19) **The red socialism market**, the *social justice and equality based market*.
- 20) **The green socialism market**, the *environmental justice and equality based market*.
- 21) **Green capitalism**, *capitalism supported by green markets*.
- 22) **Dwarf green capitalism**, *capitalism supported by dwarf green markets*.
- 23) **Traditional market**, the *market cleared by the traditional market price*.
- 24) **Green market**, the *market cleared by the green market price*.
- 25) **Red market**, the *market cleared by the red market price*.
- 26) **Pollution production market**, a *market operating under distorted market pricing*.

**27) Environmental pollution production market**, *a market operating under environmentally distorted market pricing*

**26) Pollution reduction market**, *a market operating under a corrected distorted market price.*

**27) Environmental pollution reduction market**, *a market operating under an environmentally corrected distorted market price.*

**28) Pollution management market**, *a market operating at a pollution management cost led market price.*

**29) Environmental pollution management market**, *a market operating at an environmental pollution cost led market price.*

**30) Sustainability market**, *the one cleared by the sustainability market price.*

**31) Dwarf green market**, *the market cleared by the dwarf green market price.*

## **B) Relevant market structures**

If we have the following: a = social abnormality, c = environmental abnormality, A = dominant society, C = dominant environment, and B = the dominant economy, then the structure of relevant markets can be stated as indicated below:

### **1) The traditional market as a golden model**

#### **i) $TM = B$**

Under externality neutrality assumptions the traditional market TM in section i) above is a golden paradigm, it produces no abnormalities.

#### **2) The traditional market under social abnormalities(a)**

#### **ii) $TM = aB$**

Under no social externality neutrality assumptions, the traditional market TM in section ii) above produces social abnormalities “a”. It is a flawed paradigm as it has social abnormalities to correct.

#### **3) The traditional market under environmental abnormalities(c)**

#### **iii) $TM = Bc$**

Under no environmental externality neutrality assumptions, the traditional market TM in section iii) above produces environmental abnormalities “c”. It is a flawed paradigm as it has environmental externalities to correct.

**4) The traditional market under socio-environmental abnormalities(ac)**

**iv)  $TM = aBc$**

Under no socio-environmental externality neutrality assumptions, the traditional market TM in section iv) above produces socio-environmental abnormalities “ac”. It is a flawed paradigm as it has social and environmental externalities to correct.

**5) The red market under environmental abnormalities(c)**

**v)  $RM = ABC$**

Under no environmental externality assumptions, the red market RM in section v) above produces environmental abnormalities. It is a flawed paradigm as it has environmental externalities to correct. Notice that in the red market RM, both society(A) and economy(B) are in dominant form.

**6) The green market under social abnormalities(a)**

**vi)  $GM = aBC$**

Under no social externality assumptions, the green market GM in section vi) above produces social abnormalities. It is a flawed paradigm as it has social externalities to correct. Notice that in the green market GM, both the economy(B) and the environment(C) are in dominant form.

**7) The sustainability market has no abnormalities**

**vii)  $SM = ABC$**

The sustainability market SM in section vii) above produces no abnormalities as all components are in dominant form since all components are now endogenous to the model. It is a golden paradigm as it has no abnormalities to correct.

**C) Abnormality externalization and internalization rules**

If  $y, x, z$  are three abnormalities and  $Y, X, Z$  are the corrected variables and if  $E[ ]$  = externalization and  $I[ ]$  = internalization, then the following holds true:

<b>a) <math>E[Y] = y</math></b>	<b>b) <math>E[X] = x</math></b>	<b>c) <math>E[Z] = z</math></b>
<b>d) <math>I[y] = Y</math></b>	<b>e) <math>I[x] = X</math></b>	<b>f) <math>I[z] = Z</math></b>
<b>g) <math>I[E[Y]] = Y</math></b>	<b>h) <math>E[I[y]] = y</math></b>	<b>i) <math>E[YX] = yx</math></b>

## The working of the dwarf green market in simple terms

If we insert the dwarf green market solutions(DGM) in Figure 5 above between the environmentally dirty market(EDM) and the environmental pollution problem(EPO) it generates we can see how the environmental pollution management framework works in simple terms, as shown in Figure 6 below:



Figure 6 The working of the dwarf green market: There is still a remaining environmental problem(REPO) separating the environmentally dirty economy(EDM) under dwarf green market based environmental pollution management(DGM) from the environmentally clean market(ECLM)

Figure 6 above helps us to see the following: i) the dwarf green market(DGM) manages a portion of the total environmental pollution  $EPO_M$  as indicated by the green arrow from EDM to DGM while still externalizing the remaining portion of pollution generated REPO as indicated by the green arrow from DGM to REPO; ii) this means that there is still a remaining environmental pollution problem(REPO) separating the environmentally dirty market(EDM) under pollution management from the environmentally clean economy(ECLM); and iii) this therefore indicates that the dwarf green market(DGM) breaks the environmental pollution problem(EPO) into pollution under management( $EPO_M$ ) and remaining environmental pollution(REPO), where  $EPO = EPO_M + REPO$  and where  $EPO_M < REPO$ . In other words, Figure 6 above highlights that there is still a remaining environmental pollution problem(REPO) affecting the sustainability of dwarf green markets and of climate change objectives as costs that are externalized are costs that are not accounted for.

## The working of the dwarf green markets graphically

We can transform the information in Figure 6 above into graphical information as shown in Figure 7 below:

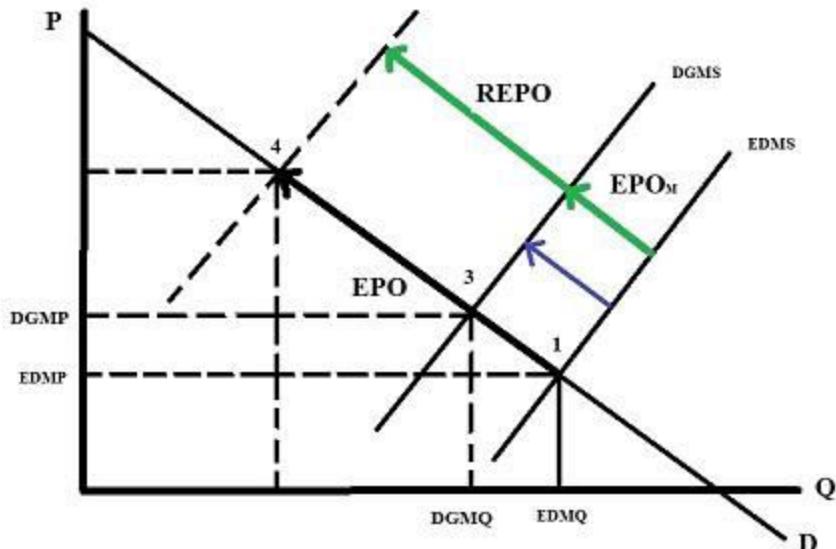


Figure 7 The working of the dwarf green market(DGM) graphically: The dwarf green market(DGM) has a remaining environmental pollution problem(REPO) that separates it from environmentally clean markets(ECLM)

We can extract the following relevant information from Figure 7 above: i) At point 1 we have environmentally dirty market(EDM) where the environmentally dirty supply EDMS meets the demand D at the environmentally dirty market price EDMP; ii) At point 1 we have the environmental problem(EPO) generated by the environmentally dirty market(EDM) as indicated by the black arrow that goes from point 1 to point 4; iii) At point 3 we have the dwarf green market(DGM) where the dwarf green market supply DGMS meets the demand D at the dwarf green market price DGMP; iv) At point 3 a portion of the environmental pollution(EPO<sub>M</sub>) is being managed while the remaining environmental pollution(REPO) is still being externalized; iv) If the environmentally dirty market(EDM) is placed under dwarf green markets(DGM) to manage a portion of the pollution generated(EPO<sub>M</sub>) then it shifts from point 1 to point 3 as indicated by the blue arrow; and v) hence when setting up dwarf green markets(DGM) we still leave active the remaining environmental pollution problem(REPO) preventing the dwarf green markets(DGM) or the environmentally dirty market under environmental pollution management to tend towards environmentally clean markets(ECLM).

### The working of dwarf green markets under pollution management expansions

If we expand environmental pollution management consistent with the situation in Figure 7 above, then the environmental pollution cost associated with the dwarf green market or dwarf green market cost margin(DEM) increases leading to a higher dwarf green market price and to decreases in production and consumption and therefore, decreases in environmental pollution as indicated in Figure 8 below:

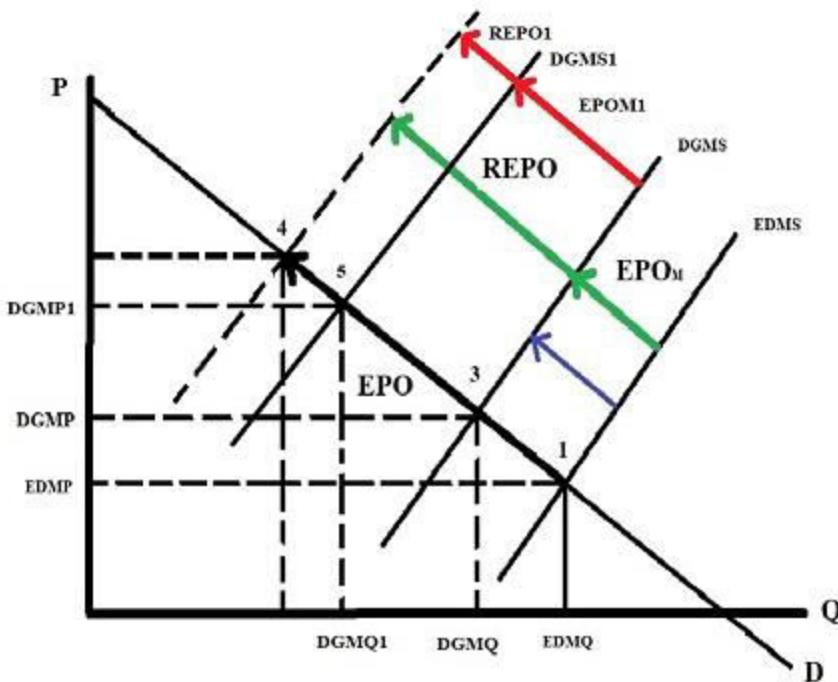


Figure 8 Expanding the dwarf green market(DGM) from point 3 to point 5 still leaves a remaining environmental pollution problem REPO<sub>1</sub> affecting its stability and preventing it to ever be an environmentally clean market(ECLM) as the pollution management cost needs to be increasing to reduce production and consumption of still pollution based goods.

We can appreciate in Figure 8 above the following: i) that when we expand the dwarf green market(DGM) from point 3 to point 5 as a result of an increased in the pollution management cost leading to a dwarf green market price increase from DGMP to DGMP<sub>1</sub> we are then reducing environmental pollution from point 3 to point 5 as indicated by the red arrow while still leaving a remaining environmental pollution problem(REPO<sub>1</sub>) as indicated by the red arrow from point 5 to point 4; ii) that the dwarf market price increase due to the increase in the pollution management cost leads to a reduction in production and consumption from DGMQ to DGMQ<sub>1</sub>, which corresponds to the decrease in environmental pollution from point 3 to point 5; and iii) that as there will be a remaining environmental problem(REPO<sub>1</sub>) at the dwarf green market(DGM<sub>1</sub>) located at point 5 and this problem will continue to affect its sustainability. We can also see in Figure 8 above that the environmental pollution problem(EPO) generated by the environmentally dirty market(EDM) at point 1 is greater than the remaining environmental problem of the first dwarf green market(DGM) at point 3, which is greater in turn than the remaining environmental problem of the second dwarf green market(DGM<sub>1</sub>) at point 5 so that EPO > REPO > REPO<sub>1</sub> as environmental pollution management expands.

### Implication:

*There will always be a remaining environmental pollution problem preventing dwarf green markets or the environmental dirty markets under environmental pollution management from ever becoming environmentally clean markets.*

## The nature of the problem of leading humanity to living inside the environmentally dirty economy under environmental pollution management or dwarf green markets

When the decision that was made in 2012 Rio + 20(UNCSD 2012a: UNCSD 2012b) led not to green markets, but to dwarf green markets, then that decision meant a future for humanity under climate change with minimal emissions in ways unconnected with the remaining environmental pollution problem(REPO) created in the process and delinked from the need to one day transition to the environmentally clean economy as indicated in Figure 9 below:

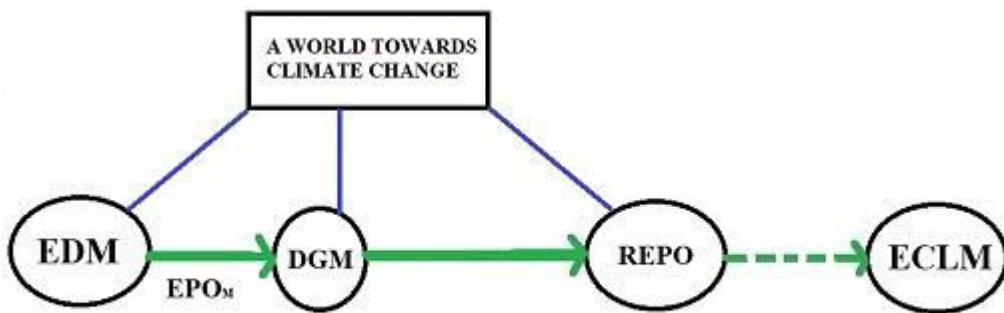


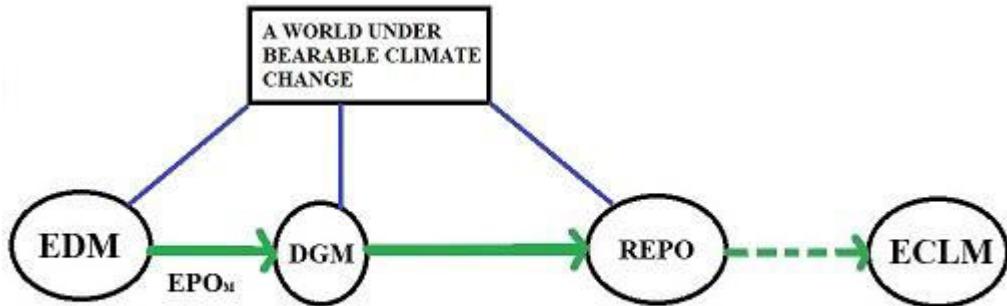
Figure 9 The decision to go the way of dwarf green markets(DGM) to manage environmental pollution(EPO) produced by environmentally dirty economies(EDM) meant to bring humanity towards a world under climate change with no way to transition towards the environmentally clean economy(ECLM)

We can clearly see in Figure 9 above that keeping the environmentally dirty economy(EDM) alive through the use of dwarf green markets(DGM) to manage some of the pollution problem(EPO<sub>M</sub>) created moves the world towards climate change in a way which has no transition path to environmentally clean economies(ECLM) as remaining environmental pollution(REPO) is still being externalized as indicated by the green arrow from DGM to REPO, which keeps the dwarf green market delinked from the environmentally clean economy(ECLM) as shown by broken green arrow from REPO to ECLM. Hence, the remaining environmental problem(REPO) affects the sustainability of the dwarf green market(DGM) or of the environmentally dirty market(EDM) under environmental pollution management and of climate change plans in ways that can never lead to a world under environmentally clean economies(ECLM) as indicated by the broken arrow from REPO to ECLM in Figure 9 above.

## The future of humanity in the eyes of those keeping the dirty economy alive

As climate change events and impacts became more severe and common since environmental pollution has still been increasing under dwarf green market management since 2012, a fact consistent with the expectation of the remaining environmental pollution problem(REPO) created when setting up dwarf green markets now actions and policies have

been directed at climate change mitigation, adaptation, and resilience, including during COP27 when a climate change fund to help less developed countries to bear the consequences of climate change has now been established(UNFCCC 2022), which means that attention has been given to create a world under permanent bearable climate change, a world summarized in Figure 10 below:



**Figure 10** The future of humanity seems to be a world under bearable climate change through the use of dwarf green markets(DGM) to manage environmental pollution(EPO<sub>M</sub>) produced by the environmentally dirty market(EDM) with no way to transition to the environmentally clean market(ECLM)

We can clearly appreciate in Figure 10 above the following: i) that those who decided to keep the environmentally dirty economy(EDM) alive through the use of dwarf green markets(DGM) to manage some of the pollution problem(EPO<sub>M</sub>) created are attempting to bring the world towards permanent bearable climate change in a way that has no transition path to environmentally clean economies(ECLM) as remaining environmental pollution(REPO) is still being externalized and it will continue to be externalized; and ii) this means that environmentally clean economies(ECLM) will never see the day in a world where a portion of the environmental pollution associated with business activity is being managed while the rest is being externalized as an ongoing remaining environmental pollution problem(REPO). A disconnect indicated by the broken green arrow from REPO to ECLM. Hence, a transition from the environmentally dirty market(EDM) to the environmentally clean market(ECLM) through the use of dwarf green markets(DGM) is not possible as indicated in Figure 10 above as there will always be a remaining environmental pollution problem blocking that transition.

### Food for thoughts

- a) In the world of perfect green markets, are green producers and green consumers leaders in development? I think Yes, what do you think?; b) In the world of dwarf green markets, are dwarf producers and dwarf consumers followers in development? I think Yes, what do you think?; and c) In the world of perfect traditional markets, are traditional producers and traditional consumers leaders in development? I think Yes, what do you think?

## Conclusions

First, it was shown by mean of Figure and graphs that when we set up dwarf green markets there still remains a remaining environmental pollution problem keeping it unconnected to the transition path towards environmentally clean markets. Second, it was pointed out that as dwarf green markets expand due to an increase in the pollution management cost dwarf production and dwarf consumption, and therefore environmental pollution fall, but there still remains an environmental pollution problem preventing it from ever taking the form of an environmentally clean economy on its own. Third, it was indicated that when the decision was made in 2012 to go dwarf green market to address the environmental pollution problem as it is being generated that meant bringing humanity through a permanent pollution generation-climate change process disconnected from the path towards an environmentally clean economy. And finally, it was stressed that as environmental pollution has continued to increase under pollution management decisions makers apparently are leading humanity towards a world of permanent but bearable climate change as they have been enacting and implementing policies for adaptation, mitigation, resilience, and monetary help, an approach disconnected from perfect green market theory and with the need to transition to the environmentally clean economy. In general, it was shown that we cannot transition the environmentally dirty economy to the environmentally clean economy using dwarf green markets because the use of dwarf green markets stills leaves active a remaining environmental pollution problem affecting its sustainability and affecting climate change plans.

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