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Sustainability thoughts 119: How can the 2012 green cold war be stated graphically in terms of sustainability gaps? What are the implications of this in terms of the only possible science based resolution to the green cold war?

By

Lucio Muñoz*

*** Independent qualitative comparative researcher/consultant, Vancouver, BC, Canada. Email: munoz@interchange.ubc.ca**

Abstract

The coming of the modern environmental movement in the 1960s with publications like silent spring and with the 1970s creation of green peace planted once and for all the seed of the green cold war, a clash between economic interests and environmental interests. Environmental concerns reached a peak in importance in 1987 when the Brundtland commission made it clear that business as traditionally done had to change in order to address current environmental problems directly through sustainable development means. The idea of win-win economy-environment coalitions came forward and widely accepted by governments and international institutions setting the stage for the Rio conference process to begin in 1992 with the first earth summit, and which culminated in the 2012 Rio + 20 conference, where this green cold war was going to be settled. When one component dominance paradigms are in conflict, whether under win-win situations or under no win-win conditions, in the end when the cold war is settled they shift to a higher level paradigm, and in the case of the perfect traditional market and the perfect environmental market in conflict the higher level perfect market to shift to is the perfect green market. And the link between each lower level perfect market and the higher level perfect market are their respective sustainability gaps, and these links indicate the nature of possible paradigms mergers and possible paradigm death and shifts that can lead to green markets. Hence, there is a need to understand the nature of the sustainability gaps that make up the green cold war in order to be able to appreciate different possible green cold war resolutions routes. And this leads to relevant questions such as how can the 2012 green cold war be stated

graphically in terms of sustainability gaps? What are the implications of this in terms of possible science based resolution routes to the green cold war? The main goal of this paper is to provide an answer to these questions using qualitative comparative means.

Key words

Sustainability, traditional market, environmental market, green market, green cold war, sustainability gaps, economic sustainability gap, environmental sustainability gap, paradigm shift, paradigm death, paradigm merger

Introduction

a) The perfect traditional market

The perfect economy only model of Adam Smith if we assume only a two component system, an active economy(B) and a passive environment(c), can be stated as follows:

1) TM = Bc

Hence, at the heart of the traditional market is the goal to ensure economic sustainability by making the environment meet our economic needs in a way that the environmental costs associated with production are externalized so the pricing(TMP = P) reflects only economic costs plus proifts(ECM + i) so that TMP = P = ECM + i.

The perfect traditional market(TM) is summarized graphically as follows:

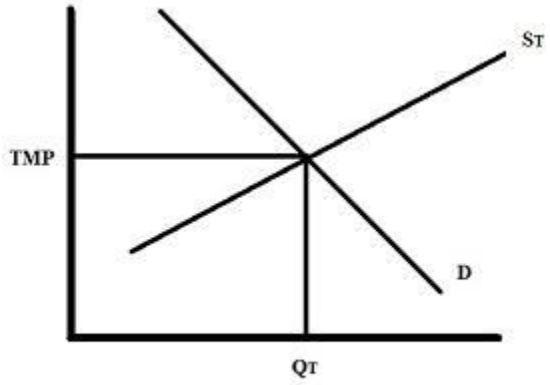

Figure 1 The structure of the perfect traditional market
Only the economy matters

Figure 1 simply tells us that the interaction of traditional supply(S_T) and traditional demand(D) determine the traditional market price(TMP) and the traditional quantity to be

produced and consumed(Q_T). Figure 1 shows that the traditional market(TM) is an economy monopoly model ruled by independent choice and perfect traditional market thinking.

b) The perfect environmental market

The perfect environment only model or deep ecology market model if we assume only a two component system, a passive economy(b) and an active environment(C), can be expressed as done below:

2) ENM = Cb

Therefore, at the heart of the environmental market is the goal to ensure environmental sustainability by making the economy meet our environmental needs in a way that the economic costs associated with production are externalized so the pricing(ENP) reflects only environmental costs or environmental margin(EM) so that ENP = EM.

The perfect environmental market(ENM) is summarized graphically as follows:

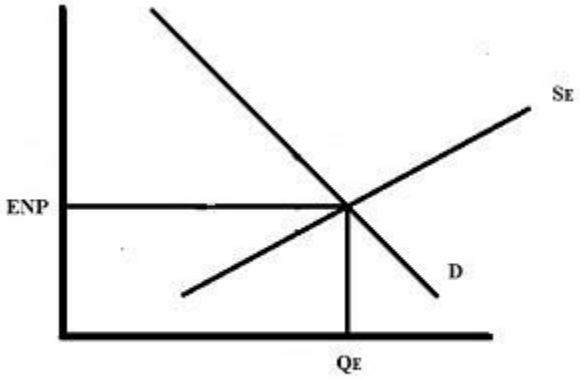

Figure 2 The structure of the perfect environmental market
Only the environment matters

Figure 2 simply says that the interaction of the environmental supply(S_E) and demand(D) determine the environmental market price(ENP) and the environmental quantity to be produced and consumed(Q_E). Figure 2 above indicates that the perfect environmental market(ENM) is an environment monopoly model ruled by independent choice and perfect environmental market thinking.

c) The green cold war

The coming of the modern environmental movement in the 1960s with publications like silent spring(Carson 1962) raising awareness about pesticides and with the 1970s creation of green peace in Vancouver, BC, Canada(Mackie 2017) to push for environmental responsibility planted once and for all the seed of the green cold war, a clash between economic interests and environmental interests. Environmental concerns reached a peak in importance in 1987 when the

Brundtland commission(WCED 1987) made it clear in the publication "Our Common Future" that business as traditionally done had to change in order to address current environmental problems directly through sustainable development means. The idea of win-win economy-environment coalitions came forward and widely accepted by governments and international institutions setting the stage for the Rio conference process to begin in 1992 with the first earth summit(UN 1992), which culminated in the 2012 Rio + 20 conference(UNCSD 2012a; UNCSD 2012b), where this green cold war was going to be settled.

The structure of the 2012 green cold war can be stated analytically as follows:

3) (TM)(ENM) = (Bc)(Cb)

Expression 3) tells us that a conflict between models(TM and ENM) is a conflict between the active and passive components of each model.

Graphically, the conflict between the perfect traditional market model(TM) and the perfect environmental market model(ENM) can be appreciated in general terms in Figure 3 below:

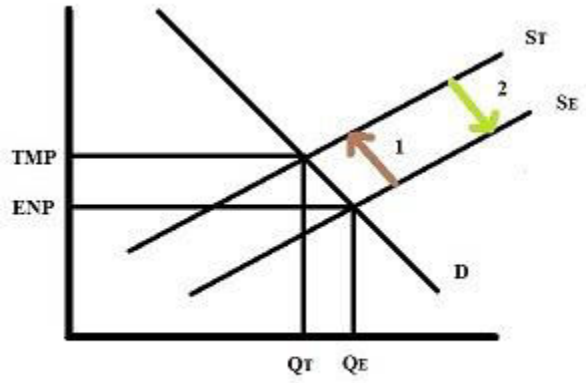

Figure 3 The structure of the green cold war in action

We can appreciate in Figure 3 above the following i) the economy model(TM) pushes the environmental model(ENM) down in order to avoid environmental responsibility as indicated by the green arrow going down to the right at point 2; and ii) the environmental model(ENM) pushes the economy model(TM) up to avoid economic responsibility as shown by the brown arrow going up to the left at point 1.

d) The paradigms in conflict shift towards higher level sustainability paradigms

When one component dominance paradigms are in conflict, there is a cold war. For example, the clash between red socialism and capitalism that ended in 1991 with the fall of the soviet bloc was a clash between the economic sustainability gap in Karl Marx's model and the social sustainability gap in Adam Smith model as the environment did not matter(Muñoz 2016a),

sustainability gaps embedded in those two great simplifications of reality(Muñoz 2016b), where red socialism was stroke down by its economic sustainability gap ending the world of Karl Marx in 1991. In all cold wars, whether under win-win situations or under no win-win conditions, in the end all competing models are expected to shift to a higher level paradigm to preserve their core values(Muñoz 2019), and in the case of the conflict between the perfect traditional market and the perfect environmental market the higher level perfect paradigm or market to shift to is the perfect green market, which is located somewhere to the left of the traditional market price in Figure 3 above as the green market price is higher than the traditional market price(GMP = P + EM > TMP = P) since green markets reflect both the environmental costs(EM) and the economic costs of doing business at a profit(P) in their pricing mechanism. And the link between each lower level perfect market and the higher level perfect market are their respective sustainability gaps, and these sustainability gap links indicate the nature of possible paradigms mergers and of possible paradigm death and shift routes that lead to green markets. Hence, there is a need to understand the nature of the sustainability gaps that make up the green cold war in order to be able to appreciate possible green cold war resolutions routes. And this leads to relevant questions such as how can the 2012 green cold war be stated graphically in terms of sustainability gaps? What are the implications of this in terms of possible science based resolution routes to the green cold war? The main goal of this paper is to provide an answer to these questions using qualitative comparative means.

Objectives

a) to restate the structure of the traditional market and of the environmental market in terms of sustainability gaps to link them individually with the structure of green markets; b) to use the structure above to state the green cold war graphically in terms of sustainability gaps; and c) to use the sustainability gap framework to show that when we close sustainability gaps either under win-win situations or under no win-win situations the green cold war ends always with shifts towards green markets.

Methodology

1) The terminology, operational concepts and merging rules and paradigm shift expectations are shared; 2) The perfect traditional market is linked to the perfect green markets through its environmental sustainability gap; 3) the perfect environmental market is linked to the perfect green market through its economic sustainability gap; 4) the structure of the green cold war in terms of both markets interacting with the green market through their sustainability gaps is shared; 4) The different routes the traditional market or the environmental market or both markets at the same time can take to shift towards green markets under win-win conditions and

no win-win conditions is pointed out in detail; and 5) some food for thoughts and conclusions are listed.

Terminology

A = Active social system a = Passive social system

B = Active economic system b = Passive economic system

C = Active environmental system c = Passive environmental system

S = Sustainability SG = Sustainability gap

X = System X Xi = System Xi

SSG = Social sustainability gap ECSG= Economic sustainability gap

ESG = Environmental sustainability gap TM = Traditional market

ENM = Environmental market GM = Green market

Q_G = Green quantity Q_E = Environmental quantity

Q_T = Traditional quantity S_G = Green supply

S_E = Environmental supply S_T = Traditional supply

Operational concepts and paradigm merging and shift rules and expectations

i) Operational concepts

Operational concepts and externalization and internalization rules

<u>i) Operational concepts</u>

1) Red socialism market, *the society only market.*

2) Red socialism market price, *the price that reflects only the social cost of production.*

3) The traditional market, *the economy only market.*

4) The traditional market price, the *general market economic only price or the price that covers the cost of production at profit(TMP = ECM + i = P) or zero profit(TMP = ECM = P).*

5) The environmental market, *the environment only market.*

6) The environmental market price, *the price that reflects only the environmental cost of production.*

7) The socio-environmental market, *the society and environment only market.*

8) The socio-environmental market price, *the price that reflects the social and environmental costs of production.*

9) The red market, *the society and economy only market.*

10) The red market price, *the price that reflects the social and economic costs of production.*

11) The green market, *the economy and environment only market.*

12) The green market price, *the price that reflects both the economic and the environmental cost of production or the price that covers the cost of environmentally friendly production.*

13) The sustainability market, *the society, economy and environment market.*

14) The sustainability market price, *the price that reflects the social, economic, and environmental costs of production.*

15) The economic margin, *to cover the economic cost of production.*

16) The environmental margin, *to cover the extra cost of making business environmentally friendly.*

17) The social margin, *to cover the extra cost of making business socially friendly.*

18) Full costing, *all costs are reflected in the pricing mechanism of the market.*

19) Partial costing, *not all costs are reflected in the pricing mechanism of the market.*

20) No costing, *all costs are not reflected in the pricing mechanism of the market.*

21) Full responsibility, *when a market uses full costing.*

22) Partial responsibility, *when a market uses partial costing.*

23) Full irresponsibility, *when a market uses no costing.*

ii) Paradigm merging and shift rules and expectations

1) Paradigm merging rules(PMR)

If "A" and "B" are dominant characteristics; and "a" and "b" are their dominated or passive counter parts, the following is expected:

a) Merging under dominant-dominant interactions

Under these conditions, dominant or active state prevails as indicated:

(AA) → A **(BB) → B**

(AA) (BB) = (AB) **(AB) → AB**

b) Merging under dominated-dominated interactions

Under these conditions, the dominated or passive form prevails as shown:

(aa) → a **(bb) → b**

(aa)(bb) = (ab) **(ab) → ab**

c) Merging under dominant-dominated interactions and win-win solutions

Under these conditions, the dominant or active system prevails as the system merge as shown below:

(Aa) → A **(bB) → B**

(Aa) (bB) = (AB) **(ab) → AB**

d) Merging under dominant-dominated interactions and no win-win solutions

Under these conditions, the dominated or passive system prevails and the system collapses as shown below:

(Aa) → a **(bB) → b**

(Aa) (bB) = (AB) **(ab) → ab**

2) Paradigm death expectations and shift under sustainability gaps

If we have three systems X_1 = Bc and a system X_2 = bC and X_3 = BC, where c = ESG and b = ECSG, then the following is true:

a) Expressing models in terms of sustainability gaps

X_1 = Bc = B(ESG) **X_2 = bC = (ECSG)C, where $0 \leq ESG < 1$ and $0 \leq ECSG < 1$**

X_3 = BC = B(SG = 1)C = BC

b) Expressing inverse opposite models in conflict

$X_1.X_2$ = B(ESG).(ECSG)C

c) Paradigm death and shift expectations under no win-win conditions

When ESG ----→0 and/or ECSG----→0 under no win-win conditions, we have the paradigm death and shift expectation where the paradigms that die take the form of the higher level paradigm, in this case the higher level paradigm is X_3 = BC

$X_1.X_2$ = B(ESG---→0).(ECSG--→0)C = the death of paradigm X_1, X_2, or both and shift $X_1.X_2$--→X_3 = BC

d) Paradigm death and shift expectations under win-win conditions

When ESG ----→1 and/or ECSG----→1 under win-win conditions, we have the paradigm shift and merger shift expectation where the paradigms that die take the form of the higher level paradigm, in this case the higher level paradigm is X_3 = BC

$X_1.X_2$ = B(ESG--→1).(ECSG--→1)C = paradigm shift X_1 or X_2 or merger of X_1 and X_2 as ESG--→1 = C and ECSG--→1 = B so that $X_1.X_2$ = B(C).(B)C = BB.CC = BC = X_3 = merger

You can find more details about the working of paradigm death and shift expectations and merging rules in the publication ***Paradigm Evolution and |Sustainability Thinking***(Muñoz 2019).

The perfect traditional market and the environmental sustainability gap

Since the passive environmental system(c) is the source of the environmental sustainability gap(ESG) that expands when the economic system expands, then ESG = c, and we can use this to restate the structure of the perfect traditional market(TM) as follows:

4) TM = Bc = B(ESG)

Expression 4) above tells us that the traditional market(TM) is affected by the presence of an environmental sustainability gap(ESG), a situation that can be appreciated easier in Figure 4 below:

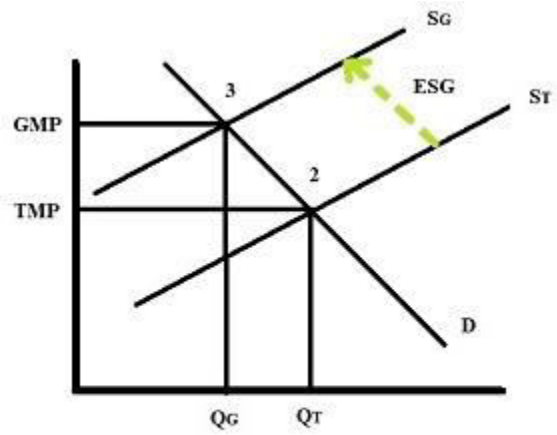

Figure 4 The perfect traditional market and its environmental sustainability gap (ESG)

We can see the following in Figure 4 above: i) at point 3 we have the structure of the perfect green market(GM) where green production and green consumption is Q_G at the green market price GMP; ii) at point 2 we have the structure of the perfect traditional market(TM) where traditional production and traditional consumption is Q_T at the traditional market price TMP; and iii) Between point 2 and point 3 there is an environmental sustainability gap(ESG) affecting the working of the traditional market model(TM) as indicated by the broken green arrow going upwards to the left. You can easily see in Figure 4 above that closing that environmental sustainability gap(ESG) affecting the traditional market would shift the perfect traditional market(TM) towards the perfect green market(GM).

The perfect environmental market and the economic sustainability gap

Since the passive economic system(b) is the source of the economic sustainability gap(ECSG) that expands when the environmental system expands, then ECSG = b, and we can use this to restate the structure of the perfect environmental market(ENM) as follows:

5) ENM = Cb = C(ECSG)

Expression 5) above says that the environmental market(ENM) is affected by the presence of an economic sustainability gap(ECSG), a situation that can be appreciated easier in Figure 5 below:

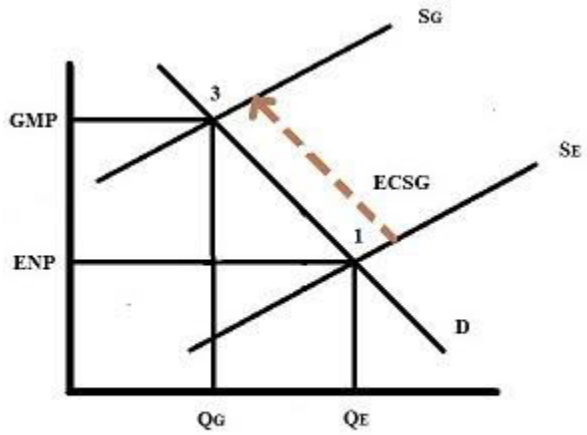

Figure 5 The perfect environmental market and its economic sustainability gap(ECSG)

We can appreciate the following in Figure 5 above: i) at point 3 we have the structure of the perfect green market(GM) where green production and green consumption is Q_G at the green market price GMP; ii) at point 1 we have the structure of the perfect environmental market(ENM) where environmental production and environmental consumption is Q_E at the environmental market price ENP; and iii) between point 1 and point 3 there is an economic sustainability gap(ECSG) affecting the working of the perfect environmental market model(ENM) as indicated by the broken brown arrow going upwards to the left. You can easily notice in Figure 5 above that closing that economic sustainability gap(ECSG) affecting the environmental market would shift the perfect environmental market(ENM) towards the perfect green market(GM).

The green cold war in terms of sustainability gaps

The conflict between economic interests(TM) and environmental interests(ENM) can be expressed in terms of sustainability gaps as follows:

6) TM.ENM = Bc.Cb = B(ESG).C(ECSG)

Expression 6) above tells us that war between the perfect traditional market(TM) with the perfect environmental market(ENM) is a war between the environmental sustainability gap(ESG) in the traditional market(TM) and the economic sustainability gap(ECSG) in the environmental market(ENM), a situation that is summarized in Figure 6 below:

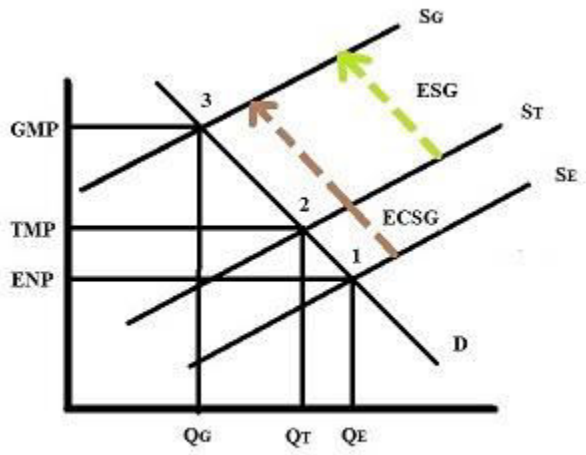

Figure 6 The green cold war in terms of sustainability gaps

The following aspects can be highlighted based on Figure 6 above: i) the final destination of any paradigm shift that comes out of this green war is the green market(GM) at point 3; ii) the economic sustainability gap(ECSG) affecting the environmental market(ENM) goes from point 1 to point 3 as indicated by the broken brown arrow; iii) the environmental sustainability gap(ESG) affecting the traditional market(TM) goes from point 2 to point 3 as indicated by the broken green arrow. Notice that if the if the environmental market(ENM) expands and shifts to the right, its economic sustainability gap(ECSG) also expands accumulating economic deficits; and if the traditional market(TM) expands too shifting to the right its environmental sustainability gap(ESG) will expand too accumulating environmental deficits.

The science based solutions to the green cold war are green markets

It is clear from the structure in Figure 6 above that closing one sustainability gap or closing both sustainability gaps at the same time will lead to paradigm shift towards green market, that is the only perfect science based way to shift so lower levels paradigms can be fully fixed, which leads to several possible shifting routes whether you have win-win conditions or no win-win conditions.

i) The case of no win-win situations

Consistent with death and shift expectations in the operational rules, under no win-win conditions competing paradigms will expand and expand accumulating deficits until one of them dies and shift to green markets forcing the other paradigm to shift too or both of them die and shift towards green markets at the same time. In other words, under no win-win conditions paradigms die alone or together taking the higher level form after death. The structure of paradigm death and shift expectation is given by the following expression:

7) TM.ENM = Bc.Cb = B(ESG--→0).C(ECSG---→0) = death and take green market form

Where ESG-→0 and ECSG-→0 under no win-win conditions leads to paradigm collapse and shift individually or together.

The implications of expression 7) are shown in Figure 7 below:

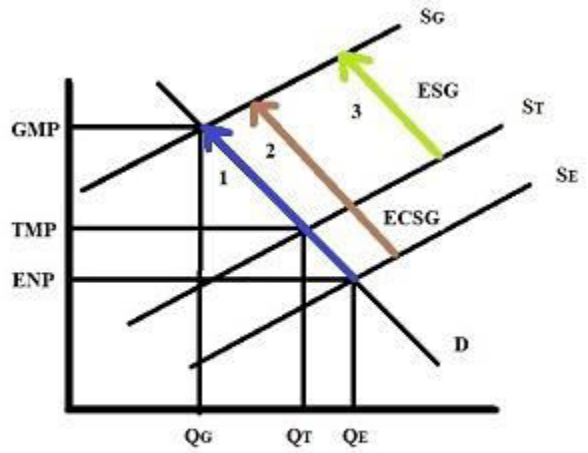

Figure 7 Resolving the green cold war under win-win or under no win-win conditions always ends with a paradigm shift to green markets(GM)

Under no win-win situations there are 3 paradigm shift possibility after systems are brought down by their respective sustainability gap: i) the traditional market(TM) and the environmental market(ENM) both collapse at the same time as (ESG-→0)(ECSG-→0), and then they take the structure of green markets(GM) following the route indicated by the continuous blue arrow at point 1; ii) the environmental market(ENM) dies first due to the worsening of its economic sustainability gap as the war goes on(ECSG-→0); and then it takes the form of the green market(GM) after collapse following the route indicated by the continues brown arrow at point 2; and iii) the traditional economy(TM) dies last due to the worsening of its environmental sustainability gap(ESG-→0) as it has the money to buy time; and then it takes the form of the green market(GM) after collapse following the route indicated by the continuous green arrow at point 3. It is clear in Figure 7 above that under no win-win conditions competing system will persist until they can no more; and when they collapse they take the form of the higher level paradigm, in this case the perfect green market(GM).

i) The case of win-win situations

Consistent with expectation in the operational concepts and rules under win-win conditions competing paradigms will close their respective sustainability gaps and shift towards the higher level market individually or they will merge into the higher level market. In other words, under win-win conditions paradigms shift one at the time or they merge. The structure of paradigm shift or merger is given by the following expression:

8) TM.ENM = Bc.Cb = B(ESG--→1).C(ECSG---→1) = shift to green market form or merge

Since ESG-→1 = C and ECSG--→1 = B under win-win conditions the paradigms will lose their original structure and shift to a higher level market individually or they will merge leaving their original structure behind.

The implications of expression 8) with respect to paradigm merger and individual paradigm shifts under win-win conditions can be appreciated in Figure 7 above as follows: i) If both the traditional market(TM) and the environmental market(ENM) close their respective sustainability gaps they merge into the green market[B(ESG-→1 = C).C(ECSG-→ 1 = B) = B(C).C(B) = BB.CC = BC = GM] as represented by the continuous blue arrow at point 1; ii) if the environmental market(ENM) closes its economic sustainability gap it shifts to the green market[C(ECSG-→1 = B) = C(B) = BC = GM] as indicated by the continuous brown arrow at point 2; and iii) if the traditional market(TM) closes its environmental sustainability gap it shifts to the green market[B(ESG--→1 = C) = B(C) = BC = GM]. Again, it is clear, under win-win conditions competing system at war will individually find to their advantage to shift by closing respective sustainability gaps or they will find to their advantage to merge to a higher level paradigm, in this case the perfect green market(GM). Notice that the structure of green markets GM = BC means that the green market(GM) is an equal responsibility economy-environment model ruled by codependent choice and perfect green market thinking.

Implications:

Paradigm cold wars are clashes between the sustainability gaps embedded within the systems that are clashing. In the case of the green cold war, it is a clash between the environmental sustainability gap embedded in the perfect traditional market and the economic sustainability gap embedded in the perfect environmental market. Any science based solution to a paradigm cold war whether it is under win-win conditions or under no win-win conditions takes the form of the higher level paradigm, and in the case of the green cold war the higher level paradigm is the perfect green market.

Food for thoughts

i) Is an environmental externality management market a dwarf green market? I think yes, what do you think?; ii) Is an economic externality management market a dwarf market? I think yes, what do you think?; and iii) Do environmental externality management markets operate still under active environmental sustainability gaps? I think yes, what do you think?

Conclusions

First, the structures of the traditional market and of the environmental market were stated analytically and graphically in a way that allow us to highlight the general structure and dynamics of the green cold war. Second, the structure of the traditional market and of the environmental market were restated analytically and graphically in terms of their sustainability gaps in a way that allow us to link sustainability gaps with green market structures and shifts. Third, the sustainability gap between the traditional market and green market as well as between the environmental market and green market were used to indicate the different shifting routes towards green markets that are possible depending on whether paradigms shift dynamics are taking place under win-win conditions or no win-win conditions. Finally, it was stressed that the end point of green cold wars is always a perfect green market under paradigm death and shift expectations as the perfect green market is the only science based solution to a green cold war.

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