True sustainability thinking 105: The socio-environmental pollution production problem, global warming, and the traditional circular economy since 2022: Pointing out the future we should have chosen and the one we should have not considered in 2022 or so.

By

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Abstract

The road of "Our common future" in 1987(WCED 1987) was a road that was supposed to lead us to a socio-environmental future we needed to build, a future towards socio-environmental pollutionless markets and to do that we had to fix the socio-environmental pollution production problem associated with the work of the traditional linear economy market, the sustainability issue was socio-environmental, it was not economic resource use inefficiency issue. The road of "The future we want" in 2012 Rio + 20 (UNCSD 2012a; UNCSD 2012b) was a road that was supposed to lead us to an environmental future we needed to built, a future towards environmental pollutionless markets and to do that we had to fix the environmental pollution problem linked to the working of the linear market economy, the sustainability issue was environmental, it was not an economic resource use efficiency issue. It is known that to address critical issues like poverty and/or global warming we need to address the social and/or environmental pollution production problems, which are driven by socially and/or environmentally distorted traditional market prices; and it is know that resource use inefficiency is a consequence of distorted market pricing, which make it profitable to externalize socio-economic use resource inefficiencies. And we know today that the proper transition tools if the goal is to transition towards a socio-environmentally clean economy are true sustainability markets, and we know at this moment that if the goal is to transition towards an environmentally clean economy then the proper transition tools are green markets, and we know now also that if the goal is to transition to a socially clean economy, then the proper transition tools are red markets. Yet, since about 2022 (WB 2022), the world starting in Europe decided to go from linear pollution production to circular pollution production, ignoring the 1987-2022 period of trying to solve socio-environmental issues a la sustainable development (1987-2022) and la dwarf green markets (2012-2022); and ignoring the need to one day transition to socio-environmental pollutionless economies to focus on fixing the resource use inefficiencies associated with the linear market under, again, socio-environmental externality neutrality assumptions, a move that can simple be seen as a deep traditional paradigm double down based on positive traditional market labeling as the root-cause of the critical socio-environmental pollution production issue remains without being addressed. Among the goals of this paper are: i) to show analytically and graphically, using the critical anthropocentric socio-environmental problem-solving impossibility zone theory, how and why circular traditional market tools and

thinking cannot be expected to fix the socio-environmental pollution production problem linked to traditional market thinking, but which they assumed away; and issue now linked to itself as socio-environmental pollution production continues to take place in the permanent socio-environmental market failure under which circular traditional markets work; and ii) And then use anthropocentric socio-environmental problem-solving impossibility zone theory and the anthropocentric socio-environmental problem-solving possibility point framework to pointing out the socio-environmental future we should have chosen to address in 2022, but we did not, when going circular traditional economy thinking as well as to stress the socio-environmental future we should have not considered, but we embraced since 2022.

Introduction

A) The socio-environmental pollution production problem, global warming and circular traditional markets (CTM) since about 2022

It has been recently pointed out (Muñoz 2025a) that there is a pollution production problem separating irresponsible human behavior led market dynamics (IRHUBLE) from irresponsible human behavior led global warming (IRHULGW), a situation that existed in 2022 but in worse conditions than the one addressed in 1987 by the Brundtland Commission (WCED 1987) in socio-environmental terms when the world went the way of sustainable development markets (SDM) to address the socio-environmental sustainability problem, a no transition tool that falls inside the impossibility zone and which should not be expected to solve the socio-environmental sustainability issue (Muñoz 2025b), a situation summarized Figure 1 below in irresponsible socio-environmental human behavior terms (IRSEHUB):

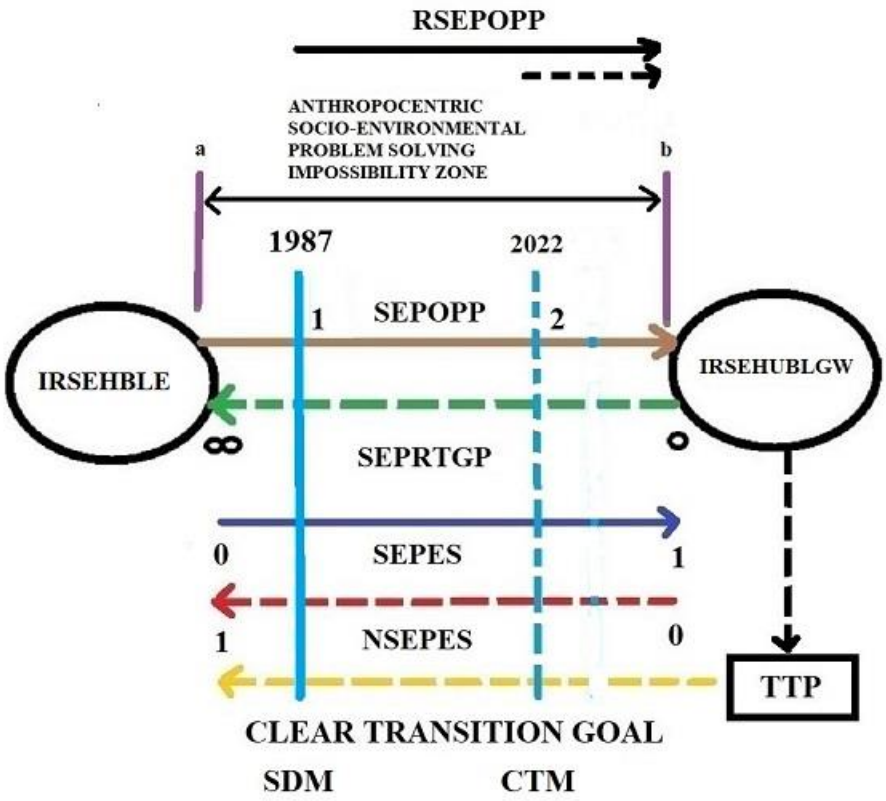

Figure 1 **The use of sustainable development based markets (SDM) to address critical socio-environmental sustainability problems, the use of circular traditional markets (CTM) to address resource use efficiency issues, not to solve critical socio-environmental problems and their respective structure of expected failure.**

Figure 1 above tells us first that there is an anthropocentric socio-environmental problem-solving impossibility zone (ASEPSIZ) separating the irresponsible dynamics of the market tool (IRSEHUBLE) and the irresponsible dynamics of the global warming problem (IRSEHUBLGW), and this zone begins at point "a" and ends at point "b". Figure 1 also shows that the 1987 sustainable development market tool (SDM) at point 1, aimed at addressing the socio-environmentally pollution problem partially, is a no transition to socio-environmental pollution-less market tool, which has a remaining socio-environmental pollution problem (RSEPOPP) attached as it works as shown by continues black arrow at top going from left to right at point 1. Figure 1 above also stresses that the 2022 circular traditional markets (CTM) at point 2 since they are aimed at addressing resource use inefficiency problems associated with linear pollution based traditional markets, and hence there are not geared at addressing the socio-environmental sustainability problem of those linear traditional markets; and therefore, they are no transition to socio-environmental pollutionless market tools as they assume that the socio-environmental pollution problem SEPOPP and its remaining socio-environmental sustainability gap that come along once implemented do not exist as indicated by the broken blue 2022 vertical line and by the broken black arrows to the right of point 2 from point 2 to point "b".

Notice too that in both cases at point at point “b” you have a fully socio-environmentally dirty economy or fully dominant socio-environmentally pollution-based economy; and at point “a” you have a fully socio-environmentally clean economy or fully dominant socio-environmentally clean economy, and the position of the 1987 sustainable development markets (SDM) and goals (SDMGs) at point 1, and the position of the 2022 circular traditional markets (CTM) and goals (CTMGs) at point 2 found in between point “a” and point “b” means that they both were implemented without a clear transition goal to one day move from socio-environmentally polluting economies to socio-environmentally clean economies.

B) The link between the anthropocentric socio-environmental critical problem-solving impossibility zone and polluting and no polluting sources of energy in the case of sustainable development markets and in the case of circular traditional markets

1) The case of the 1987 sustainable development markets SDM at point 1/vertical blue line

Figure 1 above helps us to highlight too that the 1987 sustainable development markets (SDM) were set up in a situation where there is a full socio-environmental pollution reduction technology gap problem (SEPRTGP) indicated by the broken green arrow going from right to left from “0” to ∞ as the market is run on socio-environmentally polluting sources of energy (SEPES) only as indicated by the continues blue arrow going from left to right from 0 to 1 ; and hence these markets are lacking a supply of no socio-environmental polluting energy sources (NSEPES) as indicated by the broken red arrow going from right to left from 0 to 1; and since sustainable development markets (SDM) were implemented in the absence of the need to transition to socio-environmentally clean economies (SECLEM) as the need to transition to socio-environmentally clean economies was never, and it has never been, one of the 17 sustainable development goals(UN 2025).

2) The case of the 2022 circular traditional markets CTM at point 2/vertical broken blue line

Figure 1 above tell us too that the 2022 circular traditional markets (CTM) were set up in an environment i) where there is a full socio-environmental pollution reduction technology gap problem (SEPRTGP) as indicated by the broken green arrow going from right to left from “0” to ∞ as the market is run on socio-environmentally polluting sources of energy (SEPES) as indicated by the continues blue arrow going from left to right from 0 to 1; ii) where there is a full socio-environmental pollution production problem (SEPOPP) as indicated by the continuous SEPOPP arrow going from IRSEHUBLE to IRSEHUBLGW separating irresponsible economic behavior from irresponsible global warming behavior; and iii) where these facts are being ignored to focus on dealing with resource use efficiency issues that happen to be the consequence of the socio-environmentally distorted linear traditional market prices as they are assumed away by means of the socio-environmental externality neutrality assumption, which holds that circular traditional markets can expand as much as they want without producing socio-environmental pollution or without generating socio-environmental externalities. But notice in Figure 1 above

that circular traditional markets CTM are running on socio-environmentally polluting sources of energy (SEPES) as indicated by the continues blue arrow going from left to right from 0 to 1 ; and hence these circular traditional markets are lacking a supply of no socio-environmental polluting energy sources (NSEPES) as indicated by the broken red arrow going from right to left from 0 to 1; and since circular traditional markets are being implemented in the absence of the need to transition to socio-environmentally clean circular economies as this need is also assumed away, then both the need to transition to circular socio-environmentally clean economies and the goal to focus only on fixing resource use inefficiency problems have never been, and are not among the 17 sustainable development goals(UN 2025). In other words, circular traditional markets are working and expanding outside the sustainable development frameworks and goals as circular traditional market thinking is still business as usual, but circular, a thinking the Brundtland commission told us in 1987 (WCED 1987) we should move away from, a thinking sustainable development markets leave behind partially by showing at least some socio-environmental responsibility.

Moreover, it is important to highlight here the following based on Figure 1 above: i) that point "b" is a point of full socio-environmental cost externalization; ii) that point "a" is a point of full socio-environmental cost internalization; iii) that point 1 on the vertical 1987 continuous vertical blue line of the sustainable development market (SDM) is a point of partial socio-environmental cost externalization; iv) that point 2 on the 2022 broken vertical blue line is a point of zero socio-environmental cost internalization; v) that distance from point "a" to point "b" is the full socio-environmental pollution production problem SEPOPP recognized in sustainable development thinking and assumed away in circular traditional market thinking; vi) that the distance from point "1" to point "b" is the remaining socio-environmental pollution production problem linked to and affecting the working of the sustainable development markets SDM and the distance from point "a" to point 1 is the portion of the socio-environmental problem internalized in sustainable development markets; and vii) that the distance from point "a" to point 2 is the existing socio-environmental pollution production problem SEPOPP associated with the creation of the circular traditional market a point 2, but assumed away; and the distance from point 2 to point "b" is the future socio-environmental pollution production problem associated with the working and expansion of traditional circular markets, which is also assumed away.

C) The need to understand the nature of the anthropocentric critical socio-environmental problem-solving possibility point

Notice that if we flip point "b" in Figure 1 above from being the point of full socio-environmental cost externalization to a point of full socio-environmental cost internalization, then we can create an anthropocentric critical socio-environmental problem solving possibility point, where the proper clear socio-environmental transition goal can be set up, which would determine the proper socio-environmental problem-solving transition tool to put to work, and which would move to close the socio-environmental pollution reduction technology gap problem

to release or produce the no socio-environmental polluting energy sources(NSEPES) that are needed to fully substitute socio-environmental polluting energy sources (SEPES), and be able to transition that way from socio-environmentally dirty economies to socio-environmentally clean economies.

D) The need to link the discussion above to the socio-environmental future we needed to considered, but we did not and the one we should have avoided to considered, but we implemented

Consistent with the discussion above it can be said the road towards the future we wanted in 1987 (WCED 1987) was a road that was supposed to lead to the socio-environmental future we needed to build, a future towards a socio-environmental pollutionless world, but that cannot be expected to happen as sustainable development tools are no transition tools inside the socio-environmental problem-solving impossibility zone so they should not be expected to solve the critical socio-environmental problem at hand(Muñoz 2025b). It can also be said that the road towards circular traditional markets CTM does not lead to a socio-environmental pollutionless world, but to a resource use efficiency based socio-environmentally polluting world, which is the future we should not have considered, but we have implemented(WB 2022); and time will tell as the future under linear thinking showed us, a world under socio-environmental sustainability gaps and worsening future gap's conditions is not sustainable; and sooner or later this unsustainability will lead to paradigm death and shift, an end that will have higher social, environmental and economic costs and that will need more drastic corrective transitions to true sustainability markets than if we would have corrected the socio-environmental pollution production problem in the first(1987) or second change(2022) we had . The need to avoid the circular traditional market future we have chosen since 2022 seems to be indirectly recognized when indicating the need to substitute polluting energy sources for no polluting ones to improve air quality and minimize other impacts (OECD 2025).

Perhaps this circular traditional market route would have been possible or it could have gone unchallenged under the true sustainability markets paradigm shift knowledge gaps that are created when you shift from fully socio-environmentally dirty economies to a fully socio-environmentally clean economy, which hides possible transitions tools available and which makes more attractive, specially politically, to use no transition development tools, even those tools unconnected with the need to solve the socio-environmental pollution production problem such as circular traditional markets; and by doing this we give a blessing of permanency to the market failures we are supposed to be trying to fix and which flourishes under no-transition markets with positive labeling like circular transitional markets that leave behind linear traditional markets, but this is 2026 and there are no longer true sustainability market paradigm shift knowledge gaps, we know today how to transition from dirty economies, be it socially or environmentally or socio-environmentally dirty economies to clean ones, the issue appears to be political palatability and academic tunneling based traditional market thinking double down aspirations, not issues with the existence of proper science based transition tools and thinking.

The consequences and nature of green market paradigm shift avoidance and period 2012 to now have been recently pointed out (Muñoz 2022; Muñoz 2024) as well as the consequences and nature of the true sustainability market paradigm shift and period 1987 to now that we chose in 1987 by choosing sustainable development tools instead of true sustainability tools to address the socio-environmental sustainability problem documented then (Muñoz 2025b), making this decision to go the way of sustainable development the first major development thinking blunder since 1987 (Muñoz 2025c). We also know right now how to state the structure of the true sustainability market (Muñoz 2016) and see how it would be expected to behave under perfect sustainability market competition (Muñoz 2019) as well as we know that going circular thinking by assuming socio-environmental pollution problems associated with it can be described as the third major development thinking blunder since 1987(Muñoz 2025d). Among the goals of this paper are: i) to show analytically and graphically, using the critical anthropocentric socio-environmental problem-solving impossibility zone theory, how and why circular traditional market tools and thinking cannot be expected to fix the socio-environmental pollution production problem linked to traditional and circular market thinking as socio-environmental pollution production continue to take place in the permanent socio-environmental market failure under which circular traditional markets work; and ii) And then use this framework to point out the socio-environmental future we need to considered in 2022, but we did not; and the one we should have avoided in 2022, but we implement it.

Goals of this paper

a) To introduce the nature of the anthropocentric critical socio-environmental pollution problem-solving impossibility zone and possibility point and their implications; and b) To use these frameworks to point out the socio-environmental future that we need to choose in 2022, but we did not, and the one we should have avoided to consider, but we took then.

Methodology

1) The terminology and operation concepts used in this paper are given; 2) The no transition nature of circular traditional markets is highlighted; 3) The nature of the anthropocentric critical socio-environmental pollution problem-solving impossibility zone and its implications to circular economic thinking is introduced; 4) The nature of the anthropocentric critical socio-environmental pollution problem-solving possibility point and its implications to leaving circular traditional market thinking behind is stressed; 5)The anthropocentric critical socio-environmental pollution problem-solving possibility point to stress the socio-environmental future we needed to choose in 2022 but we did not is pointed out: 6) The anthropocentric critical socio-environmental pollution problem-solving impossibility zone

framework is used to indicate the socio-environmental future we needed to avoid considering in 2022, but we took; and 7) Some relevant food for thoughts and conclusions are provided.

Terminology

TM = Traditional market TMP = Traditional market price

CTM = Circular traditional market CTMP = Circular traditional market price

YSM = Yellow sustainability market TSM = True sustainability market

YSMP = TSMP = Sustainability market price EM = Environmental margin

ECM = Economic margin SM = Social margin

DM = Dirty market SEDM = Socio-environmentally dirty market

CLM = Clean market SECLM = Socio-environmentally clean market

SEPES = Socio-environmental polluting energy sources

NSEPES = No socio-environmental polluting energy sources

SEPRTGP = Socio-environmental pollution reduction technology gap

SEPOPP = Socio-environmental pollution production problem

RSEPOPP = Remaining socio-environmental pollution production problem

IRHUBLE = Irresponsible human behavior led economy

IRHUBLGW = Irresponsible human behavior led global warming

REHUBLE = Responsible human behavior led economy

REHUBLWG = Responsible human behavior led global warming

IRSEHUBLE = Irresponsible socio-environmental human behavior led economy

RSEHBLE = Responsible socio-environmental human behavior led economy

IRSEHUBLGW = Irresponsible socio-environmental behavior led global warming

RSEHUBLGW = Responsible socio-environmental behavior led global warming

ASEPSIZ = Anthropocentric socio-environmental problem solving impossibility zone

ASEPSPP = Anthropocentric socio-environmental problem solving possibility point

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Operational concepts

1) Clean market, a pollution-less market.

2) Dirty market, a pollution production market.

3) Problem solving impossibility zone, the place where no full solution to the pollution production problem exists.

4) Problem solving possibility point, the only place where the conditions for a full solution to the pollution production problem exist.

5) Pollution production problem, the issue that separates dirty economies from clean economies.

6) Anthropocentric clean economy, a pollutionless economy led by responsible human behavior.

7) Anthropocentric dirty economy, a pollution production economy led by irresponsible human behavior.

8) Anthropocentric problem-solving impossibility zone, the place where no full solution to the anthropocentric pollution production problem exists.

9) Anthropocentric problem-solving possibility point, the only place where the conditions for a full solution to the anthropocentric pollution production problem exist.

10) Anthropocentric pollution production problem, the issue that separates anthropocentric dirty economies from anthropocentric clean economies.

11) Anthropocentric environmental problem-solving impossibility zone, the place where no full solution to the anthropocentric environmental pollution production problem exists.

12) Anthropocentric environmental problem-solving possibility point, the only place where the conditions for a full solution to the anthropocentric environmental pollution production problem exist.

13) Anthropocentric environmental pollution production problem, the issue that separates anthropocentric environmentally dirty economies from anthropocentric environmentally clean economies.

14) Traditional market, a resource use inefficient based pollution production market.

15) Circular traditional market, a resource use efficient based pollution production market.

16) True sustainability market or yellow sustainability market, a fully socially and environmentally responsible, and resource use efficient market.

The no transition nature of circular traditional markets

As mentioned in the introduction, no transition tools to socio-environmentally clean markets were set up in 2022 by those who decided to address the resource use inefficiency problem associated with the linear traditional market under the assumption of socio-environmentally externality production neutrality knowing that socio-environmental externalities are real and recognized today as their existence and the need to fix them has led to the use of other no transition tools before such as sustainable development markets since 1987, and sustainable development markets still at work today, but set up when the decision to give priority to solving the socio-environmental pollution problem was formalized in 1987 as “Our Common Future”. Yet no transition tools to socio-environmentally clean markets such as a la circular traditional market have been set up to address not this recognized socio-environmental pollution production problem but to address the resource use inefficiency problems associated with the working of the linear traditional market and hence, the set up and working of circular traditional markets is delinked from the need to fix the socio-environmental pollution production problem that was affecting traditional linear markets and that now are affecting circular traditional markets, and hence, the focus in resource use inefficiency attached to circular market thinking is delinked too from the critical socio-environmental pollution production problem-solving need to tackle issues like global warming, a situation highlighted at point 2/broken 2022 vertical blue line in Figure 2 below representing the structure of the circular traditional market CTM :

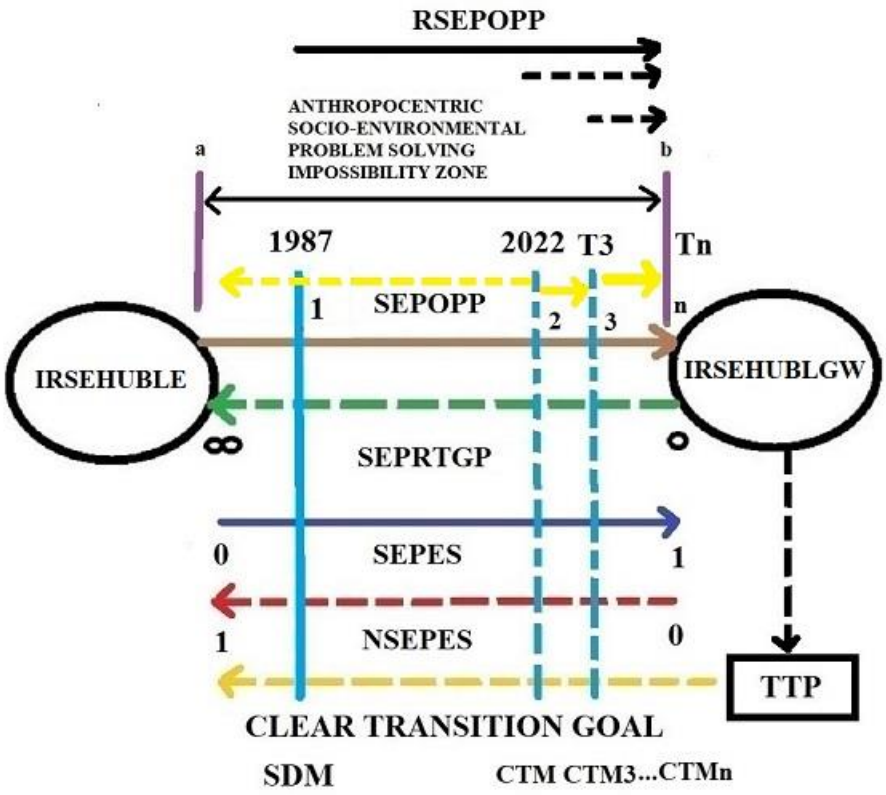

Figure 2 The nature of circular traditional markets (CTM) as no critical socio-environmental problem solving transition tools, but as resource use efficiency-problem solving tools.

Notice that in Figure 2 above the economy (E) is led (L) by irresponsible socio-environmental human behavior IRSEHUB so it is called irresponsible socio-environmental human led economy IRSEHBLE; and global warming (GW) in turn is led(L) by irresponsible socio-environmental human behavior(IRSEHUB) too so it is called irresponsible human socio-environmental behavior led global warming IRSEHBLGW; and these two irresponsible (IR) components are separated by the socio-environmental pollution production problem SEPOPP associated with the irresponsible economy (IRSEHUBLE), and the 2022 circular traditional market tool CTM sits in between, but it has a broken vertical blue line as it has nothing to do with addressing the socio-environmental pollution production problem associated with traditional market thinking, a pollution problem now associated with itself as circular traditional markets are not geared at fixing the problem, the socio-environmental unsustainability problem, but at fixing a consequence of the root-cause of the problem, resource use inefficiency problem generated by socio-environmentally distorted circular traditional economy market prices.

Hence, Figure 2 above displays the structure of the 2022 circular traditional market CTM as a broken vertical blue line directed at solving the resource use inefficiency problem, not the socio-environmental pollution production problem associated with the linear traditional market, a situation found at point 2 on the SEPOPP unbroken black arrow going from irresponsible market

dynamics IRSEHUBLE to irresponsible global warming dynamics IRSEHUBLGW: at point 2 in Figure 2 above we are addressing the resource use efficiency problem while being at a socio-environmental pollution production and expansion point. See that point "b" here is the point of full socio-environmental cost externalization as at that point the economy runs only on socio-environmentally polluting sources of energy SEPES as shown by the blue SEPES arrow going from left to right; and see that at point 2, point 3 all the way to point "n", the traditional circular economy run on socio-environmental polluting energy sources SEPES.

Moreover, Figure 2 above can be used to derived the following aspects relevant to the circular traditional market world; i) there is a tool transition problem TTP as they are no transition tools to socio-environmentally clean markets as indicated by the broken black arrow from IRSEHUBLGW to TTP, ii) there is no clear goal to transition to socio-environmentally clean economies or socio-environmental pollutionless markets as indicated by the broken gold arrow going from right to left from IRSEHUBLGW to IRSEHUBLE as their socio-environmental pollution production problem is assumed away, iii) it is a world where having a full supply of no socio-environmental polluting sources of energy NSEPES is not a priority as there is no incentive to close the socio-environmental pollution reduction technology gap SEPRTGP as indicated by the broken red arrow going from right to left, and this is because socio-environmental pollution reduction is not a good profit making opportunity in circular traditional markets, and iv) there is a socio-environmental pollution production reduction technology gap problem SEPRTGP affecting it as indicated by the broken SEPRTGP arrow going from right to left as the use of socio-environmental polluting energy sources SEPES is here a good profit making opportunity as the socio-environmental pollution problem created can be fully externalized.

We can point out the no transition nature or the permanent socio-environmental market failure situation of the 2022 circular traditional market tool (CTM) under resource use efficiency in Figure 2 above by looking at the contraction and expansion of the socio-environmental pollution production problem from point 2 to point 1 and from point 2 to point 3 and to point "n", respectively. As socio-environmental cost internalization is not a profit making opportunity in circular traditional markets under resource use efficiency we cannot expect them to contract voluntarily to reduce socio-environmental pollution production as indicated by the broken yellow arrow from point 2 to point 1. As socio-environmental pollution production or externalization is a good business opportunity under resource use efficiency we should expect circular traditional markets CTM to expand, producing at the lowest circular market price (CTMP) possible, like the expansion from point 2 to point 3 as indicated by the continuous yellow arrow from point 2 to point 3; and we should expect circular traditional markets CTM under resource use efficiency to continue to expand until socio-environmental pollution production externalization is maximized, and hence, tending towards full unsustainability as we reach point "n" as indicated by the continues yellow arrow from point 3 to point "n", the point of full socio-environmental cost externalization under resource use efficiency so at that moment point "n" = point b, and hence,

this is a point of full circular traditional market unsustainability and possible market collapse under resource use efficiency. And the above situation shows that circular traditional markets CTM are no transition tools aimed at addressing the consequences of the root-cause of irresponsible socio-environmental human behavior led economies (IRSEHUBLE), resource use inefficiency, as they are not directed at fixing the root-cause of the pollution production problem, the socio-environmentally distorted circular traditional market prices embedded in those irresponsible economies (IRE).

Stating the anthropocentric critical socio-environmental problem solving possibility point

Notice that if we fully internalize socio-environmental costs of production (EM + SM), then the model shift from irresponsible (IR) to responsible (RE) as now there is a clear goal to transition to socio-environmental pollutionless economies as then socio-environmental pollution reduction becomes a good profit making opportunity that allows true sustainability market transitions to the socio-environmentally clean economies creating in the process a critical socio-environmental problem-solving possibility point at point "b" as stated in Figure 3 below.

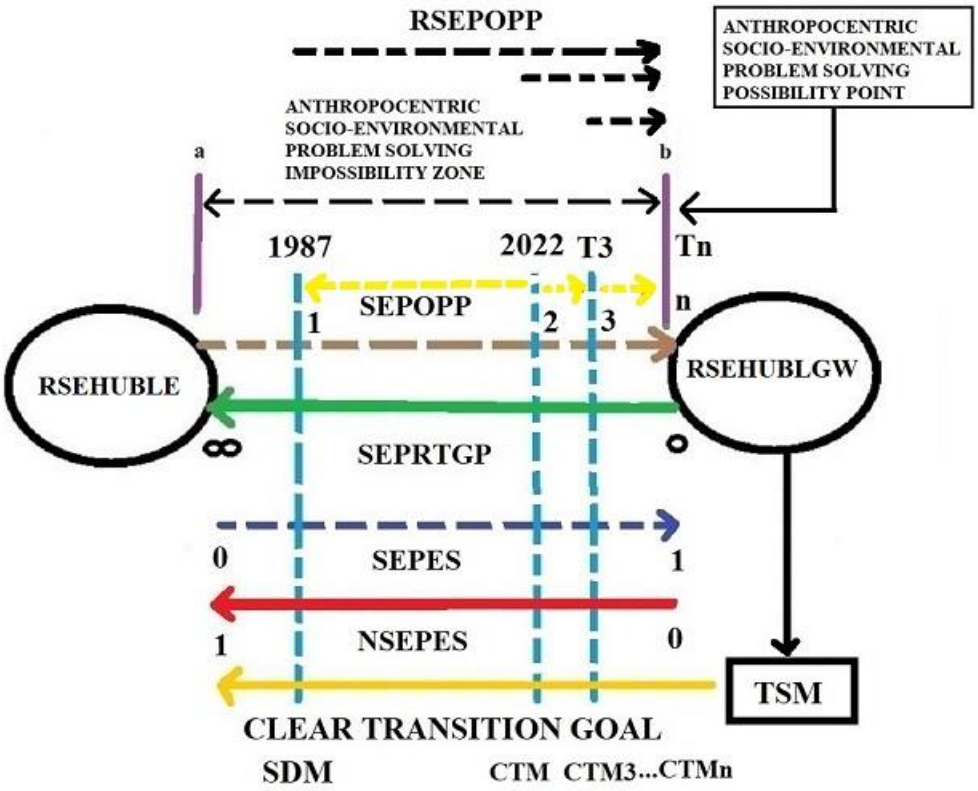

Figure 3 The structure of the anthropocentric critical socio-environmental pollution problem-solving possibility point if we chose to go circular thinking to fix that critical problem, which will also fix the resource use ineficiency problem at the same time.

It can be seen based on Figure 3 above that at point "b" there is an anthropocentric socio-environmental problem-solving possibility point (ASEPSPP), and here there is no longer a socio-environmental pollution production problem SEPOPP as the result of full socio-environmental cost internalization. See that now at the critical socio-environmental problem-solving possibility point "b" (ASEPSPP) in Figure 3 above we can appreciate the following: i) there is a clear transition goal to go from irresponsible socio-environmental human behavior led economy IRSEHUBLE to a responsible socio-environmental human behavior led economy RSEHUBLE transforming irresponsible socio-environmental human behavior led global warming IRSEHUBLGW to a responsible one RESEHUBLGW, ii) these moves towards responsible socio-environmental behavior (RSEHUB) provides now incentives to close the socio-environmental pollution reduction technology gap problem SEPRTGP producing the no socio-environmental polluting sources of energy NSEPES needed to permanent substitute the socio-environmental polluting sources of energy SEPES and move to a socio-environmentally clean world; iii) there is now a proper transition tool set up a la true sustainability markets TSM so it can be transitioned by slowly, but surely producing at the lowest true sustainability market price TSMP possible, and iv) this allows the case of making money while reducing socio-environmental pollution production to the point where the true sustainability market price TSMP equals the socio-environmentally clean market price SECLMP so that TSMP = SECLMP to become now a permanent socio-environmental pollutionless market or socio-environmentally responsible economy RSEHUBLE as shown by all continuous arrows from right to left in Figure 3 above. Notice that the possibility point at point "b" (ASEPSPP) breaks the socio-environmental problem-solving impossibility zone that exist from point "a" to point "b" as a direct result of full socio-environmental cost internalization as now there is a transition path to socio-environmentally clean markets.

Finally, it is important to stress that in Figure 3 above point "b" (ASEPSPP) is a point of full socio-environmental cost internalization now, and see that point 2 on the vertical 2022 broken blue line of the circular traditional market CTM no longer has a socio-environmental pollution production problem SEPOPP so the distance from point "a" to point "b" is now this problem has been internalized, and hence, here there is no socio-environmental pollution production problem linked to and affecting the working of the true sustainability market TSM. In other words under true sustainability markets TSM there are no longer socio-environmental sustainability gaps or socio-environmental pollution production problems as they are now internalized.

The structure of the anthropocentric critical problem solving socio-environmental problem-solving impossibility zone for circular traditional markets

The critical socio-environmental problem solving impossibility zone (ASEPSIZ) under which circular traditional markets CTM operate then can be indicated as shown below in Figure

4 below as broken vertical blue lines and broken black arrows to the left of point 2 as the circular traditional market and its expansions create socio-environmental pollution production problem while operating under resource use efficiency, but these existing externality problems created are assumed away:

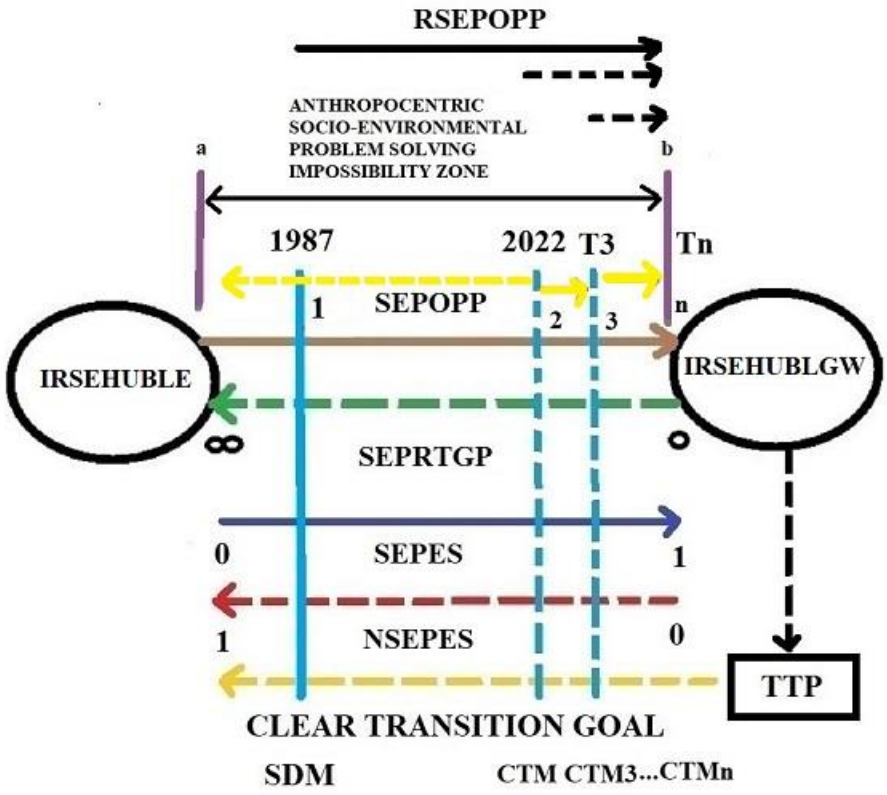

Figure 4 The anthropocentric critical socio-environmental problem-solving impossibility zone for circular traditional markets (CTM) and thinking

Figure 4 points out that when circular traditional market tools CTM are at work i) there is still a remaining socio-environmental pollution production problem RSEPOPP opportunity zone that goes from point 2 to point "b" where it can expand to produced at the lowest circular traditional market price possible and make money while polluting; ii) They run using socio-environmentally polluting energy sources SEPES as indicated by the continuous blue line, which highlight their nature as socio-environmental pollution production markets; and hence, iii) they are working under efficient resource use at point 2 while still generating socio-environmental pollution. Notice that the broken arrows going from right to left in Figure 4 above show aspects circular traditional markets lack: i) They have a fully open socio-environmental pollution reduction technology gap problem SEPRTGP as indicated by the broken green arrow; ii) They do not have a clear goal to transition to socio-environmentally clean economies SECLM as indicated by the broken gold arrow; iii) they do not have a supply of no socio-environmental polluting sources of energy NSEPES as indicated by the broken red arrow; iv) they do not have a proper transition tool to socio-environmentally clean markets SECLM as shown by the broken

down black arrow from IRSEHUBLGW to TTP; and v) They cannot be expected to internalize socio-environmental cost of production voluntarily as this is not a good business opportunity as indicated by the broken yellow arrow so they will fully externalize the socio-environmental pollution production problems associated with their working.

Implications related to implementing no transition tools in 2022 such as circular traditional markets without addressing the critical socio-environmental pollution production problem embedded in them as shown in Figure 4 above

a) A shift from fully socio-environmentally dirty circular traditional markets to socio-environmentally pollutionless markets is not possible

Consistent with the discussion above based on Figure 4, as circular traditional markets CTM operate at point 2, a point of resource use efficiency under permanent socio-environmental market failure as socio-environmental costs are not reflected in the circular traditional market pricing mechanism, then they cannot be transitioned towards socio-environmentally pollutionless markets, a situation pointed out in Figure 5 below:

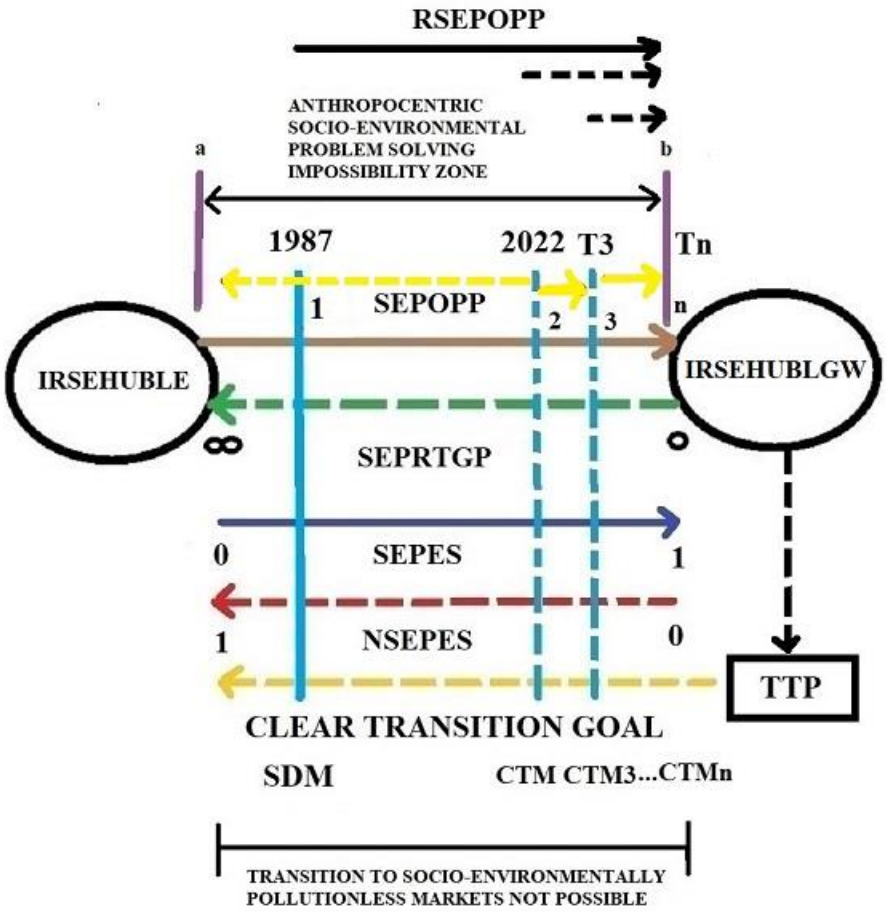

Figure 5 Circular traditional markets (CTM) as inappropriate tools to address the critical socio-environmental problem-solving as it resides inside the impossibility zone and because it is aimed at addressing the consequence of socio-environmentally distorted circular traditional market prices namely resource use inneficiency

Figure 5 above tells us that in circular traditional markets CTM transition to socio-environmentally clean economies is not possible as they are producing socio-environmental externalities as they use resources efficiently at point 2 and when they expand; and hence since their working is linked to socio-environmental pollution problems they cannot be transitioned to socio-environmentally clean markets. Also notice that the continuous blue arrow in Figure 5 above indicates that circular traditional markets CTM are running only on socio-environmental polluting energy sources SEPES, and they externalizing the socio-environmental externalities that come with the use of dirty sources of energy by assuming them away.

b) A world under possible and unbearable economy black outs is possible

As circular traditional markets CTM operate under socio-environmental polluting energy sources SEPES as this is profitable, yet still assuming they do not pollute, and they have no supply of no socio-environmental pollution sources of energy NSEPES as this is not profitable, then if socio-environmental polluting energy sources suddenly disappear at any point, there will

be circular economy black out with the possibility of unbearable circular economy black outs leading to circular economy collapses as they have a full socio-environmental pollution reduction technology gap problem SEPRTGP open as shown in Figure 6 below by the broken SEPRTGP arrow going from right to left:

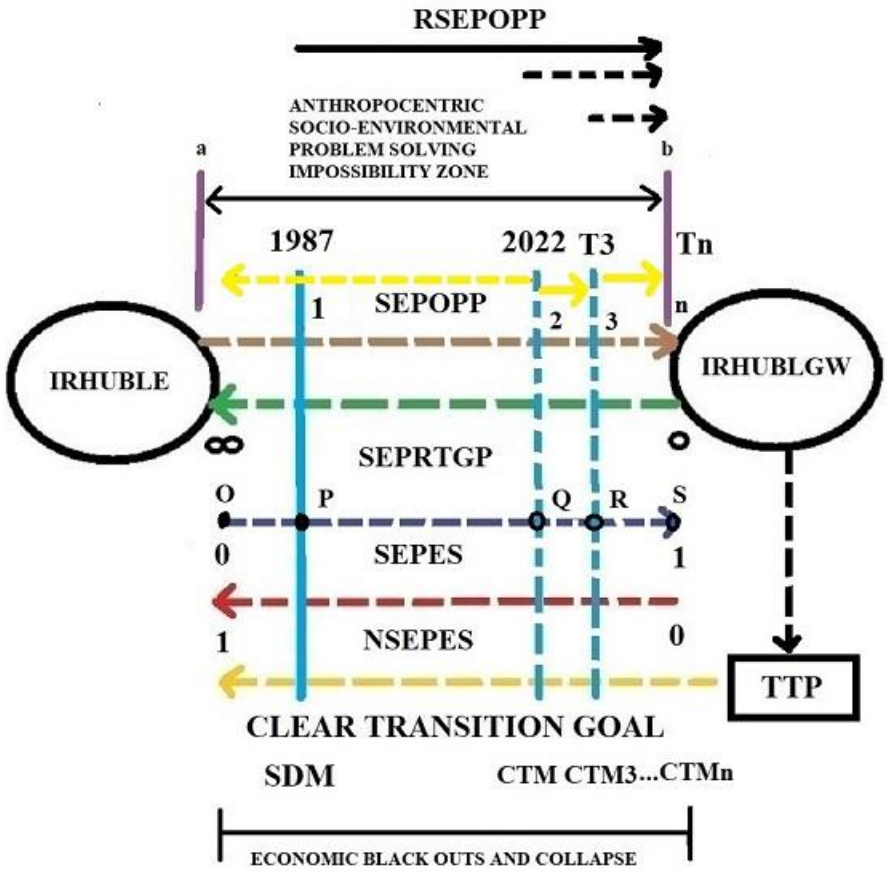

Figure 6 **The world under economic black outs when socio-environmentally polluting energy sources suddenly disappear when the socio-environmental pollution reduction technology gap problem has not yet been addressed as it is there, it exist, but it is assumed not to be therer, not to exist.**

Figure 6 above shows the situation circular traditional markets CTM are in when the socio-environmental pollution sources of energy SEPES is using to operate suddenly disappear as indicated by the broken blue line. Notice that the socio-environmental pollution production problem SEPOPP disappears if the socio-environmental polluting sources of energy SEPES disappear as indicated by the broken SEPOPP arrow and so it is being assumed away in circular traditional market thinking, but in reality it is still there as socio-environmental pollution production SEPOPP is still taking place, and since there is not a supply ready available of no socio-environmental pollution energy sources NSEPES, then there will be circular traditional economy black outs and economy collapses at any point Q, R to S if the socio-environmental polluting energy sources it is running on suddenly disappear.

For example, if the circular traditional market CTM is operating at point 2 it requires socio-environmentally polluting energy sources SEPES at the level of point Q on the broken blue line, then a) if the socio-environmental polluting source of energy SEPES disappear at that point Q there will be circular economy black outs, and then circular economy collapse as there are no sources of no socio-environmental polluting energy NSEPES available to pick up the fall as the socio-environmental pollution reduction technology gap problem SEPRTGP is wide open and there are no no socio-environmental polling sources of energy available NSEPES; b) if this is the case traditional circular market expansions to point Q to point S are not possible; and c) if socio-environmental polluting energy sources SEPES were to disappear at point "P" or worse at point "O", then circular traditional market thinking CTMT would not have been able to be implemented as markets, circular or not, cannot operate without energy.

Implications related to implementing proper transition tools in such as true sustainability markets to address the critical socio-environmental pollution production problem embedded in circular traditional markets in Figure 3 above, but assumed away

a) A shift from fully socio-environmentally dirty circular markets to socio-environmental pollution-less markets is possible

Consistent with the discussion above based on Figure 3, as true sustainability markets TSM are proper transition tools then it is possible to transition them towards socio-environmentally clean markets or responsible socio-environmental human behavior led markets RSEHUBLE and leave the socio-environmental dirty circular market behind as highlighted in Figure 7 below:

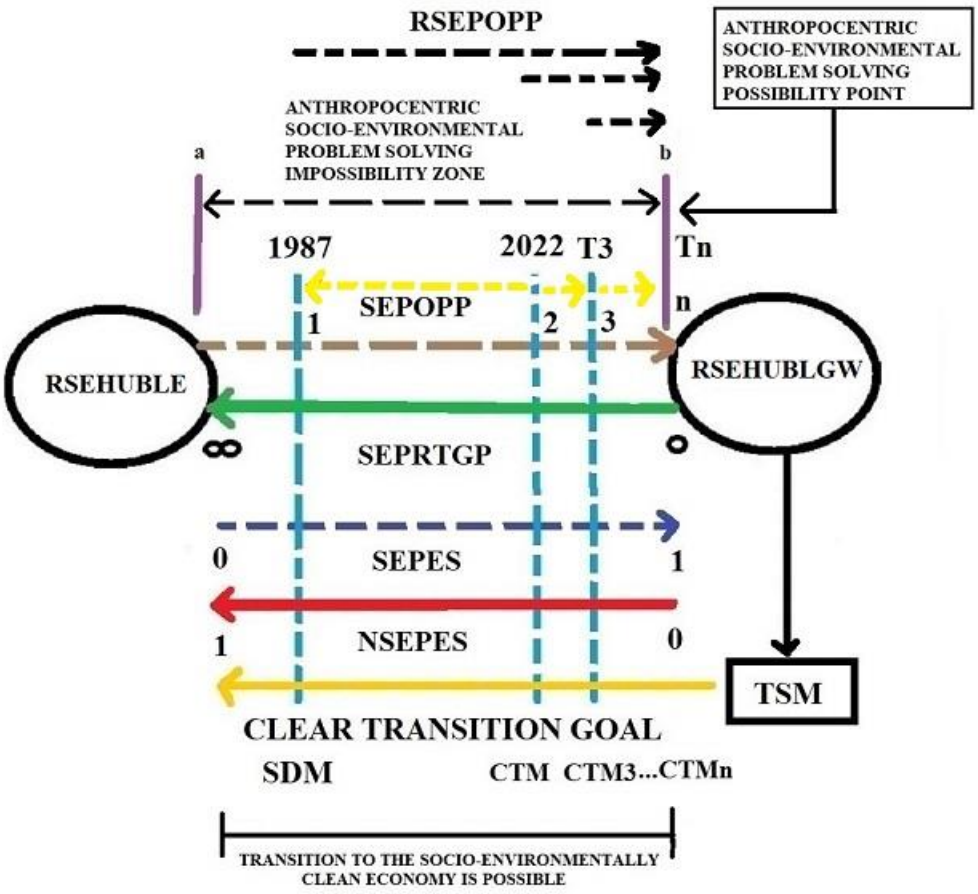

Figure 7 True sustainability markets (TSM) as the appropriate transition tool at the anthropocentric critical problem-solving possibility point

Notice now that since in Figure 7 there is a clear transition goal to bring the dirty circular market from point "b" towards the responsible socio-environmental human behavior led economy RSEHUBLE as indicated by the continuous golden arrow, using the true sustainability market TSM as the transition tool. See in Figure 7 too, that now the socio-environmental pollution reduction technology gap SEPRTGP is closed as indicated by the continues green arrow going from RSEHUBLWG to RSEHUBLE, and you can appreciate too in Figure 7 above too that since now no socio-environmentally polluting energy sources NSEPES have permanently substituted socio-environmentally polluting energy sources SEPES, then there is no longer an external pollution production problem as indicated by the broken SEPOPP arrow from RSEHUBLE to RSEHUBLGW.

Hence Figure 7 above shows the conditions under which transition to the socio-environmentally clean economy is possible as a permanent fix to the socio-environmental pollution production problem in dirty circular traditional markets, which are: i) Set a clear transition goal towards socio-environmental pollutionless markets; ii) Set up true sustainability markets; iii) invest in fully closing the socio-environmental pollution production technology gap; and iv) transition the true sustainability markets towards socio-environmentally clean market by

a process of substituting permanently socio-environmental polluting energy sources by no socio-environmental polluting ones to be able to produce at the lowest true sustainability market price possible until full transition happens at the point where the true sustainability market price (TSMP) equals the socio-environmentally clean market price (SECLMP). Finally notice that at the possibility point "b" (ASEPSPP) you can appreciate the following: i) the socio-environmental pollution reduction technology gap (SEPRTGP) is closed as the continuous green arrow from RSEHUBLGW to RSEHUBLE indicates, and ii) there are no remaining socio-environmental pollution production problems as the broken RSEPOPP arrow on top in Figure 7 above shows.

b) A world under possible but sometimes bearable economy black outs is possible

The possibility of economy black outs in the transition process from true sustainability markets TSM to socio-environmentally clean markets SECLM if socio-environmental polluting energy sources disappear suddenly is still there, but the closer we are at closing the socio-environmental pollution reduction technology gap problem when this happens, the more bearable economy black out are as they become extra incentive to close the remaining socio-environmental pollution reduction technology gap even faster as opportunities for further reducing socio-environmental pollution production come along, which means additional incentives to seek lower true sustainability market prices to maximize true sustainability based profits, a situation that can be appreciated with the help of Figure 8 below:

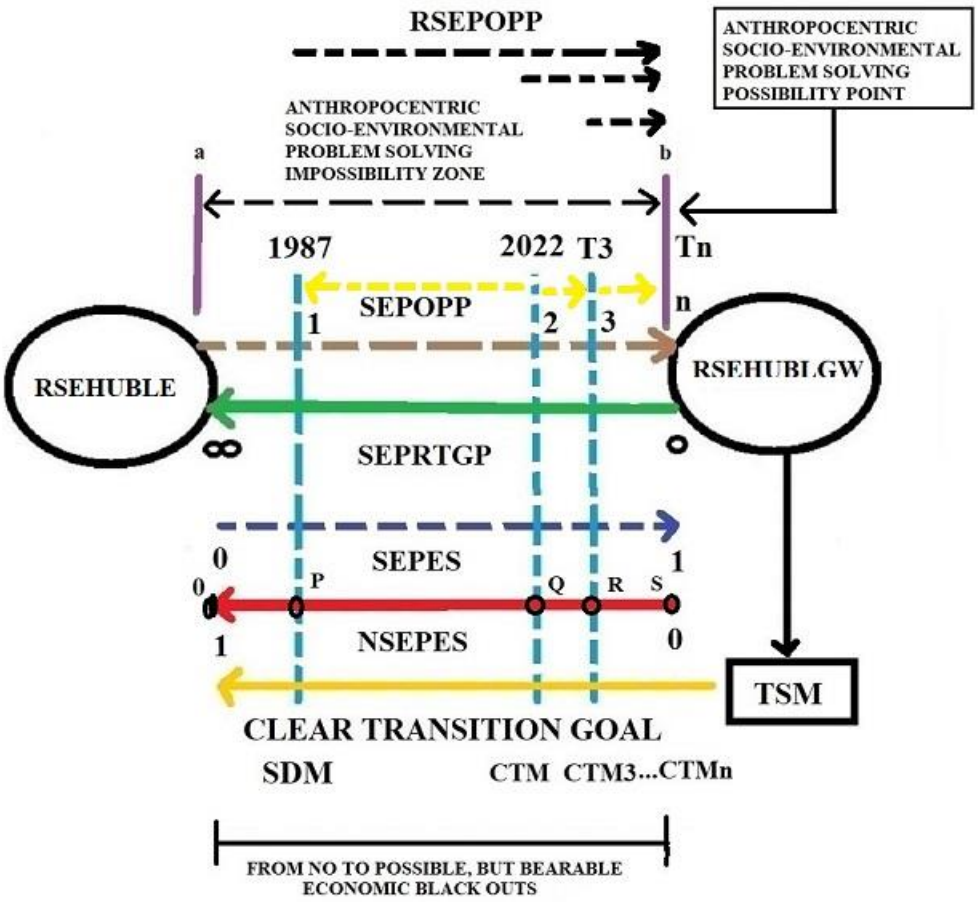

Figure 8 Transitions to socio-environmentally clean economies and economic black outs

Figure 8 above depicts the world under the anthropocentric socio-environmental problem solving possibility point (ASEPSPP) where economy black out are possible if socio-environmentally polluting energy sources SEPES suddenly disappear as indicated by the broken blue SEPES arrow, but all depend of the state of the socio-environmental pollution reduction technology gap problem at that moment. For example, a) if the transition to the socio-environmentally clean economy is at point "O" when the socio-environmental pollution reduction technology gap problem SEPRTGP is closed there will be no economy black outs if socio-environmental polluting energy sources disappear suddenly; b) if the transition to the socio-environmentally clean economy is at point "P", a dominant socio-environmentally economy exist as the use of no socio-environmental pollutions energy sources NSEPES is dominant, then there may be economy black outs, but they would be bearable as they would provide incentives to true sustainability market based producers to go the extra mile and close the remaining socio-environmental pollution reduction technology gap problem faster and make more money generating even lower true sustainability market prices; and c) if the transition to the socio-environmentally clean economy is at point "Q" or "R" or worse at point "S" we should expect economy black outs first and economy collapses soon after as not enough socio-environmentally clean energy or no enough no socio-environmental polluting energy sources

NSEPES is around to support those levels of true sustainability based economic activity in the absence of polluting energy sources.

Hence, figure 8 highlights the structure of the critical anthropocentric socio-environmental problem solving possibility point (ASEPSPP), and the possible transition route and the requirements to transition from irresponsible socio-environmental human behavior based economies to responsible socio-environmental human behavior ones.

The socio-environmental future we should have considered, but we did not, to fix the socio-environmental pollution production problem in 2022

Notice that Figure 8 above highlights a future where we close the socio-environmental pollution reduction technology gap problem SEPRTGP while socio-environmental polluting energy sources SEPES are still around, and set the goal to close it way before those socio-environmental polluting energy sources SEPES are exhausted, this is the socio-environmental future we needed to consider in 2022, but we did not, which is indicated in Figure 9 below:

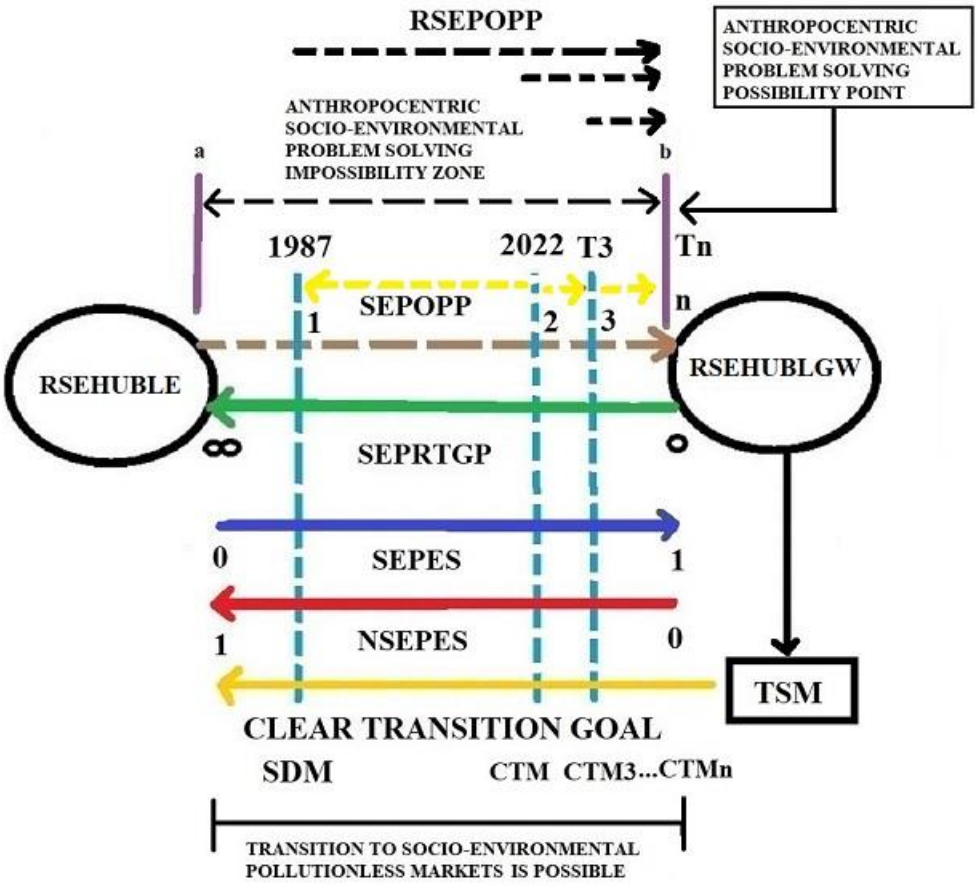

Figure 9 The socio-environmental future we should have chosen in 2022: Closing the socio-environmental pollution reduction technology gap SEPORTG while the socio-environmental polluting sources of energy SEPES are still around and when doing so solving the resource use inefficiency problem too.

The critical anthropocentric socio-environmental problem solving possibility point at point “b” in Figure 9 above indicates that to fix the socio-environmental pollution production problem SEPOPP we need to consider and take a future where: i) The priority goal is to transition towards socio-environmentally responsible human behavior led economies or socio-environmental pollutionless markets; b) To set up true sustainability markets TSM as the proper tool for such a transition; c) to invest in closing the socio-environmental pollution reduction technology gap problem to permanent leave behind socio-environmental polluting sources of energy SEPES; c) the faster we close this technology gap problem the easier would be to avoid economy black outs and collapses if socio-environmental polluting energy SEPES suddenly disappear. However, this is not the future was not considered in 2022 apparently as a future under a fully opened socio-environmental pollution reduction technology gap problem and a future that runs on socio-environmental polluting energy sources in the name if improving resource use efficiency was chosen.

Notice that transition to socio-environmentally clean market effort requires a serious shift in thinking and acting, for example we have to shift from macroeconomic and microeconomic thinking to true sustainability based macro-economics and true sustainability based microeconomic thinking to handle true sustainability market problems, we have to shift education programs at all levels kindergarten to university and gear them towards socio-eco-economic codependent choices or full codependent choices, and we have to have governments that stay outside true sustainability markets unless there is a true sustainability market failure so that true sustainability based producers and true sustainability based consumers assume the socio-eco-economic responsibility that comes with leaving the old traditional economy thinking behind and embrace the new world under true sustainability market in transition towards socio-environmentally clean markets.

The socio-environmental future we need to avoid in 2022, but we implemented it instead, exacerbating the global warming or critical problem issue while addressing the resource use inefficiency problem.

See that Figure 7 above stresses the future we should avoid, but which it was implemented, a world under socio-environmentally polluting sources of energy SEPES with no interest in closing the socio-environmental pollution reduction technology gap SEPRTGP, and hence a future that will lead to economic black outs sooner or later if alternative no socio-environmental polluting energy sources NSEPES are not readily available when socio-environmental polluting sources of energy SEPES are suddenly no longer around or are left behind, for example due to resources exhaustion or wars or deep socio-environmental policy, a situation described in Figure 10 below:

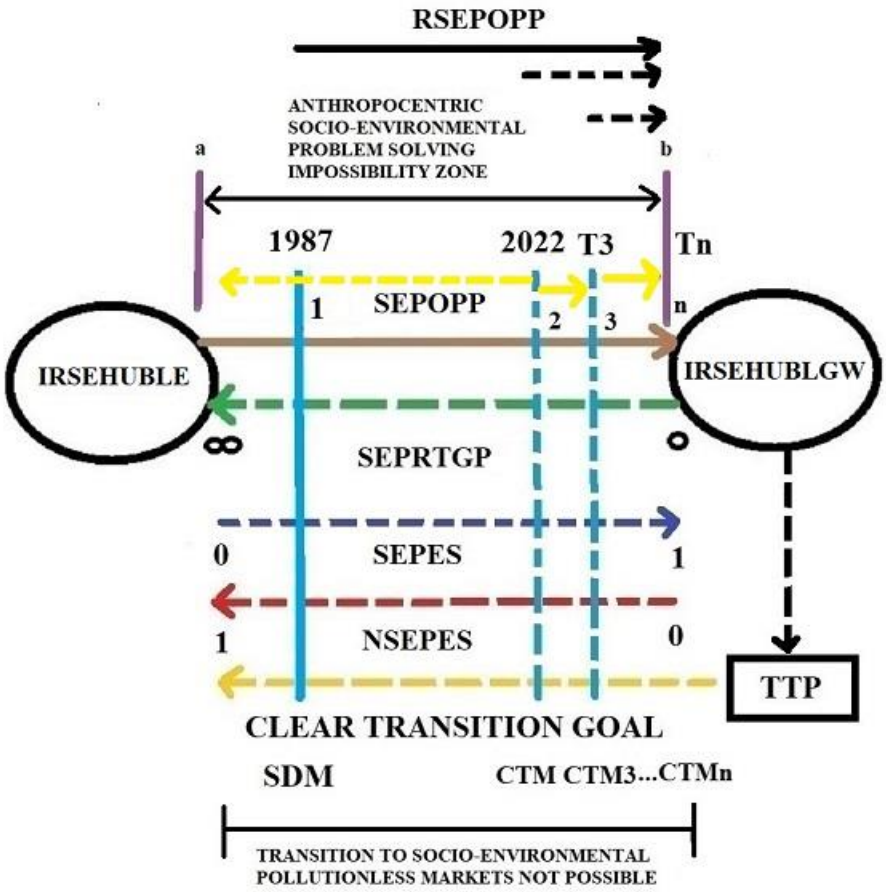

Figure 10 The future we should not have considered in 2022: Having soio-environmental polluting sources of energy SEPES disappear while the socio-environmental pollution reduction technology gap problem SEPORTG has not been addressed or closed because it is assumed not to be there when we know it is there.

Notice that the situation indicated in Figure 10 above, a world with a full socio-environmental pollution reduction technology gap problem SEPRTGP, is the same one where circular traditional markets CTM are set up, a world with no transition to socio-environmentally clean markets SECLM and a world of possible economy black out if tomorrow there are no more socio-environmental polluting sources of energy SEPES available as we lack the supply of no socio-environmental polluting energy sources NSEPES to make up for their absence as closing the socio-environmental pollution reduction technology gap problem SEPRTGP in circular traditional markets CTM is not a good business opportunity for circular traditional market producers and circular traditional market consumers to close it voluntarily.

The implications for past and current critical socio-environmental pollution production problem solving actions implemented since 1987

Closing the socio-environmental pollution production technology gap was not and it is not a goal in sustainable development thinking a la 1987 WCED(WCED 1987); it is not the goal

in dwarf green market thinking a la 2012 UNCSD too (UNCSD 2012a:UNCSD 2012b), and it is not the goal of circular traditional market thinking a la EUROPE since 2022 also (WB 2022) so all those no transition tools would not work in the impossibility zone, and eventually when socio-environmental polluting energy sources disappear there will be economy black outs as there would not be no no socio-environmental polluting energy sources NSEPES ready available to cover that gap to keep economies running efficiently. However, notice here that in the case of sustainable development markets SDM and in the case of dwarf green markets DGM, the greater the socio-environmental pollution reduction technology gap problem SEPRTGP, the greater the risk of economy black outs in case of as sudden lack of socio-environmental polluting sources of energy, but in the case of circular traditional markets CTM with a full socio-environmental pollution reduction gap problem SEPRGP embedded in it there will be economic black outs and later economy collapses at any time the supply of socio-environmental polluting energy sources suddenly disappear as they run profitably using socio-environmental polluting energy sources SEPES.

It seems to be important to point out that wars seem to increase the risk of economy black outs under an open socio-environmental pollution reduction technology gap problem as they can suddenly limit or cut all together access to socio-environmental polluting energy sources, requiring more expensive adjustments that if we had invested heavily in transitioning to the socio-environmentally clean economy from 1987 and its sustainable development markets or from 2012 and its dwarf green markets or from 2022 and its circular traditional markets, and by endorsing the future we needed to avoid, but we actually have implemented we are favoring in the process the development and wealth of the owners of the socio-environmental polluting sources of energy and circular traditional market producers instead of encouraging a new wave of owners and wealth of no socio-environmental pollution sources of energy and of new sustainability based producers and later socio-environmentally clean market's producers. In summary, the future described above under circular traditional markets is the future we should have not considered, but we actually have implemented as this is a future under a fully opened socio-environmental pollution reduction technology gap problem and a future that runs on socio-environmental polluting energy sources in the name if improving resource use efficiency was chosen, a future that under the sudden absence of polluting energy sources would lead to economy black outs and later collapses as there are no alternative non-polluting energy sources readily available at that moment.

You cannot solve the anthropocentric socio-environmental sustainability problem with tools that ignore scientific precedent and focused on solving something else

As pointed out above, all pictures above show the circular traditional market position in the anthropocentric socio-environmental problem-solving impossibility zone as a broken vertical blue line as it is not aimed at solving the socio-environmental pollution problem we have been

trying to solve since 1987 through sustainable development markets (WCED 1987) or geared to solve the environmental sustainability problem we have been addressing since 2012 Rio + 20 (UNCSD 2012a; UNCSD 2012b) using dwarf green markets. Circular traditional markets are aimed instead at solving the resource use inefficiencies associated with linear traditional market thinking, which means that circular traditional markets are socio-environmental pollution production markets just as linear traditional markets are as when circular traditional markets expand then socio-environmental pollution production takes place. In other words, whether in the linear traditional market world under resource use inefficiency or in the circular traditional market world under resource use efficiency socio-environmental pollution still takes place as those markets work and expand; and therefore, we cannot expect the socio-environmental sustainability problem be solved using tools not tasks with solving the critical problem like circular traditional markets as this circular markets work like the socio-environmental sustainability problem, and the scientific precedent and efforts aimed at dealing with this socio-environmental pollution problem since 1987 do not exist and can be assumed away.

Food for thoughts

a) Should we expect economy black outs if the socio-environmental pollution reduction technology gap is never closed and socio-environmental polluting sources of energy suddenly disappear? I think yes, what do you think? b) Can you truly fix a pollution production problem, be it social, environmental or socio-environmental pollution, by fixing a resource use efficiency issue created by that problem? I think No, what do you think? c) Can economies collapse in front of our eyes if we use tools for ever that are not aimed at fixing a critical problem, but aimed at fixing a consequence of the critical problem such as resource of inefficiency or over population problems? I think yes, what do you think? d) Should a world under socio-environmental clean markets be a human right? I think yes, what do you think? e) Would an actual total /full socio-environmental system collapse make a socio-environmental cost internalization policy be politically palatable? I think yes, what do you think?

Conclusions

First, it was pointed out that irresponsible socio-environmental human led economic behavior has been driving irresponsible socio-environmental behavior led global warming through an ongoing negative socio-environmental pollution production loop. Second, it was pointed out that the socio-environmental pollution production problem that irresponsible economic behavior in socio-environmental terms and irresponsible global warming trends in socio-environmental terms can be fixed, they can be patched and they can be ignored, and in 2022 case of going from linear traditional economic thinking to circular traditional economic thinking the need to solve the socio-environmental pollution production problem was ignored.

Third, it was pointed out that all the patches, being patching the critical problem such as sustainable development markets SDM and dwarf green markets DGM do or patching the consequence of the critical problem bypassing the fixing of the critical problem fall within the anthropocentric critical problem solving impossibility zone, which means they will never be able to fix the socio-environmental pollution production problem they are addressing or pretending to address as there is still a remaining socio-environmental pollution problem affecting the sustainability of the no transition tools like sustainable development markets or dwarf green markets as they work, and there is a full pollution production problem zone affecting the sustainability of circular traditional markets as they are delinked by assumption from the socio-environmental pollution production problem as they now pollute while under resource use efficiency. Fourth, it was highlighted that the socio-environmental pollution problem can only be fixed if we use proper transition tools towards socio-environmentally clean markets such as the use of true sustainability markets TSM, but the fix in this case must state clearly that the goal is to transition towards socio-environmental pollutionless markets, for which we need to close the socio-environmental pollution reduction technology gap problem so as to be able to permanently substitute socio-environmental polluting energy source by no socio-environmental polluting ones. Fifth, it was pointed out that when we use no transition tools to deal with the socio-environmental pollution production problem such as sustainable development markets then there is no path to transition to socio-environmentally clean economies as they operate under permanent socio-environmental market failure and if socio-polluting sources of energy disappear suddenly, due to exhaustion or war, there will be economy black outs as the socio-environmental pollution reduction technology gap is not closed and hence, no supply of no socio-environmental polluting energy sources is available, but in the case of circular traditional markets as they have a fully open socio-environmental pollution reduction technology gap problem there will be economic black outs and collapses at any point where socio-environmental polluting energy sources disappear suddenly. Sixth, it was stressed that when we use proper transition tools such as true sustainability markets there is a path towards socio-environmentally clean economies as they operate freely producing at the lowest true sustainability market price (TSMP) possible until the true sustainability market price becomes the socio-environmentally clean market prices (SECLMP) with a socio-environmental margin (SM + EM) of zero so that TSMP = SECLMP, where SM + EM = 0. Seventh, it was indicated that under true sustainability market transitions when the socio-environmental technology gap problem is fully closed and suddenly socio-environmental polluting energy sources disappear suddenly there are no economy black outs, but if polluting sources of energy disappear just before the socio-environmental pollution reduction technology gap problem is closed, then the economy black outs provide last push for incentives to fully closed the gap as rapidly as possible as now socio-environmental pollution reduction is now a good profit making opportunity. And when the socio-environmental pollution reduction technology gap is too wide such as when you are in a dominant socio-environmental polluting energy based economy while in transition and socio-environmental polluting sources suddenly disappear, there will be economy black outs and then true sustainability market transition

collapses as there would be not enough no socio-environmental polluting energy sources to sustain the true sustainability transition then. Eight, in general it was shown that the socio-environmental world we need to considered, but we did not, is the one where there are no socio-environmental pollution reduction technology gap problems, and where we can run economies using fully or only no socio-environmental polluting energy sources; and it was indicated that the world we needed to avoid considering, but one we have actually implemented, is the world we are living in since 2022 under circular traditional economic thinking, where the world runs on socio-environmental polluting energy sources, but under socio-environmental resource use efficiency, and where closing the socio-environmental pollution reduction technology gap problem does not make it as its central goal because the pollution production problem is assumed away when socio-environmental problem solving circularity should have been the goal in 2022 if fixing the socio-environmental problem linked to both linear market thinking and circular market thinking was the aim. And finally, it was indicated that no transition tools a la sustainable development market internalize some of the socio-environmental pollution production problem while no transition tools a la circular traditional market thinking internalize zero socio-environmental pollution production problem as they are focused on fixing the resource use inefficiency of the linear traditional market only, and hence both no transition tools cannot be expected to fix the socio-environmental pollution problem because sustainable development markets are technically socio-environmental patches and circular traditional markets externalized all their socio-environmental pollution production problem by means of assuming the pollution creation problem away as it does not exist when it actually exists.

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