Peer review

This is more an essay and/or commentary paper, rather than a review or an original article. It therefore falls outside the purview of the Journal and cannot be accepted as written.
However, As a point of note, the author (and many who advocate for this closed loop) overlook that the process of closing the loop is not without the expenditure of energy derived from fossil fuels. For example, in sections 5.1 through 5.3, the NaOH, acetic acid, cellulase (enzymes) etc. need to be produced (often using fossil fuels) to enable use in this “closed loop”. Fermentation tanks, stirring content, elevated temperatures during fermentation, etc. require power (energy derived from coal or fossil fuels), sufuric acid, ethanol, and then the final separation of the product (using fiiltration, centrifugation, precipitation, electrolysis…all of which require power mostly derived from fossil fuels. The final element in this ‘closed loop’ is maintaining blockchains, which require enormous amounts of energy. Therefore, in the zeal to close the loop, many authors forget that closing the loop is itself carbon-positive, emitting more GHG in the atmosphere than it would if the product were landfilled or incinerated. I was hoping to find quantitative estimates of all these steps and the manuscript providing evidence that the closed loop is carbon-negative (or at least carbon neutral).
I am willing to reconsider this manuscript if the author provides detailed analysis and shows that the entire process for closing the loop requires less energy than incinirating the product before subjecting it to the closed loop. I want detailed analysis of the energy required to close the loop including overlooked items such as energy used for mixing (motors), for filtration (usually with compressed air, which itself requires energy to produce and ship), energy used for centrifugation for electrolysis (NaOH), for manufacture from other raw materials (acetic acid is made using raw matreials, which themselves require energy to produce), energy required to produce enzymes, to operate fermentation tanks (which require various chemicals such as yeast, agar, buffers, surfactants,… which themselves requires fossil fuel energy to manufacture and ship). Other overlook factors are shipping, which adds substantially to green house emissions because of the use of fossil fueled (diesel) trucks. The other major GHG emirror is the maintanence of blockchains, which require enormous amounts of computing power (for which cooling is required, often using fossil fuels).
If the author presents this detailed analyssi, I can consider this as a review paper, rather than reject it being a commentary or essay, which fall outside the purview of the Journal. This is the reason I am giving this manuscript a ‘revise and resubmit’ decision to enable the author to respond if they wish re-review.

Dear Editor,

We are happy to submit a revision of our paper entitled “Industrial symbiosis and circular economy applied to the textile industry with realistic considerations of socioeconomic, environmental, ethical, scientific, and technical dimensions.” We thank the reviewers for their recommendations. We have addressed all their comments, which has improved the quality of our manuscript.

We performed 8 minor revisions and all changes are highlighted in the manuscript:

#	Where	Before	After	Comments
1	**All**	-	-	Changed Formatting
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3	**Methods**	-	Implemented a Search String method, shown in Table 1.	- Clarity of methodology.
4	**All**	-	Additional CNN Architecture For Evaluation Of Automation Process.	- Adds to overall technical viability.
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8	**Main Body**	-	**Table 6.** Comparison of all emissions.	Compares all processes and emission type comparison.

In case of requiring any further information, please do not hesitate to contact us.
Sincerely yours,
Kyla Kim, Dalton George

Thank you for incorporating my comments . I believe the manuscript is improve but needs significantly more work. See my comments and concerns below.

1. you state “The linear model of the Seoul textile industry is driven by cultural norms of “fast fashion” and reinforced by political greenwashing to deceive customers into believing that their production-consumption process is eco-friendly.” This is an unfounded accusation unless corroborated by evidence. Please cite references germane to the context of the Seoul textile industry or remove this statement (and others that are uncorroborated by proper references) from the manuscript. another example is the statement " The inability to manage the resulting waste is increasingly polluting the surrounding environment and creating socio-economic turmoil in Korean society." Please refrain from subjective opinion statements throughout the manuscript or provide evidence in the form of references. Yet another example “..The center was created in 2017, and not a lot of progress based on the processing of textile waste has been made….” Provide evidence. More examples are listed below
a. These fast fashion companies rarely pay attention to the life cycle analyses of the textile products that they create, mainly because they focus on the economic value of the clothing, prioritizing quantity over quality to decrease price.

2. Please make sure you have permission to use images and photographs presented in the paper (as in Figure 2). Please note that following all legal and copyright laws is the author’s responsibility since the author retains the copyright of any paper published in this Journal.

3. Figure 3 needs units. Is the living wager per year? per week? per month? do the wages have the same units?

4. Table 3 needs time units. 13.2 kg textiles per person PER YEAR ? Also, where does this number come from ? Please provide references for every fundamental quantity that is presented in the manuscript. Please thoroughly check the manuscript for unsubstantiated or non-referenced quantities and provide proper references and/or origination/use/disposal calculations or derivations. Also, not every person of those 51.62 million people is going to use fast fashion. About half the population is between the ages of 15 to 50 (see: https://en.wikipedia.org/wiki/Demographics_of_South_Korea), who are anticipated to use fast fashion, hence this brings down the total population using fast fashion to about 25 million people. Please provide realistic contextual numbers throughout the manuscript.

5. You state “…ndustrial Process: The decomposition emission rate for textiles is 0.7kg CO_2/kg. Since 66% is landfilled, 66% of 681,516,000 = 449,800,560 kg CO_2. The incineration emission rate for textiles is 2.525kg CO_2/kg. Since 30% is incinerated, 30% of 681,516,000 = 204,454,800 kg CO_2….” As mentioned in point 4, you will need to provide references for primary numbers - for example, where does the 0.7 kg CO_2/kg and the 2.525 kg CO_2/kg numbers originate from. Provide references. Also, your calculations appear to be incorrect; the 449800560 is the Kg of textiles, not CO_2. The CO_2 will be that number multiplied by 0.7. Similarly for incineration. Please check calculations throughout the manuscript. Similarly, you state in the manuscript that “..Since an average garment require 16.43 kg CO_2 to produce…” provide references.

6. provide references for “..0.5 kg NaOH (per 1kg of textiles)…”, “….”…0.24kg Acetic Acid (per 1kg of textiles)…"… since Table 8 does not have time units either (see point 3), I have no way to reconcile the numbers from the chemical and biological footnote 2 (I calculated 48 kg CO_2 per 24 hours for each).

Please provide enough information in the manuscript so that the reader can check all your calculations. For example, there is not a way for me to check that the Industrial process numbers in Table 5 are correct.

7. Your blockchain calculations are significantly underestimated. While the numbers may be true for creating and input of information into the blockchain, the blockchain has to be maintained by running on cloud or web servers 24/7 lifelong for checking the veracity of information and transactions. This cost needs to be figured into the CO2 emissions. Please perform a search of the literature and include these costs with references.

8. What you have proposed - and others before you - is not really a circular solution, but a time prolongation of the cycle from use to waste. The amount of consumed fabric does not decrease (in-fact, it continues to increase) because of this so-called ‘circular economy’; it just decreases the rate of relative emission of CO2. Hence, the rate of relative emission of CO2 also increases with time; meaning that, the objective of lowering CO2 emissions over time is not achieved. Please discuss this in the manuscript.
In summary, this manuscript needs traceable numbers with adequate references, purge unreasonable assumptions and calculations; provide correct calculations; provide more discussion on the how and why this is a ‘circular economy’ and why and how it reduces CO2 emissions over time. More depth, analysis and correct calculations with traceability and references are needed.

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10	**Abstract**	-	while also commenting on the limitations of the circular model.	-	Commented on the need to state that the circular economy can be replicated to our best efforts, but there are definitely limitations to the circular economy.
11	**Table 2**	**-**	**Formulae [28]** **Factor #(Korea Average) [28,29,30]**	-	Commented on the validity of the data of emission factors; listed references 28,29,30
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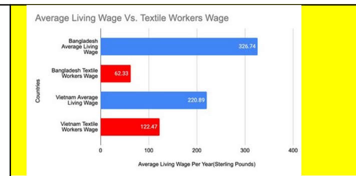
14	**Figure 2**	**Please make sure you have permission to use images and photographs presented in the paper (as in Figure 2).**	-Above are photos of utilizations of the fabrics and the material bank. Some fabrics have been made into mesh boots, others cushions, jump rope, wallets, or even exhibition artwork (hanbok). [32]		Photos in Figure 2 are taken by author; cited author as the source of images

15	**Figure 3**	-			Includes units: "Average Living Wage Per Year In Sterling Pounds"
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22	**Table 5**	**<u>Reference missing</u>**	3: All carbon emission factors below were calculated using reference 28.	-	Addressed issue of provide references for "..0.5 kg NaOH (per 1kg of textiles)…", "….”…0.24kg Acetic Acid (per 1kg of textiles)…"

23	**Appraisal of Solution**	-	However, it is necessary to state that this system is not a perfect implementation of the circular model. The circular model, although optimal in theory, has limitations, especially in the realistic sense[38]. Although the overall rate of CO2 reduces, it only prolongs the lifecycle of the waste product and ends up accumulating eventually[38]. Nonetheless, the circular system allows a prolongation of the usage of the waste stream before it reaches the end-of-cycle and has an overall positive environmental effect.	- To state limitations of the circular economy

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1.Please check the number obtained from "….Since a kilogen of average garment require 16.43 kg CO2 [36] to produce, 205,369,534 kg textiles x 16.43 kg CO2/kg = 337,422,137 kg CO2….." should the number be 16.43 or 1.643 ? Please double check the final number as well.

2.Table 5, explanation point 2) i am getting a number = 69.5, not 58. Please double check and also check all derived calculations from that number

3.Approximately 48/69 = 70% of your emissions is due to blockchain system integration. How important is it to the process? Can you live without it? if you can, that will mean a reduction of 70% in emissions from the chemical/biological processes. Please explain and discuss in the manuscript. Also discuss that most of the nodes of the blockchain are integrated with miners who obtain their energy using renewable resources such as geothermal or hydropower. Therefore, it is important to obtain blockchain power from renewable resources.

4.Please include in the manuscript, the following content or any variation you think fit "The fact that even though recycling of textiles is net CO2 emissions negative; emitting only 30% of CO2 when compared to if the textiles were incinerated or landfilled after one use; it is still not widely used. This is primarily because of logistical contraints, manufacturability, automation unsuitability and supply chain continuity. Recycling facilities need a steady stream of used garments. In the absence of a dedicated collection infrastructure, this is as -yet not obtainable. The process is not amenable to automation and is labor intensive because many extraneous and non-recyclable components, that are not compatible with the recycling process need to be manipulated or removed such as zippers, buttons, laces, decorative epauluttes and paraphernalia. The recycling process involves deconstruction of garments using procedures such as alkali treatment, bleaching and exposure to heat, that degrade the original quality of the polymeric materials to the point where conventional processes can no longer use this as acceptable raw material for manufacturing garments. Consequently, the re-processed raw material must be downcycled to produce other products. This necessitates incorporating the technology, logistics, automation into the recycling plant to enable manufacture of the downcycled product. If this is not possible, it then necissitates re-shipping and re-selling the re-processed raw material to other off-site industries; thereby creating its own logistical challenges. Hence even though the recycling process - considered in isolation - is net CO2 negative, challenges in deconstructing the existing product into re-cycled raw material, integrating the process into other downstream processes or downcycled products presents non-trivial, resource and man-power intensive and logistical challenges."

5.Refernces need to order in sequential order in the manuscript.

6.Please rewrite the conclusion and abstract to include a quantitative summary of the findings. The abstract and conclusion are the most read parts of the manuscript and need to provide a concise summary of all the important points covered in the manuscript.

7.Make sure that the units (Kg, g etc.) are separated from the numbers by a space in between.

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43.**5**	44.**Methods**	45.-	46.**Table 2.** Outlining the carbon emissions of each sector using the guidelines for carbon emission calculation.	47.To set up metadata on statistical analysis of CO2 emissions
48.				
49.	50.	51.	52.Statistical evaluation of carbon emissions for the process was calculated according to the IPCC (Intergovernmental Panel For Climate Change) guidelines of using region-specific emission factors in regards to the energy, electricity, transport, and industrial process sectors. The IEA(International Energy Agency) reported on Korea-specific emission factors for 2023 (25). Formulae	53.
54.				
55.	56.	57.	58.for each sector is as follows:	59.
60.**6**	61.**Main Body**	62.-	63.**Table 3.** Current methods of textile waste processing and their emissions.	64.In order to calculate the carbon footprint of the current methods: landfilling and incineration.
65.**7**	66.**Main Body**	67.Only 68.Blockchain-r elated technical interventions	69.*Technical Integration And Optimization of Solution (added ML learning algorithm for CNNs)*	70.In order to enhance the optimization process such that more textiles are processed and that less material is wasted even during the process.
71.**8**	72.**Main Body**	73.-	74.**Table 6.** Comparison of all emissions.	75.Compares all processes and emission type comparison.
76.**9**	77.**Introducti on**	78.**The linear model** 79.**of the Seoul textile** 80.**industry is driven**	81.As a rapidly developing city with over 841 different textile companies	82.- Commented on the subjectivity of the manuscript; changed problem areas
83.				
84.	85.	86.**by cultural norms** 87.**of "fast fashion"....** 88.**The inability to** 89.**manage the** 90.**resulting waste is** 91.**increasingly** 92.**polluting the** 93.**surrounding** 94.**environment and** 95.**creating socio-economic**	96.[25] and around 2,364,000 residents between the age of 15-40 [26] (the most likely age range to engage in "fast fashion" [27]), between 54,677 to 64,075 tonnes of textile waste is generated from the Seoul district annually and only 5% is recycled, which shows the significance of the impact of "fast fashion" on the environment o Korea [16]	97.
		100.	101.	102.
		105.	106.	107.
108.**10**	109.**Abstract**	110 .-	111.while also commenting on the	112.- Commented on the need to state that the circular economy can be replicated to our
113.				
114.	115.	116.	117.limitations of the circular model.	118. 119.best efforts, but there are definitely limitations to the circular economy.
120.	121.	122.	123.	124. 125.
126.**11**	127.**Table 2**	128 .-	129.**Formulae [28]** 130.**Factor #(Korea Average) [28,29,30]**	131.- 132.Commented on the validity of the data of emission factors; listed references 28,29,30
133.	134.	135.	136.	137. 138.
139.**12**	140.**Main Body**	141.**The center was** 142.**created in 2017…**	143.The center was created in 2017[13], and not a lot of progress based on the processing of textile waste has	144.- 145.- 146.Commented on validity of information; cited 13 to back up the year that the center for formed. 147.The evidence for the lack of development is given by the plaza's website, which is provided by reference 13.
148.	149.	150.	151.been made as the	152. 153.
154.	155.	156.	157.most recent post, on	158. 159.
160.	161.	162.	163.July 17th, 2023,	164. 165.
166.	167.	168.	169.shows an identical	170. 171.
172.	173.	174.	175.structure that was in	176. 177.
178.	179.	180.	181.the plaza in 2017.	182. 183.
184.	185.	186.	187.	188. 189.
190.**13**	191.**Main Body**	192.**These fast** 193.**fashion companies**	194.Fast fashion companies focus on the economic value	195.- 196.Commented on subjectivity of statement and the evidence for claim; changed wording, cited reference 31
197.				
198.	199.	200.**rarely pay attention to the life cycle analyses of the textile products that they create, mainly because they focus on the economic value of the clothing, prioritizing quantity over quality to decrease price.**	201.of the clothing, prioritizing quantity over quality to decrease price [31].	202.

203.

204.**14**	205.**Figure 2**	206.**Please make sure you**	207.	208.- Above	209.-	210.Photos in Figure 2 are taken by author; cited author as the source of images	211.

			ar e ph ot os of uti liz ati on s of th e		
212.	213.	214.**have**	215.fabrics and the	216.	217.
218.	219.	220.**permission**	221.material bank. Some	222.	223.
224.	225.	226.**to use**	227.fabrics have been	228.	229.
230.	231.	232.**images and**	233.made into mesh	234.	235.
236.	237.	238.**photograph**	239.boots, others	240.	241.
242.	243.	244.**s presented**	245.cushions, jump rope,	246.	247.
248.	249.	250.**in the paper**	251.wallets, or even	252.	253.
254.	255.	256.**(as in**	257.exhibition artwork	258.	259.
260.	261.	262.**Figure 2).**	263.(hanbok). [32]	264.	265.
266.**1 5**	267.**Figure 3**	268 -:-	269. 	27 0.-	271.Includes units: "Average Living Wage Per Year In Sterling Pounds"
272.	273.	274.	275.	276.	277.
278.**1 6**	279.**Table 3**	280.**Already** 281.**mentioned the source for 13.2kg/pers on in** amount of fibers used	282.13.2kg textiles/person 283.[15] x15,558,298 people (South Korean Population between 15-39[27]	28 4.- 28 5.-	286.Had already mentioned reference for data point 13.2kg textiles/person annually, but added additional reference 15 287.Updated population number to between 15-39 with reference 27 for the fact that fast fashion is mainly done by that specific age range
288.					
289.	290.	291.per person	292.	293.	294.
295.	296.	297.annually	298.	299.	300.
301.	302.	303.rose from	304.	305.	306.
307.	308.	309.7.6kg/person	310.	311.	312.
313.	314.	315.in 1995 to	316.	317.	318.
319.	320.	321.13.2kg/perso	322.	323.	324.
325.	326.	327.n in 2018,	328.	329.	330.
331.	332.	333.which is	334.	335.	336.
337.	338.	339.nearly a	340.	341.	342.
343.	344.	345.82%	346.	347.	348.
349.	350.	351.increase	352.	353.	354.
355.	356.	357.[15].	358.	359.	360.
361.	362.	363.	364.	365.	366.
367.**1 7**	368.**Table 3**	369 -:-	370.Transport1[28] 371.Industrial Process (Energy, Fuel Emissions, Electricity)2[28,29,3 0]	37 2.- -	373.Cited sources of emission factor 28,29, 30
374.**1 8**	375.**Main Body**	376.**…ndustrial** 377.**Process: The**	378.1) Industrial Process: Since 66% of the total textiles is landfilled, 66% of	37 9.- -	380.Corrected the wrong calculations Cited reference 28 for the emission factor
381.	382.	383.**decompositi** 389.**on emission**	384.205,369,534 kg	385.	386.
387.	388.		390.total textiles = 135,543,892 kg	391.	392.
393.	394.	395.**rate for**	396.textiles. The	397.	398.
399.					
400.	401.	402.**textiles is 0.7kg CO2/kg. Since 66% is landfilled, 66% of 681,516,000 = 449,800,560 kg CO2. The incineration emission rate for textiles is 2.525kg CO2/kg. Since 30% is incinerated, 30% of 681,516,000 =**	403.decomposition emission rate for textiles is 0.7kg CO2/kg[28], so 135,543,892 x 0.7 404.= 94,880,724 kg CO2 Since 30% is incinerated, 30% of 205,369,534 kg total textiles = 61,610,860kg textiles. The incineration emission rate for textiles is 2.525kg CO2/kg, so 61,610,860 x 405.2.525 = 155,567,422 kg CO2	406.	
407.					
408.	409.	410.**204,454,800**	411.	412.	413.
414.	415.	416.**kg CO2…."**	417.	418.	419.
420.	421.	422.	423.	424.	425.
426.**1 9**	427.**Table 5**	428 -:-	429.Industrial Process(Energy, Fuel Consumption, Electricity) 2 [28]	43 0.-	431.Cited 28 as reference for all of the emission factors for the chemical manufacturing processes, such as the sodium thioglycate.
432.**2 0**	433.**Main Body**	434 -:-	435.Since a kilogen of average	43 6.-	437.Commented on validation of statistic 16.43kg, added citation 36
438.	439.	440.	441.garment require	442.	443.

			16.43 kg CO_2 [36] to produce, 205,369,534 kg textiles x 16.43 kg CO_2/kg = 337,422,137 kg CO_2, which shows that this process is certainly a net loss of carbon emissions compared to producing new textiles.		
2 1	**Main Body**	-	The total emission factor is 50.24 kg CO_2/process, and since 100kg textiles is transported per process at capacity [35]. Therefore, the total emission factor per kg is 0.50 kg CO_2. Assuming that 50% of the total of 205,369,534 kg textiles is used for biological processes, 0.50 x 0.5 x 205,369,534 = 51,342,383 kg CO_2, The total emission factor is 68.53 kg CO_2/process, and since 100 kg textiles is transported per process at capacity [35].	-	Re-calculated with consideration of block chain transactions, used to store the information and transfer it. Added reference 37.
			Therefore, the total emission factor per kg is 0.69 kg CO_2. Assuming that 50% of the total of 205,369,534 kg textiles is used for chemical processes, 0.69 x 0.5 x 205,369,534 = 70,852,489 kg CO_2		
			i)	(kWhpertransact	

819.	820.	821.	822.	823.k	824.
825.	826.	827.	828.	829.W	830.
831.	832.	833.	834.	835.h	836.
837.	838.	839.	840.	841.=	842.
843.	844.	845.	846.	847.4	848.
849.	850.	851.	852.	853.8	854.
855.	856.	857.	858.	859..	860.
861.	862.	863.	864.	865.7	866.
867.	868.	869.	870.	871.7	872.
873.	874.	875.	876.	877.k	878.
879.	880.	881.	882.	883.g	884.
885.	886.	887.	888.	889.C	890.
891.	892.	893.	894.	895.O	896.
897.	898.	899.	900.	901.2	902.
903.**22**	904.**Table 5**	905.**Reference** 906.**missing**	907.3: All carbon emission factors below were calculated using reference 28.	908.-	909.Addressed issue of provide references for "..0.5 kg NaOH (per 1kg of textiles)…", "….."…0.24kg Acetic Acid (per 1kg of textiles)…"
910.**23**	911.**Appraisal of Solution**	912.-	913.However, it is	914.-	915.To state limitations of the circular economy
916.	917.	918.	919.necessary to state	920.	921.
922.	923.	924.	925.that this system is	926.	927.
928.	929.	930.	931.not a perfect	932.	933.
934.	935.	936.	937.implementation of	938.	939.

940.

941.	942.	943.	944.the circular model. The circular model, although optimal in theory, has limitations, especially in the realistic sense[38]. Although the overall rate of CO2 reduces, it only prolongs the lifecycle of the waste product and ends up accumulating eventually[38]. Nonetheless, the circular system allows a prolongation of the usage of the waste stream before it reaches the end-of-cycle and has	945.

946.

947.	948.	949.	950.an overall positive	951.	952.
953.	954.	955.	956.environmental effect.	957.	958.
965.**PLEASE START HERE**					966.
967.**24**	968.**Main Body**	969.**"….Since a** 970.**kilogen of average garment require** 971.**16.43 kg**	972.Since a kilogram of average garment require 973.16.43 kg CO2 [36] to produce, 205,369,534 kg	974.- 975.-	976.The calculation was done incorrectly. It is 16.43kg CO2 per kg of textile, which leads to the new calculation. 977.The chemical and biological processes were rechecked to ensure that they were per kg of textile.
978.	979.	980.**CO2 [36] to**	981.textiles x 16.43 kg	982.	983.
984.	985.	986.**produce,**	987.CO2/kg =	988.	989.
990.	991.	992.**205,369,534**	993.3,374,221,443 kg	994.	995.
996.	997.	998.**kg textiles x**	999.CO2,	1000.	1001.
1002.	1003.	1004.**16.43 kg**	1005.	1006.	1007.
1008.	1009.	1010.**CO2/kg =**	1011.	1012.	1013.
1014.	1015.	1016.**337,422,137**	1017.	1018.	1019.
1020.	1021.	1022.**kg CO2….**	1023.	1024.	1025.
1026.	1027.	1028.**(number**	1029.	1030.	1031.
1032.	1033.	1034.**was**	1035.	1036.	1037.
1038.	1039.	1040.**inaccurate)**	1041.	1042.	1043.
1044.	1045.	1046.	1047.	1048.	1049.
1050.**25**	1051.**Table 5**	1052.**58, not 69.53**	1053.0.55+0.5+0.18+0.15+0.01+0.1+0.16+0.748+18.36+48.	1054.-	1055.Changed calculator and all according calculations
1056.	1057.	1058.	1059.77 = 69.53 kg/per	1060.	1061.

1062.

1063.	1064.	1065.	1066.process/100kg textiles	1067.

			processed per process	
1068.**2 6**	1069.**Appraisal** 1070.**of Solution**	107 1.-	1072.Additionally, it is crucial to emphasize that approximately 70% of the carbon emissions of the proposed process is derived from the blockchain system. This reemphasizes the sheer energy consumption of blockchain. The blockchain process is used in order to connect different suppliers together in order to enhance the concept of industrial symbiosis; however, if the security of the blockchain system	10 73.-

1074.

1075.	1076.	1077.	1078.can be replicated with other communication systems through mutual trust and collaboration between the corporations, the blockchain system is not necessary, which would decrease the carbon footprint of the process even further. Moreover, if the blockchain system is to be used, it is critical to derive the power source from renewable energy such as wind energy, solar energy, geothermal energy, or tidal energy.	1079.

1080.

1081.	1082.	1083.	1084.	1085.
1086.**2 7**	1087.**Appraisal of the Solution**	108 8.-	1089.Lastly, the fact that even though recycling of textiles is net CO2 emissions negative, emitting approximately 30% less emissions compared to incineration or landfilling, it is not widely used primarily because of logistical contraints, manufacturability, automation unsuitability and supply chain continuity. Recycling facilities need a steady stream of used garments.	10 90.-

1091.

1092.	1093.	1094.	1095.In the absence of a dedicated collection infrastructure, which is the case for most countries other than a few, including South Korea, the process is not easily expandable. The process is not amenable to automation and is labor intensive because many extraneous and non-recyclable components, that are not compatible with the recycling process need to be manipulated or removed such as	1096.

1097.

1098.	1099.	1100.	1101.zippers, buttons, laces, decorative epauluttes and paraphernalia. The recycling process involves deconstruction of garments using procedures such as alkali treatment, bleaching and exposure to heat, that degrade the original quality of the polymeric materials to the point where conventional processes can no longer use this as acceptable raw material for manufacturing garments.	1102.

1103.

1104.	1105.	1106.	1107.Consequently, the re-processed raw material must be downcycled to produce other products. This necessitates incorporating the technology, logistics, automation into the recycling plant to enable manufacture of the downcycled product. If this is not possible, it then necissitates re-shipping and re-selling the re-processed raw material to other off-site industries; thereby creating its own logistical	1108.

1109.

1110.	1111.	1112.	1113.challenges. Hence even though the recycling process -considered in isolation - is net CO2 negative, challenges in deconstructing the existing product into re-cycled raw material, integrating the process into other downstream processes or downcycled products presents non-trivial, resource and man-power intensive and logistical challenges.	1114.
1115.**2 8**	1116.**References**	1117.	1118.Corrected list.	1119.

1120.

1121.**2 9**	1122.**Conclusion /Abstract**	1123.	1124.Added on all aspects requested.	1125.

1126.**In case of requiring any further information, please do not hesitate to contact us.**

Sincerely yours,

Kyla Kim, Dalton George

Thank you for addressing my comments. Before I decide to accept,

1127.please arrange the references in sequential ascending order in the text with corresponding numbers in the References section. Please make sure that each reference corresponds to the number in the references section.
1128.Please Unbold the references in the text and enclose them with curved () brackets; not square [ ] brackets.
1129.Please recheck references highlighted in yellow. I cannot seem to find them on the web.

Thank you for addressing my comments. Accepted.